

VC-EVCC

User Manual

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Reference Documents

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[1]	DIN	DIN 70121:2014-12	2014-12
[2]	DIN	DIN EN 61851-23 – Konduktive Ladesysteme für Elektrofahrzeuge – Teil 23 Gleichstromladestationen für Elektrofahrzeuge (IEC 61851-23:2014)	2014
[3]	DIN	DIN EN 61851-23 Berichtigung 1 – Konduktive Ladesysteme für Elektrofahrzeuge – Teil 23 Gleichstromladestationen für Elektrofahrzeuge (IEC 61851-23:2014/COR1:2016)	2014
[4]	IEC	IEC 61851-1:2010	2010
[5]	ISO	ISO 15118-2:2014(E)	2014
[6]	ISO	ISO 15765-2:2011	2011
[7]	ISO	ISO 14229-1:2013(E)	2013
[8]	VDV	VDV 261 specification	2018
[9]	SAE	SAE J3068 Electric Vehicle Power Transfer System Using a Three-Phase Capable Coupler	2018
[10]	SAE	SAE J1772 Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler	2017



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1 Introduction

This chapter contains relevant information about Product Compliance, Warranty and Safety Instructions. Observe all local and regional laws and regulations as well as the safety regulations mentioned in this document. This Manual is valid for the VC-EVCC and the related product variants (trade names):

- > VC-EVCC Series
- > VC-EVCC Evaluation

In the following all product variants are referred to as VC-EVCC unless expressly stated otherwise.

1.1 About This Manual

In the tables below you will find the notation and icon conventions used throughout the manual.

Symbol	Utilization
i	This symbol provides you with notes and tips that facilitate your work.
1	Danger Type and source of the hazard
	Consequences of non-complianceMeasures for avoiding the hazard
1	Warning Type and source of the hazard
	Consequences of non-complianceMeasures for avoiding the hazard
1	Caution Type and source of the hazard
	Consequences of non-complianceMeasures for avoiding the hazard
	This symbol indicates where further information is available.
Ê	This symbol indicates where examples are available.
;; /	This symbol indicates where step-by-step instructions are available.
	This symbol can be found in text areas where changes of the currently described file are allowed or necessary.



$\boldsymbol{ imes}$	This symbol indicates that you must not change these files.
	This symbol indicates that multimedia files are available.
<u> </u>	This symbol indicates where introductory information is available.
	This symbol indicates where basic knowledge is available.
1	This symbol indicates where expert knowledge is available.
5	This symbol indicates changes in the manual.

1.2 Management Standards

Quality Management System

Vector Informatik GmbH fulfills the requirements according to ISO 9001:2015 certification. The ISO standard is a globally recognized standard for quality management systems.

1.3 Product Compliance

This chapter contains relevant information about the product compliance-matters of the ECU categorized via the economic areas.

The device solely complies with the regulations listed in the following sub-chapters in the case that the device is mentioned at the corresponding sub-chapter and if the device's label also bears the market- or regulation specific mark(s) of the respective chapter.



Note

Restrictions regarding Installation and Usage due to Product Compliance Reasons

For this device only OEM installation is allowed.

Furthermore, the usage of this device is restricted to professional users and experts.



Note

Restrictions due to Product Compliance Reasons

This restriction is solely valid for evaluation-devices "VC-EVCC Evaluation".

The length of cables connected to the following pins is restricted to a maximal length of 3m:

LED0, LED1, LED2, LED_GND, VCC_SS, SS_GND, DIN, DIN_GND, HS_OUT0, HS_OUT1, HS_OUT2, HS_OUT4 (see Chapter 10.1).

The usage of the fitting wiring harness provided by Vector or a wiring harness with comparable technical properties is strongly recommended.

Note

The CE/ UKCA certification tests were conducted according to the standard EN 61326-1:2013

The standard was applied as follows:

- Emission: Class B*, Group 1**
- Immunity: Controlled Electromagnetic Environment***

* Class B product: Suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

** Group 1 product: Product in which there is intentionally generated and/or used conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.

*** Immunity test requirements for equipment intended to be used in a controlled electromagnetic environment.



1.3.1 EU: Applied Regulations & Restrictions of Use

CE Conformity (EU Product Conformity) according to Regulation (EC) 765/2008

This section is solely valid for evaluation-devices "VC-EVCC Evaluation".

For the concretely applied regulations and standards of this scope see "EU Declaration of conformity" of this device.

Due to the compliance with the regulatory requirements mentioned above the device bears the following required CE marking:

Figure 1-1 CE Mark on Product Label

WEEE Conformity according to EU Directive 2012/12/EU

This section is solely valid for evaluation-devices "VC-EVCC Evaluation".

The device must not be disposed of in the domestic waste in accordance with the Waste Electrical and Electronic Equipment (WEEE) Directive 2012/12/EU.

Bring the device to a collection point for waste electrical and electronic equipment for proper disposal.

Due to the compliance with the regulatory requirements mentioned above the device bears the following required WEEE marking:



Figure 1-2 WEEE Mark on Product Label

1.3.2 UK: Applied Regulations & Restrictions of Use UKCA Conformity (UK Product Conformity)

This section is solely valid for evaluation-devices "VC-EVCC Evaluation".

For the concretely applied regulations and standards of this scope see "UK Declaration of conformity" of this device.

Due to the compliance with the regulatory requirements mentioned above the device bears the following required UKCA marking:



Figure 1-3 UKCA Mark on Product Label



1.3.3 USA: Applied Regulations & Restrictions of Use

FCC Conformity - Certification according to FCC Part 15

This section is solely valid for evaluation-devices "VC-EVCC Evaluation".

This ECU has been certified as Part 15 Class B Digital Device by the Federal Communications Commission of the U.S. Government through following FCC ID: 2AXYRVCEVCC. For Details see "FCC certification" of this device.

Due to the certification mentioned above the device bears the following required FCC ID marking:

FCC ID: 2AXYRVCEVCC

Figure 1-4 FCC ID on Product Label

Information to user regarding changes resp. modifications (FCC § 15.21) and interferences (FCC § 15.19)

Changes or modifications not expressly approved by Party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Information

Note



Additional information regarding FCC certificiation (tests)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help



1.3.4 Canada: Applied Regulations & Restrictions of Use ISED Conformity (ICES-003)

This section is solely valid for evaluation-devices "VC-EVCC Evaluation".

This ECU represents a Category II equipment and therefore is exempt from certification and registration. To represent Vector's Supplier's Declaration of Conformity (SDoC) with ISED requirements the ISED compliance label is placed on each unit of this device.

Due to the compliance with the regulatory requirements mentioned above the device bears the following required ISED compliance label:

CAN ICES-003(B) / NMB-003(B)

Figure 1-5 ISED Compliance Label on Product Label

1.4 Warranty

We reserve the right to modify the contents of the documentation or the software without notice. Vector disclaims all liabilities for the completeness or correctness of the contents and for damages which may result from the use of this documentation.

1.5 Open-Source Software

No open-source software used.

1.6 Product Designations, Trademarks and Industrial Property Rights

All product designations and/or trademarks mentioned in this manual, which may be protected by third-party property rights, are subject to the regulations of the applicable trademark law and/or the property rights of the respective owner.

1.7 Safety Instructions and Hazard Warnings



Caution

Please take into account the following safety instructions and hazard warnings prior to installation and use of this ECU to avoid personal injuries and damage of property. Keep this documentation always near the ECU and retain this information for future reference.





Caution

This ECU is released as a safety element out of context according to the ISO 26262. The OEM is responsible for the entire vehicle safety concept and must take into account the dedicate Safety Manual [TBD] during the development and commissioning process in order to fulfill the standard and regulatory requirements.



Caution

The ECU may only be operated according to the instructions and descriptions of this manual. The ECU is exclusively designed for use by skilled personnel as its operation may result in serious personal injuries and damage to property. Therefore, only those persons may operate the ECU who have understood the possible effects of the actions which may be caused by the ECU. Users have to be specifically trained in the handling (e.g. calibration) with the ECU, the applied embedded software and the system intended to be influenced. Users must have sufficient experience in using the ECU safely. Only OEM installation is allowed.



Caution

The ECU may control and/or otherwise influence the behavior of control systems and electronic control units. Serious hazards for life, body and property may arise, in particular without limitation, by interventions in safety relevant systems (e.g. by deactivation or otherwise manipulating the engine management, steering, airbag and/or braking system) and/or if the ECU is operated in public areas (public traffic). Therefore, you must always ensure that the ECU is used in a safe manner. This includes inter alia the ability to put the system in which the ECU is used into a safe state at any time (e.g. by "emergency shutdown"), in particular without limitation in the event of errors or hazards. Furthermore, all technical safety and public law directives which are relevant for the system in which the ECU is used must apply. Provided that serious hazards for life, body and property may occur and before the use in public areas the system in which the ECU is used must applic areas the system in which the ECU is used must applic areas the system in which the ECU is used must applic areas the system in which the ECU is used must applic areas the system in which the ECU is used must apply. Provided that serious hazards for life, body and property may occur and before the use in public areas the system in which the ECU is used must apply.





Danger

Explosion due to operation of electric devices in potentially explosive atmospheres. Serious injury or death.

Observe the applicable regulations and precautionary measures for explosive environments.



Warning

Overload damage due to fault. Serious injury or death.

Protect the DC power supply circuit with a 15 A circuit breaker (or smaller) in the installation in order to limit the power in case of a fault.



Warning

Hot surfaces or moving parts due to actuated loads. Medium to light injury.

The actuation and control of loads is the responsibility of the user. Appropriate measures must be taken by the user to prevent injuries which may be caused by the connected loads.



Note

Faults in electronic devices through high-frequency energy

Observe any special regulations and disconnect the power supply of the ECU when its use is not permitted, or you have doubts whether its operation may cause faults or hazards.



l

Note Property Damage

- The device must be installed, connected and commissioned by a qualified and trained person.
- > Disconnect the device from all connections before handling it.
- > Disconnect all independently supplied power circuits.
- The degree of protection IP6K6K, IP6K7 and IP6K9K can only be guaranteed when all connections of the device are fitted with connectors with the same protection degree. Therefore, all information about qualification of the VC-EVCC is only valid for this installation position [see Chapter 8, Figure 8-2].
- > The device must only be repaired by the manufacturer.
- Keep substances containing solvents and graffiti dissolver gel away from the type plate.



2 General

The Vector Controller – Electric Vehicle Communication Controller (VC-EVCC) is a generic ECU for 24V environments.

It realizes electrical charging according to DIN SPEC 70121 see [1] and ISO15118 see [5] for power line communication (PLC) with the infrastructure.

The Hardware basis is the VP-EVCC with an integrated flash bootloader. The VC-EVCC includes a modern MICROSAR stack with all relevant application modules to realize electrical charging communication.



Figure 2-1 VC-EVCC

The following parts are included in the delivery:

Part	Description
VC-EVCC	ECU with integrated software
Documentation	Customer receives a Technical Reference as well as a User Manual (this document) and Charging Sequence Diagrams. The full delivery content is described in the Technical Reference
Remaining Bus Simulation	 CANoe bus simulation for the VC-EVCC for bus test and evaluation purposes CAN Database description (dbc) Diagnostic description File (cdd)

Table 2-1Delivery Content



3 System Architecture

The VC-EVCC is designed to be integrated into the vehicle with the following system architecture. The VC-EVCC supports either the combined charging system (CCS) combo 1 or combo 2 inlets according to the charging standards [10] and [4]. The supported charging standard is configurable via software.

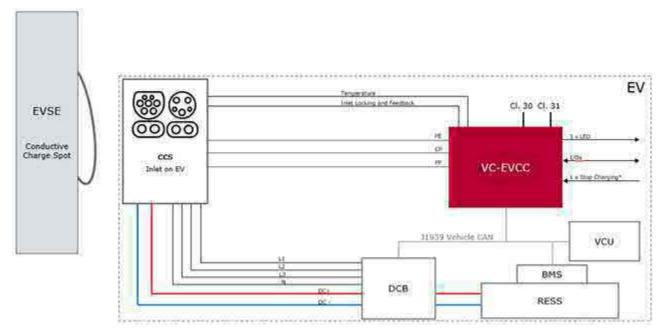


Figure 3-1 System Overview

3.1 Supported Peripherals

The supported peripherals for inlet charging depend on the charging standard:

> Charging standard CCS-1 (Combo 1 Inlet):

- > Phoenix CCS Type 1 Inlet EV-T1GBIE12-1AC series (inlet w. lock)
- Phoenix CHARX T1HBI12 series (inlet w. lock) with restrictions (see Caution note)
- > Charging standard CCS-2 (Combo 2 Inlet):
 - > Amphenol HVCO-CF6-ATR8-SF series (inlet) & C-NEVDC12V_ELOCK (lock)
 - > Phoenix CCS Type 2 Inlet EV-T2GBIE12-1AC series (inlet w. lock)
 - > Phoenix CCS Type 2 Inlet EV-T2GBIE12-3AC series (inlet w. lock)
 - Phoenix CHARX T2HBI12 series (inlet w. lock) with restrictions (see Caution note)
 - > REMA REV-2C series (inlet) & REMA CCS Actuator (lock)





Caution

The Phoenix Inlets CHARX T1HBI12 and CHARX T2HBI12 (Generation 4) use a different PT1000 characteristic curve than implemented within the VC-EVCC. As a result, the VC-EVCC will not stop charging at the critical temperature of 90°C.

Instead, the vehicle must monitor the resistance values of PTC1 and PTC2 which are transmitted on the J1939 vehicle CAN. The vehicle is responsible to stop charging once a temperature of 90°C is reached.

For further details about the PT1000 characteristic curves and the respective resistance thresholds of the Phoenix Inlets (Generation 4) please refer to the Phoenix installation manual.

In general, a vehicle inlet must have the following characteristics in order to be compatible with the VC-EVCC:

- 12V actuator for locking/unlocking mechanism
- Position feedback evaluation according to chapter "Plug Locking"
- Temperature sensors for AC charging (PTC) and DC charging (PT1000)

The VC-EVCC provides UDS configurations for certain inlet characteristics like resistors or temperature sensors. Details are described in the chapter "UDS communication".



Note

Inlet manufacturers are continuously developing inlets and adapting them to the new requirements. For this reason, the range of available inlets is also changing. Once other inlets are used than mentioned above, please contact the Vector support in order to check the compatibility with the VC-EVCC.

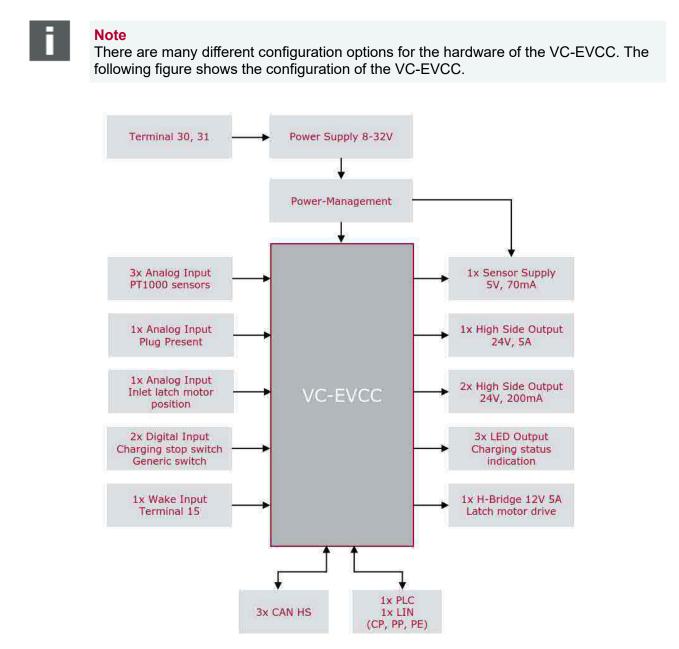


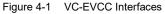
4 ECU

This chapter contains an overview about the VC-EVCC. The electrical and mechanical characteristics of the VC-EVCC are part of this User Manual.

4.1 ECU Overview

The following diagram and tables give an abstract overview of the interfaces of the hardware.







4.2 Key ECU Characteristics

Parameter	Description
CPU	SPC564B74L7, 120MHz
Memory	3,0 MB Code-Flash, 4x16 kB Data-Flash, 192 kB RAM
Voltage range	8V 32V (ISO 16750, Code E)
Overvoltage 2 min	48V
Connector	Molex CMC36 Hybrid Sealed (36 Pins)
Communication	3x CAN 2.0B (incl. shielding) 1x PLC – Power Line Communication based on IEC61851, ISO 15118 and DIN 70121 with PP, PE and CP
Ι/Ο	Extensive Inputs and Outputs typically needed for in vehicle powerline charging systems
Temperature Range	-35°C +85°C (ISO16750, Code H)
Typical Current Consumption without loads	150mA
Quiescent Current	203µA
Maximum Current Draw	12A
Recommended fuse (based on hardware tests)	15A
Weight	560 g
IP protection	IP6K6K / IP6K7 / IP6K9K (not valid for unsealed housing)
Functional Safety	Safety targets according to ASIL B

Table 4-1 VC-EVCC Key Characteristics

4.3 ECU Interface Characteristics

The following table gives an overview of the interfaces and functional blocks of the VC-EVCC.

Count	FBB Name	Description / Configuration	
3	High-speed CAN	CAN Interfaces	
		 Termination not populated 	
		 100nF capacitive ground coupling on CAN0 shield and CAN2 shield 	
		 Direct connected ground coupling on CAN1 shield 	
1	PLC	High Level Powerline Communication	
1	Control Pilot	Low Level Powerline Communication	
1	Plug Present	Proximity Pin logic	



3	Analog Input PT1000	PT1000 temperature sensor input
3	20mA LED Output	Constant current output for LEDsPWM dimmingStatic digital
1	Latch Position Input	Analog input to read a resistor value coded latch or switch
1	Digital Input 0UBat	Wake-up capable input
3	200mA High-Side Output	Low power 24V output PWM Static digital
1	Wake-up Input	Terminal 15 wake-up line.Can only be used in conjunction with CAN0
1	5A High-Side Output	 Medium power 24V output Freewheeling diode Static digital PWM
1	5A H-Bridge	12V H-Bridge for motor applicationsStatic digital
1	Real Time Clock	Internal Real Time Clock for timer and calendar applications
1	Core	 Microcontroller: SPC564B74L7C9EC Watchdog: Window Watchdog Supply: 8 32VDC

 Table 4-2
 Interfaces and Functional Blocks

5 Detailed Functional Description

5.1 J1939 CAN

Signal	Description		
WakeupRsn_VCVCCU	The wakeup reason of the VC-EVCC		

Table 5-1 J1939 CAN Signals

Functionality

CAN channel CAN1 is the J1939 vehicle CAN. The baud rate is set to 250kBit/s but can be configured through the diagnostic channel. At each reboot, the VC-EVCC checks the stored parameter for the configuration and adjusts itself automatically. The configuration needs to be done only once.

It is wakeup capable and an BMS network management is implemented.

The wakeup reason is set in the signal WakeupRsn_VCVCCU.

Wake-up Reason	Description
NETWORK	wakeup caused by the J1939 CAN
SWITCH	wakeup caused by a Digital Input
PLUG_PRESENT	wakeup caused by plug present detection
CONTROL_PILOT	wakeup caused by a control pilot detection
RTC	wakeup caused by the real-time clock
CLAMP15	Wakeup caused by the Terminal15 wakeup input

Table 5-2 Wakeup Reasons

If more than one wake-up reason is set, the signaling of the wake-up reason is done with the following priority order (from high to low):

- NETWORK
- CLAMP15
- CONTROL_PILOT
- PLUG_PRESENT
- ► RTC
- SWITCH

A charging or diagnostic request on CAN0 (Diagnostic CAN) will activate the J1939 CAN communication.

Awake Reason:

- Network startup time is not expired.
- Diagnostic communication active
- Terminal15 signal input is active



Communication via vehicle coupler (Control Pilot State B2)



Caution

The VC-EVCC is intended to be used with network management. Therefore, the CAN message "NM_CGW" must be sent by the vehicle in order to ensure full functionality. The recommend cycle time is 100 ms. The value of the included signal "WakeupRsn CGW" is not relevant and can be determined by the user.



Note

Connecting clamp 30 causes a wakeup of the VC-EVCC. After startup the VC-EVCC stays always awake for 60 seconds.

5.1.1 CAN Message Cycle Times and Bus Load

The database (*.dbc-file) of the J1939 CAN includes detailed information about all messages and signals. The message cycle times are included in the tab "Attributes". In general, there are two different message cycle times "GenMsgCycleTime" and "GenMsgCycleTimeFast".

- GenMsgCycleTime contains the message cycle time which is used for normal operation
- GenMsgCycleTimeFast contains a decreased message cycle time for certain CAN messages and is only used during an active charging event. The message cycle time switches from GenMsgCycleTime to GenMsgCycleTimeFast once a signal within the corresponding CAN message changes its value.

efinition 🚭 Signals 💻 Transmitters	Receivers	Layout	🝸 Attribu	utes Comment	
Attribute	Value				
🖃 📝 Diagnostics					
_ √ DiagRequest	No*				
- 📝 DiagResponse	No*				
🚽 DiagState	No*				
- 🖌 Interaction Layer					
– 🗹 GenMsgCycleTime	500				
– 🗹 GenMsgCycleTimeFast	20				
🗌 🗹 GenMsgDelaylime	U				
— 🗾 GenMsgFastOnStart	0×				
— 🗹 GenMsglLSupport	Yes*				
— 🗹 GenMsgNrOfRepetition	4				
– 🗹 GenMsgRequestable	0				
— 🗹 GenMsgSendType	cyclic				
🗌 🗹 Gen MsgStartDelayTime	60				
🖃 🗹 No category assigned					
- 🗹 DiagConnection	0×				
— 🗹 NmAsrMessage	no*				
– 📶 TpJ1939VarDlc	No*				
Definition:					
Read from DB Write to DB					Reset

In order to reduce the bus load, the VC-EVCC provides configurable message cycle times for certain CAN messages. CAN message cycle times can be increased or set to "0ms" to



stop sending certain CAN messages. Please refer to the chapter "UDS communication" for more information about configurable message cycle times.

5.1.2 End-to-End Protection of CAN Messages

The VC-EVCC uses the MICROSAR Safe End-to-End (E2E) for protection of the CAN messages VCVCCU_ChargeFromVehicle and VCVCCU_ChargeToVehicle. The E2E Profile 1 is used to encode and decode the exchanged data. This method comprises a sequence counter and a Cyclic Redundancy Checksum (CRC) to protect for data consistency, reliability and validity.

The E2E Profile 1 uses the following polynomial of CRC-8-SAE J1850 which protects against corruption of data ensuring its validity for use.

• $0x1D(x^8 + x^4 + x^3 + x^2 + 1)$

5.1.2.1 VCVCCU_ChargeFromVehicle

The CAN message VCVCCU_ChargeFromVehicle contains the following signals which are used for E2E protection.

E2E_Cnt_ChargeFromVehicle (Counter): This signal is used to ensure the data is received periodically.



Caution

The vehicle must ensure that the value of E2E_Cnt_ChargeFromVehicle is incremented for every message cycle. The incrementation shall start from value 0x0. Once the value 0x0E is reached the vehicle shall reset the value to 0x0 and start to increment the value again.

The VC-EVCC will raise a DTC if the current counter value deviates from the previously received counter value by a value of 3 or more or if the counter value is unchanged for more than three correctly received messages.

E2E_CRC_ChargeFromVehicle: This signal is used to ensure the data validity.

The VC-EVCC performs the following calculation to determine the correctness of the CRC received from the signal E2E CRC ChargeFromVehicle.

- Calculated CRC = CRC8 over Data ID (0xFF21) and the seven bytes of the CAN message (Byte 0 to Byte 6) including the empty area (set to 0xFF) but excluding the CRC byte (Byte 7) itself.
- E2E Profile 1 requires a XOR-operation of the calculated CRC with value 0xFF. The result is the final CRC value which is added to the CAN message.



Note

For detailed information about E2E Profile 1 and the respective CRC calculation please refer to the specifications "AUTOSAR_SWS_E2ELibrary" and "AUTOSAR_SWS_CRCLibrary" of AUTOSAR release 4.



5.1.2.2 VCVCCU_ChargeToVehicle

The CAN message VCVCCU_ChargeToVehicle contains the following signals which are used for E2E protection.

- E2E_Cnt_ChargeToVehicle (Counter): This signal is used to ensure the data is received periodically. The VC-EVCC increments the value of this signal for every message cycle until it reaches 0x0E after which it is reset to 0x0. Then incrementing will be started again.
- ▶ E2E_CRC_ChargeToVehicle: This signal is used to ensure the data validity.
- E2E_State_ChargeFromVehicle: This signal shows the result of the E2E validation of the CAN message VCVCCU_ChargeFromVehicle.

The VC-EVCC calculates the signal value of E2E_CRC_ChargeToVehicle for the CAN message VCVCCU_ChargeToVehicle according to E2E Profile 1.

E2E_CRC_ChargeToVehicle = CRC8 over Data ID (0xFF17) and the seven bytes of the CAN message (Byte 0 to Byte 6) including the empty area (set to 0xFF) but excluding the CRC byte (Byte 7) itself.

5.1.2.3 Fault Memory

The VC-EVCC provides an error detection for E2E protection. Therefore, the following diagnostic trouble code is used to indicate a fault related to the E2E protection.

VCVCCU_ChargeFromVehicle E2E Fault (DTC 0x20E0EA)



5.2 Diagnostic CAN

Signal	Description
DiagnosticCAN_Wakeup	The wakeup state of the Diagnostic CAN
DiagnosticCAN_BusOff	The bus off state of the Diagnostic CAN
DiagnosticCAN_WakeupRsn	The wakeup reason of the Diagnostic CAN
DiagnosticCAN_State	The state of the Diagnostic CAN

Table 5-3Diagnostic CAN Internal Signals

Functionality

CAN channel CAN0 is a diagnostic related CAN supporting the UDS protocol. The baud rate is set to 500kBaud. The diagnostic CAN channel supports wake-up of the ECU (DiagnosticCAN_Wakeup) and an AUTOSAR network management is implemented.

5.2.1 UDS communication

UDS over ISO TP diagnostic communication with the following CAN identifiers is implemented:

- 0x610: physical diagnostic request
- 0x614: functional diagnostic request
- 0x612: diagnostic response

The supported Services and details can be found in the *.cdd file.



Caution

UDS communication must be applied on diagnostic CAN.

5.2.1.1 Overview about ECU Parameters

The following list provides an overview about all configurable ECU parameters and the respective diagnostic identifiers of the VC-EVCC.

J1939 CAN baud rate

▶ DID FD 00 – Configuration J1939 CAN baud rate

HSOUT0 Wakeup

DID FD 03 – Configuration HSOUT0 Wakeup

High Side Output diagnostic mode

▶ DID FD 25 – Configuration HSOUT diagnostic mode

CAN message cycle times

- DID FD 04 Configuration PTC0 message
- DID FD 05 Configuration PTC1 message



- DID FD 06 Configuration PTC2 message
- DID FD 07 Configuration InletStatus message
- DID FD 08 Configuration ControlPilotStatus message
- DID FD 09 Configuration InternalVoltageStatus message
- DID FD 0A Configuration InternalVoltageRawValues message
- DID FD 0B Configuration InletStatus2 message

StopCharge CAN signal

DID FD 13 – Configuration StopCharge CAN Signal Activation

Charging arbitration

- DID FD 0F Configuration Primary J1939 Source Address
- DID FD 10 Configuration Secondary J1939 Source Address
- DID FD 14 Configuration Charge Node Selection Activation

Transport Layer Security (TLS)

- DID FD 0D Configuration TLS Certificate V2G
- DID FD 12 Configuration TLS Certificate VAS
- DID FD 0C Configuration TLS Activation

Value Added Services (VAS)

DID FD 11 – Configuration Value Added Services

Plug and Charge (PnC)

- DID FD 27 Configuration OEM Provisioning Certificate
- DID FD 28 Configuration OEM Provisioning Certificate Private Key
- ▶ DID FD 29 Configuration OEM Provisioning Certificate and Private Key
- DID FD 2A Configuration PnC Contract Certificate
- ▶ DID FD 2B Configuration PnC Contract Certificate Private Key
- DID FD 2C Configuration PnC Contract Certificate and Private Key
- DID FD 2D Configuration PnC Sub Certificate
- DID FD 2F Configuration PnC Root Certificate
- DID FD 26 Configuration PnC Activation

Charging Schedules

▶ DID FD 37 – Configuration Charging Schedules Activation

Inlet type and temperature sensors

- DID FD 20 Configuration Inlet Type
- DID FD 21 Configuration PTC Activation

AC charging via LIN (SAE J3068)

DID FD 22 – Configuration LIN charging (SAE J3068) Activation

Security Key Constant

DID FD 0E – Configuration Security Key Constant



5.2.1.2 Configuration of ECU parameters

The configuration of ECU parameters can be executed with the Vector tools CANoe or CANalyzer. Alternatively, the configuration can be executed manually. The configuration of ECU parameters with CANoe/CANalyzer is handled within the Diagnostic Console.

The following steps lead to the Diagnostic Console within CANoe/CANalyzer.

1. Start CANoe/CANalyzer and open the delivered CANoe/CANalyzer configuration "VC-EVCC".

2 7 - 0 02 - 12 22 05		vC_POSE. du III	ad Boat (Sciller Difference in		
Antic Dagrants Dagrants Field Field Control Co	L 1-53 0 springer L 1-53 2 400 - Hentory 4 doces + D 1-547 5 400 - 1047-				
Transport of the first of the f	3 Cifron Cipoloniano - Nocar Cathar Blade Blade Belitoo Contoniano - Nocar Cathar Blade Belitoo Contoniano Contoni Contoniano Contoni Contoni Contoni	ens	Andersongstation Typ 28.04.2019 (435) Dura 14.04.2019 (4517) Dura 18.04.2019 (2647) Dura	Alguer, dars trauceren A	
Verkev System CAPL	Deterrorme Convert			Configuration (Ticty) 🔍	



2. Click on the desktop "Diagnostic". The desktop "Diagnostic" contains the window "VCEVCC Diagnostic Console". Please note that not all versions of CANoe/CANalyzer include the Diagnostic Console.

Overview System CAPL
Setup Trace VC-VCCU SchematicView Diagnostic

The detailed description of the configuration of individual parameters is described in the following chapters. Please note that the measurement must be started to execute configuration of ECU parameters.



5.2.1.2.1 Configuration of CAN1 – J1939 CAN Baud Rate

It is possible to configure the baud rate of the VC-EVCC for the J1939 vehicle CAN.

By using the diagnostic service "Read Data By Identifier" (0x22) - DID 0xFD00 it is possible to read the current configured J1939 CAN baud rate.

By using the diagnostic service "Write Data By Identifier" (0x2E) - DID 0xFD00 it is possible to write the J1939 CAN baud rate.



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.

The service structure is defined as 1 byte, whereas the upper 6 bits are set to 0.

Value	Description
0x00	250 kBaud is configured (default)
0x01	500 kBaud is configured
0x02	1 MBaud is configured

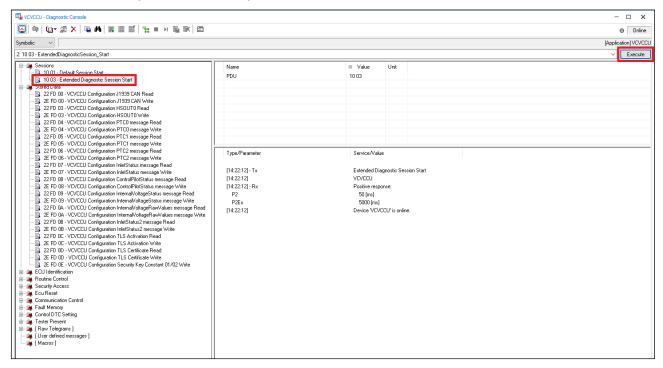
Table 5-4 CAN1 J1939 Baud Rate Configuration on UDS Channel



Configuration with CANoe/CANalyzer

The configuration of the J1939 CAN Baud rate can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.



2. Select the tab "Stored Data" and click on "2E FD 00 – VCVCCU Configuration J1939 CAN Write". Please choose the requested J1939 CAN baud rate and click on the button "Execute". Please note that the response must be positive.

R VCVCCU - Diagnostic Console			- 🗆 X
📴 👳 🗤 🗶 🗙 🖷 🖊 🗟 🗟 🖬 🤽 = H 🗞 🕸 🗎			 Online
Symbolic V			(Application) VCVCCU
4: 2E FD 00 - VCVCCU_Configuration_J1939_CAN_Write			✓ Execute
Sections 10 01 - Defuelt Section Stat 10 03 - Started Diagnostic Section Stat Stored Data Stored Data 26 FD 00 - VVVCUL Configuration, 11339 CAN Write 26 FD 00 - VVVCUL Configuration Stored Ut Nead 26 FD 03 - VVVCUL Configuration NSUI Ut Nead 26 FD 03 - VVVCUL Configuration NSUI Ut Nead 26 FD 03 - VVVCUL Configuration NSUI Ut Nead 27 FD 03 - VVVCUL Configuration NSUI Ut Nead 27 FD 04 - VVVCUL Configuration NSUI Ut Nead 27 FD 04 - VVVCUL Configuration NSUI T0 Write 27 FD 04 - VVVCUL Configuration NSUI T0 Write	J1939 CAN Configuration.J1939 CAN Baud Rate	Value Unit 2E FD 00 00 0 0x00 25008ud 25008ud ∨	
	Type/Parameter [14.22.12] - T.x [14.22.12] [14.22.12] - F.x P2 P2 P2 P2 P2 P2 P2 P2	Service/Value Extended Diagnostic Session Statt VCVCCU Positive response: 50 (ms) 5000 (ms)	
Let D4. VOVCUL configuration Internal/ValageRaw/Values message Read Let D4. VOVCUL configuration Internal/ValageRaw/Values message Write Let D4. VOVCUL configuration Internal/ValageRaw/Values message Write Let D5. VOVCUL configuration Internal/ValageRaw/Values message Write Let D5. VOVCUL configuration Internal/ValageRaw/Values Let D5. VovCUL configuration Internal/	[14:22:12] [14:22:53] - T.x VCVCCU Configuration J1938 CAN J1938 CAN Configuration J1938 CAN Configuration J1939 CAN Baud Rate J1938 CAN Configuration (reservient) [14:22:53] CAN Configuration (reservient)	Device VCVCCU' is online. VCVCCU Configuration J1939 CAN Write 0x00 0x00 255/kBaud (0x00) VCVCCU	
Redite Control Security Accords	(14:22:53) - Fix	Positive response.	



3. By executing the command "22 FD 00 – VCVCCU Configuration J1939 CAN Read" the current configuration of the baud rate can be verified.

CVCCU - Diagnostic Console				- 🗆 X
🕒 👳 📴 🗶 X 🖷 🛤 🗮 🖩 🖆 🏪 = H 📲 🕸 🕮 -				(Dnine
Symbolic V				(Application) VCVCC
3: 22 FD 00 - VCVCCU_Configuration_J1939_CAN_Read				Execute
Sessions 1003-Default Session Start 1003-Default Session Start 21003-Extended Diagnostic Session Start 220000-VEVECU Configuration J1333 CAN Read 220000-VEVECU Configuration Stort 1000 220000-VEVECU Configuration Stort 1000 220000-VEVECU Configuration Stort 1000 22000-VEVECU Configuration FCI message Read 22000-VEVECU Configuration FCI message Write 22000-VEVECU Configuration FCI message Pread 22000-VEVECU Configuration F	Name PDU	 Value 22 FD 00 	Unit	
2E FD 05-V/OCUL Configuration PTC1 message Write 22 FD 06-V/OCUL Configuration PTC2 message Read 22 FD 06-V/OCUL Configuration PTC2 message Read 22 FD 07-V/OCUL Configuration InfeCiatus message Read 22 FD 07-V/OCUL Configuration InfeCiatus message Read 22 FD 07-V/OCUL Configuration InfeCiatus message Write 22 FD 08-V/OCUL Configuration ControlFiblioSlatus message Write 22 FD 09-V/OCUL Configuration ControlFiblioSlatus message Write 22 FD 09-V/OCUL Configuration Internal/VolageSlatus message Write 22 FD 09-V/OCUL Configuration Internal/VolageSlatus message Read 22 FD 04-V/OCUL Configuration Internal/VolageSlatus message Vite	Type/Parameter [14.22:12] - Tx [14.22:12] - Rx P2 P2K [14.22:12]	Service/Value Extended Dia VCVCCU Positive respo 50 [ms] 5000 [ms] Device VCV0	gnostic Sess inse:	
□ 22 FD 08 - VDCCU Configuration IntelStatut2 message Read □ 22 FD 06 - VDCCU Configuration IntelStatut2 message Write □ 22 FD 06 - VDCCU Configuration IntelStatut2 message Write □ 22 FD 06 - VDCCU Configuration IS Advision Read □ 22 FD 00 - VDCCU Configuration IS Advision Write □ 22 FD 00 - VDCCU Configuration IS Catiticate Read □ 22 FD 00 - VDCCU Configuration IS Catiticate Read □ 22 FD 00 - VDCCU Configuration IS Catiticate Write □ 22 FD 00 - VDCCU Configuration IS Catiticate Write □ 22 FD 00 - VDCCU Configuration Security Key Constant 01/02 Write □ 22 FD 00 - VDCCU Configuration Security Key Constant 01/02 Write □ 22 FD 00 - VDCCU Configuration Security Key Constant 01/02 Write □ 22 FD 00 - VDCCU Configuration Security Key Constant 01/02 Write	[14:2253] • Tx VCVCCU Configuration J1939 CAN J1939 CAN Configuration J1939 CAN Configuration, J1939 CAN Baud Rate J1939 CAN Configuration (reserviet) [14:2253] [14:2253] Fix	VCVCCU Cor 0x00 0x00 250kBaud (0x00) VCVCCU Positive respo	-	J1939 CAN Write
til — Garage Security Access → Garage Econ Renet → Garage Communication Control ← Garage Security → Garage Memory ← Garage Description ← Garage Description ← Garage Close defined messages] ← Garage Close defined messages]	[14:2353] · Tx [14:2353] [14:2253] · Rx VCVCCL Configuration J1339 CAN J1339 CAN Configuration J1339 CAN Configuration J1339 CAN Baud Rate J1339 CAN Configuration (reservient)	VEVECU Cor VEVECU Positive respo 0x00 0x00 250kBaud (0x00)	-	J1939 CAN Read



Configuration with Indigo

The configuration of the J1939 CAN Baud rate can be executed with Indigo according to the following description.

 Select the tab "Parametrizer" and click on the field Value of the VC-EVCC application "VCVCCU Configuration J1939 CAN/J1939 CAN Configuration/J1939 CAN Baud Rate". Select the requested Baud rate and click on the button "Write" to execute the configuration.

Sart Dispestal Enhance	ed.							Vector Indige	6 SP+Beta1 + VC-VCCU ndigo*			
onnect Remote Refresh Autors	5 / X	r Revert Caris	Y 🔡	Cetals Grouping R	Report	Configuration	Store Restore					
avigation	<					2010/07/22/2012			Parame	trizer		
G Identification Browser	Name								Vakie	Unk		
	VCVCCU (Applic	ation								12 10 10 10		
Parametrizer		figuration PTC0 mess	sne/Time Darind					,	10	ins		
VC-VCCU-VAS	Cherry 1999 1988											
DTC Browser	A VEVICEU Configuration PTC1 message/Time Period							10	ms			
3 Dic browser	A VENCEJ Configuration PTC2 message/Trme Period							50	ms			
Reprogramming	🔥 VCVCCU Configuration InletStatus message/Time Period							100	175			
	💰 VCVCCU Configuration InternalVoltageStatus message/Time Period							10	ms			
	S VEVEEU Conf	figuration Internativo	tageRawValues r	nessage/Time Period					10	ms		
	es VCVCCU Configuration InternativottageRainValues message/Time Period.								10	10.25		
	K VCVCCU Configuration J1939 CAN/J1939 CAN Configuration/J1939 CAN Baud Rate								250k8aud			
	S VCVCCU conf	figuration HSOUTO/H	SOUTO Configura	ation/HSOUTO Mode					On CP/PP			
	💰 VCVCEU Configuration HSOUT0/HSOUT0 Configuration/HSOUT0 Time Period :							0	018			
	K VCVCCU Conf	K VCVC01 Configuration ControlPictStatus message/Time Penad							10	ms		
	A VENERAL CON	fouration TLS Arthor	nno/TI S Activati	on Status Field/TLS Activ	ation Status				V off			
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	138.042314 140.188466 140.545298 143.12238 144.189495 245.536309 148.136475 148.190425	VCVCCU FuncGroup-0x614 VCVCCU VCVCCU FuncGroup-0x614 VCVCCU VCVCCU FuncGroup-0x614	19 02 00 35 80 19 02 00 19 02 00 35 60 19 02 00 19 02 00 35 80	0.18986s 0.16790s 0.16895s 0.16894s	VCVCCU VCVCCU	59 02 FF 01 E0 E3 20 59 02 FF 01 E0 E3 28 59 02 FF 01 E0 E3 28 59 02 FF 01 E0 E3 28	01 E0 E5 28 02 E0 E1 28 01 E0 E5 28 02 E0 E3 28	02 E0 E4 28 02 E0 E5 28 04 E0 E 02 E0 E4 28 02 E0 E5 28 04 E0 E 02 E0 E4 28 02 E0 E5 28 04 E0 E 02 E0 E4 28 02 E0 E5 28 04 E0 E	3 28 20 E0 E2 (51 Bytes) 5 28 20 E0 E2 (51 Bytes) 3 28 20 E0 E2 (51 Bytes) 3 28 20 E0 E2 (51 Bytes) 3 28 20 E0 E2 (51 Bytes)			
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Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session, e.g. every second. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. Baud Rate:

XX:

- 0x<mark>00</mark> --> 250kBaud
- 0x<mark>01</mark> --> 500kBaud
- 0x02 --> 1MBaud

Request: 04 2E FD 00 XX FF FF FF Response: 03 6E FD 00 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present configuration of the baud rate, the following communication has to be executed.

- 4. <u>Read Baud Rate configuration:</u>
- Request: 03 22 FD 00 FF FF FF FF Response: 04 62 FD 00 XX FF FF FF



5.2.1.2.2 Configuration of HSOUT0

The VC-EVCC gives the possibility to enable an output at startup to wake-up other ECUs. The behavior can be configured.

By using the diagnostic service "Read Data By Identifier" (0x22) - DID 0xFD03 it is possible to read the current configuration of the HSOUT0.

By using the diagnostic service "Write Data By Identifier" (0x2E) - DID 0xFD03 it is possible to write the configuration of the HSOUT0.



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.

The service structure is defined as 1 byte.

Value	Description		
0x00	HSOUT0 isn't enabled at startup (default)		
0x01 (bin: nn nn nn 01)	 HSOUT0 is enabled for a specific time at startup. The lower two bits of the data byte are set to 01 The upper 6 bits leading the data are set to enable the time: Value * 100ms A time between 0ms and 6300 ms is configurable 		
0x02	HSOUT0 is enabled at startup and isn't disabled		
0x03	HSOUT0 is enabled with respect to CP and PP		

Table 5-5HSOUT0 Configuration on UDS Channel



If value 0x03 is configured the HSOUT0 will be enabled with respect to CP and PP according to the following table:

Signal Source	Value	HSOUT0
VCVCCU_ControlPilot_DutyCycle	SNA &&	Not_pressed
VCVCCU_PlugPresent_Status	Not_connected	
VCVCCU_ControlPilot_DutyCycle	SNA &&	Pressed
VCVCCU_PlugPresent_Status	Connected Error SNA	
VCVCCU_ControlPilot_DutyCycle	1% - 99% Error &&	Pressed
VCVCCU_PlugPresent_Status	Not_connected	
VCVCCU_ControlPilot_DutyCycle	1% - 99% Error &&	Pressed
VCVCCU_PlugPresent_Status	Connected Error SNA	

Table 5-6 HSOUT on CP/PP Configuration



Configuration with CANoe/CANalyzer

The configuration of the HSOUT0 can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

CVCCU - Diagnostic Console				- 🗆 X
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Symbolic V				[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start				Execute
10 03 * Exercised point - Section Start 10 03 * Exercised point - Section - Start 22 FD 00 * VVVCUU Configuration - J133 CAN Read 22 FD 00 * VVVCUU Configuration - HS0UT0 Read 22 FD 03 * VVVCUU Configuration - HS0UT0 Read 22 FD 03 * VVVCUU Configuration PT00 message Read 22 FD 04 * VVVCUU Configuration PTC0 message Read 22 FD 05 * VVVCUU Configuration PTC1 message Read 22 FD 06 * VVVCUU Configuration PTC1 message Read 22 FD 06 * VVVCUU Configuration PTC1 message Read 22 FD 06 * VVVCUU Configuration PTC1 message Read 22 FD 06 * VVVCUU Configuration PTC1 message Read 22 FD 06 * VVVCUU Configuration PTC1 message Read 22 FD 06 * VVVCUU Configuration PTC3 message Read 22 FD 07 * VVVCUU Configuration PTC3 message Read	Name PDU	Value Value 10.03 Service/Value Extended Dia	Unit Unit	Slart
→ 25 FD 07-VCVCCU Configuration Christolisatus message Write → 25 FD 08-VCVCCU Configuration ControlPiloSitatus message Read → 25 FD 08-VCVCCU Configuration ControlPiloSitatus message Read → 25 FD 08-VCVCU Configuration ControlPiloSitatus message Write → 25 FD 08-VCVCU Configuration ControlPiloSitatus message Read → 25 FD 08-VCVCU Configuration Internal/ValageRiatus message Write → 25 FD 08-VCVCU Configuration IS Activation Read → 25 FD 08-VCVCU Configuration IS Activation Write → 25 FD 08-VCVCU Configuration IS Activation Write → 25 FD 00-VVCVCU Configuration IS Activation Write → 26 FD 00-VVCVCU Configuration IS Activation Write → 27 FD 00-VVCVCU Configuration IS Activation Write → 26 FD 00-VVCVCU Configuration IS Activation Write → 27 FD 00-VVCVCU Configuration IS Activation W	(142212) (142212) (142212) Fix P2 P2Ex [142212]	Extended Uia VCVCCU Positive respo 50 (mg) 5000 (ms) Device VCVC	inse:	lart



 Select the tab "Stored Data" and click on "2E FD 03 – VCVCCU Configuration HSOUT0 Write". Please choose the requested mode as well as the requested time period (only possible in mode "Limited on") and click on the button "Execute". Please note that the response must be positive.

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Symbolic V			[Application] VCVCCU
6: 2E FD 03 - VCVCCU_Configuration_HSOUT0_Write			~ Execute
Sessions 1001 - Detault Session Stat 1003 - Stended Diagnostic Session Stat Stored Data 2 EP D0 - VCVCCU Configuration J1939 CAN Read 2 EP D0 - VCVCU Configuration J1939 CAN Read 2 EP D0 - VCVCU Configuration FLID Read 2 EP D0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration InterNol AlogeStatus message Write 2 2 FD 0 - VCVCU Configuration IS Activation Write 2 2 FD 0 - VCVCU Configuration IS Activation Write 2 2 FD 0 - VCVCU Configuration IS Activation Write 2 2 FD 0 - VCVCU Configuration IS Activation Write 2 2 FD 0 - VCVCU Configuration IS Activation Write 2 2 FD 0 - VCVCU Configuration IS Activation Write 2 2 FD 0	Name PDU VCVCCU Configuration HSOUT0 HSOUT0 Configuration HSOUT0 Mode HSOUT0 Configuration HSOUT0 Time Period Type/Parameter [14.17:57] [14.17:57] [14.17:57] [14.17:57] [14.17:57] [14.17:57] [14.17:57] [14.17:57] [14.17:57] [14.17:57] [14.13:52] Type/Parameter [14.13:52] [14.13:52] Type/Parameter [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52] [14.13:52]	Value Urit ZE P0 03 00 Loco Loco Tes Tes	

3. By executing the command "22 FD 03 – VCVCCU Configuration HSOUT0 Read" the current configuration of the HSOUT0 can be verified.

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Symbolic V					[Application] VCVCCU				
5: 22 FD 03 - VCVCCU_Configuration_HSOUT0_Read					Execute				
Sessions 1001 - Default Session Stat Stored Data Sto	Name PDU	Value 22 FD 03	Unit						
P2 FD 04-VV/CCU Cordiguation PTC0 message Write P2 FD 05-VV/CCU Cordiguation PTC1 message Read P2 FD 05-VV/CCU Cordiguation PTC1 message Write P2 FD 05-VV/CCU Cordiguation PTC1 message Read P2 FD 05-VV/CCU Cordiguation PTC3 message Read P2 FD 05-VV/CCU Cordiguation Intel®14tu message Write P2 FD 05-VV/CCU Cordiguation Intel®14tu message Read P2 FD 05-VV/CCU Cordiguation Intel®14tu message Write P2 FD 05-VV/CCU Cordiguation Intel®14tu message Read P2 FD 05-VV/CCU Cordiguation Intel®14tu message P3 FD 05-VV/CCU Cord	Type/Parameter [14.17:57] - Tx [14.17:57] - FX [14.17:57] - FX P2 P2[14.17:57] [14.17:57] - FX P2 P2[14.17:57] [14.19:52] - FX VCVCCU Configuration HSOUTO HSOUTO Configuration HSOUTO Mode HSOUTO Configuration HSOUTO Mode HSOUTO Configuration HSOUTO Time Period [14.19:52] - FX [14:21:27] - TX [14:21:27] - TX [14:21:27] - RX VCVCCU Configuration HSOUTO HSOUTO Configuration HSOUTO	0x00 0x00 0 ff 0 (ms) VCVCCU Positive respo VCVCCU Con VCVCCU Con VCVCCU Positive respo 0x00 0x00	gnostic Se: inse: CCU' is onlin figuration H inse. figuration H						
User defined messages]	HSOUTO Configuration, HSOUTO Mode HSOUTO Configuration, HSOUTO Time Period	Off O [ms]							



Configuration with Indigo

The configuration of the HSOUT0 can be executed with Indigo according to the following description.

 Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration HSOUT0/HSOUT0 Configuration/HSOUT0 Mode". Select the requested HSOUT0 configuration and click on the button "Write" to execute the configuration. If configuration is set to "Limited on" the time period can be adjusted by selecting "VCVCCU Configuration HSOUT0/HSOUT0 Configuration/HSOUT0 Time Period".

6 b						Vector Indigo 6 5P+Eerta L - VC VCCII. Indigo*			
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	A NOV WALLAND THE PARTY OF	figuration StopCharge CAN Signal/S				07)			
						Diagnostic 7	Trace		
	Request Time	Request Target Request Data	Response Time Delta	Response Source	Response Data	Çor	mmunication Error		
	764.43370s 764.66335s	FuncGroup-0x014 3E 80 VCVCCU 19 62 0D	0.16575s	VEVECU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0	2 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 Bytes)			
	767.16442s	VCV0CU 19.62 0D	0.164766	vevecu	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0				
	768.43472s 769.66457s	FundStoup-0x614 3E-80 VCVCCU 19-02-0D	0.16470s	VOVCOU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0	2 E0 E5 26 04 E0 E3 28 20 E0 E3 /SL 8.+***			
	772.180396	VCVCCU 19 02 0D	0.168966	VEVOCU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0				
	772.43570s	FuncGroup-0x614 3E 80 VGVCCU 19:02:00	0.165665	VEVEGU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0	אינג אייזין בין זה מר צר לא אל אל אי אי אי אי			
	776.436705	Func6roup-0x614 3E 60	0/169665	VEVEOU	59/02/11/01 E0/E3/28/01 E0/E5/28/02/E0/E3/28/02/E0/E4/28/0	2/E0/E5/26/04/E0/E3/26/20/E0/E2/ (51/Bytes)			
	··· 777.19577s	VCVCCU 19 02 0D	0.163766	VOVODU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0				
	779.710795	VCVCCU 19.02.00 FuncGroup-9x614 3E.60	0.16883s	VEVECU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0	2 E0 E5 28 04 E0 E3 28 20 E0 E2 (31 Bytes)			
	782.22637s	VCVCCU 19.02.0D	0.16344s	VEVOCU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0	2 E0 E5 28 04 E0 E3 29 20 E0 E2 (51 Bytes)			
	784.43866s 784.72737s	FuncGroup-0x014 3E 80 VCVCCU 19 02 8D	0.162535	VEVECU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0	12 E8 E5 28 04 E0 E2 28 20 E8 E2 (51 Bitter)			
	787.227756	VEVECU 19 02 0D	0.16224s	VEVECU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0 59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0				
	788.43968s	FuncGroup-0x614 3E 80	12.12.22.24	1100000					
	789.72973s 792.24237s	VCVCCU 19 02 0D VCVCCU 19 02 0D	0.17028s 0.16768s	Veveeu Veveeu	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0 59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0				
	2 792,44062s	792.44062s Functionum 0x614 3E 80							
	794,75776s	VOVCCU 19 02 0D FuncGroup-0x614 3E 60	0.162365	VEVERU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 26 0	2 E0 E5 26 04 E0 E3 28 20 E0 E2 (51 Bytes)			
	797.257725	VCVCCU 19 02 6D	0.16249s	VEVEEU	50 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0				
	799.75973s	VCVCCU 19-02-00	0.17056s	VEVEEU	59 02 FF 01 E0.E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 0	2 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 Bytes)			
	800.442645	FuncGroup-0x614 3E 80							



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session, e.g. every second. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. <u>HSOUT0:</u>

XX:

- 0x00: HSOUT0 isn't enabled after startup
- TTTTTT01: TTTTTT * 100ms, e.g. 33 * 100ms → 0x85 (10000101)
- 0x02: HSOUT0 is enabled after startup and isn't disabled
- 0x03: HSOUT0 is enabled with respect to CP and PP

Request: 04 2E FD 03 XX FF FF FF Response: 03 6E FD 03 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present HSOUT0 configuration, the following communication has to be executed.

- 4. <u>Read HSOUT0 configuration:</u>
- Request: 03 22 FD 03 FF FF FF FF Response: 04 62 FD 03 XX FF FF FF



5.2.1.2.3 Configuration of High Side Output Diagnostic Mode

The VC-EVCC provides the possibility to activate or deactivate the active off-state diagnostics of the HSOUT0, HSOUT1 and HSOUT4. If the active off-state diagnostic is configured as "On" the VC-EVCC will detect ShortToGnd and OpenLoad faults even if the corresponding HSOUT is disabled.

The service structure is defined as 1 byte.

Bit Pos.	Description	Value
0	HSOUT0 Active off-state diagnostics	Off: 0 (default) On: 1
1	HSOUT1 Active off-state diagnostics	Off: 0 (default) On: 1
2	HSOUT4 Active off-state diagnostics	Off: 0 (default) On: 1



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

The configuration of the High Side Output diagnostic mode can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

CVCCCU - Diagnostic Console				- 🗆 X
🕒 👳 🗤 🗶 🗙 🖬 🗛 🖩 🖩 📓 🧏 = H 🖷 🕷 🕮				 Online
Symbolic ~				[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start				~ Execute
Seriors 1011. Delay Sexion Stat Section 1013. Stateded Disposition State Sections Se	Name PDU Type/Parameter [14:22:12]-Tx [14:22:12] [14:22:12] [14:22:12] [14:22:12]	Value 10 03 Service/Value Service/Value Extended Dia VCVCCU Positive respo 50 (me) 5000 (me) Device VCVC	gnostic Session Start Inse:	



2. Select the tab "Stored Data" and click on "2E FD 25 – VCVCCU Configuration HSOUT diagnostic mode Write". Please choose the requested HSOUT diagnostic mode configuration and click on the button "Execute". Please note that the response must be positive.

VCVCCU - Diagnostic Console				
] 🗅 🏵 🕶 🚧 🗶 🖬 🛗 🔃 🕸 🕲 📰 😑 🙌 📰 🖼 🖿) Onl
nbolic 🗸				[EVCC] VCV
2E FD 25 - VCVCCU_Configuration_HSOUT_diagnostic_mode_Write				✓ Execu
Bessions	Name	Value	Unit	
10 01 - Default Session Start 10 03 - Extended Diagnostic Session Start	PDU	2E FD 25 01		
	DID 0xED23	0x01		
Stored Data	HSOUT diagnostic	0x01		
22 FD 00 - VCVCCU Configuration J1939 CAN Read	HSOUT diagnostic. HSOUT 0ActiveOffStateDiag	on	~	
- E FD 00 - VCVCCU Configuration J1939 CAN Write			~	
22 FD 03 · VCVCCU Configuration HSOUTO Read	HSOUT diagnostic. HSOUT1ActiveOffStateDiag	off	~	
2E FD 03 · VCVCCU Configuration HSOUTO Write	HSOUT diagnostic. HSOUT 4ActiveOffStateDiag	off	~	
22 FD 04 - VCVCCU Configuration PTC0 message Read	HSUU I diagnostic. (reserved)	UXUU		
2E FD 04 - VCVCCU Configuration PTC0 message Write				
22 FD 05 · VCVCCU Configuration PTC1 message Read				
2E FD 05 - VCVCCU Configuration PTC1 message Write				
22 FD 06 · VCVCCU Configuration PTC2 message Read				
2E FD 06 - VCVCCU Configuration PTC2 message Write				
22 FD 07 VCVCCU Configuration InletStatus message Read				
2E FD 07 · VCVCCU Configuration InletStatus message Write				
22 FD 08 · VCVCCU Configuration ControlPilotStatus message Read				
- 🚉 2E FD 08 - VCVCCU Configuration ControlPilotStatus message Write				
- 🚉 22 FD 09 - VCVCCU Configuration InternalVoltageStatus message Read		a :		
- 🚉 2E FD 09 · VCVCCU Configuration InternalVoltageStatus message Write	Type/Parameter	Service/Value		
- 🔂 22 FD 0A - VCVCCU Configuration InternalVoltageRawValues message Read				
	[11:45:38] - Tx	Extended Diagnos	tic Session Start	
	[11:45:38]	VEVECU		
	[11:45:38] - Rx	Positive response:		
	P2	50 [ms]		
- 🗟 2E FD 0D - VCVCCU Configuration TLS Certificate Write	P2Ex	5000 [ms]		
- 🗟 2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	[11:45:38]	Device VCVCCU'	is online.	
- 🔂 22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read				
- 🚯 2E FD 0F - VCVCCU Configuration Primary J1939 Source Address Write	[11:45:50] - Tx	VCVCCU Configur	ation HSOUT diagnostic	c mode Write
- 🗟 22 FD 10 - VCVCCU Configuration Secondary J1939 Source Address Read	DID 0xFD23	0x01		
- 🖳 2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write	HSOUTdiagnostic	0x01		
22 FD 11 - VCVCCU Configuration Value Added Service Read	-			
2E FD 11 · VCVCCU Configuration Value Added Service Write	HSOUT diagnostic. HSOUT 0ActiveOffStateDia	-		
2E FD 12 · VCVCCU Configuration TLS Certificate2 Write	HSOUT diagnostic. HSOUT1ActiveOffStateDia	-		
22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Read	HSOUT diagnostic. HSOUT 4ActiveOffStateDia	-		
- 🔂 2E FD 13 - VCVCCU Configuration StopCharge CAN Signal Write	HSOUT diagnostic. (reserved)	(0x00)		
22 FD 14 - VCVCCU Configuration Charge Node Selection Read	[11:45:51]	VCVCCU		
2E FD 14 - VCVCCU Configuration Charge Node Selection Write	[11:45:51] - Rx	Positive response.		
22 FD 20 · VCVCCU Configuration Inlet Type Read	,			
2E FD 20 · VCVCCU Configuration Inlet Type Write				
22 FD 21 - VCVCCU Configuration PTC activation Read				
2E FD 21 · VCVCCU Configuration PTC activation Write				
22 FD 22 - VCVCCU Configuration LIN J3068 charging activation Read				
E FD 22 - VCVCCU Configuration LIN J3068 charging activation Write				
22 FD 25 · VCVCCU Configuration HSOUT diagnostic mode Read				
25 FD 25 - VCVCCU Configuration HSOUT diagnostic mode Write				
22 FD 25 VEVECE configuration FnC Activation Read				



3. By executing the command "22 FD 25 – VCVCCU Configuration HSOUT diagnostic mode Read" the current HSOUT diagnostic mode configuration can be verified.

				- D
				IEVCC1VCV
4:22 FD 25 · VCVCCU Configuration HSOUT diagnostic mode Read				V Execu
	^ Name	Value	Unit	
📕 🛄 10 01 - Default Session Start			Unit	
10 03 - Extended Diagnostic Session Start	PDU	22 FD 25		
Stored Data				
22 FD 00 - VCVCCU Configuration J1939 CAN Read				
2E FD 00 - VCVCCU Configuration J1939 CAN Write				
22 FD 03 - VCVCCU Configuration HSOUTO Read				
- 🔂 2E FD 03 - VCVCCU Configuration HSOUTO Write				
- 🔂 2E FD 04 - VCVCCU Configuration PTC0 message Write				
22 FD 05 · VCVCCU Configuration PTC1 message Read				
2E FD 05 - VCVCCU Configuration PTC1 message Write				
22 FD 06 · VCVCCU Configuration PTC2 message Read				
- 🕵 2E FD 06 · VCVCCU Configuration PTC2 message Write				
22 FD 07 - VCVCCU Configuration InletStatus message Read				
22 FD 08 - VCVCCU Configuration ControlPilotStatus message Read				
2E FD 08 · VEVECU Configuration ControlPilotStatus message Write				
22 FD 09 · VCVCCU Configuration InternalVoltageStatus message Read				
- 🕵 2E FD 09 - VCVCCU Configuration InternalVoltageStatus message Write	Type/Parameter	Service/Value		
22 FD 0A · VEVECU Configuration InternalVoltageRawValues message Read				
- 🔂 2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write	[11:45:38] - Tx	Extended Diagnosti	- Cossion Start	
22 FD 0B - VCVCCU Configuration InletStatus2 message Read		VEVECU	5 Session Start	
2E FD 0B - VEVECU Configuration InletStatus2 message Write	[11:45:38]			
22 FD 0C · VCVCCU Configuration TLS Activation Read	[11:45:38] - Rx	Positive response:		
2E FD 0C - VCVCCU Configuration TLS Activation Write	P2	50 [ms]		
2E FD 0D - VCVCCU Configuration TLS Certificate Write	P2Ex	5000 [ms]		
- 🔂 2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	[11:45:38]	Device 'VCVCCU' is	online.	
22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read				
2E FD 0F · VCVCCU Configuration Primary J1939 Source Address Write	[11:45:50] - Tx	VCVCCU Configurat	ion HSOUT diagnostic	c mode Write
22 FD 10 · VCVCCU Configuration Secondary J1939 Source Address Read	DID 0xFD23	0x01		
2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write		0x01		
22 FD 11 · VCVCCU Configuration Value Added Service Read	HSOUT diagnostic			
- 🔂 2E FD 11 - VCVCCU Configuration Value Added Service Write	HSOUT diagnostic. HSOUT 0Active OffStateDiag	on		
2E FD 12 - VCVCCU Configuration TLS Certificate2 Write	HSOUT diagnostic. HSOUT 1 Active OffStateDiag	off		
22 FD 13 · VCVCCU Configuration StopCharge CAN Signal Read	HSOUT diagnostic. HSOUT 4ActiveOffStateDiag	off		
- 🔂 2E FD 13 - VCVCCU Configuration StopCharge CAN Signal Write	HSOUT diagnostic. (reserved)	(0x00)		
	[11:45:51]	VCVCCU		
- 🔁 2E FD 14 - VCVCCU Configuration Charge Node Selection Write	[11:45:51] - Rx	Positive response.		
22 FD 20 - VCVCCU Configuration Inlet Type Read				
- 🔂 2E FD 20 - VCVCCU Configuration Inlet Type Write	[11:46:36] - Tx		ion HSOUT diagnostic	o mode Read
- 🔂 22 FD 21 - VCVCCU Configuration PTC activation Read		-	ion no o o nulayhostic	s mode niedu
2E FD 21 - VCVCCU Configuration PTC activation Write	[11:46:36]	VEVECU		
22 FD 22 · VCVCCU Configuration LIN J3068 charging activation Read	[11:46:36] - Rx	Positive response:		
2E FD 22 - VEVECU Configuration LIN J3068 charging activation Write	DID 0xFD23	0x01		
🔝 22 FD 25 - VCVCCU Configuration HSDUT diagnostic mode Read	HSOUTdiagnostic	0x01		
2E FD 25 - VEVELU Configuration HSUUT diagnostic mode Write	HSOUT diagnostic. HSOUT 0ActiveOffStateDiag	on		
22 FD 26 · VCVCCU Configuration PnC Activation Read	HSOUT diagnostic. HSOUT 1 Active OffState Diag	off		
2E FD 26 - VCVCCU Configuration PnC Activation Write	HSOUT diagnostic.HSOUT 4ActiveOffStateDiag	off		
2E FD 27 · VCVCCU Configuration 0EM Provisioning Certificate Write				
2E FD 2A - VCVCCU Configuration PnC Contract Certificate Write	HSOUT diagnostic. (reserved)	(0x00)		
E 2E ED 2B . VCVCCLL Configuration PnC Contract Certificate Private Key Write	v			





Configuration with Indigo

The configuration of the HSOUT diagnostic mode can be executed with Indigo according to the following description.

1. Select the tab "Parametrizer" and click on the data field Value of the requested High Side Output (HSOUT0, HSOUT1 or HSOUT4). Select the requested HSOUT diagnostic mode configuration ("on" or "off") and click on the button "Write" to execute the configuration.

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connect Remote Refre	sh Auto Refr	esh Write Clea	r Revert Cancel	Filter Grid Vie	w Details Grouping	Report Logging	ECU Selection Parar * Select		re Restore			
Connection		Read / Write			View	Report	Configuration	Sto	ore / Restore			
avigation	<											Parametrizer
🧕 Identification Bro	wser	Name							+	Value	Unit	
	_	VCVCCU (EVCC)										
Parametrizer				tion/TLS Activati	on Status Field/TLS	Activation Status				off		
VAS			-				arge CAN Signal Statu			off		
-					ddress/Secondary So		ingo ontroignarocaca			5A 0xD7		
Plug and Charge			iguration PTC2 mes			aree nauress				20	ms	
Inlet Configuratio			iguration PTC1 mes							20	ms	
amer configuratio			iguration PTC1 mes							20		
DTC Browser											ms	
·					ess/Primary Source A					SA 0x80		
🟅 Reprogramming			-		on/LINConfigurationF		ivation			off		
					figuration/J1939 CAN	I Baud Rate				250kBaud		
		& VCVCCU Conf	iguration InternalVo	ltageStatus mess	age/Time Period					20	ms	
		🍰 VCVCCU Conf	iguration InternalVo	ltageRawValues r	nessage/Time Period					20	ms	
		🋵 VCVCCU Conf	iguration InletStatus	s2 message/Time	Period					20	ms	
		💪 VCVCCU Conf	iguration InletStatus	s message/Time I	Period					20	ms	
		🛵 VCVCCU Conf	iguration HSOUT0/H	ISOUT0 Configur	ation/HSOUT0 Time	Period				D	ms	
		lo VCVCCU Conf	iguration HSOUT0/H	ISOUT0 Configur	ation/HSOUT0 Mode					On CP/PP		
		🛵 VCVCCU Conf	iguration HSOUT dia	anostic mode/HS	SOUTdiagnostic/HSO	UT4ActiveOffStateI	liag			on		
					SOUTdiagnostic/HSO					► off		
					SOUTdiagnostic/HSO					off		
			iguration ControlPilo			oronearconotacci	ag .			20	ms	
						les Activation Statu	Field/CONFIG_Chargin	aSchedules		off		
							Node Selection Status			off		
		50 VEVEED COM	iguration charge no	ue selection/cha	rge node selection :	scacus Field/ criarge	Node Selection Status					
												Diagnostic Tra
		Request Time	Request Target	Request Data	Response Time De	Ita Response So	rce Response Data	Commun	ication Error			
		272.29970s	FuncGroup-0x614	3E 80								
		273.92036s	VCVCCU	3E 00	0.00879s	VCVCCU	7E 00					
		276.30078s	FuncGroup-0x614									
		277.92963s	VCVCCU	3E 00	0.00969s	VCVCCU	7E 00					
		 280.30159s 281.94022s 	FuncGroup-0x614 VCVCCU	3E 80 3E 00	0.00929s	VCVCCU	7E 00					
		- 201.94U22S	Function Overld	32.00	0.009295	VUVUU	7E UU					



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. HSOUT diagnostic mode configuration:

XX: HSOUT Active off-state diagnostics

- 0000 000Xb: HSOUT0 Active off-state diagnostics (Off: 0, On: 1)
- 0000 00X0b: HSOUT1 Active off-state diagnostics (Off: 0, On: 1)
- 0000 0X00b: HSOUT4 Active off-state diagnostics (Off: 0, On: 1)

Request: 04 2E FD 25 XX FF FF FF Response: 03 6E FD 25 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present HSOUT diagnostic mode configuration, the following communication has to be executed.

4. <u>Read HSOUT diagnostic mode configuration:</u> Request: 03 22 FD 25 FF FF FF FF Response: 04 62 FD 25 XX FF FF FF



5.2.1.2.4 Configuration of Message Cycle Times

The VC-EVCC provides the possibility to configure message cycle times of certain CAN messages of the J1939 database.

Message	CAN-Identifier
VCVCCU_PTC0	0x18FF1080
VCVCCU_PTC1	0x18FF1180
VCVCCU_PTC2	0x18FF1280
VCVCCU_InletStatus	0x18FF1380
VCVCCU_ControlPilotStatus	0x18FF1480
VCVCCU_InternalVoltageStatus	0x18FF1880
VCVCCU_InternalVoltageRawValues	0x18FF1980
VCVCCU_InletStatus2	0x18FF1A80

 Table 5-7
 CAN Messages with Configurable Cycle Times



Note

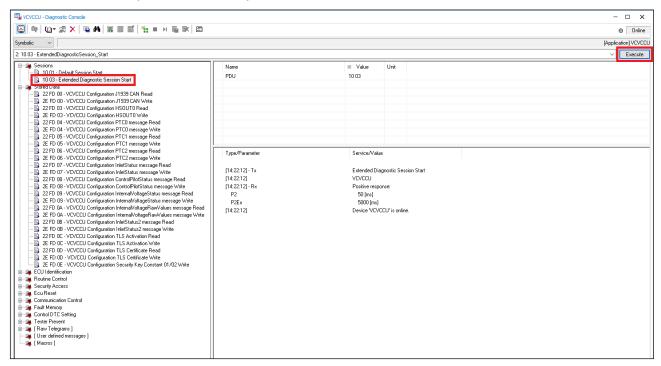
An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

The configuration of message cycle times can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.



2. Select the tab "Stored Data" and select the message whose cycle time should be configured. Please choose the requested time period (cycle time) and click on the button "Execute". Please note that the response must be positive.

VCVCCU - Diagnostic Console			- 🗆 X
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Symbolic V			(Application) VCVCCU
8: 2E FD 04 - VCVCCU_Configuration_PTC0_message_Write			~ Execute
Sestions 10 01 - Default Sestion Start 10 03 - Standed Diagnostic Sestion Start Stored Data Stored Data Stored Data Stored Data Set P0 00 - VVCCU Configuration J1939 CAN Read Set P0 03 - VVCCU Configuration J1939 CAN Read Set P0 03 - VVCCU Configuration J1930 CAN Write Set P0 03 - VVCCU Configuration J1901 Read Set P0 03 - VVCCU Configuration FISUITO Write Set P0 03 - VVCCU Configuration FISUITO Write Set P0 04 - VVCCU Configuration FISUITO Write Set P0 04 - VVCCU Configuration PICI message Write Set P0 04 - VVCCU Configuration PICI message Head Set P0 05 - VVCCU Configuration PICI message Write Set P0 05 - VVCCU Configuration PICI message Write	Name POU VCVCCU Configuration PTC0 message Time Period	Value Unit ZE FD 04 00 0x00 0 ms	
	Type/Parameter [14:52:45] - Tx [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:52:45] [14:53:04] [14:53:04] - Rx	Service/Value Extended Diagnostic Session Stat VCVCCU Positive response: 50 [ms] 5000 [ms] Device VCVCCU is online. VCVCCU Configuration PTC0 message Write 0.00 0 [ms] VCVCCU Positive response.	



3. By executing the "Read"-command of the corresponding message the current configuration of the message cycle time can be verified.

VCVCCU - Diagnostic Console				- 🗆 🗙
😑 👳 🗤 🗶 X 🖷 🗛 民 🗉 🧏 = H 🗞 🕅 👘				 Online
Symbolic V				[Application] VCVCCU
7: 22 FD 04 - VCVCCU_Configuration_PTC0_message_Read				~ Execute
 Session: Session: 10.03 - Extended Diagnostic Session Stat 10.03 - Extended Diagnostic Session Stat 21.003 - Extended Diagnostic Session Stat 22.67 D0 - VCVCCU Configuration J1393 CAN Read 22.67 D0 - VCVCCU Configuration J1393 CAN Read 22.67 D0 - VCVCCU Configuration ASINI TO Read 22.67 D0 - VCVCCU Configuration PTCI message Read 22.67 D0 - VCVCCU Configuration Tetra Molecular message Read 22.67 D0 - VCVCCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCU Configuration Intel® Molecular message Write 22.67 D0 - VCVCU Configuration Intel® Molecular message Read 22.67 D0 - VCVCU Configuration IS Activation Read 22.67 D0 - VCVCU Configuration IS Activation Read 22.67 D0 - VCVCU Configuration IS Activation Read 22.67 D0	Name PDU Image: PDU	0x00 0 [ms] VCVCCU Positive respo	gnostic Ses inse: CU' is onlin figuration P inse. figuration P	



Configuration with Indigo

The configuration of message cycle times can be executed with Indigo according to the following description.

1. Select the tab "Parametrizer" and click on the data field Value of the message to be configured, for example "VCVCCU Configuration PTC0 message/Time Period". Enter the requested message cycle time and click on the button "Write" to execute the configuration.

s 6 7 Start Degreetus Enha	net	9 =	Y EI	0 3			Vector Indigo & SPATIera 1 - VC-VCCU, ndigo*	
formett Remote Refresh A	1119 (1-144) Constants (1-144)	Repet Canod		Details Grouping Re	eport (opping EC)	Sidection Parameter Store Restore		
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	1649.530929	Veveeu	22 FD 04	0.008976	VEVCOU	52 FD 14 01		
	1649.54211s	yevecu	2E FD 04 02	0.21756s	νούσου	6E F0 04		
	1649.761413	VEVECU	22 70 04	0.008285	VOVCOU	62 FD 84 02		
	1651.06177s	VCVCCU FuncGroup-0x614	19 02 00 3F 80	0.16643s	VEVCCU	59 82 FF 61 E0 E3 28 01 E8 E5 28 82 E8 E3 28 82 E0 E4 28 82	. LO ED 20 04 EO ES 28 20 EO E2 (51 Bytes)	
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			19 02 0D	0.158915	VEVECU	59.02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02		



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. <u>Message cycle time:</u>

XX:

- 0x00: CAN Message isn't transmitted
- 0x01 ... 0xFF: CAN Message is transmitted with a cycle time of Value * 10ms (10ms ... 2550ms)

Request: 04 2E FD 0X XX FF FF FF Response: 03 6E FD 0X FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

The data identifiers (in blue) of CAN messages with configurable message cycle times are listed below.

Message	Data Identifier (DID)
VCVCCU_PTC0	FD 04

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VCVCCU_PTC1	FD 05
VCVCCU_PTC2	FD 06
VCVCCU_InletStatus	FD 07
VCVCCU_ControlPilotStatus	FD 08
VCVCCU_InternalVoltageStatus	FD 09
VCVCCU_InternalVoltageRawValues	FD 0A
VCVCCU_InletStatus2	FD 0B

Table 5-8 Data Identifiers for Message Cycle Time Configuration

In order to read the present message cycle time configuration, the following communication has to be executed.

4. <u>Read message cycle time configuration:</u> Request: 03 22 FD 0X FF FF FF FF Response: 04 62 FD 0X XX FF FF FF



5.2.1.2.5 Configuration of StopCharge CAN Signal

The VC-EVCC provides the possibility to use the CAN-signal VCVCCU_Vehicle_StopCharge to stop charging and unlocking the plug.

The service structure is defined as 1 byte.

Value	Description
0x00	StopCharge via CAN signal feature is deactivated (default)
0x01	StopCharge via CAN signal feature is activated



Note

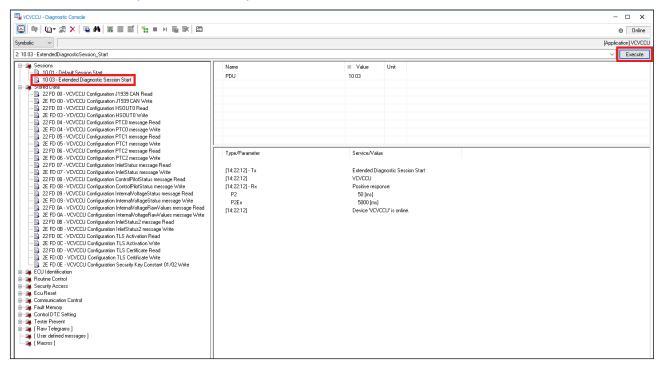
An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

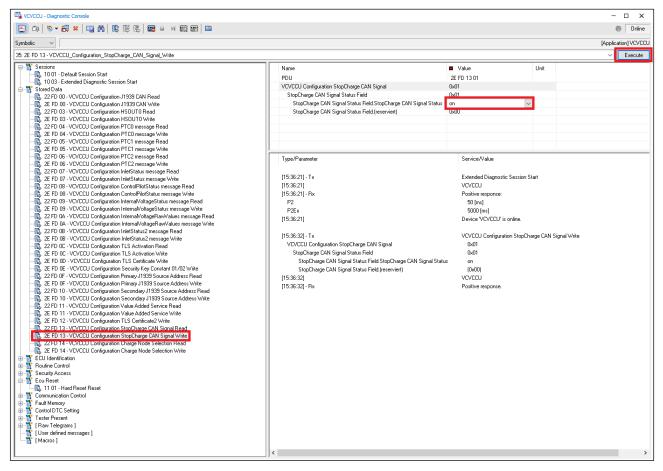
The configuration of the StopCharge CAN signal can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.





 Select the tab "Stored Data" and click on "2E FD 13 – VCVCCU Configuration StopCharge CAN Signal Write". Please choose the requested StopCharge CAN Signal configuration ("on" or "off") and click on the button "Execute". Please note that the response must be positive.





3. By executing the command "22 FD 13 – VCVCCU Configuration StopCharge CAN Signal Read" the current configuration of the StopCharge CAN Signal can be verified.

				On
2 ED 13 · VCVCCU Configuration StopCharge CAN Signal Read				[Application] VC
	Name	Value	Unit	- Linder
- 🔁 10 01 - Default Session Start		22 FD 13	OTIK	
10 03 · Extended Diagnostic Session Start	FDU	22 PD 13		
Stored Data				
22 FD 00 · VCVCCU Configuration J1939 CAN Read				
22 FD 00 · VCVCCU Configuration J 1339 CAN write				
22 FD 03 · VCVCCU Configuration HS0010 Had				
22 FD 04 · VCVCCU Configuration PTC0 message Read				
22 FD 04 · VCVCCU Configuration PTC0 message Write				
22 FD 05 · VCVCCU Configuration PTC1 message Read				
2E FD 05 - VCVCCU Configuration PTC1 message Write				
22 FD 06 · VCVCCU Configuration PTC2 message Read	Type/Parameter	Service/Value		
2E FD 06 - VCVCCU Configuration PTC2 message Write				
22 FD 07 - VCVCCU Configuration InletStatus message Read	[15:36:21] - Tx	Extended Diagnostic Sessi	on Start	
2E FD 07 · VCVCCU Configuration InletStatus message Write	[15:36:21]	VEVECU	on ordet	
22 FD 08 - VLVCLU Configuration ControlPilotStatus message Head	[13:36:21] [15:36:21] - Bx	Positive response:		
2E FD 08 - VCVCCU Configuration ControlPilotStatus message write	P2	50 [ms]		
22 FD 00 VCVCCU Configuration Internat/ortget/tatus message Write	P2Fx	5000 [ms]		
22 FD 0A · VEVEEU Configuration InternalVoltageRawValues message Read		Device VCVCCU' is online.		
2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write	[15:36:21]	Device VLVLLU is online.		
			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	
- 💼 2E FD 0B - VEVEEU Configuration InletStatus2 message Write	[15:36:32] · Tx	VEVECU Configuration Sto	pUharge LAN Signal Wr	nte
22 FD 0C · VCVCCU Configuration TLS Activation Read	VCVCCU Configuration StopCharge CAN Signal	0x01		
2E FD 0C - VCVCCU Configuration TLS Activation Write	StopCharge CAN Signal Status Field	0x01		
2E FD 0D - VCVCCU Configuration TLS Certificate Write	StopCharge CAN Signal Status Field.StopCharge CAN Signal Status	on		
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	StopCharge CAN Signal Status Field.(reserviert)	(0x00)		
22 FD 0F - VEVECED Configuration Frimary 31939 Source Address Mead	[15:36:32]	VEVECU		
22 FD 10 • VCVCCU Configuration Ferningly 1939 Source Address Write	[15:36:32] · Rx	Positive response.		
22 FD 10 · VCVCCU Configuration Secondary J1939 Source Address Write				
22 FD 11 · VCVCCU Configuration Value Added Service Read	[15:37:11] · Tx	VEVECU Configuration Sto	pCharge CAN Signal Re	ad
2E FD 11 · VCVCCU Configuration Value Added Service Write	[15:37:11]	VEVECU		
- 🔂 2E FD 12 · VCVCCU Configuration TLS Certificate2 Write	[15:37:11] - Bx	Positive response:		
12 FD 13 · VCVCCU Configuration StopCharge CAN Signal Read	VCVCCU Configuration StopCharge CAN Signal	0x01		
2E FD 13 - VLVLLU Loninguration StopLharge LAN Signal Write	StopCharge CAN Signal Status Field	0x01		
22 FD 14 · VCVCCU Configuration Charge Node Selection Read	StopEharge CAN Signal Status Field.StopEharge CAN Signal Status	on		
ECU Identification	StopCharge CAN Signal Status Field.(reserviert)	(0x00)		
Routine Control				
Security Access				
Ecu Reset				
Length 11 01 - Hard Reset Reset				
Communication Control				
Fault Memory				
Control DTC Setting				
Tester Present				
[Raw Telegrams]				
[User defined messages]				
[Macros]				



Configuration with Indigo

The configuration of the StopCharge CAN Signal can be executed with Indigo according to the following description.

 Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration StopCharge CAN Signal/StopCharge CAN Signal Status Field/StopCharge CAN Signal Status". Select the requested StopCharge CAN Signal configuration and click on the button "Write" to execute the configuration.

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Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. StopCharge CAN Signal:

XX:

- 0x00: StopCharge via CAN signal feature is deactivated
- 0x01: StopCharge via CAN signal feature is activated

Request: 04 2E FD 13 XX FF FF FF Response: 03 6E FD 13 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present configuration of the StopCharge CAN Signal configuration, the following communication has to be executed.

4. <u>Read StopCharge CAN Signal configuration:</u> Request: 03 22 FD 13 FF FF FF FF Response: 04 62 FD 13 XX FF FF FF



5.2.1.2.6 Configuration of Primary J1939 Source Address (Charging Arbitration)

The VC-EVCC provides the possibility to configure the Primary J1939 Source Address. The following source address values are available for selection

Description	Source Address Value
Primary Source Address	0x80 (default)
Primary Source Address	0xD7
Primary Source Address	0xD8
Primary Source Address	0xD9
Primary Source Address	0xDA
Primary Source Address	0xDB
Primary Source Address	0xDC
Primary Source Address	0xDD
Primary Source Address	0xDE
Primary Source Address	0xDF



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

The configuration of the Primary J1939 Source Address can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

CVCCCU - Diagnostic Console				- 🗆 X
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Symbolic ~				[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start				~ Execute
Seriors 1011. Delay Sexion Stat Section 1013. Stateded Disposition State Sections Se	Name PDU Type/Parameter [14:22:12]-Tx [14:22:12] [14:22:12] [14:22:12] [14:22:12]	Value 10 03 Service/Value Service/Value Extended Dia VCVCCU Positive respo 50 (me) 5000 (me) Device VCVC	gnostic Session Start Inse:	



2. Select the tab "Stored Data" and click on "2E FD 0F – VCVCCU Configuration Primary J1939 Source Address Write". Please choose the requested Primary Source Address and click on the button "Execute". Please note that the response must be positive.

CVCVCU - Diagnostic Console				- 🗆 X
				Online
Symbolic V			ŀ	Application] VCVCCU
28: 2E FD 0F - VEVECU_Configuration_Primary_J1939_Source_Address_Write				✓ Execute
28: 25: FD 0F - VCVCCU Configuration, Primary_11939_Source_Address_Write 10: 10: 10: Lotault Session Stat 10: 10: 10: Standad Diagnostic Sersion Stat 10: 10: 5: Standad Diagnostic Sersion Stat 10: 10: 25: 5: 5: 5: 5: 5: 5: 5: 5: 5: 5: 5: 5: 5	Name POU VCVCCUI Configuration Primary J1339 Source Address Primary Source Address Image: Source Address Imag	Value 2E FD 0F D7 VD7 SA 0xD7 SA 0xD7 Service/Value Extended Diagnostic Sessi VCVCCU Positive response: 50 [ms] 5000 [ms] Device VCVCCUU is online VCVCCUU conliguration Piri 0xD7 SA 0xD7 VCVCCU Positive response.		
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3. By executing the command "22 FD 0F – VCVCCU Configuration Primary J1939 Source Address Read" the current Primary Source Address can be verified.



Configuration with Indigo

The configuration of the Primary J1939 Source Address can be executed with Indigo according to the following description.

1. Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration Primary J1939 Source Address/Primary Source Address". Select the requested Primary J1939 Source Address and click on the button "Write" to execute the configuration.

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Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. <u>Primary J1939 Source Address:</u>
 XX: Selected Primary J1939 Source Address value

Request: 04 2E FD 0F XX FF FF FF Response: 03 6E FD 0F FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present Primary J1939 Source Address configuration, the following communication has to be executed.

4. <u>Read Primary J1939 Source Address configuration:</u> Request: 03 22 FD 0F FF FF FF FF Response: 04 62 FD 0F XX FF FF FF



5.2.1.2.7 Configuration of Secondary J1939 Source Address (Charging Arbitration)

The VC-EVCC provides the possibility to configure the Secondary J1939 Source Address. The following source address values are available for selection

Description	Source Address Value
Secondary Source Address	0x80 (default)
Secondary Source Address	0xD7
Secondary Source Address	0xD8
Secondary Source Address	0xD9
Secondary Source Address	0xDA
Secondary Source Address	0xDB
Secondary Source Address	0xDC
Secondary Source Address	0xDD
Secondary Source Address	0xDE
Secondary Source Address	0xDF



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

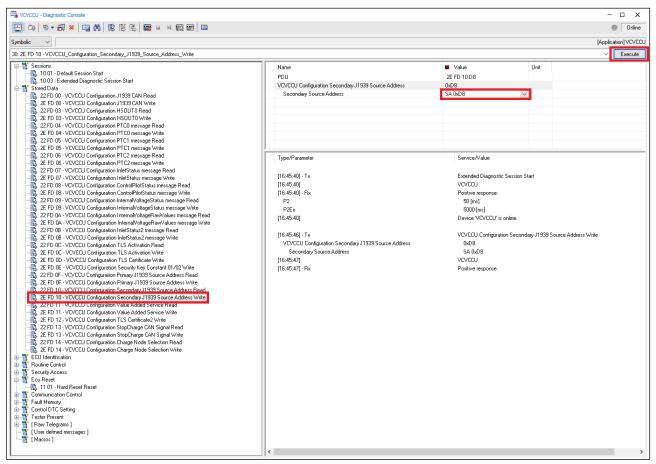
The configuration of the Secondary J1939 Source Address can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

Rev VCVCCU - Diagnostic Console			- 🗆 X
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Sessions	Name	Value Unit	
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22 FD 00 - VCVCCU Configuration J1939 CAN Read			
E FD 00 - VCVCCU Configuration J1939 CAN Write 22 FD 03 - VCVCCU Configuration HS0UT0 Read			
22 FD 04 - VCVCCU Configuration PTC0 message Read 22 FD 04 - VCVCCU Configuration PTC0 message Write			
2E FD 05 · VCVCCU Configuration PTC1 message Write 22 FD 06 · VCVCCU Configuration PTC2 message Read			
- B 2E FD 06 - VCVCCU Configuration PTC2 message Write	Type/Parameter	Service/Value	
22 FD 07 · VCVCCU Configuration InletStatus message Read 2E FD 07 · VCVCCU Configuration InletStatus message Write	[14:22:12] - Tx	Extended Diagnostic Session Start	
22 FD 07 V V V CCU Configuration Interstatus message Write 22 FD 08 - V CV CCU Configuration ControlPilotStatus message Read	[14:22:12]	VCVCCU	
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E FD 0C - VCVCCU Configuration TLS Activation Write 22 FD 0D - VCVCCU Configuration TLS Certificate Read			
- 2E FD 0D - VCVCCU Configuration TLS Certificate Write			
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write ECU Identification			
B Routine Control			
B- B Security Access			
Communication Control			
Fault Memory			
Bright Control D I C Setting			
🗑 🎯 [Raw Telegrams]			
[User defined messages]			



 Select the tab "Stored Data" and click on "2E FD 10 – VCVCCU Configuration Secondary J1939 Source Address Write". Please choose the requested Secondary Source Address and click on the button "Execute". Please note that the response must be positive.





3. By executing the command "22 FD 10 – VCVCCU Configuration Secondary J1939 Source Address Read" the current Secondary Source Address can be verified.

Image: Specific	VCVCCU - Diagnostic Console			- 🗆 🗙
12 22 27 10 - VDCCUL Conjunction, Seconday, J1328, Source, Address, Read V Exclusion 13 22 27 10 - VDCCUL Conjunction, State V V Exclusion 14 22 70 0 - VDCCUL Conjunction, State V V V Exclusion 14 22 70 0 - VDCCUL Conjunction, State V	□ □ ↓ S ▼ #2 × □ ↓ ★ B B B B B ■ H B B B ■			Online
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Configuration with Indigo

The configuration of the Secondary J1939 Source Address can be executed with Indigo according to the following description.

2. Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration Secondary J1939 Source Address/Secondary Source Address". Select the requested Secondary J1939 Source Address and click on the button "Write" to execute the configuration.

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Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

<u>Secondary J1939 Source Address:</u>
 XX: Selected Secondary J1939 Source Address value

Request: 04 2E FD 10 XX FF FF FF Response: 03 6E FD 10 FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present Secondary J1939 Source Address configuration, the following communication has to be executed.

4. <u>Read Secondary J1939 Source Address configuration:</u> Request: 03 22 FD 10 FF FF FF FF Response: 04 62 FD 10 XX FF FF FF



5.2.1.2.8 Configuration of Charge Node Selection (Charging Arbitration)

The VC-EVCC provides the possibility to use charging arbitration which enables to run two VC-EVCCs with different source addresses on the same CAN channel.

The service structure is defined as 1 byte.

Value	Description
0x00	Charging Arbitration is inactive (default)
0x01	Charging Arbitration is active



Note

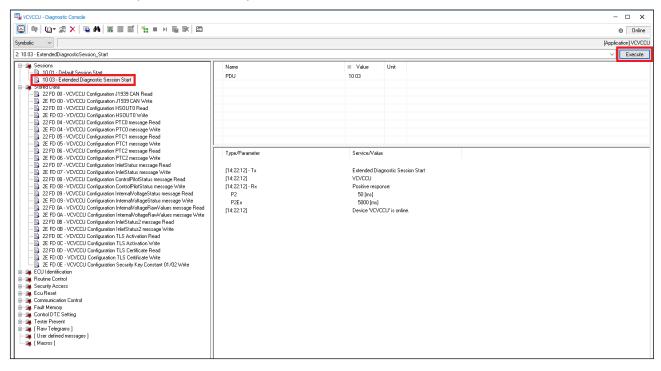
An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

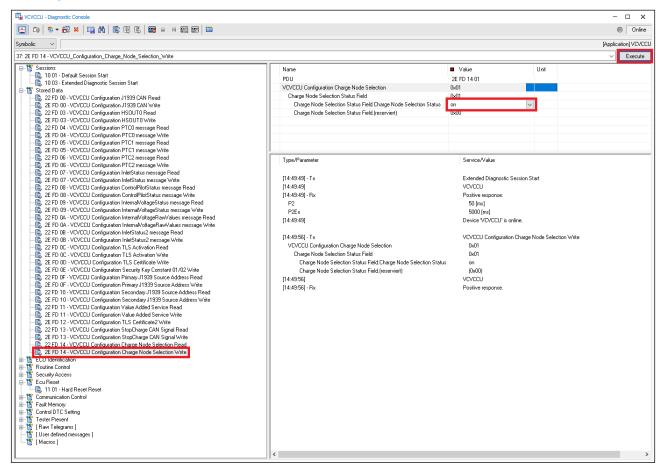
The configuration of the Charge Node Selection can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.





 Select the tab "Stored Data" and click on "2E FD 14 – VCVCCU Configuration Charge Node Selection Write". Please choose the requested Charge Node Selection ("on" or "off") and click on the button "Execute". Please note that the response must be positive.





3. By executing the command "22 FD 14 – VCVCCU Configuration Charge Node Selection Read" the current configuration of the Charge Node Selection can be verified.



Configuration with Indigo

The configuration of Charge Node Selection can be executed with Indigo according to the following description.

3. Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration Charge Node Selection/Charge Node Selection Status Field/Charge Node Selection Status". Select the requested Charge Node Selection configuration and click on the button "Write" to execute the configuration.

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Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. Charge Node Selection:

XX:

- 0x00: Charging Arbitration is inactive
- 0x01: Charging Arbitration is active

Request: 04 2E FD 14 XX FF FF FF Response: 03 6E FD 14 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present configuration of the Charge Node Selection configuration, the following communication has to be executed.

4. <u>Read Charge Node Selection configuration:</u> Request: 03 22 FD 14 FF FF FF FF Response: 04 62 FD 14 XX FF FF FF



5.2.1.2.9 Configuration of Transport Layer Security – V2G

The VC-EVCC provides the possibility to establish a secure connection to the EVSE using Transport Layer Security (TLS) for V2G communication.



Configuration with CANoe/CANalyzer

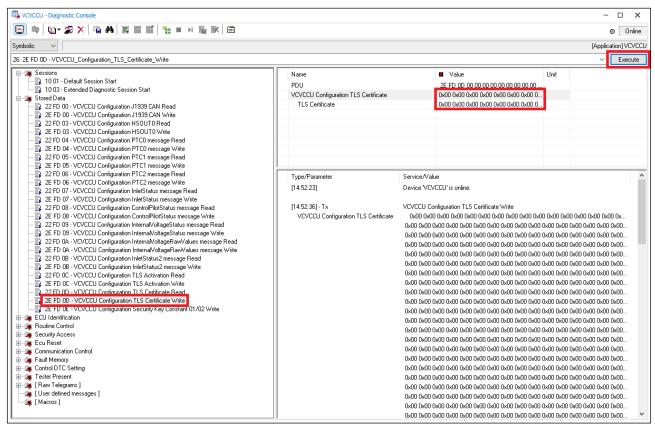
The configuration of TLS (V2G) can be executed with CANoe/CANalyzer according to the following description.

 The configuration of TLS requires the diagnostic services "Extended Session" and "Security Access". Therefore, select the window "VCVCCU – Diagnostic Session Control" and double-click on "Extended Session Start". Continue by double-clicking on "[Level 0x01] Request Seed (level 1) Request". Please note that the responses must be positive. The request and response messages are shown in the window "Trace Diagnostic".

VCVCCU - Diagnostic Session Control -	- 🗆 X	🖫 Trac	e Diagnostic								- 🗆 X
Sessions	VCVCCU	6	1 🔀 😤 🕱	5 🗛 🗴	چ ک	🗉 🔺 💽 🛜 < Se	arch>	~ 🐥 🐴	ø	s pá	• 🗟 🖏• 🖃• 🗚•• 💡
Default Session Start		Time		Chn		Name	Event Type			Da	
Extended Diagnostic Session Start		े 🕀	0.01006	2 CAN 1 2	268	msg_TxCycle10_0	CAN Frame	Rx	7	7	EC 22 00 00 00 00 00
		् 🕀	0.000260	CAN 1			CAN Error	TxErr			ECC: 110001110xxxxx, Not Ackno
		<u> </u>	xa 0.00591	2 CAN 1 6	510	msa diaa Request M	SF	Тх	6	8	[06] 27 02 9A 0C 27 82 [00]
			0.00000 😡			Extended Diagnostic			2		10 03
Security Access			0.00991			msg_diag_Response		Rx	2	8	[02] 67 02 [AA AA AA AA AA]
			0.00000			Extended Diagnostic			6		50 03 00 32 01 F4
[Level 0x01] RequestSeed (level 1) Request			0.100004			msg_nm_MyECU	CAN Frame	Rx	8	8	00 00 00 00 00 00 00 00
[Level 0x03] RequestSeed (level 3) Request			0.00000 👰			RequestSeed (level 1			2		27 01
			0.00000			RequestSeed (level 1			6		67 01 AE 50 0B 9E
			0.00000			SendKey (level 1) Sen			6		27 02 9A 0C 27 82
			· 🟹 0.00000	D CAN 1 6	512	SendKey (level 1) Sen	pos		2		67 02
Ecu Reset		15-									
Hard Reset Reset		Þ									
The Host Host		1									
		1									
DTC Settings											
Enable Disable											
Normal Communication											
Normal Communication											
Enable Disable											
Normal Mode											
Return											
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 To use TLS a certificate must be written. Therefore, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 0D – VCVCCU Configuration TLS Certificate Write". Write the requested certificate (800 bytes) and click on "Execute". Please note that the response must be positive.



 Select the tab "Stored Data" and click on "2E FD 0C – VCVCCU Configuration TLS Activation Write". Please choose the status "on" (activate) and click on the button "Execute". Please note that the response must be positive. Once status "off" (deactivate) is selected, the TLS Certificate is set to a default value.



VCVCCU - Diagnostic Console				- 🗆 X
드 📭 🗤 🕼 🗶 🖓 🖓 🖓 🖪 💀 🖬 🧏 🖿 🕫 🐘				Online
ymbolic 🗸				[Application] VCVC0
4: 2E FD 0C - VCVCCU_Configuration_TLS_Activation_Write				~ Execute
Sessions 10 01 - Default Session Start 10 03 - Extended Diagnostic Session Start 22 FD 03 - VCVCUL Onfiguration J1939 CAN Read 22 FD 00 - VCVCUL Onfiguration Start 22 FD 03 - VCVCUL Onfiguration HSOUTO Read 22 FD 03 - VCVCUL Onfiguration HSOUTO Read 22 FD 04 - VCVCUL Onfiguration PTC0 message Read 22 FD 05 - VCVCUL Onfiguration PTC1 message Read 22 FD 05 - VCVCUL Onfiguration PTC1 message Read 22 FD 06 - VCVCUL Onfiguration PTC1 message Read 22 FD 06 - VCVCUL Onfiguration PTC1 message Read 22 FD 07 - VCVCUL Onfiguration PTC1 message Read 22 FD 06 - VCVCUL Onfiguration PTC1 message Write 22 FD 07 - VCVCUL Onfiguration PTC1 message Write 22 FD 07 - VCVCUL Onfiguration PTC1 message Write 22 FD 08 - VCVCUL Onfiguration PTC1 message Write 22 FD 08 - VCVCUL Onfiguration CrattoPHotStatus message Write 22 FD 08 - VCVCUL Onfiguration CrattoPHotStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Write 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Write 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Read 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Write 22 FD 08 - VCVCUL Onfiguration InternaVolageStatus message Write 22 FD 08 - VCVCUL Onfi	Name PDU VCVCCU Configuration TLS Activation TLS Activation Status Field TLS Activation Status Field TLS Activation Status TLS Activation Status Field (reservient)	Value 2E FD 0C 01 0x01 0x01 0x01 Value Service/Value Device VCVCCU' is online. VCVCCU Configuration TLS Activ 0x01 0x01 0x01 s on (0x00) VCVCCU Positive response.	ation Write	

4. By executing the command "22 FD 0C – VCVCCU Configuration TLS Activation Read" the current configuration of TLS can be verified.

VCVCCU - Diagnostic Console			- 🗆 X
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Symbolic V			[Application] VCVCCU
23: 22 FD 0C - VCVCCU_Configuration_TLS_Activation_Read			~ Execute
Sessions Sessions 10 01 - Default Session Start 10 03 - Extended Diagnostic Session Start 10 03 - Extended Diagnostic Session Start 2 - Stored Data 2 EF 00 0 - VCVCCU Configuration J1339 CAN Fread 2 EF 00 0 - VCVCCU Configuration J1339 CAN Vrite 2 2 FD 03 - VCVCCU Configuration HSOUTO Write 2 2 FD 04 - VCVCCU Configuration PTCO message Read 2 EF 00 5 - VCVCCU Configuration PTCO message Read 2 EF 00 5 - VCVCCU Configuration PTC message Write 2 2 FD 05 - VCVCCU Configuration PTC message Read 2 EF 00 5 - VCVCCU Configuration PTC message Read 2 EF 00 6 - VCVCCU Configuration PTC message Read 2 EF 00 6 - VCVCCU Configuration PTC message Read 2 EF 00 7 - VCVCCU Configuration IntelStatus message Read 2 EF 00 7 - VCVCCU Configuration IntelStatus message Read 2 EF 00 8 - VCVCCU Configuration IntelStatus message Read 2 EF 00 8 - VCVCCU Configuration IntelStatus message Vrite 2 2 FD 08 - VCVCCU Configuration IntelStatus message Vrite 2 2 FD 08 - VCVCCU Configuration IntelStatus message Vrite 2 2 FD 08 - VCVCCU Configuration Interna/VolageStatus message Vrite 2 2 FD 04 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 04 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 08 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 08 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 08 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 08 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 08 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 08 - VCVCCU Configuration IntelStatus2 message Vrite 2 2 FD 08 - VCVCCU Configuration Interna/VolageHawValues message Vrite 2 2 FD 08 - VCVCCU Configuration IntelStatus2 message Vrite 2 2 FD 00 - VCVCCU Configuration TLS Activaton Read 2 E FD 00 - VCVCCU Configuration TLS Activaton Read 2 E FD 00 - VCVCCU Configuration TLS Activaton Mrite 2 2 FD 00 - VCVCCU Configuration TLS Activaton Mrite 2 2 FD 00 - VCVCCU Configuration Security Key Constant 01/02 Write 2 EFD 00 - VCVCCU	Name PDU Image: PDU <td>Value 22 FD 0C Service/Value Device VCVCCU' is online. VCVCCU Configuration TLS Activation 0x01 on (0x00) VCVCCU Positive response. VCVCCU Positive response. VCVCCU Positive response. 0x01 ox01 on (0x00) VCVCCU Positive response. 0x01 ox01 on (0x00) VCVCCU Positive response. 0x01 ox01 ox01 ox01 ox01 ox01 ox01 ox01</td> <td></td>	Value 22 FD 0C Service/Value Device VCVCCU' is online. VCVCCU Configuration TLS Activation 0x01 on (0x00) VCVCCU Positive response. VCVCCU Positive response. VCVCCU Positive response. 0x01 ox01 on (0x00) VCVCCU Positive response. 0x01 ox01 on (0x00) VCVCCU Positive response. 0x01 ox01 ox01 ox01 ox01 ox01 ox01 ox01	



Configuration with Indigo

The configuration of TLS (V2G) can be executed with Indigo according to the following description.

 Select the tab "VC-VCCU-VAS" and click on the empty data field of V2G. Select the requested TLS certificate and click on the button "Write" to execute the configuration. After the successful writing of the TLS certificate a notification shows up in the field "Information".

6 B						Vector Indigo & SP4Beta L - VC-VCCLLINdiga*		
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Correcton Navigation C	Read / Write			Yex	Report	, Configuration Store / Restore VC-VCCI	LVAC	
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WC-VCCH-VAS				V2EG				··· Write
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				V2ICP URL V2ICP Path				
				V2ICP Password				
								Read Write
				Information				1
				12:06:41 - Writing the Cert	lificate vias successful.	1		
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	Request Time	Request Target	Request Data	Response Time Delta	Response Source		Communication Error	
	148.32454s	FuncGroup-0x614						
	148.47336s 151.00465s		19 02 00 19 02 00	0.16129s 0.17002s	VCVCCU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 26 02 E0 E4 26 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 8ytes) 59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 20 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 8ytes)		
	152.32586s	VCVCCU FuncGroup-0x614		0.170025	VEVCED	28 05 M 01 69 63 59 91 60 63 59 91 60 63 50 05 60 64 59 95 60 63 59 60 63 50 50 67 11 131 BABRI		
	153,50451s		19 02 00	0.17025s	VCVCCU:	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 8yten)		
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	158.524825		19 02 0D	0.17009s	VCVCCU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 Bytes)		
	160.32704s	FuncGroup-0x614						
	161.02473s	VCVCCU	19 02 00	0.17026s	VEVCEU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 Bytes)		
1	163.52491	VC/CCV	19 02 80	0.170164	VCVCCU	50 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 8ytes)		
1	164.32889s	FuncGroup-0x614						
	166.02507s		19 02 90	0.17008s	VCVCCU:	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 8ytes)		
1	168.34518s	FuncGroup-Bx614						
1	168.503369		19 02 0D	0.16187s	veveeu	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 Bytes)		
1	171.64511s		19 02 00	0.17021s	VEVER	59 02 FF 01 E0 E1 28 01 E0 E5 28 02 E0 E3 29 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E1 (51 Bytes)		
1	172.34584s	FuncGroup-0x614		1222012	0000000			
	173.54511s		19 02 00	0.17029s 0.17029s	VEVEEU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 8ytes) 59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 26 04 E0 E3 28 20 E0 E2 (51 8ytes)		
	176.045205	VCVCCU FuncGroup-0x614	19.02.00	0.170295	ACAGCO	04 M5 LL 01 EN EN 50 01 EN EN 70 X5 X6 X7 EN EN 70 M5 EN FA 50 05 EN 50 50 04 EN 53 50 50 EN EN 101 0A(66)		
	178.565335		19 82 80	0.170235	VEVECU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 28 20 E0 E2 (51 Bytes)		
1	180.347904	FuncGroup-0x614		10000000				
	The strength of the strength o	A CONTRACTOR OF A CONTRACTOR O						



2. Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration TLS Activation/TLS Activation Status Field/TLS Activation Status". Select the requested TLS Activation configuration and click on the button "Write" to execute the configuration.

6 0						Vestor Indigo 6 SP4 Beta 1 - VC-VCT3). Indigo *					
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	Request Time 92,20905s	Request Target FuncGroup-0x614		Response Time Delta	Response Source	Response Data	Communication Error				
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	96.21004s 98.42686s	VCVCCU	3E 90 19 02 00	0.16774s	VEVEEU	59 02 FF 01 E0 E3 28 01 E0 E5 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 20 20 E0 E2 (51 Bytes)					
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	100.929745 103.420615 104.212025 104.212025 106.042756 108.213076 108.443555 110.943745 112.214025 112.214025 113.444705 115.958735	VEVECU Punc6roup-0x614 VEVE01 Func6roup-0x614 VEVE01 VEVE01 Func6roup-0x614 VEVE01 VEVE01 VEVE01 VEVE01 VEVE01	35 80 10 02 00 36 80 19 02 00 19 02 00 35 80 19 02 00 19 02 00	0.16420s 0.16310s 0.16339s	νενέαι νενέαι νενέαι	59 12 FF 01 E0 E3 26 01 E0 E1 28 12 E0 E3 28 02 E0 E4 28 02 E0 E1 28 04 E0 E3 20 20 E0 E2 (31 Bytas) 59 02 FF 01 E0 E3 28 01 E0 E3 28 02 E0 E3 28 02 E0 E4 28 02 E0 E5 28 04 E0 E3 20 20 E0 E2 (31 Bytas)					
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Manual Configuration

Reprogramming is also possible without CANoe. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session, e.g. every second. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

<u>Request Seed (Level 1):</u>
 XX: Seed (4 byte)
 Request: 02 27 01 FF FF FF FF FF
 Response: 06 67 01 XX XX XX XX FF

4. <u>Send Key (Level 1):</u>
XX: Key (4 byte)
Request: 06 27 02 XX XX XX XX FF
Response: 02 67 02 FF FF FF FF FF

The key can be calculated with the following algorithm and key constant:

- Key constant: 0xE3CA2342
- Algorithm: (((SEED * 0x6076DBAF) + 0x5397FB1) ^ ((~SEED * 0x72B6BF45) + 0xBC614E) ^ KEY_CONSTANT)

5. <u>TLS Certificate (800 byte):</u> XX: Certificate (800 byte) Request: 13 23 2E FD 0D XX XX XX Response: 30 08 14 AA AA AA AA Request: 21 XX XX XX XX XX XX Request: 22 XX XX XX XX XX XX ...





Note

This description does not include all request/response-messages due to the size of the TLS certificate (800 byte). In order to write the TLS certificate correctly the transport protocol according to ISO 15765-2 [6] has to be implemented.

The following response indicates a successful writing of the TLS certificate.

Response: 03 6E FD 0D FF FF FF FF

6. TLS Activation:

XX:

- 0x00 --> Deactivate TLS
- 0x01 --> Activate TLS

Request: 04 2E FD 0C XX FF FF FF Response: 03 6E FD 0C FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present TLS activation configuration, the following communication has to be executed.

7. <u>Read TLS activation configuration:</u> Request: 03 22 FD 0C FF FF FF FF Response: 04 62 FD 0C XX FF FF FF



5.2.1.2.10 Configuration of Transport Layer Security – VAS

The VC-EVCC provides the possibility to establish a secure connection to the EVSE using Transport Layer Security (TLS) for Value Added Services.



Configuration with CANoe/CANalyzer

The configuration of TLS (VAS) can be executed with CANoe/CANalyzer according to the following description.

 The configuration of TLS requires the diagnostic services "Extended Session" and "Security Access". Therefore, select the window "VCVCCU – Diagnostic Session Control" and double-click on "Extended Session Start". Continue by double-clicking on "[Level 0x01] Request Seed (level 1) Request". Please note that the responses must be positive. The request and response messages are shown in the window "Trace Diagnostic".

VCVCCU - Diagnostic Session Control -	- 🗆 🗙	🖫 Trac	e Diagnostic								- 🗆 X
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		् 🕀	0.000260	CAN 1			CAN Error	TxErr			ECC: 110001110xxxxx, Not Ackno
		<u> </u>	xa 0.00591	2 CAN 1 6	510	msa diaa Request M	SF	Тх	6	8	[06] 27 02 9A 0C 27 82 [00]
			0.00000 😡			Extended Diagnostic			2		10 03
Security Access			0.00991			msg_diag_Response		Rx	2	8	[02] 67 02 [AA AA AA AA AA]
			0.00000			Extended Diagnostic			6		50 03 00 32 01 F4
[Level 0x01] RequestSeed (level 1) Request			0.100004			msg_nm_MyECU	CAN Frame	Rx	8	8	00 00 00 00 00 00 00 00
[Level 0x03] RequestSeed (level 3) Request			0.00000 👰			RequestSeed (level 1			2		27 01
			0.00000			RequestSeed (level 1			6		67 01 AE 50 0B 9E
			0.00000			SendKey (level 1) Sen			6		27 02 9A 0C 27 82
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 To use TLS a certificate must be written. Therefore, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 12 – VCVCCU Configuration TLS Certificate2 Write". Write the requested certificate (800 bytes) and click on "Execute". Please note that the response must be positive.

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[] [] [] · · · · · · · · · · · · · · · ·				() Office
Symbolic +				Application] MDVCCU
33: 2E-FD 12 -VCVCCU_Configuration_TLS_Centilicate2_Write				* Execute
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ZE FD 0: ~ V/CUC Configuration 15. Settionarity Weis Ze TD 0: ~ V/CUC Configuration 11.5 Entitional Weis Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 1: ~ V/CUC Configuration 10.4 Settion 2016 Ze TD 2: ~ Z	Type/P d direfs	∵SektorMalai	C ₂ -	

3. Select the tab "Stored Data" and click on "2E FD 0C – VCVCCU Configuration TLS Activation Write". Please choose the status "on" (activate) and click on the button "Execute". Please note that the response must be positive. Once status "off" (deactivate) is selected, the TLS Certificate is set to a default value.



CVCVCU - Diagnostic Console				- 🗆 X
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24: 2E FD 0C - VCVCCU_Configuration_TLS_Activation_Wite				~ Execute
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22 FD 06 · VCVCCU Configuration PTC2 message Read 22 FD 06 · VCVCCU Configuration PTC2 message Read 22 FD 07 · VCVCCU Configuration IntelStatus message Write 22 FD 07 · VCVCCU Configuration IntelStatus message Read 22 FD 08 · VCVCU Configuration CentroPHotStatus message Read 22 FD 09 · VCVCCU Configuration CentroPHotStatus message Read 22 FD 09 · VCVCCU Configuration CentroPHotStatus message Read 22 FD 09 · VCVCCU Configuration Internat/VoltageStatus message Read 22 FD 09 · VCVCCU Configuration Internat/VoltageStatus message Read 22 FD 09 · VCVCCU Configuration Internat/VoltageStatus message Read 22 FD 04 · VCVCU Configuration Internat/VoltageRaw/Jalues message Read 22 FD 04 · VCVCU Configuration Internat/VoltageRaw/Jalues message Read 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Write 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Write 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Write 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Read 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Read 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Write 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Write 22 FD 08 · VCVCU Configuration Internat/VoltageRaw/Jalues message Write 22 FD 00 · VCVCU Configuration Its Activation Mrite 22 FD 00 · VCVCU Configuration Its Activation Write 22 FD 00 · VCVCUCU Configuration Its Activation Write 22 FD 00 · VCVCUCU Configuration Its Catilicate Read 22 FD 00 · VCVCUCU Configuration Its Catilicate Write 22 FD 00 · VCVCUCU Configuration Security Key Constant 01/02 Write EU Identification Security Access Eu Reset Communication Control Fault Memory Fourted DTC Setting	Type/Parameter [14:49:46] [14:50:00] - Tx VCVCCU Configuration TLS Activation TLS Activation Status Field TLS Activation Status Field (TLS Activation Statu TLS Activation Status Field (reservient) [14:50:00] [14:50:00] - Rx	Service/Value Device VCVCCU' is online. VCVCCU Configuration TLS Act 0x01 0x01 (0x00) VCVCCU Positive response.	tivation Write	
Caster Present Caster P				>

4. By executing the command "22 FD 0C – VCVCCU Configuration TLS Activation Read" the current configuration of TLS can be verified.

VCVCCU - Diagnostic Console			- 🗆 X
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Configuration with Indigo

The configuration of TLS (VAS) can be executed with Indigo according to the following description.

 Select the tab "VC-VCCU-VAS" and click on the empty data field of V2ICP. Select the requested TLS certificate and click on the button "Write" to execute the configuration. After the successful writing of the TLS certificate a notification shows up in the field "Information".

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2. Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration TLS Activation/TLS Activation Status Field/TLS Activation Status". Select the requested TLS Activation configuration and click on the button "Write" to execute the configuration.

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	92.20935: FuncTroup: 95.42695: VOVCCU 95.22711 VCVCCU 95.21044 FuncTroup: 96.21044 FuncTroup: 100.221055 FuncTroup: 100.23841 VCVCCU 1004.23841 VCVCCU 1004.23841 VCVCCU 1008.212026 FuncTroup: 1008.41355 VCVCCU 110.943746 VCVCCU 110.943746 VCVCCU	0x614 35 90 19 02 60 19 02 60 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 60 1 19 02 100 1 19 02 101 1 19 02 101 1 19 02 101 1 19 02 101 1 19 02 101 1 19 02 101 1 19 02 101 1 19 02 101 1	1.169496 V 1.169496 V 1.167746 V 1.16996 V 1.165966 V 1.165266 V 1.163106 V 1.163106 V 1.163395 V	τανέου γανέου γανέου γανέου γανέου γανέου γανέου	59 02 FF 01 E0 E32 59 02 FF 01 E0 E32	28 01 50 E 28 01 50 E	ES 26 02 0 ES 28 02 0	ED E3 28 02 E ED E3 28 02 E	0 64 28 02 E0 E5 28 0 64 28 02 E0 E5 28	04 E0 E3 20 20 E0 E2 (51 Bytes 04 E0 E3 20 20 E0 E2 (51 Bytes	Convituation Enter
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	92.209154 PuncGroup- 95.42695 VOVCCU 95.927713 VCVCCU 95.927713 VCVCCU 95.927714 VCVCCU 95.927014 FuncGroup- 95.92806 VCVCCU 100.21058 FuncGroup- 100.328745 VCVCCU 100.22024 RuneGroup- 100.83745 VCVCCU 100.43045 VCVCCU 100.43076 succord 100.443955 VCVCCU 112.412627 FuncGroup- 113.44795 VCVCCU 113.44795	326 90 32 90 19 902 600 1 19 902 600 1 3002 600 1 19 902 600 19 902 600 1 900 600 1 19 902 600 19 902 600 1 300 200 1 1 300 200 1 1 300 200 1 1 100 000 1 1 100 000 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 900 200 1 1 1 900 200 1 1 900 200 1 1	5.169496 V 5.169615 V 5.169615 V 5.1697749 V 5.169749 V 5.169749 V 5.169749 V 5.169749 V 5.169749 V 5.169436 V	τανέαυ ιανέαι ιανέαι ιανέαι ιανέαι ιανέαι ιανέαι ιανέαι	59 32 14 01 50 53 2 59 32 14 01 50 53 2	28 01 50 E 28 01 50 E	ES 28 02 0 ES 28 0 ES	E0 E3 28 02 E E0 E3 28 02 E	0 64 28 02 E0 E5 28 0 64 28 02 E0 E5 28 0 64 28 02 E0 E5 29 0 74 28 02 E0 E5 29	04 ED E3 20 20 ED E2 (51 Bytes 04 ED E3 20 20 ED E2 (51 Bytes 104 ED E3 20 20 ED E2 (51 Bytes 104 ED E3 20 20 ED E2 (51 Bytes 04 ED E3 20 20 ED E2 (51 Bytes	Communication Enter



5.2.1.2.11 Configuration of Value Added Services

The VC-EVCC provides the usage of Value Added Service (VAS) according to the VDV 261 specification. In order to use Value Added Service TLS must be activated.

Configuration with CANoe/CANalyzer

The configuration of Value Added Services can be executed with CANoe/CANalyzer according to the following description.



Caution

Before Value Added Service parameter configuration, make sure the option "Fill string parameter with spaces" is not checked.

lagnostic/ ISO TP Diagnostic Diagnostic Parameters Configuration	nostic Fault Session OBD-II CANdelaStudio	ODXStudio	J1939 DTC J1939 D Monitor * Memory		J1939 OBD M-Monitor -		
VCVCCU - Diagnostic Console	11 (- VI)	<u> </u>	- gr 🛪 🗖	VCVCCU - Di	agnostic Session	Control	- EI 🛪
🖸 🗅 🖻 - 📾 🐱 🖼 🛤 🕸	[영] (문) 🖂 🛏 🛏 🖼 🖼 🛄	Pro	perties				23
umbolic •			ervices				
: 10 01 - DefaultSession Start		100) isplay services with:	Prefix		Sequence:	
B K Sessions			Name 🔫	Displ	ay index ay SID, LID,	Do not sort Sort by name / qualit	
- 🔀 10 01 - Default Session Start	PDU	100		Tel Disbe	ay one. Lio	Solt by SID, LID,	let .
🕂 🛼 10.03 - Extended Diagnostic Sezsi 🖶 🐮 Stored Data	PDU					Contraction and the second	
B-15 ECU Identification		7	Columns Dotional parameter columns:			Displayed parameter columns:	
Routine Control Security Access		-	Description	Title	C Add>	Description	Title
e 🌃 Ecu Reset			Byte/Bit position	Dyte:Dit		Parameter name	Name
Communication Control Fault Memory			Unit of the parameter	Unit	C Delota	Parameter value	Value
🖶 🌃 Control DTC Setting	14 H		Type/Length of the p. Type/L. Parameter qualifier Qualifier to			Unit of the parameter Unit	
Tester Present	Type/Par., Service/Value	_	Parameter comment	Comment	<u> </u>		
-15 [User defined messages]	[15:00:27] Device VCVCCU					1	
Macros]	[15:00:27] Data elements in		ptions				
	•1234-x10936-x102211 - 10240-0046200984 2084-x2041122 (2015)	10/6	initialize parameters a	utomaticallu			
		11242	Display parameter por		the trace area		
			Display constant resp	onse parameb	ers in the trace an	a i	
			Fill string parameter w				
			Display PDU in the particular display in the particular display in the particular displayed in the particular displayed displayeed		219-23 A		
10 10 I			Suppress Positive Respo		Contraction of the second	ever 💌	
			Assmum number of requ	iests in the his	tory: 10		
TC Monitor			og file				
MIL RSL	AWL Protect		Path: DiagConxo	lel.og.txt			File
			OK. Cancel				-

Parameter	Description
VAS.AddressType	 0x00: V2ICP is deactivated (default)
Field	 0x01: V2ICP is configured for fixed IPv6 address
	 0x02: V2ICP is configured for URL based address
V2ICP-URL	 URL Parameter of the URI Option1: Fixed Ipv6 address in case of AddressTypeField 0x01 Option2: URL address in case of AddressTypeField 0x02
V2ICP-Path	Path Parameter of the URI
V2ICP-Username	Username required for Basic Authentication (17 Bytes)
V2ICP-Password	Password required for Basic Authentication





> Option1: Fixed IP Address

Select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 11 – VCVCCU Configuration Value Added Service Write". Select the value "Fixed IP Address" for the field "VAS AddressType Field.VAD Address Type". Then write the values of IPv6 Address, path, user name and password in the corresponding field. Click on "Execute" after all fields are filled out. Please note that the response must be positive.

[] () () () () () () () () () () () () ()			© Office
ymbolic 🔹			(Application) VDVDC
12 22 FD 11 · VCVCCJ_Configuration_Value_Added_Service_Write			- Execute
2 2FD 16 - 42X/2012 Distripution internet/MatgPBav/State message Read 2 FPD 16 - 42X/2012 Distripution internet/MatgPBav/State message Read 2 FPD 16 - 40X/2012 Distripution internet/MatgPBatter message Read 2 FPD 10 - 40X/2012 Distripution internet/MatgPBatter message Read 2 FPD 10 - 40X/2012 Distripution FPD 40X/2014 Distripution - 40X/2014 2 FPD 10 - 40X/2012 Distripution FPD 40X/2014 2 FPD 10 - 40X/2012 Distripution Fease 40X/2014 2 FPD 10 - 40X/2012 Distripution FEAse/2014 2 FPD 10 - 40X/2012 Distripution FEAse/2014 2 FPD 10 - 40X/2012 Distripution FEAse/2014 2 FPD 10 - 40X/2014 2 FPD 10 - 40X/20	 None PBU VDCCD: Configuration Vision Added Services VDS Address Type Field VAS Address Type Field (VAS Address Type) VAS Address Type Type) 	Vala Vala	
22 FO 0C - VCDCU Configuration T is Activation Write E2 FO 0C - VCDCU Configuration T is Settinged Wite 22 FO 12 - VCDCU Configuration T is Configurate Write 22 FO 11 - VCDCU Configuration Value Activity Branch Brad.	Type/Polameter	Service/Value	

E

Note

For Fixed IPv6 address (AddressType.Field:0x01), encode the IPv6 address in square brackets. Eg- [fe80::22]

> Option2: URL based Address

Select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 11 – VCVCCU Configuration Value Added Service Write". Select the value "URL" for the field "VAS AddressType Field.VAS Address Type". Then write the values of URL, path, user name and password in the corresponding field. Click on "Execute" after all fields are filled out. Please note that the response must be positive.

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bolic 🔻				[Application] VCVC
2E FD 11 · VEVECU_Configuration_Value_Added_Service_Write				- Execute
2E FD 07 - VCVCCU Configuration InletStatus message Write	^ Name	Value	Unit	
- 🔂 22 FD 0B - VCVCCU Configuration InletStatus2 message Read	PDU	2E FD 11 02 76 61 73 73 72 76 72 3	11 2E	
	VEVEEU Configuration Value Adde	0x02 0x76 0x61 0x73 0x73 0x72 0x7	0x72	
22 FD 04 - VEVECU Configuration InternativoltageRawValues message Write	VAS AddressType Field	0x02		
22 FD 09 - VCVCCU Configuration Internat/oragenative audes message Read	VAS AddressType Field.VAS A	URL	•	
2E FD 09 - VEVECU Configuration Internal/VoltageStatus message Write	VAS AddressType Field.(reserv	0x00		
- 🕵 22 FD 00 - VCVCCU Configuration J1939 CAN Read	V2ICP-URL	vassrvr1.home.lan		
— E FD 00 - VCVCCU Configuration J1939 CAN Write	V2ICP-Path			
- 🔯 22 FD 04 · VCVCCU Configuration PTC0 message Read	VCICP-UserName	Vector_Vehicle1		
E FD 04 - VCVCCU Configuration PTC0 message Write 22 FD 05 - VCVCCU Configuration PTC1 message Read	V2ICP-Password	VectorTester		
22 FD 05 - VEVECU Configuration PTC1 message Head 25 FD 05 - VEVECU Configuration PTC1 message Write				
22 FD 05 • VCVCCU Configuration PTC2 message Read				
2 FD 06 - VCVCCU Configuration PTC2 message Write				
22 FD 0F • VCVCCU Configuration Primary J1939 Source Address Read				
🗟 2E FD 0F - VCVCCU Configuration Primary J1939 Source Address Write				
22 FD 10 - VEVECU Configuration Secondary J1939 Source Address Read	Type/Par Service/Value			
— 2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write	[15:00:27] Device VCVCCU			
E FD 0E - VEVECU Configuration Security Key Constant 01/02 Write Security Key Constant 01/02 Write Security Key Constant Configuration StopCharge CAN Signal Read	[15:00:27] Data elements im			
22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Nead Research Configuration StopCharge CAN Signal Write	[15:29:41] Data elements im			
22 FD 0C - VEVEEU Configuration TLS Activation Read				
2E FD 0C - VCVCCU Configuration TLS Activation Write				
- 🔂 2E FD 0D - VEVECU Configuration TLS Certificate Write				
2E FD 12 - VCVCCU Configuration TLS Certificate2 Write				



Configuration with Indigo

The configuration of TLS (V2G) can be executed with Indigo according to the following description.

 Select the tab "VC-VCCU-VAS" and click on the data field "Address Type". Select the requested Address Type configuration and enter the User Name, V2ICP URL, V2ICP Path and V2ICP Password. Click on the button "Write" to execute the configuration. After the successful writing of the TLS certificate a notification shows up in the field "Information".

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VC-VCCU-VAS			-					
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1. Surgers			User Name					
Reprogramming			Address type	Fixed IP address (0x01)				10
			V2ICP, URL					193
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			V2ICF Password					
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	108.970036 311.469655 312.44928 313.969806 313.969806 316.469836 316.469836 316.969166 320.475935 321.49998 322.49918 324.47797 325.124945 323.139718 325.339485 325.339485 325.339485	VCVPCU VCVPCU Hunchroup-6x814 VCVPCU VCVPCU Funchroup-0x814 VCVPCU Funchroup-0x814 VCVPCU Funchroup-0x814 VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU	10 02 30 10 02 70 10 02 70 10 00 10 02 00 10 00 10 00 10 00 10 00 00 10 00 00 00 00 00 00 00 00 00 00 00 00 0	00 00 00 00 00 00 00 00 00 00 00 00 00	0.10962a 0.170215 0.170215 0.170215 0.170295 0.170295 0.170295 0.009305 0.009305 0.009305 0.009556	VEVECU VEVECU VEVECU VEVECU VEVECU VEVECU VEVECU VEVECU		Communication Erner
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	108.970038 111.440458 112.474928 113.3963805 116.476928 116.475958 116.475958 121.480918 122.4609128 122.4809128 122.440908 123.124048 123.124048 123.124048 123.124048 123.124048 123.124048 123.124048 124.477079 125.124048 125.12408 125.1240	VCVPCU VCVPCU HuncBroup-0x814 VCVPCU VCVPCU VCVPCU FuncBroup-0x814 VCVPCU FuncBroup-0x814 VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU	10 01 20 00 10 21 20 0 10	00 00 00 00 00 00 00 00 00 00 00 00 00	0.10962a 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625	VOVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ		Communication Error
	108.970038 311.469658 312.47928 313.969805 316.47998 316.47998 320.479978 320.479978 321.960129 324.479978 325.130718 325.130718 325.341428 326.347959 328.479959 328.479959 328.479959 328.479959 328.479959 328.479595 328.47055 328.47055 329.47056 329.47056 329.47056 329.47056 329.47055 329.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 32	VCVPCU VCVPCU Functiroup-0x814 VCVPCU VCVPCU VCVPCU VCVPCU Functiroup-0x814 VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU VCVPCU	19 02 20 0 19 02 20 0 19 00 19 00 19 00 19 02 20 0 19 00 19 00 27 02 0.00 27 00 19 00 00 00 00 00 00 00 00 00 19 00 10 00	00 00 00 00 00 00 00 00 00 00 00 00 00	0.10962a 0.170285 0.170285 0.170285 0.170295 0.170295 0.170295 0.170295 0.170295 0.005075 0.005595 0.005595 0.005595 0.169475 0.169458	VOVCOJ VOVCOJ	Horstending 9400 Horstendi	Communication Error
	108.970028 311.440405 312.474928 313.346980 316.476903 316.476903 320.476975 321.480908 320.476975 321.244908 324.477075 325.124494 325.33488 325.33488 325.334482 326.477955 325.33488 325.341428 326.476955 325.341428 326.476955 326.476955 326.37655 326.37755 326.37755 326.37755 326.37755 326.37755 326.37755 326.37755 326.37755 326.37755 327.377555 327.377555 327.377555 327.377555 327	VCVCCU VCVCQU Functionup-0x814 VCVCQU	10 01 20 01 10 20 00 10	00 00 00 00 00 00 00 00 00 00 00 00 00	0.10962a 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.170295 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625 0.000625	VOVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ VEVEDJ		Communication Error
	108.970038 311.469658 312.47928 313.969805 316.47998 316.47998 320.479978 320.479978 321.960129 324.479978 325.130718 325.130718 325.341428 326.347959 328.479959 328.479959 328.479959 328.479959 328.479959 328.479595 328.47055 328.47055 329.47056 329.47056 329.47056 329.47056 329.47055 329.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 320.47056 32	VCVPCU/ VCVPCU/ Functinoup-0x814 VCVPCU/ VPVPCU/ VPVPPV/ VPVPCU/ VPVPCU/ VPVPCU/ VPVPCU/ VPVPPV/ VPVPPV/ VPVPPV/ VPVPPV/ VPVPPV/ VPVPPV/ VPVPPV/ VPVPPV/ VPVPPV/ VPVPV/	10 01 20 01 10 20 00 10	20 00 00 00 00 00 00 00 00 00 00 00 00 0	0.109628 0.170285 0.170285 0.170285 0.170295 0.170295 0.170295 0.170295 0.170295 0.005075 0.005595 0.005595 0.005595 0.169475 0.169458	VOVCOJ VOVCOJ	Horstending 9400 Horstendi	Contraunipoten Erter



5.2.1.2.12 Configuration of Plug and Charge

The VC-EVCC provides the possibility to use Plug and Charge (PnC) according to ISO 15118. The following DIDs are used for the Plug and Charge configuration of the VC-EVCC.

PnC Activation:

▶ DID FD 26 – Configuration PnC Activation

PnC Certificates/Private Keys:

- DID FD 27 Configuration OEM Provisioning Certificate
- ▶ DID FD 28 Configuration OEM Provisioning Certificate Private Key
- DID FD 29 Configuration OEM Provisioning Certificate and Private Key
- ▶ DID FD 2A Configuration PnC Contract Certificate
- ▶ DID FD 2B Configuration PnC Contract Certificate Private Key
- ▶ DID FD 2C Configuration PnC Contract Certificate and Private Key
- DID FD 2D Configuration PnC Sub Certificate
- DID FD 2F Configuration PnC Root Certificate

5.2.1.2.12.1 Configuration of Plug and Charge Activation/Deactivation

Plug and Charge can be activated via UDS as described in this chapter.

The service structure is defined as 1 byte.

Value	Description
0x00	Plug and Charge is deactivated (default)
0x01	Plug and Charge is activated



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

The configuration of Plug and Charge can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

Rev VCVCCU - Diagnostic Console			- 🗆 X
🔁 👳 🗤 🗶 🗙 🖬 🗛 🗟 🗟 🕺 🗉 H 🗞 🕅			 Online
Symbolic V			[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start			~ Execute
Sessions	Name	Value Unit	
10 01 - Default Session Stat	PDU	10 03	
22 FD 00 - VCVCCU Configuration J1939 CAN Read			
E FD 00 - VCVCCU Configuration J1939 CAN Write 22 FD 03 - VCVCCU Configuration HS0UT0 Read			
22 FD 04 - VCVCCU Configuration PTC0 message Read 2E FD 04 - VCVCCU Configuration PTC0 message Write			
2E FD 05 · VCVCCU Configuration PTC1 message Write 22 FD 06 · VCVCCU Configuration PTC2 message Read			
- B 2E FD 06 - VCVCCU Configuration PTC2 message Write	on PTC0 message Write on PTC1 message Write on PTC1 message Write on PTC1 message Write on PTC2 message Write on PTC2 message Write on PTC2 message Write Statements of the St	Service/Value	
	[14:22:12] - Tx	Extended Diagnostic Session Start	
22 FD 07 V V V CCU Configuration Interstatus message Write 22 FD 08 - V CV CCU Configuration ControlPilotStatus message Read	22 FD 06 - VCVCCU Configuration PTC2 message Write 1, year rationale Jean Very Value 22 FD 07 - VCVCCU Configuration IntelStatus message Read 1, year rationale Jean Very Value 22 FD 07 - VCVCCU Configuration IntelStatus message Write [14:22:12] - Tx Extended Diagnostic Session S1		
E FD 08 - VCVCCU Configuration ControlPilotStatus message Write	[14:22:12] · Rx	Positive response:	
22 FD 09 - VCVCCU Configuration Internal/oltageStatus message Read 2E FD 09 - VCVCCU Configuration Internal/oltageStatus message Write	P2 P2Ex	50 (ms) 5000 (ms)	
- 🗒 22 FD 0A - VCVCCU Configuration InternalVoltageRawValues message Read	[14:22:12]	Device VCVCCU' is online.	
2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write 22 FD 0B - VCVCCU Configuration InletStatus2 message Read			
2E FD 0B - VCVCCU Configuration InletStatus2 message Write			
22 FD 0C - VCVCCU Configuration TLS Activation Read			
E FD 0C - VCVCCU Configuration TLS Activation Write 22 FD 0D - VCVCCU Configuration TLS Certificate Read			
- 2E FD 0D - VCVCCU Configuration TLS Certificate Write			
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write ECU Identification			
Boutine Control			
B- B Security Access			
Communication Control			
Fault Memory			
Bright Control D I C Setting			
🗑 🎯 [Raw Telegrams]			
[User defined messages]			



2. Select the tab "Stored Data" and click on "2E FD 26 – VCVCCU Configuration PnC Activation Write". Please choose the requested Plug and Charge configuration ("on" or "off") and click on the button "Execute". Please note that the response must be positive.

①				🔵 🗌 On
				[EVCC] VC
E FD 26 - VCVCCU_Configuration_PnC_Activation_Write				~ Exec
			11.5	
Bit Discrete Bit Discrete Bit Discre Bit Discrete	Name PDU VCVCCU Configuration PnC Activation PnC Activation Status Field PnC Activation Status PnC Activation Status Field (reserved) Type/Parameter [11:24:57] - Tx [11:24:57] - Tx [11:24:57] - Tx [11:24:57] - Tx [11:24:57] - Tx VCVCCU Configuration PnC Activation PnC Activation Status Field PnC Activation Status Field (reserved) PnC Activation Status Field (reserved) [11:25:03] - Tx	Value ZE FD 26 01 0x01 0x01 0x0 0x00 Service/Value Extended Diagnostic Ses VCVCCU Positive response: 50 [ms] 5000 [ms] Device VCVCCU' is onlin VCVCCU Configuration Pr 0x01 0x01 0x01 0x01 0x01 Positive response.	sion Start	



3. By executing the command "22 FD 26 – VCVCCU Configuration PnC Activation Read" the current configuration of Plug and Charge can be verified.

□ ● ► □ ● ■ ● ■	Online
46: 22 FD 26 - VCVCCU_Configuration_PnC_Activation_Read	[EVCC] VCVCCU
	 Execute
Ref D QA - VCVCCU Configuration Internat/VoltageRawValues message Write Name Value Unit	-
Configuration InletStatus2 message Read PDU 22 FD 08 - VCVCCU Configuration InletStatus2 message Write PDU 22 FD 26	
- R 22 FD 00 - VC/CCU Configuration interstations: message write - R 22 FD 00 - VC/CCU Configuration TLS Activation Read	
- E E DO C-VCVCD Configuration TLS Activation Write	
- E 2E FD 0D - VCVCCU Configuration TLS Certificate Write	
E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	
22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read	
E FD 0F - VCVCCU Configuration Primary J1939 Source Address Write	
- 🕵 22 FD 10 · VCVCLU Configuration Secondary J1338 Source Address Read	
2 EFD 10 - VCVCDU Configuration Secondary J1939 Source Address Write	
Contiguration Value Added Service Read Contiguration Value Added Service Write Contiguration Value Added Service Write	
Care D 11 - VOCCU Configuration Value Acades Service Write	
Z L D 12 - VOCCD Configuration L S Centradaz Vine Z D 13 - VOCCD Configuration StopCharge CAN Signal Read	
E 2F D13 · VCVCU Configuration StopCharge CAN Signal Write	
- 22 FD 14 - VCVCCU Configuration Charge Node Selection Read	
- 🔀 2E FD 14 - VCVCCU Configuration Charge Node Selection Write	
22 FD 20 - VCVCCU Configuration Inlet Type Read	
2E FD 20 - VCVCCU Configuration Inlet Type Write Type/Parameter Service/Value	
22 FD 21 · VCVCCU Configuration PTC activation Read	
ZE FD 21 - VCVCUL Configuration PTC activation Write [11:24:57] - Tx Extended Diagnostic Session Start	
Contiguitation LIN J3068 charging activation Read [11:24:57] VCVCCU VCVCCU VCVCCU VCVCCU	
E TO 22 TO 25 - VOVCCD Configuration LSOUT diagnostic mode Read [11:24:57] - Rx Positive response:	
P2 50 [ms]	
- 🔁 22 FD 26 - VCVCCU Configuration Pnc Activation Read P2Ex 5000 [ms]	
2.2.E.FU.26 - YLVCCU Loniguration PhC Activation Write [11:24:57] Device VCVCCU' is online.	
2E FD 27 - VCVCCU Configuration 0EM Provisioning Cettificate Write	
📔 🕂 🕵 2E FD 2A - VCVCCU Configuration PnC Contract Certificate Write [11:25:03] - Tx VCVCCU Configuration PnC Activation Write	
E FD 28 · VCVCCU Configuration PnC Contract Certificate Private Key Write VCVCCU Configuration PnC Activation 0x01	
2 EFD 2C - VCVCCU Configuration ProC Contract Certificate and Private Key Write ProC Activation Status Field 0x01	
CE FD 2D - VCVCCU Configuration PnC Sub Certificate Write PnC Activation Status Field PnC Activation Status on	
The def to a status field (reserved) (0x00) (0x00)	
Construction of the movie of the set of	
E2 EP 37 - VCVCU Configuration Charging Schedules Activation Read [11:25:03] - Rx Positive response.	
- 🔁 2E FD 37 - VCVCCU Configuration Charging Schedules Activation Write	
ECU Identification [11:25:42] • Tx VCVCCU Configuration PnC Activation Read	
E Routine Control [11:25:42] VCVCCU	
Security Access [11:25:42] - Rx Positive response:	
Ecu Reset	
11 UI - Hard Heset Heset	
Communication Control Pric Activation Status Field Pric Activation Status Field Pric Activation Status on	
For Christian Control DTC Setting PnC Activation Status Field (reserved) (0x00)	
Control Die Setting (and a setting (and a setting a sett	



Configuration with Indigo

The configuration of Plug and Charge can be executed with Indigo according to the following description.

1. Select the tab "Plug and Charge" and choose the requested Plug and Charge configuration ("on" or "off") and click on the button "Write" to execute the configuration.

Navigation	< Plug and Charge	
Identification Browser		
atta	PnC Certificates	
Parametrizer	OEM Provisioning Certificate	Write
VAS	OEM Provisioning Certificate Private Key	Write
-	OEM Provisioning Certificate and Private Key	Write
Plug and Charge	PnC Contract Certificate	Write
Inlet Configuration	PnC Contract Certificate Private Key	Write
	PnC Contract Certificate and Private Key	Write
DTC Browser	PnC Sub Certificate 1	
Reprogramming	PnC Sub Certificate 2	Write
A Reprogramming	PnC Root Certificate	Write
	PnC Activation	
	PnC Activation on (0x01) V Read	Write
	Information	
	15:42:18 - Writing DID-Parameters was successful.	
		Clear



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. Plug and Charge:

XX:

- 0x00: Plug and Charge is deactivated
- 0x01: Plug and Charge is activated

Request: 04 2E FD 26 XX FF FF FF Response: 03 6E FD 26 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present configuration of Plug and Charge, the following communication has to be executed.

4. <u>Read Plug and Charge configuration:</u> Request: 03 22 FD 26 FF FF FF FF Response: 04 62 FD 26 XX FF FF FF



5.2.1.2.12.2 Configuration of PnC Certificates/Private Keys

The certificates and private keys for Plug and Charge can be configured via UDS as described in this chapter.



Caution

The stated lengths of certificates and private keys must be observed. If a certificate or a private key is shorter than the stated length the remaining bytes must be filled with zeros.

OEM Provisioning Certificate/Private Key:

The OEM provisioning certificate and the associated private key can be configured separately in two steps (FD 27/ FD 28) or together in one step (FD 29).

- DID FD 27 Configuration OEM Provisioning Certificate (800 Bytes)
- DID FD 28 Configuration OEM Provisioning Certificate Private Key (32 Bytes)
- DID FD 29 Configuration OEM Provisioning Certificate and Private Key (832 Bytes)
 - > Byte 0...799: Certificate byte array
 - > Byte 800...831: Private Key byte array

PnC Contract Certificate/Private Key:

The PnC contract certificate and the associated private key can be configured separately in two steps (FD 2A/ FD 2B) or together in one step (FD 2C).

- DID FD 2A Configuration PnC Contract Certificate (800 Bytes)
- DID FD 2B Configuration PnC Contract Certificate Private Key (32 Bytes)
- DID FD 2C Configuration PnC Contract Certificate and Private Key (832 Bytes)
 - > Byte 0...799: Certificate byte array
 - > Byte 800...831: Private Key byte array

PnC Sub Certificate:

DID FD 2D – Configuration PnC Sub Certificate (1600 Bytes)

- > Byte 0...799: Sub Certificate 1 (Distance to root 0) byte array
- > Byte 800...1599: Sub Certificate 2 (Distance to root 1) byte array





Note

If only one sub certificate is used, the byte arrays of the second sub certificates shall be filled with zeros.

PnC Root Certificate

DID FD 2F – Configuration PnC Root Certificate (800 Bytes)

Configuration with CANoe/CANalyzer

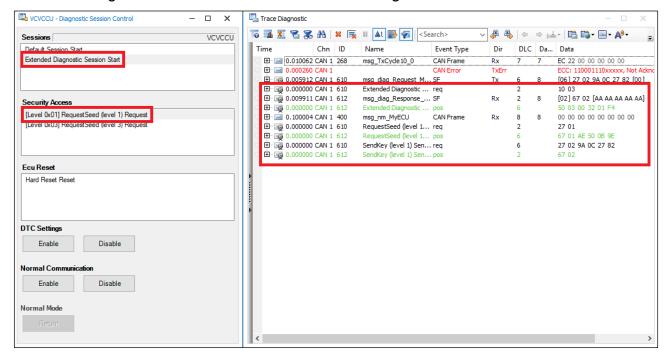
The configuration of PnC certificates and private keys can be executed with CANoe/CANalyzer according to the following description.



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.

 The configuration of PnC certificates and private keys requires the diagnostic services "Extended Session" and "Security Access". Therefore, select the window "VCVCCU – Diagnostic Session Control" and double-click on "Extended Session Start". Continue by double-clicking on "[Level 0x01] Request Seed (level 1) Request". Please note that the responses must be positive. The request and response messages are shown in the window "Trace Diagnostic".





2. As soon as the extended session is active and the security access has been performed successfully, the configuration of certificates and private keys can be started according to the following description.

Configuration of PnC Contract Certificate/Private Key:

In order to configure the PnC contract certificate, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 2A – VCVCCU Configuration PnC Contract Certificate Write". Write the requested certificate (800 bytes) and click on "Execute". Please note that the response must be positive.

VCVCCU - Diagnostic Console] C₂+ S₂ + 🔐 🕺 🖫 Mʒ 🕸 (図) (図) 🖼 📟 = → 🖬 📾 🖿					- 🗆 ×
					- ,
nbolic 🗸					[EVCC] VCVC
2E FD 2A - VCVCCU_Configuration_PnC_Contract_Certificate_Write					 Execute
- 🖳 22 FD 09 - VCVCCU Configuration InternalVoltageStatus message Read	Name		Value	Unit	
🔂 2E FD 09 - VCVCCU Configuration Internal/VoltageStatus message Write	PDU		2E FD 2A 00 00 00 00 00 00 00 00 00 00	0	
🚯 22 FD 0A - VEVECU Configuration Internal/VoltageRawValues message Read		ration PnC Contract Certificate	0x00 0x00 0x00 0x00 0x00 0x00 0x00		
🔂 2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write					
	Contract Certif	icate	0x00 0x00 0x00 0x00 0x00 0x00 0x00	U	
- 🖶 22 FD 0C - VCVCCU Configuration TLS Activation Read					
- 🚯 2E FD 0C - VCVCCU Configuration TLS Activation Write					
- 🔂 2E FD 0D - VCVCCU Configuration TLS Certificate Write					
- 🛃 2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write					
- 🛃 22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read					
- 🔁 2E FD 0F - VCVCCU Configuration Primary J1939 Source Address Write			1		
- 🔂 22 FD 10 - VCVCCU Configuration Secondary J1939 Source Address Read	Type/Parameter	Service/Value			
- 🙀 2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write		0.000 0.000 0.000 0.000 0.000 0.000 0.000	00 0x00	าก กงกก กงกก กงกก กงกก กงกก	
			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0		
			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	00 0x00 0x00 0x00 0x00 0x00 0x00 0x00	00x00 0x00 0x00 0x00 0x00 0x00	
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		0x00 0x00 0x00 0x00 0x00 0x00 0x	x0 00x0 00x0 00x0 00x0 00x0 00x0 00x0	0 0x00 0x00 0x00 0x00 0x00 0x00	
		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	x0 0x0 0x00 0x00 0x00 0x00 0x00 0x00 0	0 0×00 0×00 0×00 0×00 0×00	
			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
- 🛃 22 FD 21 - VCVCCU Configuration PTC activation Read			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
- 🗟 2E FD 21 - VCVCCU Configuration PTC activation Write					
- 🔂 22 FD 22 - VCVCCU Configuration LIN J3068 charging activation Read			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
2E FD 22 - VCVCCU Configuration LIN J3068 charging activation Write			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
- 🔁 22 FD 25 - VCVCCU Configuration HSOUT diagnostic mode Read		0x00 0x00 0x00 0x00 0x00 0x00 0x	00 0x00 0x00 0x00 0x00 0x00 0x00 0x0 0x	00x00 0x00 0x00 0x00 0x00 0x00 0	
2E FD 25 - VCVCCU Configuration HSOUT diagnostic mode Write		0x00 0x00 0x00 0x00 0x00 0x00 0x	00 0x00 0x00 0x00 0x00 0x00 0x00 0x00	00x0 00x0 0x00 0x00 0x00 0x00 0	
- 🔁 22 FD 26 - VCVCCU Configuration PnC Activation Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	x0 00x0 00x0 00x0 00x0 00x0 00x0 00x0	00x00 0x00 0x00 0x00 0x00 0x00 0	
2E FD 26 - VCVCCU Configuration PnC Activation Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	x0 0x00 0x00 0x00 0x00 0x00 0x00 0x00	0 0x00 0x00 0x00 0x00 0x00	
2E ED 27 - VEVECH Configuration OEM Provisioning Certificate Write			00 0x00		
2E FD 2A - VEVECU Configuration PnC Contract Certificate Write			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
2E FD 2B - VEVEEU Configuration Phe Contract Certificate Private Key Write					
- R 2E FD 2C - VCVCCU Configuration PnC Contract Certificate and Private Key Write			00 0x00		
			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0		
			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
2E FD 28 - VCVCCU Configuration DEM Provisioning Certificate Private Key Write		0x00 0x00 0x00 0x00 0x00 0x00 0x	00 0x00 0x00 0x00 0x00 0x00 0x00 0x0 0x	00x00 0x00 0x00 0x00 0x00 0x00	
2E FD 29 - VCVCCU Configuration OEM Provisioning Certificate and Private Key Write		0x00 0x00 0x00 0x00 0x00 0x00 0x	x0 00x0 00x0 00x0 00x0 00x0 00x0 00x0	00x00 0x00 0x00 0x00 0x00 0x00 0	
22 FD 37 - VCVCCU Configuration Charging Schedules Activation Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	x0 0x00 0x00 0x00 0x00 0x00 0x00 0x00	00x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
2E FD 37 - VCVCCU Configuration Charging Schedules Activation Write			00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
ECU Identification	[16:26:19]	VCVCCU		0 0100 0100 0100 0100 0100	
	[10:20:13]				
Security Access	[16:26:19] · Rx	Positive response.			



In order to configure the PnC contract certificate's private key, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 2B – VCVCCU Configuration PnC Contract Certificate Private Key Write". Write the requested private key (32 bytes) and click on "Execute". Please note that the response must be positive.

C VCVCCU - Diagnostic Console				– 🗆 🗙	
				Online	
Symbolic 🗸				[EVCC] VCVCCU	
50: 2E FD 2B - VCVCCU_Configuration_PnC_Contract_Certificate_Private_Key_Write				~ Execute	
Configuration Internal/VoltageStatus message Read Configuration Internal/VoltageStatus message Read Configuration Internal/VoltageStatus message Read Configuration Internal/VoltageFlawWates message Write Configuration Internal/VoltageFlawWates message Write Configuration Internal/VoltageFlawWates message Write Configuration Internal/VoltageFlawWates message Write Configuration Internal/VoltageFlawWates Configuration Inter	Name POU VEVECU Configuration PnC Contract Certificate Private Key Private Key	Value 2E FD 28 00 00 00 00 00 00 00 00 00 00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	Unit		
25 FD 0C - VCVCCU Configuration TLS Activation Write 25 FD 00 - VCVCCU Configuration TLS Certificate Write 25 FD 06 - VVCCU Configuration Security Rey Constant 01/02 Write 25 FD 06 - VVCCU Configuration Primary J1939 Source Address Read 25 FD 07 - VCVCCU Configuration Primary J1939 Source Address Read 25 FD 07 - VCVCCU Configuration Primary J1939 Source Address Read 26 FD 07 - VCVCCU Configuration Primary J1939 Source Address Read					
22 FD 10 - VEVECU Configuration Secondary J1939 Source Address Read 22 FD 10 - VEVECU Configuration Secondary J1939 Source Address Write	Type/Parameter	Service/Value			
G. 22 FD 11 - VCVCU Configuration Value Added Service Read G. 25 FD 11 - VCVCU Configuration Value Added Service Write G. 25 FD 11 - VCVCU Configuration Value Added Service Write G. 25 FD 13 - VCVCU Configuration TLS Certificates Write G. 25 FD 13 - VCVCU Configuration StopCharge CAN Signal Netad G. 25 FD 13 - VCVCU Configuration Charge Node Selection Netad G. 25 FD 14 - VCVCU Configuration Charge Node Selection Netad G. 25 FD 23 - VCVCU Configuration Charge Node Selection Netad G. 25 FD 24 - VCVCU Configuration PLS Node Selection Write G. 25 FD 24 - VCVCU Configuration PLS Node Selection Write G. 25 FD 24 - VCVCU Configuration PLS Node Selection Write G. 25 FD 24 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 24 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 24 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 24 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 24 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 25 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 25 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 25 - VCVCU Configuration PLS Cervision Vrite G. 25 FD 25 - VCVCU Configuration PLS Contract Certificate Write G. 25 FD 26 - VCVCU Configuration PLS Contract Certificate Private Key Write G. 25 FD 28 - VCVCU Configuratio	[16,28:09] [16,28:18]- Tx VCVCCU Configuration PnC Contract Certificate Private Key Private Key [16:28:19] [16:28:19]- Rx	0x00 0x00 0x00 0x00 0x00 0x00 0x00	00 0x00 0x00 0x00 0x00 0x00 0x00 0x00		
Beutine Control Security Access	c			>	
The R countries of the second				2	



In order to configure the PnC contract certificate and the associated private key in one step, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 2C – VCVCCU Configuration PnC Contract Certificate and Private Key Write". Write the requested certificate and private key (832 bytes) and click on "Execute". Please note that the response must be positive.

VCVCCU - Diagnostic Console			- 0
] 🖙 🗞 ¥ 🔛 🗰 🛤 🕸 🕸 🕸 🖷 📟 🕬 📰 🖼 🖿			li Onl
nbolic 🗸			[EVCC] VC\
2E FD 2C - VCVCCU_Configuration_PnC_Contract_Certificate_and_Private_Key_Write			~ Ехесц
- 🔀 22 FD 09 - VCVCCU Configuration InternalVoltageStatus message Read	Name	Value Unit	
- 🖳 2E FD 09 - VCVCCU Configuration InternalVoltageStatus message Write	PDU	2E FD 2C 00 00 00 00 00 00 00 00 00	
- 🔂 22 FD 0A - VCVCCU Configuration InternalVoltageRawValues message Read	VCVCCU Configuration PnC Contract Certificate and Private		
2E FD 0A - VCVCCU Configuration Internal/VoltageRawValues message Write	Contract Certificate		
22 FD 0B - VCVCCU Configuration InletStatus2 message Read			
2E FD 0B - VCVCCU Configuration InletStatus2 message Write	Private Key	0x00 0x00 0x00 0x00 0x00 0x00 0x00 0	
22 FD 0C - VCVCCU Configuration TLS Activation Read			
E FD 0C - VCVCCU Configuration TLS Activation Write			
2E FD 0D - VCVCCU Configuration TLS Certificate Write			
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write			
22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read			
2E FD 0F - VCVCCU Configuration Primary J1939 Source Address Write			
22 FD 10 - VCVCCU Configuration Secondary J1939 Source Address Read	Type/Parameter	Service/Value	
Rev 2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write Secondary J1939 Source Address Write Secondary J1939 Source Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	x00 0x00 0x00 0x00 00x
		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	
E FD 11 - VCVCCU Configuration Value Added Service Write Service Write 2E FD 12 - VCVCCU Configuration TLS Certificate2 Write			
Example 2 FD 12 - VCVCCU Configuration TLS Certificate2 write		0x00 0x	
22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Nead			
22 PD 13 - VCVCCD Configuration Stopping CAN Signal Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
22 PD 14 - VCVCCU Configuration Charge Node Selection Nead		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
22 FD 20 - VCVCCU Configuration Inlet Type Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
22 FD 20 VCVCCU Configuration Inlet Type Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	x00 0x00 0x00 0x00
22 FD 21 - VCVCCU Configuration PTC activation Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	x00 0x00 0x00 0x00
22 FD 21 - VCVCCU Configuration FTC activation Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	x00 0x00 0x00 0x00 00x
22 FD 21 VEVECU Configuration LIN J3068 charging activation Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	×00 0×00 0×00 0×00
22 FD 22 - VCVCCU Configuration LIN J3068 charging activation Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
22 FD 22 - VCVCCU Configuration Enviced charging deviation white		0x00 0x	
E FD 25 - VCVCCU Configuration HSOUT diagnostic mode Write		0x00 0x	
22 FD 26 - VCVCCU Configuration PnC Activation Read			
2E FD 26 - VCVCCU Configuration PnC Activation Write		0x00 0x	
2E FD 27 - VCVCCU Configuration 0EM Provisioning Certificate Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
2E FD 2A - VCVCCU Configuration PnC Contract Certificate Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
2E ED 2B - VCVCCU Configuration PnC Contract Certificate Private Key Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	x00 0x00 0x00 0x00
😰 2E FD 2C - VCVCCU Configuration PnC Contract Certificate and Private Key Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	x00 0x00 0x00 0x00
2E FD 2D - VLVLLU Configuration PhL Sub Certificate Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	x00 0x00 0x00 0x00
2E FD 2F - VCVCCU Configuration PnC Root Certificate Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	x00 0x00 0x00 0x00 00x
- 🚯 2E FD 28 - VCVCCU Configuration OEM Provisioning Certificate Private Key Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x	
- 🚯 2E FD 29 - VCVCCU Configuration OEM Provisioning Certificate and Private Key Write	Private Key		
- 🐘 22 FD 37 - VCVCCU Configuration Charging Schedules Activation Read	- materialy	0x00 0x	
2E FD 37 - VCVCCU Configuration Charging Schedules Activation Write	110-20-421	VEVECII	
- 🐩 ECU Identification	[16:29:42]		
- 🐮 Routine Control	[16:29:42] - Rx	Positive response.	
🐮 Security Access 🗸 🗸	<		

Configuration of OEM Provisioning Certificate/Private Key:

The configuration of the OEM provisioning certificate and the associated private key follows the same approach as the configuration of the contract certificate and its private key.

In order to configure the OEM provisioning certificate, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 27 – VCVCCU Configuration OEM Provisioning Certificate Write". Write the requested certificate (800 bytes) and click on "Execute". Please note that the response must be positive.

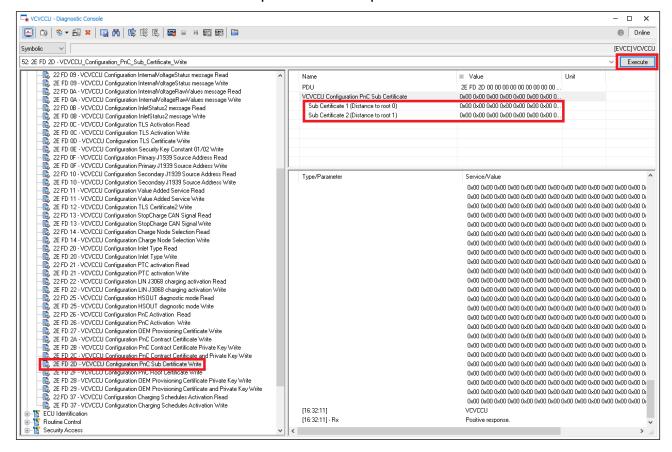
In order to configure the OEM provisioning certificate's private key, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 28 – VCVCCU Configuration OEM Provisioning Certificate Private Key Write". Write the requested private key (32 bytes) and click on "Execute". Please note that the response must be positive.

In order to configure the OEM provisioning certificate and the associated private key in one step, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 29 – VCVCCU Configuration OEM Provisioning Certificate and Private Key Write". Write the requested certificate and private key (832 bytes) and click on "Execute". Please note that the response must be positive.



Configuration of PnC Sub Certificates:

In order to configure the PnC sub certificates, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 2D – VCVCCU Configuration PnC Sub Certificate Write". Write the requested sub certificates (1600 bytes) and click on "Execute". Please note that the response must be positive.





Configuration of PnC Root Certificate:

In order to configure the PnC root certificate, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 2F – VCVCCU Configuration PnC Root Certificate Write". Write the requested root certificate (800 bytes) and click on "Execute". Please note that the response must be positive.

VCVCCU - Diagnostic Console			
🔄 🖙 も - 総 × 🖙 🕅 略 略 低 🗃 = 🖻 🎟 数 🖿			Onlin
mbolic ~			[EVCC] VCV
3: 2E FD 2F - VCVCCU_Configuration_PnC_Root_Certificate_Write			~ Execu
R 22 FD 09 - VCVCCU Configuration Internal/VoltageStatus message Write R 22 FD 09 - VCVCCU Configuration Internal/VoltageStatus message Write R 25 PD 04 - VCVCCU Configuration Internal/VoltageRewValues message Write R 22 FD 04 - VCVCCU Configuration Internal/VoltageRewValues message Read R 22 FD 04 - VCVCCU Configuration Internal/VoltageRewValues message Write R 22 FD 04 - VCVCCU Configuration InterNatus2 message Read R 22 FD 08 - VCVCCU Configuration IntelStatus2 message Write R 22 FD 08 - VCVCCU Configuration IntelStatus2 message Write R 22 FD 08 - VCVCCU Configuration TLS Activation Read R 22 FD 00 - VCVCCU Configuration TLS Activation Read	Name PDU DID 0xFD2F Root Certificate	■ Value 2E FD 2F 00 00 00 00 00 00 00 00 00 00 00 00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0 0x00 0x00	Unit
2E FD 00 - VCVDCU Configuration TLS Certificate Write 2E FD 06 - VCVDCU Configuration Security Key Constant 01/02 Write 2E FD 06 - VCVCU Configuration Primary J1333 Source Address Read 2E FD 07 - VCVCCU Configuration Primary J1333 Source Address Write 22 FD 10 - VCVCCU Configuration Secondary J1333 Source Address Read 2E FD 10 - VCVCCU Configuration Secondary J1333 Source Address Write 2E FD 10 - VCVCCU Configuration Secondary J1333 Source Address Write 2E FD 10 - VCVCCU Configuration Secondary J1333 Source Address Write 2E FD 10 - VCVCCU Configuration Secondary J1333 Source Address Write 2E FD 10 - VCVCCU Configuration Secondary J1333 Source Address Write	Type/Parameter	Service/Value 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	
2E FD 11 - VCVCCU Configuration Value Added Service Write 2E FD 12 - VCVCUU Configuration TLS Certificate2 Write 22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Read 22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Write 22 FD 14 - VCVCCU Configuration Charge Node Selection Read 22 FD 14 - VCVCCU Configuration Charge Node Selection Write 22 FD 14 - VCVCCU Configuration Charge Node Selection Write 22 FD 14 - VCVCCU Configuration Charge Node Selection Write 22 FD 14 - VCVCCU Configuration Charge Node Selection Write 22 FD 14 - VCVCCU Configuration Charge Node Selection Write		0x00 0x00	0200 0x00 0x00 0x00 0x00 0x00 0 0x00 0x00 0x00 0x00 0x00 0 0x00 0x00 0x00 0x00 0x00 0 0x00 0x00 0x00 0x00 0x00 0x00 0 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0 0x00 0x00 0
22 FD 20 - VCVCU Configuration Inlet Type Write 22 FD 21 - VCVCU Configuration PTC activation Read 22 FD 21 - VCVCU Configuration PTC activation Write 22 FD 22 - VCVCU Configuration LIN J3088 charging activation Read 22 FD 22 - VCVCCU Configuration LIN J3088 charging activation Write 22 FD 22 - VCVCCU Configuration LIN J3088 charging activation Write 22 FD 25 - VCVCCU Configuration SUUT diagnostic mode Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	0x00 0x00
E FD 25 - VCVCUC onfiguration HS0UT diagnostic mode Write 22 FD 25 - VCVCCU Configuration PnC Activation Read 22 FD 26 - VCVCCU Configuration PnC Activation Write 22 FD 27 - VCVCCU Configuration DEM Provisioning Centificate Write 22 FD 24 - VCVCCU Configuration DEM Contract Centralet Write 22 FD 28 - VCVCCU Configuration PnC Contract Centralet Write		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	0x00 0x00
22 FD 22 - VCVCCU Configuration PnC Contract Certificate and Private Key Write 22 FD 24 - VCVCCU Configuration PnC Rob Certificate Write 22 FD 25 - VCVCCU Configuration PnC Rob Certificate Write 22 FD 28 - VCVCCU Configuration UEM Provisioning Certificate Private Key Write 22 FD 29 - VCVCCU Configuration OEM Provisioning Certificate and Private Key Write 22 FD 27 - VCVCCU Configuration Charging Schedules Activation Read		0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x0	0x00 0x00
2E FD 37 - VCVCCU Configuration Charging Schedules Activation Write ECU Identification Routine Control Security Access V	[16:30:54] [16:30:54] - Rx	VCVCCU Positive response.	



Configuration with Indigo

The configuration of certificates and private keys for Plug and Charge can be executed with Indigo according to the following description.

1. Select the tab "Plug and Charge" and select the requested certificate/private key that shall be written. Click on the button "Write" to execute the configuration. After the successful writing of the certificate/private key a notification shows up in the field "Information".

Navigation	<	Plug and Charge				
Identification Browser						
		PnC Certificates	_			
Parametrizer		OEM Provisioning Certificate Write	a			
IN VAS	OEM Provisioning Certificate Private Key Write	e				
VAS		OEM Provisioning Certificate and Private Key Write	e			
Plug and Charge		PnC Contract Certificate Write	e			
Inlet Configuration	PnC Contract Certificate Private Key Write					
	PnC Contract Certificate and Private Key Write					
DTC Browser		PnC Sub Certificate 1				
A Reprogramming	PnC Sub Certificate 2	2				
	PnC Root Certificate	e				
		PnC Activation				
		PnC Activation on (0x01) V Read Write	e			
		Information				
			r)			



5.2.1.2.12.3 Routine Controls for PnC Certificates/Private Keys

The VC-EVCC provides several routine controls for Plug and Charge certificates/private keys. The following routine controls are available in order to validate or compare PnC certificates.



Caution

The execution of routine controls requires the diagnostic services "Extended Session" and "Security Access". Otherwise, the VC-EVCC will send a negative response code.

Validation of PnC certificates/signature chain:

- RID 0xF002 Validate OEM Provisioning Certificate
- RID 0xF003 Validate Contract Certificate

The VC-EVCC validates the OEM Provisioning Certificate or the Contract Certificate against the respective stored private key. The validation result is either valid or invalid.

▶ RID 0xF008 – Validate Contract Certificate Signature Chain

The Contract Certificate Signature Chain is validated by the VC-EVCC with the reference time value provided in the diagnostic request message. The validation result is either "Valid" or "Invalid".

Value	Description
0x00	Valid
0x01	Invalid

 Table 5-9:
 Validation Result of PnC Certificates/Signature Chain

Comparison of PnC certificates:

- RID 0xF004 Compare Contract Certificate
- RID 0xF005 Compare OEM Provisioning Certificate
- RID 0xF006 Compare Sub Certificate
- RID 0xF007 Compare PnC Root Certificate

The VC-EVCC compares the installed certificate with the certificate provided in the diagnostic request message. The result is either "NonIdentical" or "Identical". If the Sub Certificate shall be compared the distance to root (0 or 1) has to be provided in addition to the certificate.

Value	Description
0x00	NonIdentical
0x01	Identical

Table 5-10: Result of Comparison Between PnC Certificates



Routine Controls with CANoe/CANalyzer

The routine controls of PnC certificates and private keys can be executed with CANoe/CANalyzer according to the following description.

 The routine controls of PnC certificates and private keys require the diagnostic services "Extended Session" and "Security Access". Therefore, select the window "VCVCCU – Diagnostic Session Control" and double-click on "Extended Session Start". Continue by double-clicking on "[Level 0x01] Request Seed (level 1) Request". Please note that the responses must be positive. The request and response messages are shown in the window "Trace Diagnostic".

VCVCCU - Diagnostic Session Control -	Trace Diagnostic	- 🗆 X
Sessions	🐻 🔜 🕱 😤 🏦 🙀 🖡 🗉 🔺 🛃 두 🎼 🗛 🧇	* 🗟 * 🗟 🖏 * 🗟 • 🗚 🖡
Default Session Start	Time Chn ID Name Event Type Dir DLC	Da Data
Extended Diagnostic Session Start		7 EC 22 00 00 00 00 00
	CAN Error TxErr	ECC: 110001110xxxxx, Not Ackno
	⊡ □ □ □	8 [06] 27 02 9A 0C 27 82 [00]
	G ⊕ 30,000000 CAN 1 610 Extended Diagnostic reg 2	10 03
Security Access	G ⊞ 😡 0.009911 CAN 1 612 msg_diag_Response SF Rx 2	8 [02] 67 02 [AA AA AA AA AA]
	G ⊡ 100 0.000000 CAN 1 612 Extended Diagnostic pos 6	50 03 00 32 01 F4
[Level 0x01] RequestSeed (level 1) Request	🗇 🕀 📓 0.100004 CAN 1 400 msg nm MyECU CAN Frame Rx 8	8 00 00 00 00 00 00 00 00
[Level 0x03] RequestSeed (level 3) Request	G ⊞ 30.000000 CAN 1 610 RequestSeed (level 1 reg 2	27 01
	G 🕀 🐨 0.000000 CAN 1 612 RequestSeed (level 1 pos 6	67 01 AE 50 0B 9E
	G ⊞ 📆 0.000000 CAN 1 610 SendKey (level 1) Sen… reg 6	27 02 9A 0C 27 82
	C 🕀 😡 0.000000 CAN 1 612 SendKey (level 1) Sen pos 2	67 02
Ecu Reset		
Hard Reset Reset		
DTC Settings		
Enable Disable		
Enable Disable		
Normal Communication		
Enable Disable		
Normal Mode		
Return		
		>



2. As soon as the extended session is active and the security access has been performed successfully, the routine controls of certificates and private keys can be started according to the following description.

<u>Validation of OEM Provisioning or Contract Certificate:</u> Select the tab "Routine Control" in the diagnostic console. Please choose the requested routine control for certificate validation and click on the button "Execute".

► VCVCCU - Diagnostic Console							
Symbolic V							
70: 31 01 F0 02 - Validate_DEM_Provisioning_Certificate_Start				~ Execute			
 Sessions Stored Data Routine Control Social Statt Routine Control Routine Reserve R	Type/Parameter	Service/Value	Value 31 01 F0 02				



<u>Validation of Contract Certificate Signature Chain:</u> Select the tab "Routine Control" in the diagnostic console. Please choose the requested routine control for certificate validation and enter the reference time value. Then click on the button "Execute".

🕞 VCVCCU - Diagnostic Console 🧧	×
	Offline
Symbolic V	VCVCCU
76: 31 01 F0 08 - Validate_Contract_Certificate_Signature_Chain_Start	kecute
Image: Section and a section of the section of th	



<u>Comparison of PnC Certificates:</u> Select the tab "Routine Control" in the diagnostic console. Please choose the requested routine control for certificate comparison and enter the respective certificate. If the Sub Certificate shall be compared the distance to root (0 or 1) has to be entered in the field "Distance to Root" additionally. Then click on the button "Execute".

VCVCCU - Diagnostic Console			- 🗆 X
	1911 - 19		Offline
Symbolic 🗸			[EVCC] VCVCCU
74: 31 01 F0 06 - Compare_Sub_Certificate_Start			✓ Execute
Sessions Stored Data Societ Data	Name PDU Distance to Root Reference Certificate	0×00	



Manual Configuration

Executing routine controls is also possible without CANoe. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session, e.g. every second. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

<u>Request Seed (Level 1):</u>
 XX: Seed (4 byte)
 Request: 02 27 01 FF FF FF FF
 Response: 06 67 01 XX XX XX XX FF

4. <u>Send Key (Level 1):</u>
XX: Key (4 byte)
Request: 06 27 02 XX XX XX FF
Response: 02 67 02 FF FF FF FF FF

The key can be calculated with the following algorithm and key constant:

- Key constant: 0xE3CA2342
- Algorithm: (((SEED * 0x6076DBAF) + 0x5397FB1) ^ ((~SEED * 0x72B6BF45) + 0xBC614E) ^ KEY_CONSTANT)
 - 5. Execution of Routine Controls:
- Validation of Contract Certificate or OEM Provisioning Certificate

XX: PnC Certificate

- 02: Validate OEM Provisioning Certificate
- 03: Validate Contract Certificate



Request: 31 01 F0 XX FF FF FF FF

The following response indicates whether the certificate is valid or invalid.

Response: 71 01 F0 XX XX FF FF FF

XX:

- 00: Valid
- 01: Invalid
- Validation of Contract Certificate Signature Chain

XX: Reference Time Value

- Byte 4: Year (A raw value of 0 identifies the year 1985. A raw value of 24 identifies the year 2021)
- Byte 5: Month (1 to 12)
- Byte 6: Day (physical value = raw value/4)
- Byte 7: Hours (0 to 23)
- Byte 8: Minutes (0 to 59)
- Byte 9: Seconds (physical value = raw value/4)

Request: 31 01 F0 08 XX XX XX XX XX XX

The following response indicates whether the contract certificate signature chain is valid or invalid.

Response: 71 01 F0 08 XX FF FF FF

XX:

- 00: Valid
- 01: Invalid
- Comparison of PnC Certificates:

XX: PnC Certificate

- 04: Compare Contract Certificate
- 05: Compare OEM Provisioning Certificate
- 06: Compare Sub Certificate
- 07: Compare PnC Root Certificate

XX: Distance to Root Certificate

- 00: Distance to Root Certificate is 0
- 01: Distance to Root Certificate is 1



Note

The distance to root certificate parameter is only relevant if a sub certificate shall be compared (routine control F0 06). Otherwise, the distance to root certificate parameter is omitted and this byte is used to transmit the certificate.

XX: Certificate (800 byte)



Request:	31 01 F0 XX XX XX XX XX
Response:	30 08 14 AA AA AA AA AA
Request:	21 XX XX XX XX XX XX XX XX
Request:	22 XX XX XX XX XX XX XX XX



Note

This description does not include all request/response-messages due to the size of the TLS certificate (800 byte). In order to write the TLS certificate correctly the transport protocol according to ISO 15765-2 [6] has to be implemented.

The following response indicates whether the certificates are identical or not identical.

Response: 71 01 F0 XX XX FF FF FF

XX:

- 00: Not identical
- 01: Identical



5.2.1.2.13 Configuration of Charging Schedules

The VC-EVCC provides the possibility to use Charging Schedules according to ISO 15118. This feature can be activated via UDS as described in this chapter.

The service structure is defined as 1 byte.

Value	Description
0x00	Charging Schedules are deactivated (default)
0x01	Charging Schedules are activated



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

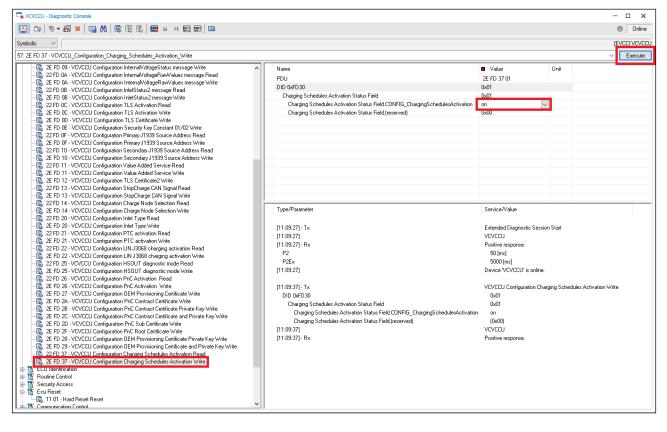
The configuration of Charging Schedules can be executed with CANoe/CANalyzer according to the following description.

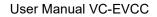
 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

CVCCCU - Diagnostic Console			- 🗆 X
🔁 👳 🗤 🗶 🗙 🖬 🗛 🗟 🗟 🕺 🗉 H 🗞 🕅			Online
Symbolic V			[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start			Execute
Symbolic ~	Name PDU Image: Second Sec	Value Unit 10 03 Unit Service/Value Image: Constant VCVCCU Extended Diagnostic Session Start VCVCCU Positive response: S0 (ma) S000 (ma) Device VCVCCU' is online.	(Application) VCVCCU
🦓 [Macros]			
Ц	1		



 Select the tab "Stored Data" and click on "2E FD 37 – VCVCCU Configuration Charging Schedules Activation Write". Please choose the requested Charging Schedules configuration ("on" or "off") and click on the button "Execute". Please note that the response must be positive.







3. By executing the command "22 FD 37 – VCVCCU Configuration Charging Schedules Activation Read" the current configuration of the Charging Schedules can be verified.

- VCVCCU - Diagnostic Console							
Symbolic V							
56: 22 FD 37 - VCVCCU_Configuration_Charging_Schedules_Activation_Read				~	Execute		
- 🗟 2E FD 09 - VCVCCU Configuration InternalVoltageStatus message Write	Name	Value	Unit				
- 🗟 22 FD 0A - VCVCCU Configuration InternalVoltageRawValues message Read	PDU	22 FD 37					
- 🗟 2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write	100	2210 01					
- 🔂 22 FD 0B - VCVCCU Configuration InletStatus2 message Read							
E FD 0B · VCVCCU Configuration InletStatus2 message Write							
- 22 FD 0C - VCVCCU Configuration TLS Activation Read							
E FD 0C - VCVCCU Configuration TLS Activation Write E FD 0D - VCVCCU Configuration TLS Certificate Write							
2E FD 00 - VEVECU Configuration TES Certificate write							
22 FD 0F · VCVCCU Configuration Primary J1939 Source Address Read							
E FD 0F · VCVCCU Configuration Primary J1939 Source Address Write							
22 FD 10 • VEVECU Configuration 1 million J 1000 Source Address Write							
22 FD 10 • VCVCCU Configuration Secondary J1939 Source Address Write							
22 FD 11 - VCVCCU Configuration Value Added Service Read							
2E FD 11 - VCVCCU Configuration Value Added Service Write							
E FD 12 · VCVCCU Configuration TLS Certificate2 Write							
22 FD 13 · VCVCCU Configuration StopCharge CAN Signal Read							
- 🗟 2E FD 13 - VCVCCU Configuration StopCharge CAN Signal Write							
22 FD 14 - VEVECU Configuration Charge Node Selection Read							
E FD 14 - VEVECU Configuration Charge Node Selection Write	Type/Parameter	Service/Value					
- 🖳 22 FD 20 - VEVECU Configuration Inlet Type Read							
- 🔁 2E FD 20 - VCVCCU Configuration Inlet Type Write	[11:09:27] - Tx	Extended Diagnostic Sessio	n Start				
- 🔂 22 FD 21 - VCVCCU Configuration PTC activation Read	[11:09:27]	VEVECU					
- 22 FD 21 · VCVCCU Configuration PTC activation Write	[11:09:27] - Rx	Positive response:					
22 FD 22 · VCVCCU Configuration LIN J3068 charging activation Read 2E FD 22 · VCVCCU Configuration LIN J3068 charging activation Write	P2	50 [ms]					
- 22 FD 22 • VCVCCU Configuration Lin 35066 charging activation write - 22 FD 25 • VCVCCU Configuration HSOUT diagnostic mode Read	P2Ex	5000 [ms]					
	[11:09:27]	Device VCVCCU' is online.					
- 2 FD 25 VEVECU Configuration PnC Activation Read	(·········						
2E FD 26 · VEVECU Configuration PnC Activation Write	[11:09:37] - Tx	VCVCCU Configuration Cha	aina Sched	ules Activation Write			
E FD 27 · VCVCCU Configuration 0EM Provisioning Certificate Write	DID 0xFD30	0x01	iging conod				
- 🔂 2E FD 2A - VEVECU Configuration PnE Contract Certificate Write	Charging Schedules Activation Status Field	0x01					
- 🗟 2E FD 2B - VCVCCU Configuration PnC Contract Certificate Private Key Write	Charging Schedules Activation Status Field CONFIG Charging Schedules Activation	on					
- 🕞 2E FD 2C - VCVECU Configuration PnC Contract Certificate and Private Key Write	Charging Schedules Activation Status Field. Convinta_ChargingSchedulesActivation Charging Schedules Activation Status Field. (reserved)	(0x00)					
E FD 2D · VCVCCU Configuration PnC Sub Certificate Write	[11:09:37]	VEVECU					
- 🔁 2E FD 2F - VCVCCU Configuration PnC Root Certificate Write							
- 22 FD 28 · VCVCCU Configuration OEM Provisioning Certificate Private Key Write	[11:09:37] - Rx	Positive response.					
25 ED 29 - VEVCCLL Configuration OEM Provisioning Certificate and Private Key Write 22 ED 27 - VEVCCLL Configuration OEM Provisioning Certificate and Private Key Write							
22 FD 37 - VCVCCU Configuration Charging Schedules Activation Read	[11:10:25] - Tx	VEVECU Configuration Cha	rging Sched	ules Activation Read	1		
ECU Identification	[11:10:25]	VEVEEU					
Routine Control	[11:10:25] - Rx	Positive response:					
	DID 0xFD30	0x01					
Ecu Reset	Charging Schedules Activation Status Field	0x01					
11 01 - Hard Reset Reset	Charging Schedules Activation Status Field.CONFIG_ChargingSchedulesActivation	on					
Communication Control	Charging Schedules Activation Status Field.(reserved)	(0x00)					
Eault Memori							



Configuration with Indigo

The configuration of charging schedules can be executed with Indigo according to the following description.

 Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration Charging Schedules Activation/Charging Schedules Activation Status Field/CONFIG_ChargingSchedulesActivation". Select the requested charging schedules configuration ("on" or "off") and click on the button "Write" to execute the configuration.

onnect Remote Refresh Auto Ref		Revert Cancel	Filter Grid View	Details Grouping Rep	ort Logging ECU Se	ection Parameter	Store Restor	e		
Connection	Read / Write		Vie	w	Report	Configuration	Store / Restore			
vigation <						_				Parametrizer
d Identification Browser	Name							Value	Unit	
Identification Browser										
Parametrizer	VCVCCU (EVCC)									
	💪 VCVCCU Confi	guration TLS Activat	ion/TLS Activation	Status Field/TLS Activat	ion Status			off		
VAS	🛵 VCVCCU Confi	guration StopCharge	CAN Signal/StopC	harge CAN Signal Status	Field/StopCharge CAN	I Signal Status		off		
Diverse dicharan	🏡 VCVCCU Confi	guration Secondary	J1939 Source Add	ess/Secondary Source A	ddress			SA 0xD7		
Plug and Charge	A VCVCCU Confi	guration PTC2 mess	age/Time Period					20	ms	
Inlet Configuration		guration PTC1 mess						20	ms	
*		guration PTC0 mess						20	ms	
DTC Browser				Dimen Course A.L.					115	
-				Primary Source Address				SA 0x80		
🕻 Reprogramming				LINConfigurationField/CC				off		
	🋵 VCVCCU Confi	guration J1939 CAN	/J1939 CAN Config	uration/J1939 CAN Baud	Rate			250kBaud		
	💪 VCVCCU Confi	🛵 VCVCCU Configuration InternalVoltageStatus message/Time Period						20	ms	
	🛵 VCVCCU Confi	🛵 VCVCCU Configuration InternalVoltageRawValues message/Time Period						20	ms	
	🛵 VCVCCU Confi	guration InletStatus	2 message/Time Pe	eriod				20	ms	
	🛵 VCVCCU Confi	guration InletStatus	message/Time Per	iod				20	ms	
	A VCVCCU Confi	guration HSOUT0/H	SOUTO Configuratio	on/HSOUT0 Time Period				0	ms	
		guration HSOUT0/H						On CP/PP		
				JTdiagnostic/HSOUT4Ac	hin officients Die e			off		
				JTdiagnostic/HSOUT1Ac				off		
	🋵 VCVCCU Confi	guration HSOUT diag	gnostic mode/HSO	JTdiagnostic/HSOUT0Ac	tiveOffStateDiag			off		
	🛵 VCVCCU Confi	guration ControlPilot	Status message/Ti	me Period				20	ms	
	🛵 VCVCCU Confi	guration Charging So	chedules Activation	/Charging Schedules Act	ivation Status Field/CO	ONFIG_ChargingSche	dulesActivation	► on		
	🛵 VCVCCU Confi	guration Charge Nod	le Selection/Charge	Node Selection Status	Field/Charge Node Se	lection Status		off		
										Diagnostic Trac
	Request Time	Request Target	Request Data	Response Time Delta	Response Source	Response Data	Communicatio	n Error		
	332.31641s	FuncGroup-0x614	3E 80							
	334.07310s	VCVCCU	3E 00	0.00879s	VCVCCU	7E 00				
	336.31729s	FuncGroup-0x614								
	338.08271s	VCVCCU	3E 00	0.00937s	VCVCCU	7E 00				
	 340.31815s 342.09291s 	FuncGroup-0x614 VCVCCU	3E 80 3E 00	0.00934s	VCVCCU	7E 00				



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. Charging Schedules:

XX:

- 0x00: Charging Schedules are deactivated
- 0x01: Charging Schedules are activated

Request: 04 2E FD 37 XX FF FF FF Response: 03 6E FD 37 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present Charging Schedules configuration, the following communication has to be executed.

4. <u>Read Charging Schedules configuration:</u> Request: 03 22 FD 37 FF FF FF FF Response: 04 62 FD 37 XX FF FF FF



5.2.1.2.14 Configuration of Inlet Type

The VC-EVCC provides the possibility to configure the lock motor movement time, the lock motor overload protection time and the internal proximity pin (PP) resistor of the vehicle inlet.

The service structure is defined as 4 bytes.

Byte No.	Description	Value
Byte 0	Lock motor movement time	600 ms (default)
Byte 1 and 2	Lock motor overload protection time	2650 ms (default)
Byte 3	 Internal resistor between PP and PE of the vehicle inlet CCS Combo 1: 2,7 kΩ 	2,7 kΩ: 0 4,7 kΩ: 1 (default)
	CCS Combo 2: 4,7 kΩ	

The configuration of the PP resistor determines whether the VC-EVCC considers a CCS Combo 1 or Combo 2 inlet as connected which affects the Proximity Pin evaluation.



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

The inlet type configuration can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

Rev VCVCCU - Diagnostic Console			- 🗆 X
🔁 👳 🗤 🗶 🗙 🖬 🗛 🗟 🗟 🕺 🗉 H 🗞 🕅			 Online
Symbolic V			[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start			~ Execute
Sessions	Name	Value Unit	
10 01 - Default Session Stat	PDU	10 03	
22 FD 00 - VCVCCU Configuration J1939 CAN Read			
E FD 00 - VCVCCU Configuration J1939 CAN Write 22 FD 03 - VCVCCU Configuration HS0UT0 Read			
22 FD 04 - VCVCCU Configuration PTC0 message Read 2E FD 04 - VCVCCU Configuration PTC0 message Write			
2E FD 05 · VCVCCU Configuration PTC1 message Write 22 FD 06 · VCVCCU Configuration PTC2 message Read			
- B 2E FD 06 - VCVCCU Configuration PTC2 message Write	Type/Parameter	Service/Value	
22 FD 07 · VCVCCU Configuration InletStatus message Read 2E FD 07 · VCVCCU Configuration InletStatus message Write	[14:22:12] - Tx	Extended Diagnostic Session Start	
22 FD 07 V V V CCU Configuration Interstatus message Write 22 FD 08 - V CV CCU Configuration ControlPilotStatus message Read	[14:22:12]	VCVCCU	
E FD 08 - VCVCCU Configuration ControlPilotStatus message Write	[14:22:12] · Rx	Positive response:	
22 FD 09 - VCVCCU Configuration Internal/oltageStatus message Read 2E FD 09 - VCVCCU Configuration Internal/oltageStatus message Write	P2 P2Ex	50 (ms) 5000 (ms)	
- 🗒 22 FD 0A - VCVCCU Configuration InternalVoltageRawValues message Read	[14:22:12]	Device VCVCCU' is online.	
2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write 22 FD 0B - VCVCCU Configuration InletStatus2 message Read			
2E FD 0B - VCVCCU Configuration InletStatus2 message Write			
22 FD 0C - VCVCCU Configuration TLS Activation Read			
E FD 0C - VCVCCU Configuration TLS Activation Write 22 FD 0D - VCVCCU Configuration TLS Certificate Read			
- 2E FD 0D - VCVCCU Configuration TLS Certificate Write			
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write ECU Identification			
Boutine Control			
B- B Security Access			
Communication Control			
Fault Memory			
Bright Control D I C Setting			
🗑 🎯 [Raw Telegrams]			
[User defined messages]			



2. Select the tab "Stored Data" and click on "2E FD 20 – VCVCCU Configuration Inlet Type Write". Please choose the requested inlet type configuration and click on the button "Execute". Please note that the response must be positive.

] 다 S - 4월 × III M E (왕 K 프 = H III III)				🔵 🗌 Onli
mbolic 🗸				[EVCC] VCV
: 2E FD 20 - VCVCCU_Configuration_Inlet_Type_Write				 Execut
Sessions	∧ Name	Value	Unit	
- 🔂 10 01 - Default Session Start	PDU	2E FD 20 3C 01 2C	01	
🖳 🚯 10 03 - Extended Diagnostic Session Start	DID 0x0005	0x3C 0x01 0x2C 0x01		
👫 Stored Data 	CONFIG LockMotorMovementTime	600	ms	
- E FD 00 - VCVCCU Configuration 31333 CAN Neau	CONFIG LockMotorOverloadProtectionTime		ms	
- 💫 22 FD 03 - VCVCCU Configuration HSOUTO Read	PPResistorValueField	0x01	110	
22 FD 03 VCVCCU Configuration HS00T0 Write	PPResistorValueField.CONFIG PPResisto		\sim	
22 FD 03 VEVECU configuration PS0010 write	_	0x00	\sim	
22 FD 04 - VCVCCU Configuration PTC0 message Write	PPResistorValueField.(reserved)	UXUU		
22 FD 05 · VCVCCU Configuration PTC1 message Read				
22 FD 05 VEVECU Configuration PTC1 message Write				
22 FD 06 - VCVCCU Configuration PTC2 message Read				
2E FD 06 - VCVCCU Configuration PTC2 message Write				
22 FD 07 · VCVCCU Configuration InletStatus message Read				
2E FD 07 - VEVECU Configuration InletStatus message Write				
22 FD 08 - VCVCCU Configuration ControlPilotStatus message Read				
2E FD 08 - VEVECU Configuration ControlPilotStatus message Write				
22 FD 09 · VCVCCU Configuration InternalVoltageStatus message Read				
	Type/Parameter	Service/Value		
22 FD 0A - VCVCCU Configuration InternatVoltageRawValues message Read				
- 🗟 2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write	[11:36:58] - Tx	Extended Diagno	stic Session Start	
	[11:36:58]	VCVCCU		
🚯 2E FD 0B - VCVCCU Configuration InletStatus2 message Write	[11:36:58] - Rx	Positive response		
	P2	50 [ms]		
🔁 2E FD 0C - VCVCCU Configuration TLS Activation Write				
- 🔂 2E FD 0D - VCVCCU Configuration TLS Certificate Write	P2Ex	5000 [ms]		
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	[11:36:58]	Device VCVCCU	is online.	
22 FD 0F · VCVCCU Configuration Primary J1939 Source Address Read				
2E FD OF - VCVCCU Configuration Primary J1939 Source Address Write	[11:37:06] · Tx	-	ration Inlet Type Write	
22 FD 10 - VCVCCU Configuration Secondary J1939 Source Address Read	DID 0x0005	0x3C 0x01 0x2	C 0x01	
2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write	CONFIG_LockMotorMovementTime	600 [ms]		
22 FD 11 - VCVCCU Configuration Value Added Service Read	CONFIG_LockMotorOverloadProtectionTi	me 3000 [ms]		
2E FD 11 - VCVCCU Configuration Value Added Service Write	PPResistorValueField	0x01		
22 FD 12 - VCVCCU Configuration TLS Certificate2 Write 22 FD 12 - VCVCCU Configuration Stars Classes SAM Simul Read	PPResistorValueField.CONFIG PPResi			
22 FD 13 · VCVCCU Configuration StopCharge CAN Signal Read 52 FD 13 · VCVCCU Configuration StopCharge CAN Signal Write	PPResistorValueField.(reserved)	(0x00)		
22 FD 13 - VLVLU Configuration StopLharge LAN Signal Write 22 FD 14 - VCVCCU Configuration Charge Node Selection Read	[11:37:06]	VCVCCU		
22 FD 14 - VEVECU Configuration Charge Node Selection Read 22 FD 14 - VEVECU Configuration Charge Node Selection Write				
22 FD 14 - VCVCCO Conliguiation Charge Note Selection white 22 FD 20 - VCVCCU Configuration Inlet Type Read	[11:37:06] - Rx	Positive response		
Ex 22 FD 20 - VCVCCU Configuration Infect you Read				
22 FD 20 - VCVCCU Conliguration File. Type white				
22 FD 21 • VCVCCU Configuration PTC activation Write				
22 FD 21 VEVECE configuration I/ PC activation white				
22 FD 22 VEVECE configuration LIN J3068 charging activation Write				
22 FD 22 - VEVECE Configuration HSOUT diagnostic mode Read				
25 FD 25 VEVECE configuration HS0UT diagnostic mode Write	×			



3. By executing the command "22 FD 20 – VCVCCU Configuration Inlet Type Read" the current inlet type configuration can be verified.

□ S < 43 S □ Image: Im				Online
38: 22 FD 20 - VCVCCU_Configuration_Inlet_Type_Read				
E Sessions				[EVCC] VCVCCU
				~ Execute
IUUI - Default Session Start	Name	Value	Unit	
10 03 - Extended Diagnostic Session Start	PDU	22 FD 20		
Stored Data				
22 FD 00 - VCVCCU Configuration J1939 CAN Read				
2E FD 00 - VCVCCU Configuration J1939 CAN Write				
- 🔂 22 FD 03 - VCVCCU Configuration HSOUTO Read				
- 🚉 2E FD 04 · VCVCCU Configuration PTC0 message Write				
22 FD 05 - VCVCCU Configuration PTC1 message Read				
2E FD 05 · VCVCCU Configuration PTC1 message Write				
22 FD 06 · VCVCCU Configuration PTC2 message Read				
E FD 06 · VCVCCU Configuration PTC2 message Write				
— R 22 FD 07 · VCVCCU Configuration InletStatus message Read R 2E FD 07 · VCVCCU Configuration InletStatus message Write				
22 FD 07 VCVCCU Configuration Interstatus message white				
22 FD 08 - VCVCCU Configuration Control into auto intersage intersage write				
22 FD 09 • VCVCCU Configuration InternalVoltageStatus message Read				
E FD 09 - VCVCCU Configuration InternalVoltageStatus message Write	Type/Parameter	Service/Value		
22 FD 0A · VCVCCU Configuration InternalVoltageRawValues message Read				
2E FD QA - VCVCCU Configuration Internal/VoltageRawValues message Write	[11:36:58] - Tx	Extended Diagnostic Ses	sion Start	
- 🔂 22 FD 0B - VCVCCU Configuration InletStatus2 message Read	[11:36:58]	VCVCCU	sion start	
	[11:36:58] - Bx			
- 🗟 22 FD 0C - VCVCCU Configuration TLS Activation Read		Positive response:		
- 🗟 2E FD 0C - VCVCCU Configuration TLS Activation Write	P2	50 [ms]		
- 🔂 2E FD 0D - VCVCCU Configuration TLS Certificate Write	P2Ex	5000 [ms]		
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	[11:36:58]	Device VCVCCU' is onlin	e.	
22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read				
- 2E FD 0F · VCVCCU Configuration Primary J1939 Source Address Write	[11:37:06] - Tx	VCVCCU Configuration In	let Type Write	
22 FD 10 - VCVCCU Configuration Secondary J1939 Source Address Read	DID 0x0005	0x3C 0x01 0x2C 0x01		
— R 2E FD 10 · VCVCCU Configuration Secondary J1939 Source Address Write Read 22 FD 11 · VCVCCU Configuration Value Added Service Read	CONFIG_LockMotorMovementTime	600 [ms]		
- S 22 FD 11 - VCVCCU Configuration Value Added Service Head	CONFIG_LockMotorOverloadProtectionTime	3000 [ms]		
2E FD 12 - VCVCCU Configuration TLS Certificate2 Write	PPResistorValueField	0x01		
22 FD 12 • VCVCCU Configuration FLS Certificate2 write	PPResistorValueField.CONFIG_PPResistorValue	4,7 k0hm		
22 FD 13 VEVECU Configuration StopCharge CAN Signal Write	PPResistorValueField.(reserved)	(0x00)		
22 FD 14 - VCVCCU Configuration Charge Node Selection Read	[11:37:06]	VEVECU		
2E FD 14 - VCVCCU Configuration Charge Node Selection Write	[11:37:06] - Bx	Positive response.		
🖳 22 FD 20 - VCVCCU Configuration Inlet Type Read		· · · · · · · · · · · · · · · · · · ·		
- E FD 20 - VLVLLU Configuration Inlet Type Write	[11:37:39] - Tx	VCVCCU Configuration In	let Tupe Bead	
	[11:37:40]	VEVECU		
2E FD 21 - VCVCCU Configuration PTC activation Write	[11:37:40] [11:37:40] - Bx	Positive response:		
- 🔁 22 FD 22 · VCVCCU Configuration LIN J3068 charging activation Read	DID 0x0005	0x3C 0x01 0x2C 0x01		
2E FD 22 - VCVCCU Configuration LIN J3068 charging activation Write				
22 FD 25 - VCVCCU Configuration HSOUT diagnostic mode Read	CONFIG_LockMotorMovementTime	600 [ms]		
22 FD 25 · VCVCCU Configuration HSOUT diagnostic mode Write	CONFIG_LockMotorOverloadProtectionTime	3000 [ms]		
- 🕵 22 FD 26 - VCVCCU Configuration PnC Activation Read	PPResistorValueField	0x01		
ZE FD 26 · VLVLU Configuration PhL Activation Write Set 50 27 · VCVCCU Configuration 0EM Provisioning Certificate Write	PPResistorValueField.CONFIG_PPResistorValue	4,7 k0hm		
E FD 27 - VLVLCU Configuration UEM Provisioning Lentificate Write E FD 2A - VCVCCU Configuration PnC Contract Certificate Write	PPResistorValueField.(reserved)	(0x00)		
2E ED 2R - YCVCCO Conligatedion Find Contract Certificate Write 2E ED 2R - YCVCCO Conligatedion Pind Contract Certificate Rejuste Key Life				





Configuration with Indigo

The configuration of the inlet type can be executed with Indigo according to the following description.

1. Select the tab "Inlet Configuration" and choose the requested configuration of the inlet parameters (Lock Motor Movement Time, Lock Motor Overload Protection Time, PP resistor). Click on the button "Write" to execute the configuration.

Connect Remote Refresh Auto Ref			Report Logging	ECU Selection * Selection	Store Restore	
Connection	Read / Write	View	Report	Configuration	Store / Restore	
Navigation <						Parametrizer
dentification Browser	Name		Val	ue	Unit	
	VCVCCU (EVCC)					
Parametrizer	🛵 VCVCCU Configuration Inlet Type		60		ms	
VAS						
		/CONFIG_LockMotorOverloadProtection T			ms	
Plug and Charge		/PPResistorValueField/CONFIG_PPResistor		' kOhm		
anna -	& VCVCCU Configuration PTC/PTCA	ctivationField/CONFIG_PTC0Activation	on			
Inlet Configuration		ctivationField/CONFIG_PTC1Activation	on			
	& VCVCCU Configuration PTC/PTC₽	ctivationField/CONFIG_PTC2Activation	F	off		
DTC Browser	& VCVCCU Configuration PTC/CONF	IG_PTC0Threshold	150	00	Ohm	
Reprogramming	& VCVCCU Configuration PTC/CON	IG_PTC0LowerBoundary	80)	Ohm	
						Diagnostic Trace
	Request Time Request Target 466.90832s VCVCCU	Request Data Response Time Delta 3E 00 0.00965s	Response Sourc		Communication Error	
	 466.90832s VCVCCU 468.35154s FuncGroup-0x614 		VCVCCU	7E 00		
	470.91937s VCVCCU	3E 00 0.00878s	VCVCCU	7E 00		
	E 472.35234s FuncGroup-0x614					
	474.92897s VCVCCU	3E 00 0.00937s	VCVCCU	7E 00		
	E 476.35378s FuncGroup-0x614	4 3E 80				
	478.93918s VCVCCU	3E 00 0.00934s	VCVCCU	7E 00		



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. <u>Inlet type configuration:</u>
 XX: Lock motor movement time = XX * 10ms

XX XX: Lock motor overload protection time = XX XX * 10ms

XX: Internal PP resistor of the vehicle inlet

- 0x00: 2,7 kΩ
- 0x01: 4,7 kΩ

Request: 04 2E FD 20 XX XX XX XX Response: 03 6E FD 20 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present inlet type configuration, the following communication has to be executed.

4. Read inlet type configuration:

Request: 03 22 FD 20 FF FF FF FF Response: 04 62 FD 20 XX XX XX XX



5.2.1.2.15 Configuration of Temperature Sensors

The VC-EVCC provides the possibility to activate or deactivate the temperature inputs PTC0 (AC charging) as well as PTC1 and PTC2 (DC charging). Furthermore, the lower boundary and the threshold of the PTC0 can be configured.

The service structure is defined as 5 bytes.

Byte No.	Bit Pos.	Description	Value
Byte 0	0	PTC0 Activation	Off: 0
			On: 1 (default)
Byte 0	1	PTC1 Activation	Off: 0
			On: 1 (default)
Byte 0	2	PTC2 Activation	Off: 0 (default)
			On: 1
Byte 1 and 2	-	PTC0 Threshold (Resistance value in a range from 400 to 5000 Ohm)	1500 Ohm (default)
Byte 3 and 4	-	PTC0 Lower Boundary (Resistance value in a range from 400 to 5000 Ohm)	600 Ohm (default)



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

The configuration of temperature sensors can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

CVCCCU - Diagnostic Console				- 🗆 ×
😑 👳 🗤 🗶 🗙 🖬 🗛 🖩 🗑 🗃 🧏 = H 🖷 🕸 🗎				() Online
Symbolic V				[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start				~ Execute
 Sersion: Sersion: Stream Carl Data Sersion Stat Stream Carl Data Sersion Stat Stream Carl Data Sersion Stat 2 EF D 00 - VC/CCU Configuration J1333 CAN Wite 2 EF D 00 - VC/CCU Configuration Stat Difference Service Servic	Name PDU Type/Parameter [14:22:12]. Tx [14:22:12] [14:22:12] [14:22:12] [14:22:12]	Value 10 03 Service/Value Extended Dias VCVCCU Positive respo 50 (mi) Device VCVC	gnostic Session Start nse:	



2. Select the tab "Stored Data" and click on "2E FD 21 – VCVCCU Configuration PTC Activation Write". Please choose the requested temperature sensor configuration and click on the button "Execute". Please note that the response must be positive.

) (p.) S = 🔐 🗶 📭 🔥 🕵 🛞 🕼 📟 = 🙌 🎫 🖼 🖿				🔵 🗌 Onli
				[EVCC] VCV
2E FD 21 - VCVCCU_Configuration_PTC_activation_Write				V Execu
				· Execu
🍟 Sessions — 🖳 1001 - Default Session Start	^ Name	Value	Unit	
10 01 - Derault Session Start	PDU	2E FD 21 07 01 F4 05 DC		
Stored Data	DID 0xFD21	0x07 0x01 0xF4 0x05 0xDC		
22 FD 00 · VCVCCU Configuration J1939 CAN Read	PTCActivationField	0x07		
E 22 FD 00 - VCVCCU Configuration 01939 CAN Write	PTCActivationField.CONFIG PTC0Activation	on 🗸		
22 FD 03 - VCVCCU Configuration HSOUTO Read	PTCActivationField.CONFIG_PTC1Activation			
2E FD 03 · VCVCCU Configuration HSOUTO Write	PTCActivationField.CONFIG PTC2Activation	on 🗸		
22 FD 04 - VCVCCU Configuration PTC0 message Read	_	0x00		
2E FD 04 - VCVCCU Configuration PTC0 message Write	PTCActivationField.(reserved)			
22 FD 05 · VCVCCU Configuration PTC1 message Read	CONFIG_PTC0Threshold	500	Ohm	
2E FD 05 - VCVCCU Configuration PTC1 message Write	CONFIG_PTC0LowerBoundary	1500	Ohm	
22 FD 06 - VCVCCU Configuration PTC2 message Read				
E FD 06 · VCVCCU Configuration PTC2 message Write				
22 FD 07 · VCVCCU Configuration InletStatus message Read				
- 🔀 2E FD 07 - VCVCCU Configuration InletStatus message Write				
22 FD 08 · VCVCCU Configuration ControlPilotStatus message Read				
- E FD 08 - VCVCCU Configuration ControlPilotStatus message Write				
22 FD 09 - VCVCCU Configuration Internal/VoltageStatus message Read				
2E FD 09 · VCVCCU Configuration Internal/VoltageStatus message Write	Type/Parameter	Service/Value		
22 FD 0A - VCVCCU Configuration Internal/VoltageRawValues message Read	[11:40:59]	Device VCVCCU' is online		
2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write	[[]			
22 FD 0B · VCVCCU Configuration InletStatus2 message Read	(11, 11, 00) To	Estandad Diamania Casa	C11	
- E FD 0B - VCVCCU Configuration InletStatus2 message Write	[11:41:00] - Tx	Extended Diagnostic Sess	iun p(alt	
22 FD 0C - VCVCCU Configuration TLS Activation Read	[11:41:00]	VCVCCU		
2E FD 0C - VCVCCU Configuration TLS Activation Write	[11:41:00] - Rx	Positive response:		
2E FD 0D - VCVCCU Configuration TLS Certificate Write	P2	50 [ms]		
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	P2Ex	5000 [ms]		
22 FD 0F · VCVCCU Configuration Primary J1939 Source Address Read				
2E FD 0F VCVCCU Configuration Primary J1939 Source Address Write	[11:41:13] - Tx	VCVCCU Configuration PT	C activation Write	
- 🗟 22 FD 10 - VCVCCU Configuration Secondary J1939 Source Address Read	DID 0xFD21	0x07 0x01 0xF4 0x05 0x		
- 🕵 2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write	PTCActivationField	0x07		
	PTCActivationField.CONFIG_PTC0Activation	on		
🚯 2E FD 11 - VCVCCU Configuration Value Added Service Write				
- 🗟 2E FD 12 · VCVCCU Configuration TLS Certificate2 Write	PTCActivationField.CONFIG_PTC1Activation	on		
🕵 22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Read	PTCActivationField.CONFIG_PTC2Activation	on		
- 👫 2E FD 13 - VCVCCU Configuration StopCharge CAN Signal Write	PTCActivationField.(reserved)	(0x00)		
22 FD 14 · VCVCCU Configuration Charge Node Selection Read	CONFIG_PTC0Threshold	500 [Ohm]		
- 🗟 2E FD 14 - VCVCCU Configuration Charge Node Selection Write	CONFIG_PTC0LowerBoundary	1500 (Ohm)		
- 🖺 22 FD 20 - VCVCCU Configuration Inlet Type Read	[11:41:13]	VCVCCU		
- 🚉 2E FD 20 · VCVCCU Configuration Inlet Type Write	[11:41:13] - Bx	Positive response.		
22 FD 21 - VCVCCU Configuration PTC activation Read				
😩 2E FD 21 - VCVCCU Configuration PTC activation Write				
Ex 22 FD 22 • VLVLLU Configuration LIN J3068 charging activation Read				
2E FD 22 · VCVCCU Configuration LIN J3068 charging activation Write				
2E FD 25 - VCVCCU Configuration HSOUT diagnostic mode Write				
- 🚉 22 FD 26 - VCVCCU Configuration PnC Activation Read				
- 🚯 2E FD 27 - VCVCCU Configuration 0EM Provisioning Certificate Write				



3. By executing the command "22 FD 21 – VCVCCU Configuration PTC Activation Read" the current configuration of the temperature sensors can be verified.

VCVCCU - Diagnostic Console				>
				Onlin
ymbolic V				[EVCC] VCVC
0: 22 FD 21 - VCVCCU_Configuration_PTC_activation_Read				 Execute
Kessions Kession Start	Name	Value	Unit	
10 03 - Extended Diagnostic Session Start	PDU	22 FD 21		
Stored Data				
22 FD 00 · VCVCCU Configuration J1939 CAN Read				
22 FD 00 - VCVCCU Configuration J1939 CAN Write				
22 FD 03 - VCVCCU Configuration HSOUTO Read				
22 FD 03 - VCVCCU Configuration HSOUTO Write				
22 FD 04 · VCVCCU Configuration PTC0 message Read				
- 🔂 2E FD 04 - VCVCCU Configuration PTC0 message Write				
22 FD 05 · VCVCCU Configuration PTC1 message Read				
- 🔂 2E FD 05 - VCVCCU Configuration PTC1 message Write				
- 🔂 22 FD 07 - VCVCCU Configuration InletStatus message Read				
🔂 2E FD 07 - VCVCCU Configuration InletStatus message Write				
- 🔂 22 FD 08 - VCVCCU Configuration ControlPilotStatus message Read				
🚯 2E FD 08 - VCVCCU Configuration ControlPilotStatus message Write				
🔂 22 FD 09 - VCVCCU Configuration InternalVoltageStatus message Read				
	Type/Parameter	Service/Value		
- 🚯 22 FD 0A - VCVCCU Configuration Internal/VoltageRawValues message Read	[11:40:59]	Device VCVCCU' is online	e.	
	[11:41:00] - Tx	Extended Diagnostic Ses	sion Start	
🔂 2E FD 0B - VCVCCU Configuration InletStatus2 message Write	[11:41:00]	VCVCCU		
- 🖳 22 FD 0C - VCVCCU Configuration TLS Activation Read	[11:41:00] - Bx	Positive response:		
- 🔂 2E FD 0C - VCVCCU Configuration TLS Activation Write	P2			
- 🔁 2E FD 0D - VCVCCU Configuration TLS Certificate Write	P2Ex	50 [ms]		
- 2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	P2EX	5000 [ms]		
22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read				
2E FD 0F · VCVCCU Configuration Primary J1939 Source Address Write	[11:41:13] · Tx	VCVCCU Configuration P1		
22 FD 10 - VCVCCU Configuration Secondary J1939 Source Address Read	DID 0xFD21	0x07 0x01 0xF4 0x05 0)xDC	
2E FD 10 VCVCCU Configuration Secondary J1939 Source Address Write	PTCActivationField	0x07		
22 FD 11 · VCVCCU Configuration Value Added Service Read	PTCActivationField.CONFIG_PTC0Activation	on		
2E FD 11 - VCVCCU Configuration Value Added Service Write	PTCActivationField.CONFIG_PTC1Activation	on		
22 FD 12 - VCVCCU Configuration TLS Certificate2 Write 22 FD 12 - VCVCCU Configuration StopCharge CAN Simpl Read	PTCActivationField.CONFIG PTC2Activation	on		
	PTCActivationField.(reserved)	(0x00)		
22 FD 13 - VCVCCU Configuration StopLonarge Calv Signal Write 22 FD 14 - VCVCCU Configuration Charge Node Selection Read	CONFIG_PTC0Threshold	500 [Ohm]		
22 FD 14 - VCVCCU Configuration Charge Node Selection Write	CONFIG_FTC0LowerBoundary			
22 FD 14 VCVCCU Configuration Charge Note Selection write		1500 [Ohm]		
22 FD 20 - VCVCCC Conliguration Inlet Type Tread	[11:41:13]	VEVECU		
22 FD 21 - VCVCCU Configuration PTC activation Read	[11:41:13] - Rx	Positive response.		
ZE FD 21 · VEVELU Loniguration PTL activation Write				
22 FD 22 · VCVCCU Configuration LIN J3068 charging activation Read	[11:41:48] - Tx	VCVCCU Configuration P1	TC activation Read	
2E FD 22 - VCVCCU Configuration LIN J3068 charging activation Write	[11:41:48]	VCVCCU		
22 FD 25 · VCVCCU Configuration HSOUT diagnostic mode Read	[11:41:48] - Rx	Positive response:		
- 🔂 2E FD 25 - VCVCCU Configuration HSOUT diagnostic mode Write	DID 0xFD21	0x07 0x01 0xF4 0x05 0)xDC	
- 🔂 22 FD 26 · VCVCCU Configuration PnC Activation Read	PTCActivationField	0x07		
- 🔂 2E FD 26 - VCVCCU Configuration PnC Activation Write	PTCActivationField.CONFIG_PTC0Activation	on		
2E FD 27 - VCVCCU Configuration 0EM Provisioning Certificate Write	PTCActivationField.CONFIG_PTC1Activation	on		
- 🔂 2E FD 2A - VCVCCU Configuration PnC Contract Certificate Write				
- 🔂 2E FD 2B - VCVCCU Configuration PnC Contract Certificate Private Key Write	PTCActivationField.CONFIG_PTC2Activation	on (0.00)		
	PTCActivationField.(reserved)	(0x00)		
	CONFIG_PTC0Threshold	500 [Ohm]		
- 🔂 2E FD 2F - VCVCCU Configuration PnC Root Certificate Write	CONFIG_PTC0LowerBoundary	1500 [Ohm]		





Configuration with Indigo

The configuration of temperature sensors can be executed with Indigo according to the following description.

1. Select the tab "Inlet Configuration" and choose the requested configuration of the temperature sensors (Activation/Deactivation of PTC0/PTC1/PTC2, PTC0 Threshold, PTC0 Lower Boundary). Click on the button "Write" to execute the configuration.

	Refrest Write Clear	Revert Cancel	Filter Grid Vie	w Details Grouping	Report Logging EC	U Selection Paramet	ter Store Rest	-		
Connection	Read / Write			View	Report	 Selection Configuration 	Store / Resto	re		
avigation	<									Parametrizer
_	Name				Value	•	Unit			raramounzor
dentification Browser					14440				 	
🖞 Parametrizer	VCVCCU (EVCC)									
_	🛵 VCVCCU Confi	juration Inlet Type/	CONFIG_LockMo	torMovementTime	600		ms			
VAS	🋵 VCVCCU Confi	guration Inlet Type/	CONFIG_LockMo	torOverloadProtectionT	ime 2650		ms			
physical channel	🛵 VCVCCU Confi	juration Inlet Type/	PPResistorValue	Field/CONFIG_PPResistor	Value 4,7 k	Ohm				
Plug and Charge				NFIG_PTC0Activation	on					
Inlet Configuration				NFIG_PTC1Activation	on					
Inlet Configuration				NFIG_PTC2Activation	bii t of	er .				
8 DTC Browser							Ob m			
		juration PTC/CONFI			1500		Ohm			
🖡 Reprogramming	Sa veveeo conn	guration PTC/CONFI	G_PTC0LowerBC	oundary	800		Ohm			
	Request Time	Request Target VCVCCU	Request Data 3E 00	Response Time Delta 0.00965s	Response Source VCVCCU	Response Data 7E 00	Communication E	rror		 Diagnostic Tra
	 № 466.90832s № 468.35154s 	VCVCCU FuncGroup-0x614	3E 00 3E 80	0.00965s	VCVCCU	7E 00	Communication E	rror		
	 466.90832s 468.35154s 470.91937s 	VCVCCU FuncGroup-0x614 VCVCCU	3E 00 3E 80 3E 00				Communication E	rror		
	 № 466.90832s № 468.35154s 	VCVCCU FuncGroup-0x614	3E 00 3E 80 3E 00	0.00965s	VCVCCU	7E 00	Communication E	rror		
	 466.90832s 468.35154s 470.91937s 472.35234s 	VCVCCU FuncGroup-0x614 VCVCCU FuncGroup-0x614	3E 00 3E 80 3E 00 3E 80 3E 00	0.00965s 0.00878s	VCVCCU	7E 00 7E 00	Communication E	TOT		



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. Temperature sensor configuration:

XX: PTC Activation

- 0000 000Xb: PTC0 Activation/Deactivation (Off: 0, On: 1)
- 0000 00X0b: PTC1 Activation/Deactivation (Off: 0, On: 1)
- 0000 0X00b: PTC2 Activation/Deactivation (Off: 0, On: 1)



Note

At least one temperature sensor, either PTC1 or PTC2, must be activated for DC charging.

XX XX: PTC0 Threshold (Resistance value in Ohm)

XX XX: PTC0 Lower Boundary (Resistance value in Ohm)

Request: 04 2E FD 21 XX XX XX XX XX XX Response: 03 6E FD 21 FF FF FF FF





Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present temperature sensor configuration, the following communication has to be executed.

4. <u>Read temperature sensor configuration:</u> Request: 03 22 FD 21 FF FF FF FF Response: 04 62 FD 21 XX XX XX XX XX



5.2.1.2.16 Configuration of Three-phase AC Charging via LIN (SAE J3068)

The VC-EVCC provides the possibility to use three-phase AC charging via LIN according to SAE J3068. This feature can be activated via UDS as described in this chapter.

The service structure is defined as 1 byte.

Value	Description
0x00	Three-phase AC charging via LIN is deactivated (default)
0x01	Three-phase AC charging via LIN is activated



Note

An update of the parameter requires a reboot of the VC-EVCC to be applicable. The diagnostic service "Write Data By Identifier" is only available in the application extended session.



Configuration with CANoe/CANalyzer

The configuration of three-phase AC charging via LIN can be executed with CANoe/CANalyzer according to the following description.

 Select the tab "Sessions" and click on "10 03 – Extended Diagnostic Session Start". Click on the button "Execute" to start the Extended Diagnostic Session. Please note that the response must be positive.

Rev VCVCCU - Diagnostic Console			- 🗆 X
🔁 👳 🗤 🗶 🗙 🖬 🗛 🗟 🗟 🕺 🗉 H 🗞 🕅			 Online
Symbolic V			[Application] VCVCCU
2: 10 03 - ExtendedDiagnosticSession_Start			~ Execute
Sessions	Name	Value Unit	
10 01 - Default Session Stat	PDU	10 03	
22 FD 00 - VCVCCU Configuration J1939 CAN Read			
E FD 00 - VCVCCU Configuration J1939 CAN Write 22 FD 03 - VCVCCU Configuration HS0UT0 Read			
22 FD 04 - VCVCCU Configuration PTC0 message Read 2E FD 04 - VCVCCU Configuration PTC0 message Write			
2E FD 05 · VCVCCU Configuration PTC1 message Write 22 FD 06 · VCVCCU Configuration PTC2 message Read			
- B 2E FD 06 - VCVCCU Configuration PTC2 message Write	Type/Parameter	Service/Value	
22 FD 07 · VCVCCU Configuration InletStatus message Read 2E FD 07 · VCVCCU Configuration InletStatus message Write	[14:22:12] - Tx	Extended Diagnostic Session Start	
22 FD 07 V V V CCU Configuration Interstatus message Write 22 FD 08 - V CV CCU Configuration ControlPilotStatus message Read	[14:22:12]	VCVCCU	
E FD 08 - VCVCCU Configuration ControlPilotStatus message Write	[14:22:12] · Rx	Positive response:	
22 FD 09 - VCVCCU Configuration Internal/oltageStatus message Read 2E FD 09 - VCVCCU Configuration Internal/oltageStatus message Write	P2 P2Ex	50 (ms) 5000 (ms)	
- 🗒 22 FD 0A - VCVCCU Configuration InternalVoltageRawValues message Read	[14:22:12]	Device VCVCCU' is online.	
2E FD 0A - VCVCCU Configuration InternalVoltageRawValues message Write 22 FD 0B - VCVCCU Configuration InletStatus2 message Read			
2E FD 0B - VCVCCU Configuration InletStatus2 message Write			
22 FD 0C - VCVCCU Configuration TLS Activation Read			
E FD 0C - VCVCCU Configuration TLS Activation Write 22 FD 0D - VCVCCU Configuration TLS Certificate Read			
- 2E FD 0D - VCVCCU Configuration TLS Certificate Write			
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write ECU Identification			
Boutine Control			
B- B Security Access			
Communication Control			
Fault Memory			
Bright Control D I C Setting			
🗑 🎯 [Raw Telegrams]			
[User defined messages]			



2. Select the tab "Stored Data" and click on "2E FD 22 – VCVCCU Configuration LIN J3068 Charging Activation Write". Please choose the requested LIN J3068 charging configuration ("on" or "off") and click on the button "Execute". Please note that the response must be positive.

VCVCCU - Diagnostic Console				
] 🗅 🤊 🕶 🔐 🗶 🖬 🛗 🗱 🕸 🕼 📰 😑 🕖 📰 🖼 🚞) Onli
nbolic 🗸				[EVCC] VCV
2E FD 22 - VCVCCU_Configuration_LIN_J3068_charging_activation_Write				~ Execu
- 🙀 Sessions	∧ Name	Value	Unit	
	PDU	2E FD 22 01		
🛼 10 03 - Extended Diagnostic Session Start	DID 0xFD22	0x01		
- 🎁 Stored Data				
民 22 FD 00 - VCVCCU Configuration J1939 CAN Read	LINConfigurationField	0x01	-	
🛼 2E FD 00 - VCVCCU Configuration J1939 CAN Write	LINConfigurationField.CONFIG_LINActivation	on	~	
- 🔂 22 FD 03 - VCVCCU Configuration HSOUT0 Read	LINConfigurationField.(reserved)	UxUU		
🔂 2E FD 03 - VCVCCU Configuration HSOUT0 Write				
- 🔂 2E FD 04 - VCVCCU Configuration PTC0 message Write				
22 FD 05 · VCVCCU Configuration PTC1 message Read				
2E FD 05 - VCVCCU Configuration PTC1 message Write				
22 FD 06 - VCVCCU Configuration PTC2 message Read				
2E FD 06 · VCVCCU Configuration PTC2 message Write				
22 FD 07 - VCVCCU Configuration InletStatus message Read				
2E FD 01 VCVCCU Configuration InletStatus message Write				
22 FD 08 - VCVCCU Configuration ControlPilotStatus message Read				
22 FD 06 VCVCCU Configuration ControlPilotStatus message Write				
22 FD 00 VCVCCU Configuration InternalVoltageStatus message Read				
22 PD 03 VCVCCU Configuration InternalVoltageStatus message Neau	Type/Parameter	Service/Value		
22 FD 03 - VCVCCU Configuration Internal/oltageStatus message write	Typert arameter	00111001110100		
22 FD 0A - VCVCCU Configuration Internationagen awvalues message head 25 FD 0A - VCVCCU Configuration Internationagen awvalues message Write				
22 FD 0A - VCVCCU Configuration Internationational and the status and the st	[11:15:47] - Tx	Extended Diagnostic Se	ssion Start	
	[11:15:47]	VEVECU		
2E FD 0B - VCVCCU Configuration InletStatus2 message Write	[11:15:47] - Rx	Positive response:		
22 FD 0C - VCVCCU Configuration TLS Activation Read	P2	50 [ms]		
2E FD 0C - VCVCCU Configuration TLS Activation Write	P2Ex	5000 [ms]		
2E FD 0D - VCVCCU Configuration TLS Certificate Write				
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	[11:15:47]	Device VCVCCU' is onli	ne.	
22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read				
2E FD 0F - VCVCCU Configuration Primary J1939 Source Address Write	[11:15:57] - Tx	VCVCCU Configuration L	IN J3068 charging act	ivation Write
22 FD 10 · VCVCCU Configuration Secondary J1939 Source Address Read	DID 0xFD22	0x01		
2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write	LINConfigurationField	0x01		
- 🔁 22 FD 11 - VCVCCU Configuration Value Added Service Read	LINConfigurationField.CONFIG LINActivation	on		
- 🚉 2E FD 11 - VCVCCU Configuration Value Added Service Write	LINConfigurationField.(reserved)	(0x00)		
- 🖺 2E FD 12 - VCVCCU Configuration TLS Certificate2 Write				
📲 22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Read	[11:15:57]	VCVCCU		
	[11:15:57] - Rx	Positive response.		
— 22 FD 14 - VCVCCU Configuration Charge Node Selection Read				
🚯 2E FD 14 - VCVCCU Configuration Charge Node Selection Write				
🚯 2E FD 20 - VCVCCU Configuration Inlet Type Write				
🔂 22 FD 21 - VCVCCU Configuration PTC activation Read				
2E FD 21 - VCVCCU Configuration PTC activation Write				
22 FD 22 - VCVCCU Configuration LIN J3068 charging activation Read				
📲 🚉 2E FD 22 - VCVCCU Configuration LIN J3068 charging activation Write				
22 FD 25 - VLVLLU Configuration HSUUT diagnostic mode Head				
2E ED 25 - VEVECH Configuration HSOLIT diagnostic mode Write	V			





 By executing the command "22 FD 22 – VCVCCU Configuration LIN J3068 Charging Activation Read" the current configuration of the LIN J3068 charging can be verified.

VCVCCU - Diagnostic Console				- □ >
□ □ 0 + 0 + 20 × 10 M 0 0 0 0 0 20 = 14 00 00 20				Onlin
Symbolic V				[EVCC] VCVC
42: 22 FD 22 - VCVCCU_Configuration_LIN_J3068_charging_activation_Read				 Execute
	^ Name	Value	Unit	
- 🖳 10 01 - Default Session Start	PDU	22 FD 22		
📲 🔒 10 03 - Extended Diagnostic Session Start	100			
🖶 🚺 Stored Data				
22 FD 03 · VCVCCU Configuration HSOUTO Read				
- 🔂 2E FD 04 · VCVCCU Configuration PTC0 message Write				
22 FD 05 · VCVCCU Configuration PTC1 message Read				
🔂 2E FD 05 - VCVCCU Configuration PTC1 message Write				
🖳 🛼 22 FD 06 · VCVCCU Configuration PTC2 message Read				
2E FD 06 - VCVCCU Configuration PTC2 message Write				
22 FD 07 · VCVCCU Configuration InletStatus message Read				
🚯 2E FD 07 - VCVCCU Configuration InletStatus message Write				
22 FD 09 · VCVCCU Configuration InternalVoltageStatus message Read				
	Type/Parameter	Service/Value		
- 🔂 22 FD 0A - VCVCCU Configuration InternalVoltageRawValues message Read				
	[11:15:47] - Tx	Extended Diagnosti	c Session Start	
22 FD 0B - VCVCCU Configuration InletStatus2 message Read	[11:15:47]	VEVECU	o oooloin otalt	
2E FD 0B - VCVCCU Configuration InletStatus2 message Write				
22 FD 0C - VCVCCU Configuration TLS Activation Read	[11:15:47] - Rx	Positive response:		
- 🗟 2E FD 0C - VCVCCU Configuration TLS Activation Write	P2	50 [ms]		
2E FD 0D - VCVCCU Configuration TLS Certificate Write	P2Ex	5000 [ms]		
2E FD 0E - VCVCCU Configuration Security Key Constant 01/02 Write	[11:15:47]	Device VCVCCU' is	s online.	
- 🔂 22 FD 0F - VCVCCU Configuration Primary J1939 Source Address Read				
- 🔂 2E FD 0F · VCVCCU Configuration Primary J1939 Source Address Write	[11:15:57] - Tx	VEVECH Configura	tion LIN J3068 charging	activation Write
22 FD 10 · VCVCCU Configuration Secondary J1939 Source Address Read	DID 0xFD22	0x01	aon En Cooco charging	g dearadon mile
2E FD 10 - VCVCCU Configuration Secondary J1939 Source Address Write				
22 FD 11 · VCVCCU Configuration Value Added Service Read	LINConfigurationField	0x01		
22 FD 11 - VCVCCU Configuration Value Added Service Write	LINConfigurationField.CONFIG_LINActivati			
22 FD 12 · VCVCCU Configuration TLS Certificate2 Write	LINConfigurationField.(reserved)	(0x00)		
22 FD 13 · VCVCCU Configuration StopCharge CAN Signal Read	[11:15:57]	VEVECU		
22 FD 13 - VCVCCU Configuration StopCharge CAN Signal Write	[11:15:57] - Rx	Positive response.		
22 FD 14 - VCVCCU Configuration Charge Node Selection Read		F		
22 FD 14 - VCVCCU Configuration Charge Node Selection Write	[11:16:48] - Tx		tion LIN J3068 charging	a activation Read
22 FD 20 - VCVCCU Configuration Inlet Type Read		VEVECU Configura	oon any 55066 charging	y acavation neda
22 FD 20 - VCVCCU Configuration Inlet Type Vrite	[11:16:48]			
- 22 FD 20 VEVECU Configuration THE Type white	[11:16:48] - Rx	Positive response:		
22 FD 21 • VCVCCU Configuration FTC activation Write	DID 0xFD22	0x01		
22 FD 21 - VCVCCU Configuration FTC activation write 2 FD 22 - VCVCCU Configuration LIN J3068 charging activation Read	LINConfigurationField	0x01		
22 FD 22 - VEVECU Configuration EIN 33068 charging activation Meau 22 FD 22 - VEVECU Configuration LIN 33068 charging activation Write	LINConfigurationField.CONFIG LINActivati	on on		
2E FD 22 - VCVCCU Configuration LIN J3068 charging activation write	LINConfigurationField (reserved)	(0x00)		
22 FD 25 - VEVELU Configuration HSUUT diagnostic mode Head	V LinkConinguration in iciu.(resetVeu)	[0/00]		



Configuration with Indigo

The configuration of three-phase AC charging via LIN can be executed with Indigo according to the following description.

 Select the tab "Parametrizer" and click on the data field Value of the VC-EVCC application "VCVCCU Configuration LIN J3068 charging activation/LINConfigurationField/CONFIG_LINActivation". Select the requested LIN J3068 charging configuration ("on" or "off") and click on the button "Write" to execute the configuration.

Connect Remote Refresh Auto Re	fresh Write Clea	r Revert Cancel	Filter Grid View	Details Grouping Re	port Logging ECU Se	election Parameter Selection *	Store Rest	JIC .		
Connection	Read / Write		Vi	iew	Report	Configuration	Store / Resto	e		
vigation <										Parametrizer
Identification Browser	Name							✓ Value	Unit	
Parametrizer	VCVCCU (EVCC)									
-	🛵 VCVCCU Configuration TLS Activation/TLS Activation Status Field/TLS Activation Status									
VAS	🛵 VCVCCU Conf	iguration StopCharg	e CAN Signal/Stop	Charge CAN Signal Statu	s Field/StopCharge CAN	I Signal Status		off		
Plug and Charge	🛵 VCVCCU Conf	iguration Secondary	J1939 Source Add	dress/Secondary Source	Address			SA 0xD7		
Plug and charge	🏡 VCVCCU Conf	iguration PTC2 mes	sage/Time Period					20	ms	
Inlet Configuration	💪 VCVCCU Conf	iguration PTC1 mes	sage/Time Period					20	ms	
•	/ VCVCCU Configuration PTC0 message/Time Period								ms	
OTC Browser	💪 VCVCCU Conf	iguration Primary J1	939 Source Addres	s/Primary Source Addres	s			SA 0x80		
Reprogramming	🍌 VCVCCU Conf	iguration LIN J3068	charging activation	/LINConfigurationField/C	ONFIG_LINActivation			► on		
	🆾 VCVCCU Conf	iguration J1939 CAN	I/J1939 CAN Config	guration/J1939 CAN Bau	d Rate			250kBaud		
	6 VCVCCU Configuration InternalVoltageStatus message/Tme Period								ms	
									ms	
	& VCVCCU Configuration InletStatus2 message/Time Period								ms	
	🍌 VCVCCU Conf	iguration InletStatu	s message/Time Pe	eriod	20	ms				
	🛵 VCVCCU Conf	iguration HSOUT0/H	ISOUT0 Configurat	ion/HSOUT0 Time Period	0	ms				
	🍌 VCVCCU Conf	iguration HSOUT0/H	ISOUT0 Configurat	ion/HSOUT0 Mode	On CP/PP					
	Lo VCVCCU Configuration HSOUT diagnostic mode/HSOUTdiagnostic/HSOUT4ActiveOffStateDiag									
	🛵 VCVCCU Conf	iguration HSOUT dia	agnostic mode/HSC)UTdiagnostic/HSOUT1A	off					
	VCVCCU Configuration HSOUT diagnostic mode/HSOUTdiagnostic/HSOUTOActwoOffStateDiag VoVCCU Configuration ControPlotStatus message/Tme Period VoVCCU Configuration Charging Schedules Activation/Charging Schedules Activation Status Field/CONFIG_ChargingSchedulesActivation									
									ms	
	& VCVCCU Configuration Charge Node Selection/Charge Node Selection Status Field/Charge Node Selection Status									
										Diagnostic Trac
	Request Time	Request Target	Request Data	Response Time Delta	Response Source	Response Data	Communicat	ion Error		
	392.62520s	VCVCCU	3E 00	0.00937s	VCVCCU	7E 00				
	394.29401s	VCVCCU	10 01	0.00065s	VCVCCU	50 01 00 32 01 F4				
	 394.29726s 304.20547a 	VCVCCU	10 03	0.00742s	VCVCCU	50 03 00 32 01 F4				
	394.30547s	VCVCCU	3E 00	0.00919s	VCVCCU	7E 00				



Manual Configuration

Reprogramming is also possible without CANoe/CANalyzer. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

- 3. Three-phase AC charging via LIN:
- XX:
- 0x00: Three-phase AC charging is deactivated
- 0x01: Three-phase AC charging is activated

Request: 04 2E FD 22 XX FF FF FF Response: 03 6E FD 22 FF FF FF FF



Note

In some cases the response message might include the value "AA" instead of "FF".

In order to read the present three-phase AC charging via LIN configuration, the following communication has to be executed.

4. <u>Read three-phase AC charging via LIN configuration:</u> Request: 03 22 FD 22 FF FF FF FF Response: 04 62 FD 22 XX FF FF FF



5.2.1.2.17 Configuration of Security Key Constant

The VC-EVCC provides the possibility to configurate the security key constant of the security access.

The service structure is defined as 4 bytes.

Value	Description
0xE3CA2342 (default)	Security Key Constant



Configuration with CANoe/CANalyzer

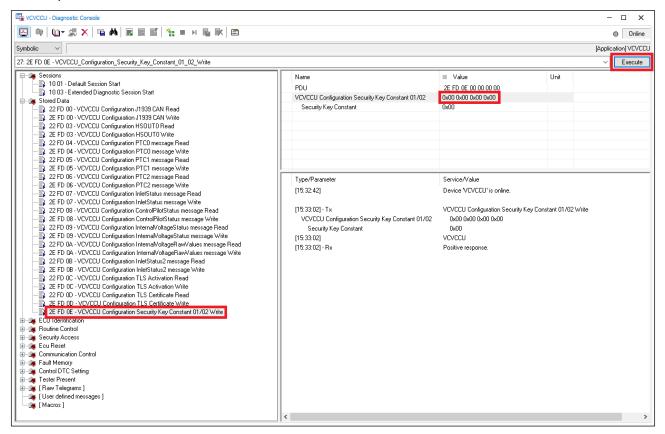
The configuration of the security key constant can be executed with CANoe/CANalyzer according to the following description.

 The configuration of the security key constant requires the diagnostic services "Extended Session" and "Security Access". Therefore, select the window "VCVCCU – Diagnostic Session Control" and double-click on "Extended Session Start". Continue by double-clicking on "[Level 0x01] Request Seed (level 1) Request". Please note that the responses must be positive. The request and response messages are shown in the window "Trace Diagnostic".

VCVCCU - Diagnostic Session Control -	οx	🖫 Tra	ice Diagnostic								– 🗆 X
Sessions	VCVCCU	6	i 🗵 😪 S	s A	× 🛼	🖩 🔺 💽 🐖 🛛 <se< th=""><th>arch></th><th>- 🌽 🐴</th><th></th><th>n pá</th><th>- 🗟 🖏 - 🖃 - A^ş - 💡</th></se<>	arch>	- 🌽 🐴		n pá	- 🗟 🖏 - 🖃 - A ^ş - 💡
Default Session Start		Tim		Chn		Name	Event Type	Dir	DLC	Da	
Extended Diagnostic Session Start		E	0.0100	52 CAN 1	268	msg_TxCycle10_0	CAN Frame	Rx	7	7	EC 22 00 00 00 00 00
		ं छ	0.00026	50 CAN 1			CAN Error	TxErr			ECC: 110001110xxxxx, Not Ackno
		ं 🖻		12 CAN 1	610	msa diaa Request M	. SF	Тх	6	8	[06] 27 02 9A 0C 27 82 [00]
		ं 🗄	- 🖂 0.0000	00 CAN 1	610	Extended Diagnostic	reg		2		10 03
Security Access		- E	l- 👼 0.0099:	11 CAN 1	612	msg_diag_Response	. SF	Rx	2	8	[02] 67 02 [AA AA AA AA AA]
			l- 👼 0.0000			Extended Diagnostic	pos		6		50 03 00 32 01 F4
[Level 0x01] RequestSeed (level 1) Request			- 🗟 0.1000			msg_nm_MyECU	CAN Frame	Rx	8	8	00 00 00 00 00 00 00 00
[Level 0x03] HequestSeed (level 3) Hequest		9 E	- 📷 0.0000	00 CAN 1	610	RequestSeed (level 1	reg		2		27 01
			- 👼 0.0000			RequestSeed (level 1	pos		6		67 01 AE 50 0B 9E
		ं 🖸 🖻	- 👼 0.0000	00 CAN 1	610	SendKey (level 1) Sen	. reg		6		27 02 9A 0C 27 82
		- E	- 📷 0.0000	00 CAN 1	612	SendKey (level 1) Sen	. pos		2		67 02
Ecu Reset		115-									
Hard Reset Reset		Þ									
Hard Reset Reset		8									
		8									
		1									
		Þ									
DTC Settings											
Enable Disable											
Normal Communication											
Enable Disable											
Lilable Disable											
Normal Mode											
Return											
		<									>



 To configurate the security key constant, select the window "VCVCCU – Diagnostic Console" and select the tab "Stored Data". Click on "2E FD 0E – VCVCCU Configuration Security Key Constant 01/02 Write". Write the requested security key constant (4 byte) and click on "Execute". Please note that the response must be positive.





Manual Configuration

Reprogramming is also possible without CANoe. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Extended Session:</u> Request: 02 10 03 FF FF FF FF FF Response: 06 50 03 00 32 01 F4 FF

2. <u>Tester Present:</u> Request: 02 3E 00 FF FF FF FF FF Response: 02 7E 00 FF FF FF FF FF



Caution

The message "Tester Present" has to be sent cyclically in order to keep the VC-EVCC in the extended session, e.g. every second. Otherwise the extended session will be terminated after approximately 4 - 5 seconds.

3. <u>Request Seed (Level 1):</u> XX: Seed Request: 02 27 01 FF FF FF FF Response: 06 67 01 XX XX XX FF

4. <u>Send Key (Level 1):</u>
XX: Key
Request: 06 27 02 XX XX XX XX FF
Response: 02 67 02 FF FF FF FF FF

The key can be calculated with the following algorithm and key constant:

- Key constant: 0xE3CA2342
- Algorithm: (((SEED * 0x6076DBAF) + 0x5397FB1) ^ ((~SEED * 0x72B6BF45) + 0xBC614E) ^ KEY_CONSTANT)

5. <u>Security Key Constant (4 byte):</u>
XX: Security Key Constant (4 byte)
Request: 07 2E FD 0E XX XX XX XX
Response: 03 6E FD 0E FF FF FF FF





Note

In some cases the response message might include the value "AA" instead of "FF".



5.2.1.3 ECU Identification

5.2.1.3.1 Read Software Version Information

By using the diagnostic service "Read Data By Identifier" (0x22) - DID 0xF195 it is possible to read the VC-EVCC software version information.

Reading with CANoe/CANalyzer

Reading the VC-EVCC software version information can be executed with CANoe/CANalyzer according to the following description.

1. Select the tab "ECU Identification" and click on "22 F1 95 – Software Version Information Read". Then click on the button "Execute".



Manual Reading

Reading the VC-EVCC software version information is also possible without CANoe. In this case, the following CAN Messages (UDS/ TP) must be send on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

 <u>Read Software Version Information:</u> Request: 03 22 F1 95 FF FF FF
 Response: 06 62 F1 95 XX XX XX FF, e.g. 06 62 F1 95 08 00 00 FF

The "VC-EVCC Software Version Information" is included in 3 bytes (Major.Minor.Patch). Accordingly, the above example shows software version 8.0.0.



Note

In some cases the response message might include the value "AA" instead of "FF".



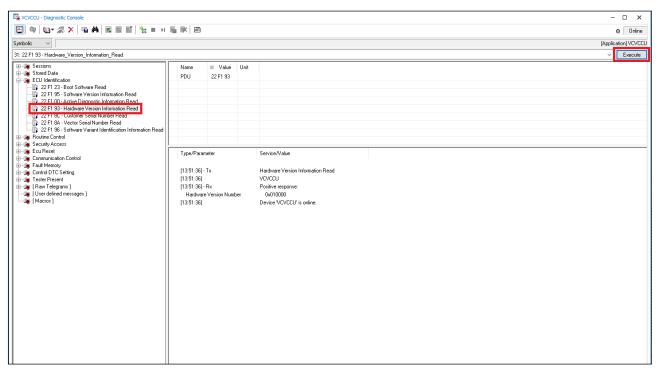
5.2.1.3.2 Read Hardware Version Information

By using the diagnostic service "Read Data By Identifier" (0x22) - DID 0xF193 it is possible to read the VC-EVCC hardware version information.

Reading with CANoe/CANalyzer

Reading the VC-EVCC hardware version information can be executed with CANoe/CANalyzer according to the following description.

1. Select the tab "ECU Identification" and click on "22 F1 93 – Hardware Version Information Read". Then click on the button "Execute".





Manual Reading

Reading the VC-EVCC hardware version information is also possible without CANoe. In this case, the following CAN Messages (UDS/ TP) must be sent on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

1. <u>Read Hardware Version Information:</u> Request: 03 22 F1 93 FF FF FF Response: 06 62 F1 93 XX XX XX FF, e.g. 06 62 F1 95 01 00 00 FF

The "VC-EVCC Hardware Version Information" is included in 3 bytes (Major.Minor.Patch). Accordingly, the above example shows hardware version 1.0.0.



Note

In some cases the response message might include the value "AA" instead of "FF".



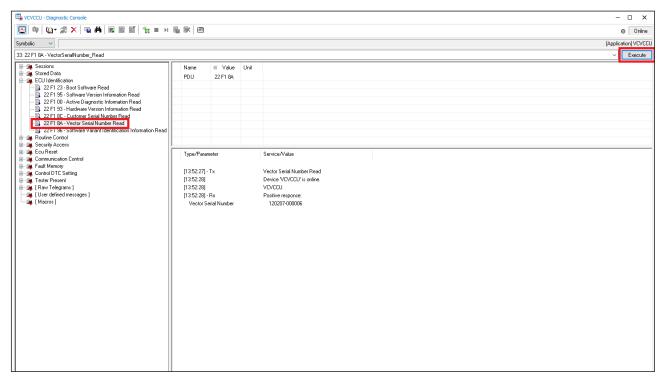
5.2.1.3.3 Read Vector Serial Number Information

By using the diagnostic service "Read Data By Identifier" (0x22) - DID 0xF18A it is possible to read the Vector serial number information.

Reading with CANoe/CANalyzer

Reading the Vector serial number information can be executed with CANoe/CANalyzer according to the following description.

1. Select the tab "ECU Identification" and click on "22 F1 8A – Vector Serial Number Read". Then click on the button "Execute".





Manual Reading

Reading the Vector serial number information of the VC-EVCC is also possible without CANoe. In this case, the following CAN Messages (UDS/ TP) must be send on the diagnostic CAN (CAN0) manually:

<u>CAN-Identifier:</u> Tester --> VC-EVCC, Request: 0x610

VC-EVCC --> Tester, Response: 0x612

Tester --> Functional: 0x614

The following description contains an example of a Vector serial number and describes the conversion of the response code.

 <u>Read Vector Serial Number Information:</u> Request: 03 22 F1 8A FF FF FF Response (First Frame):10 10 62 F1 8A 31 32 30 Request (Flow Control): 30 00 14 00 00 00 00 00 Response (Consecutive Frame): 21 32 30 37 2D 30 30 30 30 Response (Consecutive Frame): 22 30 30 36 FF FF FF FF Complete Response: 62 F1 8A 31 32 30 32 30 37 2D 30 30 30 30 30 30 36



Note

In order to read the Vector serial number information correctly the transport protocol according to ISO 15765-2 [6] has to be implemented. In some cases, the response messages might include the value "AA" instead of "FF".

The "Vector Serial Number Information" is included in 13 bytes. The service response is structured as follows: "XXXXX-YYYYYY"

- "XXXXXX" equals the ECU identifier in ASCII representation (bytes 0...5)
- "-" equals a separation value in ASCII representation (byte 6)
- "YYYYY" equals a consecutive number in ASCII representation (bytes 7...12)

Response: 62 F1 8A 31 32 30 32 30 37 2D 30 30 30 30 30 36

31 32 30 32 30 37 (Hex) → 120207 (ASCII) 2D (Hex) → "-" (ASCII) 30 30 30 30 30 36 (Hex) → 000006 (ASCII)

In this example the Vector serial number is "120207-000006".



5.2.1.4 Fault Memory

The VC-EVCC contains a fault memory which can be handled via UDS according to ISO 14229-1 [7]. The following services are supported by the VC-EVCC.

SID 0x19	Description
19 01	Fault Memory Read (Number)
19 02	Fault Memory Read (all identified)
19 06	Fault Memory Read (extended)
19 07	Fault Memory Report number of DTC by severity
19 08	Fault Memory Read DTC by severity
19 09	Fault Memory Read severity information
19 0A	Fault Memory Read (supported errors)

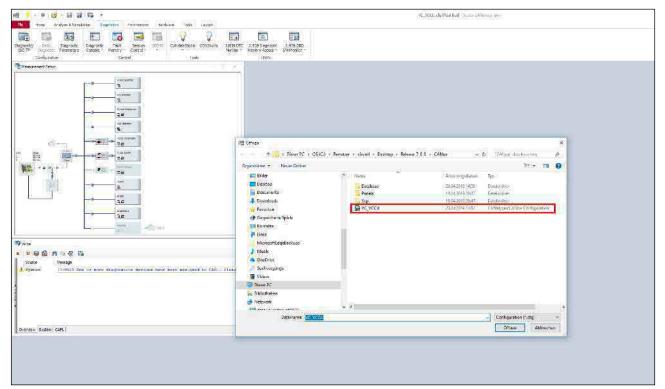
Table 5-11Read DTC Information Service (0x19)

SID 0x14	Description
14	Fault Memory Clear (all errors)

 Table 5-12
 Clear Diagnostic Information (0x14)

The following description explains the reading and clearing of the fault memory with CANoe/CANalyzer and the delivered CANoe/CANalyzer configuration.

1. Start CANoe/CANalyzer and open the delivered CANoe/CANalyzer configuration "VC-EVCC".





2. Select the desktop "Diagnostic". The window "VCVCCU – Fault memory" provides functionalities to read and clear the fault memory.

Overview System CAPL
Setup Trace VC-VCCU SchematicView Diagnostic

3. Click on the button "Update fault memory list" in order to **read** the fault memory. It is also possible to update the fault memory list cyclically by using the button "Activate cyclic update". Please note that the measurement must be started to read the fault memory.

	CU - Fault Memory		-	o x
	• 🗟 💌 🕅 📲 🛍 🛑	station and the second	0	Online
Symbolic	 [15:06:55] - Identified error 	entries updated	[Application	n] VCVCCU
DTC	Description	Status		
01e0e5	ProximityPin_OpenLoad	true : : true : false : true : false :		
04e0e3	DIN_ShortToBat	false : : true : false : true : false :		
l				



4. Click on the button "Delete all fault memory entries" in order to **clear** the fault memory. It is also possible to delete single fault memory entries by selecting a DTC and using the button "Delete DTC". Please note that the measurement must be started to clear the fault memory.

	– 🗆 X			
			Offline	
Symbolic V [15:13:18] - All DTC entries deleted.				[Application] VCVCCU
DTC	Description	Status		



5.2.2 Reflashing the VC-EVCC

Reflashing can only be executed by using the Vector flash tool "vFlash". vFlash is required to install new software versions on the VC-EVCC. The flashing process with vFlash is described in this chapter. Since there are different versions of vFlash the following two vFlash Packs are provided.

- VC-EVCC_Vx.x.x
- VC-EVCC_Vx.x.x_vFlash3.0

The vFlash Pack "VC-EVCC_Vx.x.x_vFlash3.0" is used for vFlash version 3.0 whereas the vFlash Pack "VC-EVCC_Vx.x.x" is used for newer vFlash versions than version 3.0.



Note

In preparation for the flashing process the VC-EVCC must be connected to power supply. Furthermore, a Vector interface could be used as a CAN-Interface between Tester and VC-EVCC.

1. Start vFlash and click on the button "Open".

ngg WettervHash File Tools Help		
File Tools Help		
	vFlash 6	
Start	Get Started Tips and Resources Latest News	
New		
Open	😡 vFlash Help	
	Velash Installation and Quick Start Guide	
	🛃 Vector Hardware Coofig	
	12 Demos	
Recent Projects		
VC-		
EVCC_V2.1.89_EngineeringDrop.v flashpack		
SVC VCCU_V8.1.0.vflashpack		
So VC-VCCU_V8.0.0.vflashpack		
P_V3_1_0_vFlash4.vflashpack		
CWG_V3_1_0_vPash4.vPashpack		
VC-EVCC- P+CV/G_V3_1_0_vFlash4.vflashpa dk		
VG-		
VCCU_V8.0.0_EOL_Parametrizato n_vRash5.vflashpadk		
VG- & EVCC_V2.1.89_EngineeringDrop_ Production_vflashpack		
SappValid_QcaValid.vflashpack		
AppValid, vflashpack		





2. Open the requested flashpack according to the applied vFlash version.

tor vFlash						
Tools Help						
	VF	lash 6				
art	Get Started	Tips and Resources	Latest	lews		
New	🙆 vFlash Help					
Gpen	VFlash Installation and	d Quick Start Cuida				
	-Vector Hardware Con					
💰 Open Project						×
12741 Erzen	S (C:) > Benutzer > visvml > Desk	top > Release_3_0_0 > vFlash		ى م	,© "vFlash" durch	suchen
Organisieren 🔻 Neuer Ordner					855	- 🔟 🕜
CANTraces_EigeneTraces	* *	Name	Änderungsdatum	Тур	Größe	
CAIN Iraces_Eigene Iraces						
Normen	st.	S VC-EVCC V3.0.0.vflashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
Normen	1 1	VC-EVCC_V3.0.0.vflashpack	12.02.2021 08:57	Vector vFlash Pack&Go	1.337 KB	
Normen	98 98 98	VC-EVCC_V3.0.0.vflashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25082020_WorkshopHHB	y. y.	VC-EVCC_V3.0.0.vflashpack	12,02.2021 08;57	Vector vFlash Pack&Go		
25082020_WorkshopHHB BMW Team RBM	y. y.	₩ VC-EVCC_V3.0.0.vflashpack	12,02,2021 08:57	Vector vFlash Pack&Go		
25082020_WorkshopHHB BMW Team RBM CANoe UDS_Screenshots	y. y.	₩ VC-EVCC_V3.0.0.vHashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25082020_WorkshopHHB BMW Team RBM CANoe UDS_Screenshots VFlash	y. y.	₩ VC-EVCC_V3.0.0.vflashpack	12,02,2021 08:57	Vector vFlash Pack&Go		
25082020_WorkshopHHB BMW Team RBM CANoe UDS_Screenshots	y. y.	₩ VC-EVCC_V3.0.0.vflashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25022020 WorkshopHHB BMW Team RBM CANce UDS Screenshots vFlash Desktop OneDrive - Personal	y. y.	₩ VC-EVCC_V3.0.0.vflashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25082020_WorkshopHHB BMW Team RBM CANee UDS_Screenshots VFlash Desktop	y. y.	₩ VC-EVCC_V3.0.0.vHashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25022020 WorkshopHHB BMW Team RBM CANce UDS Screenshots vFlash Desktop OneDrive - Personal	y. y.	k∰ VC-EVCC_V3.0.0.vHashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25020202 WorkshopHHB BMW Team RBM CANee UD5_Screenshots VFlash Desktop OneDrive - Personal Vector Informatik GmbH Vick Michael Diser PC	y. y.	k∰ VC-EVCC_V3.0.0.vHashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25020202 VorkshopHHB BMW Team RBM CANee UDS_Screenshots UDS_Screenshots VFlash Desktop OneDrive - Personal Vector Informatik GmbH Vick, Michael Vick, Michael Bibliotheken	y. y.	k∰ VC-EVCC_V3.0.0.vHashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25020202 WorkshopHHB BMW Team RBM CANee UD5_Screenshots VFlash Desktop OneDrive - Personal Vector Informatik GmbH Vick Michael Diser PC	y. y.	₩ VC-EVCC_V3.0.0.vHashpack	12.02.2021 08:57	Vector vFlash Pack&Go		
25020202 VorkshopHHB BMW Team RBM CANee UDS_Screenshots UDS_Screenshots VFlash Desktop OneDrive - Personal Vector Informatik GmbH Vick, Michael Vick, Michael Bibliotheken	y. y.	₩ VC-EVCC_V3.0.0.vflashpack	12.02.2021 08:57	Vector vFlash Pack&Go	1,337 KB	itç*Mîashp ∨

3. Once the corresponding vFlash Pack is selected a new window is opened. Now start the flash process by clicking on the button "Flash".

sg Vector /Flash - VC-EVC_V3.00./flashpack			
File Tools Help			
Plash Configure			
Flash Statistics			
additional additiona Additional additional additiona			
Performing staps:	Segments:		
TimeStamp Description	Status Start Address Length Type Datablock Segment		



4. The green bar shows the progress of the flash process. As soon as the flash process is successfully finished the information "Ecu flashed successfully" is displayed in green.

w Vector vFlath - VC-EVCC_V3.0.0.vflathpack	
File Tools Help	
Rish Corfigue	
Flash Download Finshed. 1591520 bytes transferred. (Average transferrete: 27,6 KB/teb)	
Performing steps	Segmente
TimeStamp Description	Status Start Address Length Type Datablock (Segment
00/01.361 Start Communication	0x0 1376 DRUGE1 1 [1
00/01.924 Force Boot Mode in process	Ø 0v40000 1264968 DATA 2 [1
00:01.091 Farce Boot Mode Completed	OK280000 325776 DATA 3 1
00:02.000 Start Reprogramming	
00:02.520 Start Extended Session (Network)	
00:02.729 Check Programming Preconditions	
00:02.763 Disable DTC Settings (Network)	
00:02:523 Disable Normal Communication (Retwork)	
00:03.073 Start Programming Session	
00022.076 Unick ECU (Security Access)	
0033.099 EDU amoded	
00.03.200 Write Progenymet	
00:02:133 Download 00:01:210 Direck Chedisam	
00/3220 Under Understein 00/3226 Enset Menory	
Oo11225 Dowlad	
00151223 Ownedia	
00:99.312 Ende Henry	
01:02:236 Download	
01:13.837 Oreck Checksum	
01:13:842 Deck Programming Dependencies	
01-1384 FUIDest HertDast	
01:13.846 Em flashed successfully	
01:13,547 Start Extended Session	
01:13.986 Enable Normal Communication (Network)	
01:14.137 Enable DTC Settings (Network)	
01:14:289 Start Default Session	
01:14-658 Stop Communication	



5.3 Low Level Signal Evaluation & Control

- 5.3.1 Combo-Inlet
- 5.3.1.1 PlugPresent Evaluation



Note

PlugPresent and Proximity Pin is an alias to each other.

Signal	Description
PlugPresent_Status	The proximity pin connection state of the cable/plug
PlugPresent_Voltage	The voltage measured at the proximity pin
PlugPresent_Resistance	The cable resistance value
PlugPresent_Wakeup	The wakeup state of the proximity pin signal
PlugPresent_SelfDiagnosticStatus	The self-diagnostic state of the proximity pin signal

Table 5-13Proximity Pin Evaluation Signals

Functionality

Via the proximity pin the ECU starts from sleep mode if a cable is connected.

The VC-EVCC detects the wakeup caused by the proximity pin in the first 75ms after the wakeup event. If the ECU is already running it cyclically checks if an inlet is connected (PlugPresent_Wakeup).

Combo2 Inlet

The VC-EVCC interprets the measured voltage (PlugPresent_Voltage) to detect if a cable is connected (PlugPresent_Status).



Caution

If the value of the internal resistor between PP and PE is configured to 4,7 kOhm, the VC-EVCC will consider a Combo2 inlet connected and calculate the plug present voltage accordingly.



If a cable is connected the VC-EVCC determines the cable resistance value (PlugPresent_Resistance) from the measured voltage. Possible detectable resistance values which represent different cable types capable of different charging currents are:

PlugPresent Voltage	PlugPresent Status	Protective Earth Offset
1,15 V	Connected (100 Ohm)	-0,77 V +2,1 V
1,9 V	Connected (220 Ohm)	-1,58 V +2,1 V
3,2 V	Connected (680 Ohm)	-2,1 V +2,1 V
3,85 V	Connected (1500 Ohm)	-2,1 V +2,1 V
4,65 V	Not connected	-2,1 V +2,1 V

 Table 5-14
 PlugPresent Voltage Levels Combo2



Note

The values of the Plug Present Voltage are no real measured values. They are just the mean of the defined voltage range. A real calculation of the voltage value in software is too complex.

If no cable is connected the CAN signal for the internal PlugPresent_Resistance signal is set to not available.

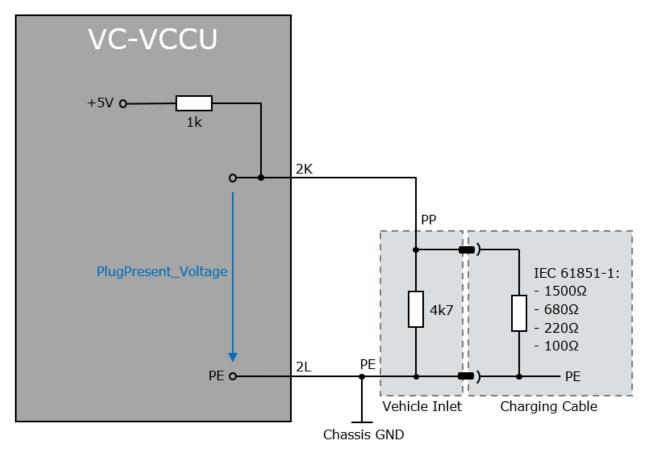


Figure 5-1: Electrical Circuit Proximity Pin Combo2 Inlet



Combo1 Inlet

The VC-EVCC interprets the measured voltage (PlugPresent_Voltage) to detect if a cable is connected (PlugPresent_Status).



Caution

If the value of the internal resistor between PP and PE is configured to 2,7 kOhm, the VC-EVCC will consider a Combo1 inlet connected and calculate the plug present voltage accordingly.

The Combo1 plug has a built-in switch. If the plug is connected the VC-EVCC determines the status of the switch from the measured voltage. It is made available on the CAN Signal S3Switch_Status to be communicated on CAN1.

PlugPresent Voltage	PlugPresent Status	S3 Switch Status	Protective Earth Offset
1,5 V	Connected	Not pressed	-1,06 V +2,1 V
2,75 V	Connected	Pressed	-2,1 V +2,1 V
4,4 V	Not Connected	Not available	-2,1 V +2,1 V

Table 5-15 PlugPresent Voltage Levels and S3 Switch Status Combo1

If AC charging with LIN communication according to SAE J3068 is activated the plug present evaluation is performed as follows.

PlugPresent Voltage	PlugPresent Status	S3 Switch Status	Protective Earth Offset
1,1 V	Connected (100 Ohm)	Not available	-0,77 V +2,1 V
1,5 V	Connected	Not pressed	-1,06 V +2,1 V
1,9 V	Connected (220 Ohm)	Not available	-1,58 V +2,1 V
2,75 V	Connected	Pressed	-2,1 V +2,1 V
3,1 V	Connected (680 Ohm)	Not available	-2,1 V +2,1 V
3,7 V	Connected (1500 Ohm)	Not available	-2,1 V +2,1 V
4,4 V	Not Connected	Not available	-2,1 V +2,1 V

Table 5-16 PlugPresent Voltage Levels and S3 Switch Status Combo 1 with Activated LIN Charging



Note

The values of the Plug Present Voltage are no real measured values. They are just the mean of the defined voltage range. A real calculation of the voltage value in software is too complex.

Combo1 does not support the PlugPresent Resistance, therefore the signal PlugPresent_Resistance is set to SNA.

If the CAN Signal PlugPresent_SelfDiagnosticStatus has any fault value, the signal S3Switch_Status is set to Error.



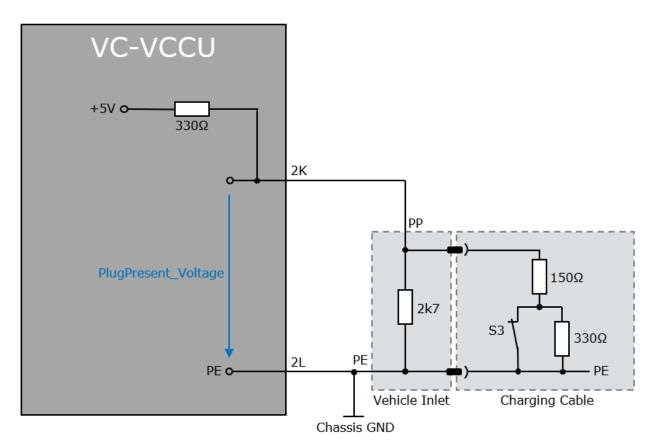


Figure 5-2: Electrical Circuit Proximity Pin Combo1 Inlet

Self-Diagnostics

The VC-EVCC cyclically polls for electrical faults at the proximity pin.

If PlugPresent_Voltage is in one of the valid ranges for normal operation PlugPresent_SelfDiagnosticStatus is set to OK.

Also, the CAN signals of PlugPresent_Wakeup and PlugPresent_Status are set to error value if a fault is detected.

If the measured resistance is not in any of the valid ranges for normal operation or known electrical faults the CAN signals of the respective internal signals are set to value not available.

- PlugPresent_Status
- PlugPresent_Resistance
- PlugPresent_Wakeup
- PlugPresent_SelfDiagnosticStatus



5.3.1.2 Control Pilot Evaluation

The control pilot signal is a low-level communication between the charging infrastructure and the VC-EVCC based on the voltage level, the duty cycle and the period of the Control Pilot signal.

Signal	Description
ControlPilot_Frequency	The period of the control pilot signal
ControlPilot_DutyCycle	The duty cycle of the control pilot signal
ControlPilot_Voltage	The voltage level of the control pilot signal
ControlPilot_Wakeup	The wakeup state of the control pilot signal
ControlPilot_ChargeMode	The requested control pilot charge mode (via CAN)

Table 5-17Control Pilot Evaluation Signals

Functionality

The VC-EVCC detects a wakeup on the control pilot line in the first 75ms after the wakeup event and sets the signal ControlPilot_Wakeup.

Frequency, duty cycle and voltage level are measured or set to a specific value according to the following logic. Also, the state of the control pilot communication is set.

If the measured frequency (ControlPilot_Frequency) is within the range of 800Hz - 1200Hz the Control Pilot communication may be ready (active). If the measured frequency is outside this range the communication is not ready (inactive).

- If the communication is ready the VC-EVCC measures the duty cycle (ControlPilot_DutyCycle) of the signal.
- If the communication is not ready or the measured frequency is 0Hz ControlPilot_DutyCycle is set to signal not available.
- If the communication is ready or the frequency is 0 Hz the voltage level ControlPilot_Voltage of the control pilot signal is measured.
- If the communication is not ready and the frequency is > 0 Hz the ControlPilot_Voltage is set to signal not available.

Self-Diagnostic

The hardware circuit of the VC-EVCC supports to detect a short to battery fault at the control pilot pin.

If the control pilot frequency is 0 Hz and the voltage is in its defined range for short to battery detection the VC-EVCC sets the duty cycle signal and the frequency signal to error value

5.3.1.3 Protective Earth

The VC-EVCC measures the Protective Earth (PE) to GND offset voltage at the microcontroller pins. If the offset voltage exceeds the respective minimum or maximum limit the VC-EVCC will raise the following diagnostic trouble code.

Protective Earth (PE) to GND offset out of range (DTC 0x2BE0E2)



5.3.1.4 Plug Locking

Signal	Description
PlugLock_MotorStatus	The motor drive status
PlugLock_SelfDiagnosticStatusOutput0	The self-diagnostic status of the full bridge output 0
PlugLock_SelfDiagnosticStatusOutput1	The self-diagnostic status of the full bridge output 1

Table 5-18Plug Locking Signals

Functionality

The VC-EVCC provides a full bridge solution to control a DC motor. It controls the movement and the direction of a connected motor and detects electrical faults by reading the voltage and current levels of the full bridge. The signals and their CAN representatives are for debugging purposes.

The automatic plug locking is described in the following chapters.

Self-Diagnostic

The electrical faults of the full bridge outputs are detected during movement and also without output activation.

The VC-EVCC measures the voltage of the full bridge outputs (PlugLock_VoltageOutput0, PlugLock_VoltageOutput1) cyclically.

If a movement of the motor is requested the detection of an electrical fault of a full bridge output depends on the direction.

If an error is detected the signal PlugLock_MotorStatus is set to error value. The type of the error is stored in the signal PlugLock_SelfDiagnosticStatusOutput0 or the signal PlugLock_SelfDiagnosticStatusOutput1 respectively.

5.3.1.5 Lock Position Evaluation

Signal	Description
POSFeedback_Voltage	The position feedback voltage value
POSFeedback_SelfDiagnosticStatus	The position feedback self-diagnostic status

 Table 5-19
 Lock Position Evaluation Signals

Functionality

The VC-EVCC detects the position of the inlet lock via the position feedback pin. This is done via a resistor coded switch. The measured voltage is stored in the signal POSFeedback_Voltage.

Self-Diagnostic

If POSFeedback_Voltage is in one of the valid ranges for normal operation POSFeedback_SelfDiagnosticStatus is set to ok.

If POSFeedback_Voltage is in one of the ranges of an electrical fault its type is stored in the signal POSFeedback_SelfDiagnosticStatus.

If POSFeedback_SelfDiagnosticStatus has any fault value, POSFeedback_Voltage is set to error.



If POSFeedback_Voltage isn't in any of the valid ranges for normal operation or electrical faults, POSFeedback_Voltage and POSFeedback_SelfDiagnosticStatus are set to not available.

If the sensor supply voltage is outside the valid range the VC-EVCC sets the POSFeedback_Voltage and POSFeedback_SelfDiagnosticStatus to signal not available.

5.3.2 Inputs

5.3.2.1 Digital Input (Charging Stop Switch)

Signal	Description
DigitalInput_Status	The digital input value
DigitalInput_SelfDiagnosticStatus	The digital input self-diagnostic status
DigitalInput_Wakeup	The digital input wakeup status

Table 5-20 Digital Input Signals

Functionality

The Charging process can be directly stopped by pressing a connected button. Also, the VC-EVCC wakes up when the button is pressed. The wakeup is recognized within 75ms. **Self-diagnostic**

If a short-to-battery is detected the signal DigitalInput_Status is set to error value.



Note

The self-diagnostic is only performed when the button is not pressed.

5.3.2.2 S3 Switch on Combo 1

Signal	Description
S3Switch_Status	Status of the S3 Switch

Table 5-21Combo 1 Digital Input Signals

Functionality

The charging process can be directly stopped by pressing the switch on the charging gun.



Note

The S3 switch is realized in software and is made available through the PlugPresent pin on the VC-EVCC and therefore does not require any hard wire.

Self-Diagnostic

If any fault value is detected in the signal PlugPresent_SelfDiagnosticStatus, the signal S3Switch_Status is set to error.



5.3.2.3 Digital Input (Generic Switch)

One high side output of the VC-EVCC is implemented to work as an input.

Signal	Description
HighSideOut2_Input_Status	The HSOUT2 input value

Table 5-22Analog Inputs Signals

The following table shows the implemented hysteresis for the detection of a pressed button event.

Input voltage level	HighsideOut2_InputStatus
≥ 4500 mV	pressed
≤ 3500 mV	not pressed
≥ 3500 mV ≤ 4500 mV	Remain present value
Initial value	Signal not available

Table 5-23 Button Hysteresis



Note

Self-diagnostics is not supported for this input.

5.3.2.4 Terminal 15 Signal Input

Signal	Description
HighSideOut3_Input_Status	The high side out 3 input value:
HighSideOut3_Input_Wakeup	The high side out 3 wakeup status

Table 5-24Terminal 15 Input Signals

The following table shows the implemented hysteresis for Terminal 15 signal Input.

Input voltage level	HighsideOut3_InputStatus
≥ 4500 mV	Pressed (active)
≤ 3500 mV	not pressed (inactive)
≥ 3500 mV ≤ 4500 mV	Remain present value
Initial value	Signal not available

Table 5-25Terminal 15 Signal Hysteresis

If the Terminal 15 signal input is the source for a wakeup event the information is stored in the signal HighSideOut3_Input_Wakeup.





Note Self-diagnostics is not supported for this input.

5.3.2.5 Temperature Measurement

Signal	Description
PTC0_Raw	The PTC0 ADC (12 bit) raw value
PTC1_Raw	The PTC1 ADC (12 bit) raw value
PTC2_Raw	The PTC2 ADC (12 bit) raw value
PTC0_Resistance	The PTC0 resistance value
PTC1_Resistance	The PTC1 resistance value
PTC2_Resistance	The PTC2 resistance value
PTC0_SelfDiagnosticStatus	The PTC0 self-diagnostic status
PTC1_SelfDiagnosticStatus	The PTC1 self-diagnostic status
PTC2_SelfDiagnosticStatus	The PTC2 self-diagnostic status

Table 5-26Temperature Measurement Signals

Functionality

Three connected temperature sensors are measured cyclically. The internal measured values are stored in the signals:

- PTC0_Raw / PTC0_Resistance
- PTC1_Raw / PTC1_Resistance
- PTC2_Raw / PTC2_Resistance

Self-diagnostic

Detected electrical faults are stored in the signal representing the affected channel

- PTC0_SelfDiagnosticStatus
- PTC1_SelfDiagnosticStatus
- PTC2_SelfDiagnosticStatus

5.3.2.6 Hardware Version Coding

The VC-EVCC contains an internal hardware version coding for hardware generation 1.5. If the hardware version coding is not correct the VC-EVCC will raise the following diagnostic trouble code.

Hardware Software Incompatibility (DTC 0x40E0E2)





Caution

The software of the VC-EVCC cannot be used with the hardware of the VC-VCCU or the VC-EVCC-P.

5.3.3 Outputs

5.3.3.1 LED Control

Signal	Description
VCVCCU_LED0_Request	The LED0 duty cycle percentage
VCVCCU_LED1_Request	The LED1 duty cycle percentage
VCVCCU_LED2_Request	The LED2 duty cycle percentage
VCVCCU_LED0_SelfDiagnosticStatus	The LED0 self-diagnostic status
VCVCCU_LED1_SelfDiagnosticStatus	The LED1 self-diagnostic status
VCVCCU_LED2_SelfDiagnosticStatus	The LED2 self-diagnostic status

Table 5-27LED Outputs Signals

Functionality

The LED outputs can be controlled by setting the following signals via CAN, VCVCCU_LED0_Request, VCVCCU_LED1_Request and VCVCCU_LED2_Request. If one of the signals is not available, the respective LED output is not controlled.

Self-Diagnostic

Electrical faults are stored in the following signals representing the three different outputs:

- LED0_SelfDiagnosticStatus
- LED1_SelfDiagnosticStatus
- LED2 SelfDiagnosticStatus



5.3.3.2 High Side Output Control

Signal	Description
VCVCCU_HighSideOut0_Request	The HighSideOut0 output value
VCVCCU_HighSideOut1_Request	The HighSideOut1 output value
VCVCCU_HighSideOut2_Request	The HighSideOut2 output value
VCVCCU_HighSideOut3_Request	The HighSideOut3 output value
VCVCCU_HighSideOut4_Request	The HighSideOut4 output value
VCVCCU_HighSideOut0_SelfDiagnosticStatus	The HighSideOut0 self-diagnostic status
VCVCCU_HighSideOut1_SelfDiagnosticStatus	The HighSideOut1 self-diagnostic status
VCVCCU_HighSideOut2_SelfDiagnosticStatus	The HighSideOut2 self-diagnostic status
VCVCCU_HighSideOut3_SelfDiagnosticStatus	The HighSideOut3 self-diagnostic status
VCVCCU_HighSideOut4_SelfDiagnosticStatus	The HighSideOut4 self-diagnostic status

Table 5-28 High Side Outputs Signals

Functionality

The VC-EVCC provides three general purpose high side outputs which can be controlled via CAN signals. The high side outputs are set cyclically by the corresponding signal:

- VCVCCU_HighSideOut0_Request
- VCVCCU_HighSideOut1_Request
- VCVCCU_HighSideOut4_Request

If a signal is not available, the corresponding output is not controlled.

Self-Diagnostic

Electrical faults are stored in the diagnostic status signals of the outputs.

- VCVCCU_HighSideOut0_SelfDiagnosticStatus
- VCVCCU_HighSideOut1_SelfDiagnosticStatus
- VCVCCU_HighSideOut4_SelfDiagnosticStatus





Caution

If the High Side Outputs of the VC-EVCC are used, measures must be taken to ensure a load current greater than 15mA (HSOUT0, HSOUT1) respectively 330mA (HSOUT4).

An appropriate load resistor must be calculated depending on the supply voltage. Otherwise, the VC-EVCC will detect an OpenLoad error which leads to a switch-off of the respective High Side Output.

If in doubt, please contact the Vector support.

In ON state a short to GND and an open load can be detected. A short to battery situation will be detected as an open load.

In OFF state a short to GND, a short to battery and an open load could be detected depending on the off-state diagnostic configuration. If active off-state diagnostic is configured as "On" the VC-EVCC will detect a short to GND and an open load error even if the corresponding HSOUT is disabled.

5.4 ECU Control

5.4.1 ECU Control

Signal	Description
EcuControl_AwakeDiagActv	The UDS diagnostic session state
EcuControl_AwakeECU	The ECU awake state

Table 5-29: ECU Control Signals

Functionality

If the current UDS diagnostic session is not default the signal EcuControl_AwakeDiagActv is set to active.

The signal EcuControl_AwakeECU is set to active if

- DiagnosticCAN_State is active or
- ▶ J1939CAN_State is active

5.4.2 Real-Time Clock

Signal	Description
RTC_TimerValue	The real-time clock timer start value in minutes
RTC_TimerRequest	The real-time clock timer start trigger
RTC_Wakeup	The real-time clock wakeup state
RTC_TimerStatus	The real-time clock timer state

Table 5-30Real-time Clock Signals

Functionality

A real-time clock, which supports to notify or wakeup the microcontroller after a defined time or at a defined time, can be programmed via CAN.



If the signal RTC_TimerRequest is active and the signal RTC_TimerValue is > 0, a timer is started and the signal RTC_TimerStatus is set to "running".



Note

While RTC_TimerRequest is active the timer is set and started only once. The real time clock functionality is deactivated once charging schedules are used.

If the signal RTC_TimerRequest is active and the signal RTC_TimerValue is 0, the timer is stopped and the signal RTC_TimerStatus is set to "stopped".

If the set time has elapsed, the signal RTC_TimerStatus is set to "elapsed".

A wakeup caused by the real-time clock is stored in the signal RTC_Wakeup.

5.5 Charging Control

5.5.1 Plug Detection

Signal	Description
Inlet_ConnectionStatus	The inlet/cable connection status
Inlet_MaxCurrent The maximum charging current given by the	

Table 5-31Plug Detection Signals

Parameter	Value
Inlet_PlugDetectionTime	2000ms

Table 5-32Plug Detection Parameters

Functionality

If the plug is recognized as connected (PlugPresent_Status) for the plug detection time (Inlet_PlugDetectionTime) the inlet is regarded as plugged and the maximum charging current (Inlet_CableMaxCurrent) according to the derived cable resistance is chosen (Table B.3 in [4]).

If the derived Plug Present resistance is not available or is set to error, the maximum cable charging current is set to signal not available.

5.5.2 Plug Locking

Signal	Description
Vehicle_PlugLockAllowed	The permission from the vehicle to lock the plug
Vehicle_PlugUnlockAllowed	the permission from the vehicle to unlock the plug
Inlet_UnlockedTime	The time where a new plug lock is prevented after an unlock
DigitalInput_MinPressTime	The minimum detection time of the press event at the digital input
Inlet_MotorStatus	The position and status of the lock/unlock mechanism of the plug



Inlet_OverloadTimeoutTime	The VC-EVCC time to pause the movement to protect the inlet motor against over heating
Inlet_OverloadProtection	The Status of the overload protection of the plug motor
Inlet_MaxMovementTime	The maximum time to activate the motor for movement

Table 5-33 Plug Locking Signals

Parameter	Value
Inlet_MaxMovementTime	600ms (default)
Inlet_OverloadTimeoutTime	2650ms (default)
Inlet_UnlockedTime	5000ms

Table 5-34Plug Locking Parameters



Note

The parameters "Inlet_MaxMovementTime" and "Inlet_OverloadTimeoutTime" are configurable via UDS. For more information please refer to the chapter "UDS communication".

Functionality

The VC-EVCC sets the state of the signal VCVCCU_Inlet_MotorStatus according to the following table.

VCVCCU_POSFeedback_Voltage	VCVCCU_Inlet_MotorStatus
480mV – 680mV and no latch movement	Unlocked
480mV – 680mV or 2510mV – 3210mV and latch movement is ongoing	Moving
2510mV – 3210mV and no latch movement	Locked
Error or out of valid voltage range	Error

 Table 5-35
 Inlet Locking Interpretation



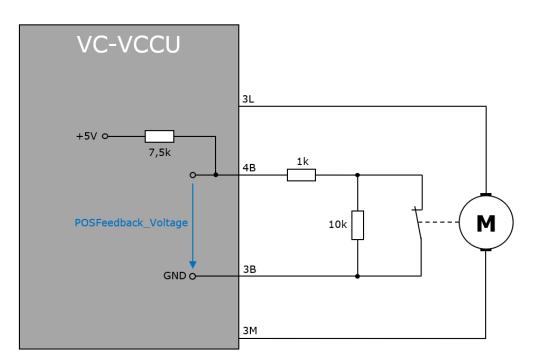


Figure 5-3: Electrical Circuit Position Feedback Evaluation

The following table gives an overview of the plug locking considering different start and end positions.

Situation	Start position	Movement	End position
Lock-A	Bolt is in the no locking position	Lock movement	Bolt is in the locked position
Lock-B	Bolt is in the no locking position	Lock movement	Bolt is in the no locking position
Lock-C	Bolt is in the no locking position	Lock movement	Bolt is in the failed locking position
Lock-D	The bolt is in the failed locking position	Lock movement	Bolt is in the failed locking position
Lock-E	The bolt is in the locked position	Lock movement (ignored)	Bolt is in the locked position

Table 5-36Plug Locking Considerations

The VC-EVCC starts to lock the plug (set PlugLock_MotorDrive to direction which closes the plug) if all following conditions are fulfilled:

- Inlet_ConnectionStatus is active
- Inlet_UnlockedTime has elapsed
- Vehicle_PlugLockAllowed is set
- Inlet MotorStatus is unlocked
- PlugLock_MotorStatus is not error



The lock movement is stopped if the Inlet_MaxMovementTime has elapsed or the PlugLock_MotorStatus is error.

When the lock movement is stopped a timer (Inlet_OverloadTimeoutTime) for overload protection is set, during which no motor movement is possible.

If the lock movement stops and the Inlet_MotorStatus is not locked, an unlock trigger is set.

The timer to ensure a minimum pause (Inlet_UnlockedTime) between an unlocking and the next locking movement is started also when a lock movement was stopped but the Inlet_MotorStatus is not locked.

The following table gives an overview of the plug unlocking considering different start and end positions.

Situation	Start position	Movement	End position
Unlock-A	Bolt is in the no locking position	Unlock movement	Bolt is in the no locking position
Unlock-B	Bolt is in the locked position	Unlock movement	Bolt is in the no locking position
Unlock-C	Bolt is in the locked position	Unlock movement	Bolt is in the locked position
Unlock-D	Bolt is in the failed locking position	Unlock movement	Bolt is in the locked position
Unlock-E	Bolt is in the failed locking position	Unlock movement	Bolt is in the failed locking position
Unlock-F	Bolt is in the failed locking position	Unlock movement	Bolt is in the no locking position

 Table 5-37
 Plug Unlocking Considerations

5.5.3 Plug Unlocking



Caution

To avoid personal injuries and damage to property, the vehicle must check the contactor voltage before the unlock permission is set to "Allowed".

If charging is stopped due to either digital input or S3 switch or StopCharge CAN signal, the VC-EVCC will not monitor whether the contactor voltage has dropped below 60V.

The VC-EVCC start to unlock the plug (set PlugLock_MotorDrive to direction which opens the plug) if

- VCVCCU_ChargeUnit_State is not StateC and
- VCVCCU_ChargeUnit_State is not StateD and
- VCVCCU_Vehicle_PlugUnlockPermission is allowed and
- VCVCCU_PlugLock_MotorStatus is not error and
- Inlet_OverloadProtection is not active

and either



- VCVCCU_DigitalInput_DebouncedStatus is pressed or
- VCVCCU_S3Switch_DeboundedStatus is pressed (only in case of Combo1) or
- VCVCCU_Vehicle_StopCharge is pressed (only if feature is activated) or
- unlock movement trigger from an unsuccessful lock movement is set

The unlock movement is stopped if the Inlet_MaxMovementTime has elapsed or the PlugLock_MotorStatus is error.

To prevent a locking movement directly after the unlock movement has stopped a timer (with Inlet_UnlockedTime), during which no lock movement is allowed, is started.

When the unlock movement is stopped a timer (Inlet_OverloadTimeoutTime) for overload protection is set, during which no motor movement is possible.

5.5.4 Control Pilot Handling

Signal	Description
VCVCCU_ChargeUnit_State	The state of control pilot signal
VCVCCU_ChargeUnit_Mode	The charge unit mode derived from the control pilot duty cycle
VCVCCU_ChargeUnit_MaxCurrent	The maximum allowed current derived from the control pilot duty cycle

Table 5-38Control Pilot Handling Signals

Functionality

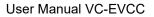
The ControlPilot_Status is dependent on the measured ControlPilot_Voltage and set according to table A.3 in [4].

ControlPilot_Voltage	ControlPilot_Status
-1V <= ControlPilot_Voltage <= 1V and PlugPresent_Status is not connected	StatusA
8V <= ControlPilot_Voltage <= 10V and charge communication is not active	StatusB1
8V <= ControlPilot_Voltage <= 10V and charge communication is active	StatusB2
5V <= ControlPilot_Voltage <= 7V	StatusC
2V <= ControlPilot_Voltage <= 4V	StatusD
-1V <= ControlPilot_Voltage <= 1V and PlugPresent_Status is connected.	StatusE
-13V <= ControlPilot_Voltage <= -11V	StatusF
See below	Not available

Table 5-39Setting of the Control Pilot Status

The ControlPilot_Status is set to not available if ControlPilot_Voltage is in one of the following ranges (according to table A.3):

10V < ControlPilot_Voltage</p>





- 7V < ControlPilot_Voltage < 8V</p>
- ► 4V < ControlPilot_Voltage < 5V
- ► 1V < ControlPilot Voltage < 2V
- -11V < ControlPilot_Voltage < -1V</p>
- -13V > ControlPilot_Voltage

Caution

The Protective Earth to GND offset must be within a range from -2,1V to 2,1V in order to detect the Control Pilot Status reliably.

VCVCCU_ChargeUnit_State	Control Pilot_PresentStatus
StateB2, StateC or StateD.	Active
StateA, StateB1 or StateE.	Not active
StateF or not available	Not available

Table 5-40Control Pilot Status

The signal VCVCCU_ChargeUnit_Mode is set to ChargeV2G if

- ControlPilot_PresentStatus is active and
- ▶ 3% <= ControlPilot_DutyCycle <= 7%.

The signal VCVCCU_ChargeUnit_Mode is set to ChargePwm if

- ControlPilot_PresentStatus is active and
- ▶ 8% <= ControlPilot_DutyCycle <= 97%.

The signal VCVCCU_ChargeUnit_Mode is set to ChargeLIN if

- ControlPilot_Voltage equals 6V or 9V (tolerance ±1V) and
- LIN frame SeInfoList has been detected by the LIN transceiver

The signal VCVCCU_ChargeUnit_Mode is set to ChargingNotAllowed if ControlPilot_PresentStatus is active and

- 0% < ControlPilot_DutyCycle < 3% or</p>
- 7% < ControlPilot_DutyCycle < 8% or</p>
- ControlPilot_DutyCycle > 97%



The signal VCVCCU_ChargeUnit_Mode is set to signal not available if

- ControlPilot_PresentStatus is not active or
- ControlPilot_PresentStatus is not available or
- ControlPilot_DutyCycle is set to signal not available.

If the signal VCVCCU_ChargeUnit_Mode is ChargePwm the ChargeUnit_MaxCurrent is derived from ControlPilot_DutyCycle (according to table A.6 in [4]).

If the signal VCVCCU_ChargeUnit_Mode is not ChargePwm the ChargeUnit_MaxCurrent is set to signal not available.



Note The ChargeUnit_MaxCurrent is calculated with a deviation of ±1A.

5.5.5 Digital Input Control

Signal	Description
DigitalInput_DebouncedStatus	The debounced status of the digital input (charging stop switch)
DigitalInput_MinPressTime	The minimum time for a valid digital input press event
HighSideOut2_Input_DebouncedStatus	The debounced status of the generic switch input
HighSideOut3_Input_DebouncedStatus	The debounced status of the Terminal 15 signal input
S3Switch_DebouncedStatus	The debounced status of the switch on the gun for Combo1

Table 5-41 Digital Input Control Signals

Parameter	Value
DigitalInput_MinPressTime	30ms

 Table 5-42
 Digital Input Control Parameters

Functionality

The different digital inputs are debounced and work as the following. The respective debounced status signal is set to status pressed if the status of the digital input reports pressed for DigitalInput_MinPressTime.

The debounced status is set to status not pressed if the status of the digital input reports not pressed for DigitalInput_MinPressTime.

The DigitalInput_DebouncedStatus is set to error if the status of the digital input reports error.



5.5.6 Temperature Control

Signal	Description
PTC0_Temperature (AC temperature inlet pin)	The PTC0 temperature value
PTC1_Temperature (DC temperature inlet pin)	The PTC1 temperature value
PTC2_Temperature (DC temperature inlet pin)	The PTC2 temperature value

 Table 5-43
 Temperature Control Signals

Parameter	Value
PTC0_NormalTemperature	20°C
PTC0_CriticalTemperature	120°C

Table 5-44Temperature Control Parameters

Functionality

PTC0 shall be connected to a PTC sensor according to the supported inlet. The measured values are sent on CAN and used for the higher-level charging algorithm.



Note

Due to the specification of the supported inlet PTC0_Temperature is only sent on CAN preprocessed. The signal only contains two different values related to the measured resistance.

PTC0_NormalTemperature (600 Ohm <= PTC0_Resistance < 1500 Ohm)

PTC0_CriticalTemperature (1500 Ohm <= PTC0_Resistance <= 1600 Ohm)

The threshold of 1500 Ohm and the lower boundary of 600 Ohm are default values. If other values are required due to a specific PTC sensor, the threshold and the lower boundary can be configured via UDS as described in the chapter "UDS communication". Please note that both values must be within a range from 400 Ohm to 5000 Ohm. Otherwise, the VC-EVCC is not able to measure the resistance value reliably.

The PTC0 can be activated/deactivated via UDS as described in the chapter "UDS communication". The DTCs of the PTC0 are only evaluated by the VC-EVCC if the PTC0 is activated.

PTC1 and PTC2 shall be connected with a PT1000 sensor. The temperature is processed from the measured resistance for PTC1 and PTC2 if the respective self-diagnostic status is OK.

Parameter	Value
Critical temperature for DC Charging	90°C
Resistance of PTC1/PTC2	1347 Ohm

Table 5-45Resistance Threshold of PTC1/PTC2 at the Critical Temperature of 90°C



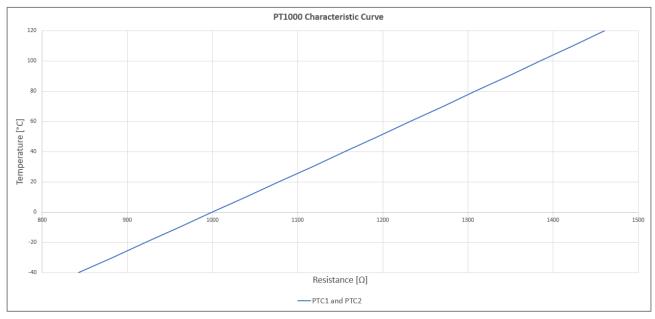


Figure 5-4: Characteristic Curve of PTC1 and PTC2 (PT1000)

The PTC1 and PTC2 can be activated/deactivated via UDS as described in the chapter "UDS communication". The DTCs of the PTC1 and PTC2 are only evaluated by the VC-EVCC if the corresponding temperature sensor is activated.

All three temperature values of PTC0, PTC1 and PTC2 are set to error if the respective selfdiagnostic status is not OK.

5.5.7 Charging with Control Pilot

Signal	Description
Vehicle_ChargePermission	The permission from the vehicle to start charging
ChargePwm_ModeBSettleTime	Time to pause the PWM charging after mode B was entered

Table 5-46Charging with Control Pilot Signals

Parameter	Value
ChargePwm_ModeBSettleTime	1000ms

Table 5-47Charging with Control Pilot Parameters

5.5.7.1 Functionality

The signal VCVCCU_ChargeUnit_State is set to mode C if

- VCVCCU_Inlet_MotorStatus is Locked and
- VCVCCU_PlugPresent_Status is Connected and
- VCVCCU_ChargeUnit_Mode is ChargePwm and
- VCVCCU_Vehicle_ChargePermission is set to Allowed and



- VCVCCU_Vehicle_PwmChargeModeRequest is set to PwmChargeModeRequestC and
- VCVCCU_PTC0_Temperature is PTC_NormalTemperatureAC (only if PTC0 is activated) and
- VCVCCU_DigitalInput_DebouncedStatus is not pressed and
- VCVCCU_S3Switch_DebouncedStatus is not pressed (only in case of Combo1) and
- VCVCCU_StopCharge is not pressed (only if StopCharge CAN signal is activated) and
- VCVCCU_Vehicle_ChargeSelection is set to "PrimaryNode" and VCVCCU_HighSideOut2_Input_DebouncedStatus is set to "Not_pressed" (only if charging arbitration is activated) or
- VCVCCU_Vehicle_ChargeSelection is set to "SecondaryNode" and VCVCCU_HighSideOut2_Input_DebouncedStatus is set to "Pressed" (only if charging arbitration is activated) and
- ChargePwm_ModeBSettleTime has elapsed



Note

If charge mode D (enable ventilation) shall be used, the vehicle must set the CAN signal VCVCCU_Vehicle_PwmChargeModeRequest to "PwmChargeModeRequestD". All other conditions mentioned above must be fulfilled for charge mode D too.

The signal VCVCCU_ChargeUnit_State is set to mode B if

- VCVCCU_Inlet_MotorStatus isn't Locked or
- VCVCCU_PlugPresent_Status is not Connected and
- VCVCCU_ ChargeUnit_Mode is not ChargePwm or
- VCVCCU_Vehicle_ChargePermission is not set to allowed or
- VCVCCU_PTC0_Temperature is not PTC_NormalTemperatureAC (only if PTC0 is activated) or
- VCVCCU_DigitalInput_DebouncedStatus is pressed or
- VCVCCU_S3Switch_DebouncedStatus is pressed (only in case of Combo1) or
- VCVCCU_Vehicle_StopCharge is pressed (only if StopCharge CAN signal is activated) or
- Active DTC in the DM01 message (see charge error detection)

The VC-EVCC starts the ChargePwm_ModeBSettleTime after ControlPilot_ChargeMode was set from mode C to mode B due the above behavior.





Caution

The condition "VCVCCU_Inlet_MaxCurrent > VCVCCU_ChargeUnit_MaxCurrent" is not checked by the VC-EVCC. Both signals and the corresponding values are transmitted on CAN but there will be no intervention by the VC-EVCC if the value of the signal VCVCCU_ChargeUnit_MaxCurrent exceeds the value of the signal VCVCCU_Inlet_MaxCurrent. The VCU has the full responsibility to monitor the current value and likewise to react in case of exceedance of the maximum allowed current.

5.5.7.2 Charge Error Detection

The VC-EVCC provides a charge error detection. Therefore, the following Diagnostic Trouble Codes (DTC) are used to indicate missing information or invalid conditions which are needed for charging.

J1939 Vehicle CAN (CAN1):

VCVCCU_ChargeFromVehicle E2E fault (0x20E0EA)

Charging Stop Switch (DIN):

DIN ShortToBat error (DTC 0x04E0E3)

PTC0:

- PTC0 OutOfRange error (DTC 0x05E0E2)
- PTC0 ShortToBat error (DTC 0x05E0E3)
- PTC0 ShortToGnd error (DTC 0x05E0E4)
- PTC0 OpenLoad error (DTC 0x05E0E5)

Control Pilot:

Control Pilot ShortToBat error (DTC 0x00E0E3)

Position Feedback:

- POS_FB ShortToBat error (DTC 0x02E0E3)
- POS_FB ShortToGnd error (DTC 0x02E0E4)
- POS_FB OpenLoad error (DTC 0x02E0E5)

Hardware Compatibility:

Hardware Software Incompatibility error (DTC 0x40E0E2)

5.5.8 Charging with V2G

The following chapters describe the V2G charging and its dependencies to certain CAN signals. Common requests and response are equal within the DIN70121 and the ISO15118. Differences between the DIN70121 and the ISO15118 are described in separate chapters.



Signal	Description
Vehicle_LinkVoltage	The voltage at the vehicle side of the DC connection
Vehicle_ContactorVoltage	The voltage at the EVSE side of the DC connection
Vehicle_IsolationMeasurementRequest	The control request of the vehicle isolation measurement
Vehicle_IsolationMeasurementStatus	The status of the vehicle isolation measurement
Vehicle_ContactorRequest	The Representation of the control request of the vehicle contactors
Vehicle_ContactorStatus	The Representation of the status of the vehicle contactors
ChargeV2G_PreChargeStabilityTime	The Representation of the time to wait during pre- charge for the voltages being stable
ChargeV2G_MaxAllowedTemperature	The Representation of the maximum temperature of the DC pins where V2G charging is still allowed:

Table 5-48Charging with V2G Signals

Parameter	Value
ChargeV2G_MaxAllowedTemperature	90°C
ChargeV2G_PreChargeStabilityTime	500ms

Table 5-49Charging with V2G Parameters

5.5.8.1 Initial Situation

- ControlPilot_ChargeMode is set to mode B.
- Vehicle_IsolationMeasurementRequest is set to activated.
- The VC-EVCC sets the following CAN signals initially and after any end of a V2G sequence to the specified values:
 - VCVCCU_V2G_DateTimeNowFlag to 0 (FALSE)
 - VCVCCU_V2G_EVSECurrentRegulationToleranceFlag to 0 (FALSE)
 - VCVCCU_V2G_EVSEEnergyToBeDeliveredFlag to 0 (FALSE)
 - VCVCCU_V2G_EVSEIsolationStatusFlag to 0 (FALSE)
 - VCVCCU_V2G_EVSEMaximumCurrentLimitFlag to 0 (FALSE)
 - VCVCCU_V2G_EVSEMaximumPowerLimitFlag to 0 (FALSE)
 - VCVCCU_V2G_EVSEMaximumVoltageLimitFlag to 0 (FALSE)
 - VCVCCU_Vehicle_ContactorRequest to 2 (ForceOpen)

5.5.8.2 Charge Error Detection

The VC-EVCC provides a charge error detection. Therefore, the following Diagnostic Trouble Codes (DTC) are used to indicate missing information or invalid conditions which are needed for charging.



J1939 Vehicle CAN (CAN1):

- VCVCCU_ChargeFromVehicle E2E fault (0x20E0EA)
- VCVCCU_V2G_EVMaximumCurrentLimit Timeout error (DTC 0x21E0E2)
- VCVCCU_V2G_EVMaximumVoltageLimit Timeout error (DTC 0x22E0E2)
- VCVCCU_V2G_EVTargetCurrent Timeout error (DTC 0x23E0E2)
- VCVCCU_V2G_EVTargetVoltage Timeout error (DTC 0x24E0E2)
- VCVCCU_V2G_VehicleStatus Timeout error (DTC 0x25E0E2)



Note

Timeout duration is five times of the message cycle time.

Charging Stop Switch (DIN):

DIN ShortToBat error (DTC 0x04E0E3)

PTC1:

- PTC1 ShortToBat error (DTC 0x06E0E3)
- PTC1 ShortToGnd error (DTC 0x06E0E4)
- PTC1 OpenLoad error (DTC 0x06E0E5)

PTC2:

- PTC2 ShortToBat error (DTC 0x07E0E3)
- PTC2 ShortToGnd error (DTC 0x07E0E4)
- PTC2 OpenLoad error (DTC 0x07E0E5)

Control Pilot:

Control Pilot ShortToBat error (DTC 0x00E0E3)

Position Feedback:

- POS_FB ShortToBat error (DTC 0x02E0E3)
- POS_FB ShortToGnd error (DTC 0x02E0E4)
- POS_FB OpenLoad error (DTC 0x02E0E5)

Hardware Compatibility:

- Hardware Software Incompatibility error (DTC 0x40E0E2)
- Plug and Charge (only if feature is activated):
 - Plug and Charge Configuration Error (DTC 0x2AE0E2)



5.5.8.3 Start Sequence

The communication with the EVSE over V2G is started if

- VCVCCU_Inlet_MotorStatus is locked and
- VCVCCU_ChargeUnit_Mode is ChargeV2G and
- VCVCCU_PTC1_Temperature is below ChargeV2G_MaxAllowedTemperature (only if PTC1 is activated) and
- VCVCCU_PTC2_Temperature is below ChargeV2G_MaxAllowedTemperature (only if PTC2 is activated) and
- VCVCCU_DigitalInput_DebouncedStatus is not pressed and
- VCVCCU_S3Switch_DebouncedStatus is not pressed (only in case of Combo1) and
- VCVCCU_Vehicle_StopCharge is not pressed (only if StopCharge CAN signal is activated) and
- VCVCCU_Vehicle_ChargeSelection is set to "PrimaryNode" and VCVCCU_HighSideOut2_Input_DebouncedStatus is set to "Not_pressed" (only if charging arbitration is activated) or
- VCVCCU_Vehicle_ChargeSelection is set to "SecondaryNode" and VCVCCU_HighSideOut2_Input_DebouncedStatus is set to "Pressed" (only if charging arbitration is activated) and
- ChargeV2G start trigger is set and
- ▶ No active DTC is detected (except DTCs of Full Bridge 12V)



Caution

At least one temperature sensor, either PTC1 or PTC2, must be activated for DC charging.

On a change of signal VCVCCU_ChargeUnit_Mode from "not ChargeV2G" to "ChargeV2G" the trigger to charge is set. This trigger is reset after a start of the V2G charge sequence or on a reset of the VC-EVCC.

If the V2G communication is started according to the start sequence Vehicle_ContactorRequest is set to Open.

5.5.8.4 SECC Discovery Protocol

The VC-EVCC sends the SECCDiscoveryReq after a communication link has been successfully established with the EVSE.

5.5.8.4.1 Common Request Parameter

If there is no V2G TLS Activation configuration done the SECCDiscoveryReq sets the Security parameter to 0x10 (No transport layer security).

If V2G TLS Activation configuration is done the VC-EVCC should use the configured value for the Security parameter of the SECCDiscoveryReq.



- TLS activated: 0x00 (secured with TLS)
- TLS not activated: 0x10 (No transport layer security)

5.5.8.4.2 Common Response Parameter

The SECC IP Address of the SECCDiscoveryRes is evaluated. The SECC Port of the SECCDiscoveryRes is evaluated. The Transport Protocol of the SECCDiscoveryRes is evaluated.

5.5.8.5 Connect Transport Layer

5.5.8.5.1 Transmission Control Protocol (TCP)

The VC-EVCC establishes an unsecure TCP connection using the SECC IP address and SECC Port of the SECCDiscoveryRes if

- SECCDiscoveryProtocolRes has been received and
- conditions for a sequence error reaction of SECCDiscoveryProtocol do not apply and
- ▶ the Security of the SECCDiscoveryRes is 0x10 (No transport layer security).

5.5.8.5.2 Transport Layer Security (TLS)

The VC-EVCC establishes a secure TLS/TCP connection using the SECC IP address and SECC Port of the SECCDiscoveryRes if

- SECCDiscoveryProtocolRes has been received and
- conditions for a sequence error reaction of SECCDiscoveryProtocol do not apply and
- the Security of the SECCDiscoveryRes is 0x00 (secured with TLS).

The VC-EVCC uses Transport Layer Security version 1.2.

The VC-EVCC uses the configured TLS Certificates to validate the connection.

5.5.8.6 Supported App Protocol

The supportedAppProtocolReq is sent after the successful communication setup with the EVSE.

5.5.8.6.1 Common Request Parameter

The supportedAppProtocolReq contains the ISO15118 protocol with priority 1 (high priority) and the DIN70121 protocol with priority 2 (lower priority).

5.5.8.6.2 Common Response Parameter

If the supportedAppProtocolRes contains the DIN 70121 as supported protocol (SchemalD) by the EVSE, the DIN 70121 sequence will be processed.

If the supportedAppProtocolRes contains the ISO 15118 as supported protocol (SchemalD) by the EVSE, the ISO 15118 sequence will be processed.

5.5.8.7 Session Setup

The VC-EVCC proceeds with the SessionSetupReq if the response code in the supportedAppProtocolRes was OK and the SchemalD refers to one of the supported protocols.



5.5.8.7.1 Common Request Parameter

The SessionSetupReq sets the EVCCID to the MAC address of the VC-EVCC. The individual MAC address of the VC-EVCC is calculated with a specified MAC base address and the consecutive Vector serial number.

5.5.8.7.2 Common Response Parameter

The EVSEID of the SessionSetupRes is ignored.

5.5.8.7.3 DIN 70121 Response Parameter

If the SessionSetupRes contains DateTimeNow the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_DateTimeNow and
- sets the value of the CAN signal VCVCCU_V2G_DateTimeNowFlag to 1.

5.5.8.7.4 ISO 15118 Response Parameter

If the SessionSetupRes contains EVSETimeStamp the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_DateTimeNow and
- sets the value of the CAN signal VCVCCU_V2G_DateTimeNowFlag to 1.

5.5.8.8 Service Discovery

The VC-EVCC sends the ServiceDiscoveryReq if the response code in the SessionSetupRes was OK.

The ServiceDiscoveryReq does not use the ServiceScope and Service Category parameter.

5.5.8.9 Service Detail

The VC-EVCC proceeds with the ServiceDetailReq if

Option 1 (VAS):

- Charging protocol is ISO 15118
- TLS connection has been established successfully during SECC Discovery and
- The response code in the ServiceDiscovery was OK and
- Value Added Services are activated ("Fixed IP address" or "URL") and
- SECC offered a service in the ServiceList of ServiceDiscoveryResponse as specified below:
 - > ServiceID: 3
 - > FreeService: TRUE

Option 2 (PnC):

- Charging protocol is ISO 15118
- TLS connection has been established successfully during SECC Discovery and
- The response code in the ServiceDiscovery was OK and
- Plug and Charge is activated and
- Payment Option "Contract" is supported by the SECC and



- One of the following conditions concerning the contract certificate applies and
 - > No contract certificate is installed
 - > Invalid contract certificate is installed
 - > Currently installed contract certificate is within 1 day of expiry
- SECC offered a service in the ServiceList of ServiceDiscoveryResponse as specified below:
 - > ServiceID: 2
 - > FreeService: TRUE

5.5.8.10 PaymentServiceSelection (ISO) / ServicePaymentSelection (DIN)

The VC-EVCC supports "ExternalPayment" as well as "Contract" (Plug and Charge) as selected payment options.

5.5.8.10.1 Common Request Parameter

The VC-EVCC replies with "ExternalPayment" within the ServicePaymentSelectionReq SelectedPaymentOption if Plug and Charge is deactivated. If Plug and Charge is activated the VC-EVCC replies with "Contract" as SelectedPaymentOption.

In the ServicePaymentSelectionReq the ServiceID of the received Charging Service listed in the ServiceDiscoveryRes is used.

5.5.8.10.2 ISO 15118 Request Parameter

The following Services are added to the SelectedServiceList if the corresponding feature is activated.

If VAS are supported by the EVSE, the PaymentServiceSelectionReq adds the Value Added Service as a SelectedService to the SelectedServiceList as described below:

- ServiceID: 3
- ParameterSetID: 4

If contract installation is supported by the EVSE, the PaymentServiceSelectionReq adds contract installation as a SelectedService to the SelectedServiceList as described below:

- ServiceID: 2
- ParameterSetID: 1

If contract update is supported by the EVSE, the PaymentServiceSelectionReq adds contract update as a SelectedService to the SelectedServiceList as described below:

- ServiceID: 2
- ParameterSetID: 2

5.5.8.11 Certificate Installation

The VC-EVCC proceeds with the CertificateInstallationReq if

- Charging protocol is ISO 15118
- ServicePaymentSelectionRes/ PaymentServiceSelectionRes has been received



- PaymentOption "Contract" is selected
- Certificate installation service is supported by the EVSE
- No valid contract certificate is installed

5.5.8.12 Certificate Update

The VC-EVCC proceeds with the CertificateUpdateReq if

- Charging protocol is ISO 15118
- ServicePaymentSelectionRes/ PaymentServiceSelectionRes has been received
- PaymentOption "Contract" is selected
- Certificate update service is supported by the EVSE
- The currently installed contract certificate is within 1 day of expiry

5.5.8.13 Payment Details

The VC-EVCC proceeds with the PaymentDetailsReq if

- Charging protocol is ISO 15118
- PaymentOption "Contract" is selected
- A valid contract certificate and private key is currently installed
- ServicePaymentSelectionRes/ PaymentServiceSelectionRes or CertificateInstallationRes or CertificateUpdateRes has been received

5.5.8.14 Authorization (ISO) / ContractAuthentication (DIN)

The VC-EVCC proceeds with the AuthorizationReq/ContractAuthenticationReq if the response code in the PaymentServiceSelectionRes/ServicePaymentSelectionRes was OK. In addition, the PaymentDetailsRes must be received successfully if Plug and Charge is used.

5.5.8.15 Charge ParameterDiscovery

The VC-EVCC proceeds with the ChargeParameterDiscoveryReq if

- the EVSEProcessing status in the ContractAuthenticationRes is finished and the response code was OK and
- the ChargeService.EnergyTransferType/ ChargeService.SupportedEnergyTransferMode in the ServiceDiscoveryRes contains the value of the CAN signal VCVCCU_V2G_StateM_EnergyTransferMode and
- the CAN signal VCVCCU_V2G_EVMaximumCurrentLimitFlag is 1 and
- the CAN signal VCVCCU_V2G_EVMaximumVoltageLimitFlag is 1

If charging schedules are activated the conditions for proceeding with the ChargeParameterDiscoveryReq are extended as follows.

PowerDeliveryRes(Renegotiate) has been received and ControlPilot_ChargeMode is set to mode B.



5.5.8.15.1 DC_EVStatus Request Parameter

The ChargeParameterDiscoveryReq is filled with the content of the received CAN signals according to the table below.

ChargeParameterDiscoveryReq	CAN Signal
DC_EVChargeParameter.DC_EVStatus.EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus.EVErrorCode	VCVCCU_V2G_EVErrorCode CAN
DC_EVChargeParameter.DC_EVStatus.EVRESSSOC	VCVCCU_V2G_EVRESSSOC

 Table 5-50
 ChargeParameterDiscoveryReq CAN Signal Mapping

5.5.8.15.2 Common Request Parameter

The ChargeParameterDiscoveryReq sets EVRequestedEnergyTransferType/RequestedEnergyTransferMode to VCVCCU V2G StateM EnergyTransferMode CAN signal.



Note

The EVSE reports the supported energy transfer modes for DC charging in the ServiceDiscoveryRes.

The VC-EVCC transmits this information within the CAN signal VCVCCU_V2G_StateM_EnergyTransferModeFlags.

The supported modes list within the signal VCVCCU_V2G_StateM_EnergyTransferModeFlags is a binary combination of the modes mentioned below.

The VC-EVCC supports the following energy transfer modes for DC charging:

DC core (coded as 0x04)

DC extended (coded as 0x08)

DC combo core (coded as 0x10)

DC unique (coded as 0x20)

The unsupported energy transfer modes for DC charging are:

AC single phase core (coded as 0x01)

AC three phase core (coded as 0x02)

The VC-EVCC will stop the charging sequence if unsupported values are requested!

The ChargeParameterDiscoveryReq uses

DC_EVChargeParameter.EVMaximumCurrentLimit and fill with the VCVCCU_V2G_EVMaximumCurrentLimit CAN signals.





Note

VCVCCU_V2G_EVMaximumCurrentLimitFlag has to be 1 (already a condition to send the ChargeParameterDiscoveryReq)

The ChargeParameterDiscoveryReq uses DC_EVChargeParameter.EVMaximumPowerLimit and fill with the VCVCCU_V2G_EVMaximumPowerLimit CAN signals if VCVCCU_V2G_EVMaximumPowerLimitFlag is 1.

The ChargeParameterDiscoveryReq uses DC_EVChargeParameter.EVMaximumVoltageLimit and fill with the VCVCCU_V2G_EVMaximumVoltageLimit CAN signals.



Note

VCVCCU_V2G_EVMaximumVoltageLimitFlag has to be 1 (already a condition to send the ChargeParameterDiscoveryReq)



Caution

The multiplier of the EVMaximumVoltageLimit, EVMaximumCurrentLimit and EVMaximumPowerLimit must be within the range from -3 to 3.

The ChargeParameterDiscoveryReq uses DC_EVChargeParameter.EVEnergyCapacity and fill with the VCVCCU_V2G_EVEnergyCapacity CAN signals if VCVCCU_V2G_EVEnergyCapacityFlag is 1.

The ChargeParameterDiscoveryReq uses DC_EVChargeParameter.EVEnergyRequest and fills with the VCVCCU_V2G_EVEnergyRequest CAN signals if VCVCCU_V2G_EVEnergyRequestFlag is 1.

The ChargeParameterDiscoveryReq uses DC_EVChargeParameter.FullSOC and fill with the VCVCCU_V2G_FullSOC CAN signals if VCVCCU_V2G_FullSOCFlag is 1.

The ChargeParameterDiscoveryReq uses DC_EVChargeParameter.BulkSOC and fill with the VCVCCU_V2G_BulkSOC CAN signals if VCVCCU_V2G_BulkSOCFlag is 1.

5.5.8.15.3 ISO 15118 Request Parameter

The ChargeParameterDiscoveryReq uses DC_EVChargeParameter.DepartureTime and fill with the VCVCCU_V2G_DepartureTime CAN signals if VCVCCU_V2G_DepartureTimeFlag is 1.

5.5.8.15.4 ISO 15118 Schedule Request Parameter

The ChargeParameterDiscoveryReq sets MaxEntriesSAScheduleTuple depending on the charging schedules configuration.

 Charging Schedules are deactivated: The ChargeParameterDiscoveryReq sets MaxEntriesSAScheduleTuple to 1.



Charging Schedules are activated: The ChargeParameterDiscoveryReq sets MaxEntriesSAScheduleTuple to 24.

5.5.8.15.5 DC_EVSEStatus Response Parameter

DC_EVSEChargeParameter.DC_EVSEStatus.EVSENotification of the ChargeParameterDiscoveryRes is transmitted in the VCVCCU_V2G_EVSENotification CAN signal.

DC_EVSEChargeParameter.DC_EVSEStatus.NotificationMaxDelay of the ChargeParameterDiscoveryRes is transmitted in the VCVCCU_V2G_NotificationMaxDelay CAN signal.

DC_EVSEChargeParameter.DC_EVSEStatus.DC_EVSEStatusCode of the ChargeParameterDiscoveryRes is transmitted in the VCVCCU_V2G_EVSEStatusCode CAN signal.

If the ChargeParameterDiscoveryRes contains DC_EVSEChargeParameter.DC_EVSEStatus.EVSEIsolationStatus the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and
- sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1

5.5.8.15.6 Common Response Parameter

The DC_EVSEChargeParameter.EVSEMaximumCurrentLimit of the ChargeParameterDiscoveryRes is transmitted in the CAN signal

- VCVCCU V2G EVSEMaximumCurrentLimit and
- The value of the CAN signal VCVCCU_V2G_EVSEMaximumCurrentLimitFlag is set to 1

The DC_EVSEChargeParameter.EVSEMaximumPowerLimit of the ChargeParameterDiscoveryRes is transmitted in the CAN signal

- VCVCCU_V2G_EVSEMaximumPowerLimit and
- the value of the CAN signal VCVCCU_V2G_EVSEMaximumPowerLimitFlag to 1

The DC_EVSEChargeParameter.EVSEMaximumVoltageLimit of the ChargeParameterDiscoveryRes is transmitted in the CAN signal

- VCVCCU_V2G_EVSEMaximumVoltageLimit and
- value of the CAN signal VCVCCU_V2G_EVSEMaximumVoltageLimitFlag is set to 1

The DC_EVSEChargeParameter.EVSEMinimumCurrentLimit of the ChargeParameterDiscoveryRes is transmitted in the CAN signal VCVCCU_V2G_EVSEMinimumCurrentLimit.

If the ChargeParameterDiscoveryRes contains DC_EVSEChargeParameter.EVSEMinimumVoltageLimit the VC-EVCC sets the value in the CAN signal VCVCCU V2G EVSEMinimumVoltageLimit.

The DC_EVSEChargeParameter.EVSEPeakCurrentRipple of the ChargeParameterDiscoveryRes is transmitted in the CAN signal VCVCCU_V2G_EVSEPeakCurrentRipple.



If the ChargeParameterDiscoveryRes contains

DC_EVSEChargeParameter.EVSECurrentRegulationTolerance the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_EVSECurrentRegulationTolerance
- sets the CAN signal VCVCCU_V2G_EVSECurrentRegulationToleranceFlag to 1

If the ChargeParameterDiscoveryRes contains DC_EVSEChargeParameter.EVSEEnergyToBeDelivered the VC-EVCC

- ▶ sets the value in the CAN signal VCVCCU_V2G_EVSEEnergyToBeDelivered
- sets the CAN signal VCVCCU_V2G_EVSEEnergyToBeDeliveredFlag to 1

5.5.8.15.7 Schedule Response Parameter

The VC-EVCC transmits the PMax value of the current PMaxScheduleEntry within the CAN signals VCVCCU_V2G_CurrentPMaxValue and VCVCCU_V2G_CurrentPMaxMultiplier.

The remaining time of the current PMaxScheduleEntry is calculated by the VC-EVCC with the help of the RelativeTimeInterval information and transmitted within the CAN signal VCVCCU_V2G_CurrentPMaxDuration.

The VC-EVCC transmits the PMax value of the subsequent PMaxScheduleEntry within the CAN signals VCVCCU_V2G_NextPMaxValue and VCVCCU_V2G_NextPMaxMultiplier.



Note

The SalesTariff information of the ChargeParameterDiscoveryRes is not considered by the VC-EVCC and thus not transmitted on the J1939 vehicle CAN.

5.5.8.16 Cable Check

The VC-EVCC proceeds with the CableCheckReq and sets the ControlPilot_ChargeMode to mode C if

- the response code in the ChargeParameterDiscoveryRes was OK and
- Vehicle_ChargePermission is set to allowed and
- Vehicle_ContactorStatus is Opened



5.5.8.16.1 DC_EVStatus Request Parameter

The CableCheckReq is filled with the content of the received CAN signals according to the table below.

CableCheckReq	CAN signal
DC_EVChargeParameter.DC_EVStatus.EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus.EVErrorCode	VCVCCU_V2G_EVErrorCode
DC_EVChargeParameter.DC_EVStatus.EVRESSSOC	VCVCCU_V2G_EVRESSSOC

Table 5-51 CableCheckReq CAN Signal Mapping

5.5.8.16.2 DC_EVSEStatus Response Parameter

The CAN signals are filled with the parameters of the CableCheckRes according to the table below.

CableCheckRes	CAN signal
DC_EVSEChargeParameter.DC_EVSEStatus. EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter.DC_EVSEStatus. NotificationMaxDelay	VCVCCU_V2G_NotificationMaxDelay
DC_EVSEChargeParameter.DC_EVSEStatus. DC_EVSEStatusCode	VCVCCU_V2G_EVSEStatusCode

Table 5-52 CableCheckRes CAN Signal Mapping

If the CableCheckRes contains

DC_EVSEChargeParameter.DC_EVSEStatus.EVSEIsolationStatus the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and
- sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1.

5.5.8.17 PreCharge

The VC-EVCC proceeds with the PreChargeReq and sets Vehicle_IsolationMeasurementRequest to not activated if the EVSEProcessing status in the CableCheckRes is finished and the response code was OK.

The Vehicle_ContactorRequest is set to Close if

- the difference between Vehicle_ContactorVoltage and the Vehicle_LinkVoltage is for ChargeV2G_PreChargeStabilityTime (500ms) less than 20V and
- Vehicle_IsolationMeasurementStatus is not active.



5.5.8.17.1 DC_EVStatus Request Parameter

The PreChargeReq is filled with the content of the received CAN signals according to the table below.

PreChargeReq	CAN signal
DC_EVChargeParameter.DC_EVStatus.EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus.EVErrorCode	VCVCCU_V2G_EVErrorCode CAN
DC_EVChargeParameter.DC_EVStatus.EVRESSSOC	VCVCCU_V2G_EVRESSSOC

 Table 5-53
 PreChargeReq CAN Signal Mapping

5.5.8.17.2 Common Request Parameter

The PreChargeReq uses EVTargetVoltage and fill with the VCVCCU_Vehicle_LinkVoltage CAN signal.

The PreChargeReq uses EVTargetCurrent and fill with the VCVCCU_V2G_EVTargetCurrent CAN signal.

5.5.8.17.3 DC_EVSEStatus Response Parameter

The CAN signals are filled with the parameters of the PreChargeRes according to the table below.

PreChargeRes	CAN signal
DC_EVSEChargeParameter.DC_EVSEStatus. EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter.DC_EVSEStatus. NotificationMaxDelay	VCVCCU_V2G_NotificationMaxDelay
DC_EVSEChargeParameter.DC_EVSEStatus. DC_EVSEStatusCode	VCVCCU_V2G_EVSEStatusCode

 Table 5-54
 PreChargeRes CAN Signal Mapping

If the PreChargeRes contains

DC_EVSEChargeParameter.DC_EVSEStatus.EVSEIsolationStatus the VC-EVCC

- ▶ sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and
- sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1.

5.5.8.17.4 Common Response Parameter

If the PreChargeRes contains EVSEPresentVoltage the VC-EVCC sets the value in the CAN signal VCVCCU_V2G_EVSEPresentVoltage.

5.5.8.18 Power Delivery (TRUE)

The VC-EVCC proceeds with the PowerDeliveryReq(TRUE) if

- the PreCharge condition is still fulfilled and
- Vehicle_ContactorStatus is Closed



5.5.8.18.1 DC_EVStatus Request Parameter

The PowerDeliveryReq(TRUE) is filled with the content of the received CAN signals according to the table below.

PowerDeliveryReq(TRUE)	CAN signal
DC_EVChargeParameter.DC_EVStatus.EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus.EVErrorCode	VCVCCU_V2G_EVErrorCode
DC_EVChargeParameter.DC_EVStatus.EVRESSSOC	VCVCCU_V2G_EVRESSSOC

Table 5-55 PowerDeliveryReq(TRUE) CAN Signal Mapping

5.5.8.18.2 Common Request Parameter

The PowerDeliveryReq(TRUE) uses DC_EVPowerDeliveryParameter.ChargingComplete and fills it with the VCVCCU_V2G_ChargingComplete CAN signal.

The PowerDeliveryReq(TRUE) uses DC_EVPowerDeliveryParameter.BulkChargingComplete and fills it with the VCVCCU_V2G_BulkChargingComplete CAN signal if VCVCCU_V2G_BulkChargingCompleteFlag is 1.

5.5.8.18.3 DIN 70121 Request Parameter

The PowerDeliveryReq(TRUE) sets ReadyToChargeState to TRUE.

5.5.8.18.4 ISO 15118 Request Parameter

The PowerDeliveryReq(TRUE) sets ChargeProgress to Start.

The PowerDeliveryReq(TRUE) sets SAScheduleTupleID to the first (in the list) received SAScheduleTupleID in the ChargeParameterDiscoveryRes.

5.5.8.18.5 DC_EVSEStatus Response Parameter

The CAN signals are filled with the parameters of the PowerDeliveryRes(TRUE) according to the table below.

PowerDeliveryRes(TRUE)	CAN signal
DC_EVSEChargeParameter.DC_EVSEStatus. EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter.DC_EVSEStatus. NotificationMaxDelay	VCVCCU_V2G_NotificationMaxDelay
DC_EVSEChargeParameter.DC_EVSEStatus. DC_EVSEStatusCode	VCVCCU_V2G_EVSEStatusCode

Table 5-56 PowerDeliveryRes(TRUE) CAN Signal Mapping

If the PowerDeliveryRes(TRUE) contains DC EVSEChargeParameter.DC EVSEStatus.EVSEIsolationStatus the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and
- sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1.



5.5.8.19 Current Demand

The VC-EVCC proceeds with cyclic transmission of CurrentDemandReq if the response code in the PowerDeliveryRes was OK.

The VC-EVCC extends the request-response loop in state CurrentDemand by a MeteringReceipt request and response if the following conditions are met.

- Payment option "Contract" has been selected
- The ReceiptRequired element is included within the CurrentDemandRes message and set to "TRUE"
- ▶ The MeterInfo record containing the MeterID is included within the CurrentDemandRes

5.5.8.19.1 DC_EVStatus Request Parameter

The CurrentDemandReq is filled with the content of the received CAN signals according to the table below.

CurrentDemandReq	CAN signal
DC_EVChargeParameter.DC_EVStatus.EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus.EVErrorCode	VCVCCU_V2G_EVErrorCode
DC_EVChargeParameter.DC_EVStatus.EVRESSSOC	VCVCCU_V2G_EVRESSSOC

Table 5-57 CurrentDemandReq CAN Signal Mapping

5.5.8.19.2 Common Request Parameter

The CurrentDemandReq uses EVTargetCurrent and fills it with the VCVCCU_V2G_EVTargetCurrent CAN signal.

The CurrentDemandReq uses EVTargetVoltage and fills it with the VCVCCU_V2G_EVTargetVoltage CAN signal.

The CurrentDemandReq uses EVMaximumCurrentLimit and fills it with the VCVCCU_V2G_EVMaximumCurrentLimit CAN signal if VCVCCU_V2G_EVMaximumCurrentLimitFlag is 1.

The CurrentDemandReq uses EVMaximumPowerLimit and fills it with the VCVCCU_V2G_EVMaximumPowerLimit CAN signal if VCVCCU_V2G_EVMaximumPowerLimitFlag is 1.

The CurrentDemandReq uses EVMaximumVoltageLimit and fills it with the VCVCCU_V2G_EVMaximumVoltageLimit CAN signal if VCVCCU_V2G_EVMaximumVoltageLimitFlag is 1.

The CurrentDemandReq uses ChargingComplete and fills it with the VCVCCU_V2G_ChargingComplete CAN signal

The CurrentDemandReq uses BulkChargingComplete and fills it with the VCVCCU_V2G_BulkChargingComplete CAN signal if VCVCCU_V2G_BulkChargingCompleteFlag is 1.

The CurrentDemandReq uses RemainingTimeToFullSOC and fills it with the VCVCCU_V2G_RemainingTimeToFullSOC CAN signal if VCVCCU_V2G_RemainingTimeToFullSOCFlag is 1.



The CurrentDemandReq uses RemainingTimeToBulkSOC and fills it with the VCVCCU_V2G_RemainingTimeToBulkSOC CAN signal if VCVCCU_V2G_RemainingTimeToBulkSOCFlag is 1.

5.5.8.19.3 DC_EVSEStatus Response Parameter

The CAN signals are filled with the parameters of the CurrentDemandRes according to the table below.

CurrentDemandRes	CAN signal
DC_EVSEChargeParameter.DC_EVSEStatus. EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter.DC_EVSEStatus. NotificationMaxDelay	VCVCCU_V2G_NotificationMaxDelay
DC_EVSEChargeParameter.DC_EVSEStatus. DC_EVSEStatusCode	VCVCCU_V2G_EVSEStatusCode

Table 5-58 CurrentDemandRes CAN Signal Mapping (DC_EVSEStatus)

If the CurrentDemandRes contains

DC_EVSEChargeParameter.DC_EVSEStatus.EVSEIsolationStatus the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and
- sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1.

5.5.8.19.4 Common Response Parameter

The CAN signals are filled with the parameters of the CurrentDemandRes according to the table below.

CurrentDemandRes	CAN signal
EVSEPresentVoltage	VCVCCU_V2G_EVSEPresentVoltage
EVSEPresentCurrent	VCVCCU_V2G_EVSEPresentCurrent
EVSECurrentLimitAchieved	VCVCCU_V2G_EVSECurrentLimitAchieved
EVSEVoltageLimitAchieved	VCVCCU_V2G_EVSEVoltageLimitAchieved
EVSEPowerLimitAchieved	VCVCCU_V2G_EVSEPowerLimitAchieved

 Table 5-59
 CurrentDemandRes CAN Signal Mapping (Common)

If the CurrentDemandRes contains EVSEMaximumCurrentLimit the VC-EVCC

- ▶ sets the value in the CAN signal VCVCCU_V2G_EVSEMaximumCurrentLimit and
- sets the value of the CAN signal VCVCCU_V2G_EVSEMaximumCurrentLimitFlag to 1.

If the CurrentDemandRes contains EVSEMaximumPowerLimit the VC-EVCC

- sets the value with in CAN signal VCVCCU_V2G_EVSEMaximumPowerLimit and
- ▶ sets the value of the CAN signal VCVCCU_V2G_EVSEMaximumPowerLimitFlag to 1.

If the CurrentDemandRes contains EVSEMaximumVoltageLimit the VC-EVCC



- sets the value in the CAN signal VCVCCU_V2G_EVSEMaximumVoltageLimit and
- ▶ set the value of the CAN signal VCVCCU_V2G_EVSEMaximumVoltageLimitFlag to 1.

5.5.8.19.5 ISO 15118 Response Parameter

The EVSEID of the CurrentDemandRes is ignored.

Remaining data in ISO 15118:

- ► EVSEID
- SAScheduleTupleID
- MeterInfo (optional)
- ReceiptRequired (optional)

5.5.8.20 Metering Receipt

The VC-EVCC proceeds with the MeteringReceiptReq if the following conditions are met.

- Charging protocol is ISO 15118
- CurrentDemandRes has been received
- Payment option "Contract" has been selected
- The ReceiptRequired element is included within the CurrentDemandRes message and set to "TRUE"
- ▶ The MeterInfo record containing the MeterID is included within the CurrentDemandRes

5.5.8.20.1 DC_EVSEStatus Response Parameter

The CAN signals are filled with the parameters of the MeteringReceiptRes according to the table below.

MeteringReceiptRes	CAN signal
DC_EVSEChargeParameter.DC_EVSEStatus. EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter.DC_EVSEStatus. NotificationMaxDelay	VCVCCU_V2G_NotificationMaxDelay
DC_EVSEChargeParameter.DC_EVSEStatus. DC_EVSEStatusCode	VCVCCU_V2G_EVSEStatusCode

 Table 5-60
 CurrentDemandRes CAN Signal Mapping (DC_EVSEStatus)

If the MeteringReceiptRes contains

DC_EVSEChargeParameter.DC_EVSEStatus.EVSEIsolationStatus the VC-EVCC

- sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and
- sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1.

5.5.8.21 Power Delivery (Renegotiate)

The VC-EVCC proceeds with the PowerDeliveryReq(Renegotiate) if the following conditions are met.



- Charging Protocol is ISO 15118
- CurrentDemandRes or MeteringReceiptRes has been received
- The EVSE sets the parameter "EVSENotification" of the CurrentDemandRes or MeteringReceiptRes to "ReNegotiation"
- ▶ The EV sets the CAN signal VCVCCU_Vehicle_Renegotiate to "Requested"
- The last entry of the charging profile is active and the remaining duration equals the renegotiation time of 2 minutes

5.5.8.21.1 DC_EVStatus Request Parameter

The PowerDeliveryReq(Renegotiate) is filled with the content of the received CAN signals according to the table below.

PowerDeliveryReq(Renegotiate)	CAN signal
DC_EVChargeParameter.DC_EVStatus. EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus. EVErrorCode	VCVCCU_V2G_EVErrorCode
DC_EVChargeParameter.DC_EVStatus. EVRESSSOC	VCVCCU_V2G_EVRESSSOC

 Table 5-61
 PowerDeliveryReq(Renegotiate) CAN Signal Mapping

5.5.8.21.2 Common Request Parameter

The PowerDeliveryReq(Renegotiate) uses DC_EVPowerDeliveryParameter.ChargingComplete and fill with the VCVCCU_V2G_ChargingComplete CAN signal.

The PowerDeliveryReq(Renegotiate) uses

DC_EVPowerDeliveryParameter.BulkChargingComplete and fills with the VCVCCU_V2G_BulkChargingComplete CAN signal if VCVCCU_V2G_BulkChargingCompleteFlag is 1.

5.5.8.21.3 ISO 15118 Request Parameter

The PowerDeliveryReq(Renegotiate) sets ChargeProgress to "Renegotiate".

The PowerDeliveryReq(Renegotiate) sets SAScheduleTupleID to the first (in the list) received SAScheduleTupleID in the ChargeParameterDiscoveryRes.



5.5.8.21.4 DC_EVSEStatus Response Parameter

The CAN signals are filled with the parameters of the PowerDeliveryRes(Renegotiate) according to the table below.

PowerDeliveryRes(Renegotiate)	CAN signal
DC_EVSEChargeParameter.DC_EVSEStatus. EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter.DC_EVSEStatus.NotificationMa xDelay	VCVCCU_V2G_NotificationMaxD elay
DC_EVSEChargeParameter.DC_EVSEStatus.DC_EVSE	VCVCCU_V2G_EVSEStatusCod e

 Table 5-62
 PowerDeliveryReq(Renegotiate) CAN Signal Mapping

If the PowerDeliveryRes(Renegotiate) contains DC EVSEChargeParameter.DC EVSEStatus.EVSEIsolationStatus the VC-EVCC

- ▶ sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and
- sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1.

5.5.8.22 Power Delivery (FALSE)

The VC-EVCC proceeds with the PowerDeliveryReq(FALSE) if

- VCVCCU_Vehicle_ChargePermission is not set to allowed or
- VCVCCU_ChargeUnit_Mode is not ChargeV2G or
- VCVCCU_PTC1_Temperature is not below ChargeV2G_MaxAllowedTemperature or
- VCVCCU_PTC2_Temperature is not below ChargeV2G_MaxAllowedTemperature or
- VCVCCU_DigitalInput_DebouncedStatus is pressed or
- VCVCCU_S3Switch_DebouncedStatus is pressed (only in case of Combo1) or
- VCVCCU_Vehicle_StopCharge is pressed (only if StopCharge CAN signal is activated)

Vehicle_ContactorRequest is set to Open if the response code in the PowerDeliveryRes(FALSE) was OK.



5.5.8.22.1 DC_EVStatus Request Parameter

The PowerDeliveryReq(FALSE) is filled with the content of the received CAN signals according to the table below.

PowerDeliveryReq(FALSE)	CAN signal
DC_EVChargeParameter.DC_EVStatus. EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus. EVErrorCode	VCVCCU_V2G_EVErrorCode
DC_EVChargeParameter.DC_EVStatus. EVRESSSOC	VCVCCU_V2G_EVRESSSOC

Table 5-63 PowerDeliveryReq(FALSE) CAN Signal Mapping

5.5.8.22.2 Common Request Parameter

The PowerDeliveryReq(FALSE) uses DC_EVPowerDeliveryParameter.ChargingComplete and fill with the VCVCCU_V2G_ChargingComplete CAN signal.

The PowerDeliveryReq(FALSE) uses

DC_EVPowerDeliveryParameter.BulkChargingComplete and fills with the VCVCCU_V2G_BulkChargingComplete CAN signal if VCVCCU_V2G_BulkChargingCompleteFlag is 1.

5.5.8.22.3 DIN 70121 Request Parameter

The PowerDeliveryReq(FALSE) sets ReadyToChargeState to FALSE.

5.5.8.22.4 ISO 15118 Request Parameter

The PowerDeliveryReq(FALSE) sets ChargeProgress to "Stop".

The PowerDeliveryReq(FALSE) sets SAScheduleTupleID to the first (in the list) received SAScheduleTupleID in the ChargeParameterDiscoveryRes.

5.5.8.22.5 DC_EVSEStatus Response Parameter

The CAN signals are filled with the parameters of the PowerDeliveryRes(FALSE) according to the table below.

PowerDeliveryRes(FALSE)	CAN signal
DC_EVSEChargeParameter.DC_EVSEStatus. EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter.DC_EVSEStatus.NotificationMa xDelay	VCVCCU_V2G_NotificationMaxD elay
DC_EVSEChargeParameter.DC_EVSEStatus.DC_EVSE	VCVCCU_V2G_EVSEStatusCod e

Table 5-64 PowerDeliveryRes(FALSE) CAN Signal Mapping

If the PowerDeliveryRes(FALSE) contains

DC_EVSEChargeParameter.DC_EVSEStatus.EVSEIsolationStatus the VC-EVCC

sets the value in the CAN signal VCVCCU_V2G_EVSEIsolationStatus and



sets the value of the CAN signal VCVCCU_V2G_EVSEIsolationStatusFlag to 1.

5.5.8.23 Welding Detection

The VC-EVCC proceeds with WeldingDetectionReq and sets the ControlPilot_ChargeMode to mode B if Vehicle_ContactorStatus is Opened.

5.5.8.23.1 DC_EVStatus Request Parameter

The WeldingDetectionReq is filled with the content of the received CAN signals according to the table below.

WeldingDetectionReq	CAN signal
DC_EVChargeParameter.DC_EVStatus.EVReady	VCVCCU_V2G_EVReady
DC_EVChargeParameter.DC_EVStatus.EVErrorCode	VCVCCU_V2G_EVErrorCode
DC_EVChargeParameter.DC_EVStatus.EVRESSSOC	VCVCCU_V2G_EVRESSSOC

Table 5-65 WeldingDetectionReq CAN Signal Mapping

5.5.8.23.2 DC_EVSEStatus Response Parameter

The CAN signals are filled with the content of the corresponding WeldingDetectionRes parameter according to the table below.

WeldingDetectionRes	CAN signal
DC_EVSEChargeParameter. DC_EVSEStatus.EVSENotification	VCVCCU_V2G_EVSENotification
DC_EVSEChargeParameter. DC_EVSEStatus.NotificationMaxDelay	VCVCCU_V2G_NotificationMaxDelay
DC_EVSEChargeParameter. DC_EVSEStatus.DC_EVSEStatusCode	VCVCCU_V2G_EVSEStatusCode
DC_EVSEChargeParameter.	VCVCCU_V2G_EVSEIsolationStatus
DC_EVSEStatus.EVSEIsolationStatus	VCVCCU_V2G_EVSEIsolationStatusFlag = 1

 Table 5-66
 WeldingDetectionRes CAN Signal Mapping

5.5.8.23.3 Common Response Parameter

If the WeldingDetectionRes contains EVSEPresentVoltage the VC-EVCC sets the value in the CAN signal VCVCCU_V2G_EVSEPresentVoltage.

5.5.8.24 Session Stop

The VC-EVCC proceeds with the SessionStopReq

- Vehicle_ContactorVoltage is less than 60V or
- WeldingDetectionRes is received five times in the correct loop sequence and
 - VCVCCU_DigitalInput_DebouncedStatus is pressed or
 - VCVCCU_S3Switch_DeboundedStatus is pressed (only in case of Combo1) or
 - VCVCCU_Vehicle_StopCharge is pressed (only if feature is activated).



5.5.8.24.1 ISO 15118 Request Parameter

The SessionStopReq sets the parameter ChargingSession as described below.

- ChargingSession is set to "Terminate" if the charging session is terminated by the EV or EVSE
- ChargingSession is set to "Pause" if charging schedules are activated and the EVSE has initiated a charge pause

5.5.8.25 Stop Sequence

The VC-EVCC sets Vehicle_IsolationMeasurementRequest to activated if the response code in the SessionStopRes was OK.



5.5.9 Charging with LIN

Signal	Description
LIN_EvAwake	Indication that the EV is ready for charging using LIN communication
Vehicle_ChargePermission	The permission from the vehicle to start charging

Table 5-67 Charging with LIN Signals

Parameter	Value
ChargeLIN_ToggleBaudRateTime	500ms

Table 5-68Charging with LIN Parameters

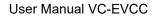
5.5.9.1 Functionality

The ECU shall enable its LIN transceiver if

- LIN-CP charging functionality is enabled AND
- PlugPresent_Status has value "connected" AND
- ControlPilot_Status is StatusB1 AND
- either LINAwake is set to 1 OR
- wakeup frame via LIN has been received from EVSE

The signal VCVCCU_ChargeUnit_State is set to mode C and StatusOp is set to Permit_V if

- LINAwake is set to 1 AND
- EVSE_StatusOp is Permit_V AND
- LIN communication is active AND
- VCVCCU_Inlet_MotorStatus is Locked AND
- VCVCCU_PlugPresent_Status is Connected AND
- VCVCCU_Vehicle_ChargePermission is set to Allowed AND
- VCVCCU_PTC0_Temperature is PTC_NormalTemperatureAC (only if PTC0 is activated) AND
- VCVCCU_DigitalInput_DebouncedStatus is not pressed AND
- ChargeLin_TerminationOnError is not set to failed AND
- ChargeNode_Status is set to selected AND
- VCVCCU_Vehicle_StopCharge is neither pressed nor error (only if StopCharge CAN signal is activated) AND
- DTC 0x40E0E2 (HW SW incompatibility) is not set





The signal VCVCCU_ChargeUnit_State is set to mode B if

- LINAwake is set to 0 OR
- A sleep frame has been received from EVSE via LIN OR
- EVSE_StatusOp is set to Deny_V OR
- LIN communication has timed out for longer than ChargeLIN_NoLinTime OR
- Power outage was detected OR
- ControlPilot_ChargeComActv is set to active OR
- VCVCCU_Vehicle_ChargePermission is not set to allowed OR
- VCVCCU_PTC0_Temperature is not PTC_NormalTemperatureAC (only if PTC0 is activated) OR
- VCVCCU_DigitalInput_DebouncedStatus is pressed OR
- ChargeLin_TerminationOnError is active OR
- VCVCCU_S3Switch_DebouncedStatus is pressed (only in case of Combo1) OR
- VCVCCU_Vehicle_StopCharge is either pressed or error (only if StopCharge CAN signal is activated) OR

The ECU shall end the LIN session if

- VCVCCU_PlugPresent_Status is Not_Connected OR
- LIN communication has timed out for longer than ChargeLIN_NoLinTime OR
- Power outage was detected.

The ECU shall end the LIN session and go to sleep mode if

• a LIN sleep frame has been received from the EVSE.

The ECU shall set the LIN signal EvAwake to 0 in order to request LIN sleep at EVSE if

- ControlPilot_ChargeMode has changed from Mode C to Mode B OR
- LINAwake changes from 1 to 0 (falling edge) OR
- DigitalInput_DebouncedStatus is pressed OR
- S3Switch_DebouncedStatus is pressed OR
- ChargeNode_Status is not set to selected (as described in PJ-SWREQ-183476) OR
- "StopCharge CAN Signal" is active and Vehicle_StopCharge is either 'Pressed' or 'Error' OR
- VCVCCU_PlugPresent_Status is Not_Connected



5.5.9.2 Charge Error Detection

The VC-EVCC provides a charge error detection. Therefore, the following Diagnostic Trouble Codes (DTC) are used to indicate missing information or invalid conditions which are needed for charging.

J1939 Vehicle CAN (CAN1) errors:

VCVCCU_ChargeFromVehicle E2E fault (0x20E0EA)



Note

Timeout duration is five times the message cycle time.

Charging Stop Switch (DIN) errors:

DIN ShortToBat error (DTC 0x04E0E3)

PTC0 errors:

- PTC0 OutOfRange error (DTC 0x05E0E2)
- PTC0 ShortToBat error (DTC 0x05E0E3)
- PTC0 ShortToGnd error (DTC 0x05E0E4)
- PTC0 OpenLoad error (DTC 0x05E0E5)

Control Pilot errors:

Control Pilot ShortToBat error (DTC 0x00E0E3)

Position Feedback errors:

- POS_FB ShortToBat error (DTC 0x02E0E3)
- POS_FB ShortToGnd error (DTC 0x02E0E4)
- POS_FB OpenLoad error (DTC 0x02E0E5)

Hardware Compatibility error:

Hardware Software Incompatibility error (DTC 0x40E0E2)

LIN Timeout errors:

- VCVCCU_LIN_EvMaxMinCurrents Timeout (DTC 0x41E0E2)
- VCVCCU_LIN_EvMaxVoltageList Timeout (DTC 0x42E0E2)
- VCVCCU_LIN_EvMinVoltageList Timeout (DTC 0x43E0E2)
- VCVCCU_LIN_EvPresentCurrentList Timeout (DTC 0x44E0E2)
- VCVCCU_LIN_EvStatus Timeout (DTC 0x45E0E2)



5.6 Value Added Services

Value Added Services (VAS) are specified as a part of ISO 15118-1 standard. The objective of VAS is to exchange information between Vehicle (Vehicle Charging Controller Unit) and SECC (Infrastructure) which is not a part of V2G communication.

The VC-EVCC supports VAS according to the VDV 261 specification [8]. Vehicle to Infrastructure Communication Protocol (V2ICP) as defined in VDV 261 is used to exchange this information.



VAS is an optional service and is not mandatory for charging.

5.6.1 Functionality

Note

The communication with the backend server is started if

- TLS communication has been successfully established for V2G Session
- Service ID: 3 was available in ServiceList
- ParameterSet ID: 4 was available in ServiceParameterList with parameter name as "https" and parameter port as 443
- AuthorizationRes has been received with ResponseCode = OK and EVSEProcessing = Finished
- VAS Configuration parameters and the TLS certificate are configured correctly

5.6.1.1 HTTP Request

If the above conditions are fulfilled successfully, the VC-EVCC will try to establish a connection with the backend and will send the HTTP Request. The request contains a payload with signals encoded in Json format.

5.6.1.2 HTTP Response

The VC-EVCC expects a HTTP Response with Response Code 200 from the backend with its signals encoded in Json format.

5.6.1.3 Request Response Loop

The request-response loop will continue, and the data exchange will take place between the vehicle and the backend.

The request-response loop will end if

- V2G Session has ended
- Sending of HTTP Request is not possible
- ▶ No response is received from the backend for 3 consecutive HTTP requests.

Once the VAS communication has ended, the reconnection will take place only after a new V2G session has started.



5.6.2 Signal Mapping

The following CAN signals are forwarded to the backend in the Http Request.

VD Message contains TotalVehicleDistance signal.

VCVCCU_V2ICP_VehicleToBackend consists of other preconditioning related signals. Apart from that, there are other Json signals which are handled internally by VC-EVCC and are also forwarded to the backend in the Http Request.

CAN Signal	Json Parameter	Description
-	vin	Username configured as VIN of the vehicle
-	evccid	MAC ID of the VC-EVCC
TotalVehicleDistance	odo	Odometer reading
VCVCCU_V2ICP_RequiredDuration ToPreconditionBattery	bat_reqtime	Required duration to precondition battery
VCVCCU_V2ICP_RequiredEnergy ToChargeBattery	bat_eamount	Required energy to charge battery
VCVCCU_V2ICP_RequiredEnergy ToPreconditionVehicle	prec_eamount	Required energy to precondition vehicle
VCVCCU_V2ICP_RequiredDuration ToPreconditionVehicle	prec_reqtime	Required duration to precondition vehicle
-	chrg_stat	Vehicle charging status

The signals received from the backend in Http Response are forwarded in the CAN Message VCVCCU_V2ICP_BackendToVehicle.

Json Parameter	CAN Signal	Description
driveoff	VCVCCU_V2ICP_ ScheduledDepartureTime	Scheduled departure time
prec_dsrd	VCVCCU_V2ICP_ PreconditioningDesired	Preconditioning desired
prec_hvac	VCVCCU_V2ICP_ PreconditioningDesiredHVAC	Type of preconditioning
ambienttemp	VCVCCU_V2ICP_ AmbientTemperature	Ambient temperature outside the garage

5.6.3 Fault Memory

The VC-EVCC provides an error detection for Value Added Service. Therefore, the following Diagnostic Trouble Codes (DTC) are used to indicate missing information or invalid conditions which are needed for value added services.

V2ICP_WrongConfiguration:

WrongConfiguation error (DTC 0x26E0E2)

V2ICP_CommunicationError:

Communication error (DTC 0x27E0E2)



5.7 Charging Arbitration

The charging arbitration enables the operation of two VC-EVCCs on the same CAN channel. It targets use cases which require two charging inlets per vehicle but only one charging inlet is used for charging at a time.

5.7.1 Functionality

For charging arbitration, the VC-EVCC supports three selectable modes:

- Passive node: The VC-EVCC has limited communication and functionality and has no clearance to charge.
- Active node: The VC-EVCC has normal communication and functionality but has no clearance to charge.
- Selected node: The VC-EVCC has normal communication and functionality and has a clearance to charge.

If charging arbitration is not used the Charge Node Selection must be set to "off" (default value). In this case the VC-EVCC uses the primary source address and operates always in mode "Selected node".

If charging arbitration is used the Charge Node Selection must be set to "on" via UDS. In order to run two VC-EVCCs on the J1939 vehicle CAN, two different Source Addresses are required. The configuration of both Source Addresses as well as the activation of the Charge Node Selection via UDS is described in the chapter "UDS communication". The VC-EVCC selects the Source Address to be used for operation according to the input voltage of the High Side Output 2 at startup. Please note that the High Side Output 2 is configured as an Input. The input voltage of the High Side Output 2 is interpreted as follows.

HS_OUT2 input voltage level	VC-EVCC Source Address
< 4500mV	Primary Source Address
>= 4500mV	Secondary Source Address

Table 5-69: HS_OUT2 Input Voltage Hysteresis

The VCU determines the VC-EVCC which is allowed to charge charge by setting the CANsignal VCVCCU_Vehicle_ChargeSelection to "PrimaryNode" or "SecondaryNode". The acknowledgement is sent by both VC-EVCCs within the signal VCVCCU_Vehicle_ChargeSelectionAck.

The mode of each VC-EVCC is determined as follows:

Passive node:

- VCVCCU_Vehicle_ChargeSelection is set to "PrimaryNode" and
- > HS_OUT2 input voltage is pressed or
- > VCVCCU_Vehicle_ChargeSelection is set to "SecondaryNode" and
- > HS_OUT2 input voltage is not pressed



Active node:

> VCVCCU_Vehicle_ChargeSelection is set to "SNA" or "Error"

Selected node:

- > VCVCCU_Vehicle_ChargeSelection is set to "PrimaryNode" and
- > HS_OUT2 input voltage is not pressed or
- > VCVCCU_Vehicle_ChargeSelection is set to "SecondaryNode" and
- > HS_OUT2 input voltage is pressed



Note

If a VC-EVCC and a VC-VCCU are operated on the same CAN channel the vehicle must ensure that E2E protection is applied on the message "VCVCCU_ChargeFromVehicle" when the VC-EVCC is the selected node.



5.8 Plug and Charge

The VC-EVCC supports Plug and Charge (PnC) according to ISO 15118. Plug and Charge provides an automatic authentication and authorization process via TLS-secured charging communication.

5.8.1 Preconditions

The following preconditions must be fulfilled in order to use Plug and Charge with the VC-EVCC.

- Activation of TLS via UDS
- Successful configuration of a TLS certificate via UDS
- Activation of Plug and Charge via UDS
- Availability of an ISO 15118-compliant Public Key Infrastructure (PKI)

An ISO 15118-compliant PKI contains certain certificates which must be installed on the VC-EVCC. It is mandatory to install the following certificates/private keys.

- PnC Root Certificate
- OEM Provisioning Certificate and Private Key
- PnC Sub Certificate (at least one Sub Certificate must be installed)
- PnC Contract Certificate and Private Key
 - > Use Case 1: Contract certificate installation via UDS
 - Use Case 2: Contract certificate installation via charge protocol (Certificate Installation/Certificate Update)

The VC-EVCC supports both use cases to install the contract certificate. All other certificates can be installed only via UDS.



Note

Details about the activation of Plug and Charge/TLS and the configuration of certificates are included in the chapter "UDS communication".

5.8.2 Functionality

If all preconditions are fulfilled Plug and Charge can be used for DC charging. Since Plug and Charge is only supported by the ISO 15118 the EVSE must support and select the ISO 15118 protocol in state SupportedAppProtocol. The VC-EVCC will always set the ISO 15118 protocol to priority 1 and DIN 70121 to priority 2.

5.8.2.1 Charging Communication

The charging communication is extended by the following message sets which are required for Plug and Charge.

ServiceDetailReq/Res



- PaymentDetailsReq/Res
- CertificateInstallationReq/Res
- CertificateUpdateReq/Res
- MeteringReceiptReq/Res

If the EVSE supports Service ID 2 the VC-EVCC will select payment option "Contract" within the PaymentServiceSelectionReq and request Payment Details.

If no PnC Contract Certificate is installed and the EVSE supports the ParameterSetID 1 (Contract Certificate Installation), the VC-EVCC will initiate the installation of a new Contract Certificate by sending the CertificateInstallationReq.

If an existing PnC Contract Certificate is about to expire within one day and the EVSE supports the ParameterSetID 2 (Contract Certificate Update), the VC-EVCC will initiate an update of the Contract Certificate by sending the CertificateUpdateReq.



Note

A detailed description of the charging sequence with the message sets for Plug and Charge is included the chapter "Charging with V2G".

5.8.2.2 J1939 CAN Communication

The vehicle must send the message "TD" so that the VC-EVCC can check the validity of certificates. There are no further CAN messages or signals which are dedicated for Plug and Charge.

5.8.3 Fault Memory

The VC-EVCC provides an error detection for Plug and Charge. Therefore, the following diagnostic trouble code is used to indicate configuration errors of certificates/private keys.

Plug and Charge Configuration Error (DTC 0x2AE0E2)



5.9 Charging Schedules

The VC-EVCC supports the usage of charging schedules according to ISO 15118.

5.9.1 Preconditions

The following preconditions must be fulfilled in order to use Charging Schedules with the VC-EVCC.

- Activation of Charging Schedules via UDS
- The charge cable must be connected during the whole charging session including charge pauses
- The inlet must be locked during the whole charging session including charge pauses



Note

Details about the activation of Charging Schedules are included in the chapter "UDS communication".

5.9.2 Functionality

If all preconditions are fulfilled Charging Schedules can be used for DC charging. During a charging session the EVSE must support and select the ISO 15118 protocol in state SupportedAppProtocol. The VC-EVCC will always set the ISO 15118 protocol to priority 1 and DIN 70121 to priority 2.

The available SAScheduleList is transmitted by the EVSE in state ChargeParameterDiscovery. The VC-EVCC limits the MaxEntriesSAScheduleTuple to 24 within the ChargeParameterDiscoveryReq.

The VC-EVCC will use the first SAScheduleTuple for charging and send the corresponding SAScheduleTupleID back to the EVSE within the PowerDeliveryReq.



Note

The VC-EVCC does neither consider the SalesTariff information provided in ChargeParameterDiscoveryRes for charging nor transmit any of the SalesTariff information on the J1939 vehicle CAN.

The following CAN signals are used for Charging Schedules on the J1939 vehicle CAN.

- VCVCCU_V2G_CurrentPMaxValue
- VCVCCU_V2G_CurrentPMaxDuration
- VCVCCU_V2G_CurrentPMaxMultiplier
- VCVCCU_V2G_NextPMaxMultiplier
- VCVCCU_V2G_NextPMaxValue
- VCVCCU_Vehicle_Renegotiate



The VC-EVCC transmits the PMax value of the current PMaxScheduleEntry within the CAN signals VCVCCU_V2G_CurrentPMaxValue and VCVCCU_V2G_CurrentPMaxMultiplier.

The remaining time of the current PMaxScheduleEntry is calculated by the VC-EVCC with the help of the RelativeTimeInterval information and transmitted within the CAN signal VCVCCU V2G CurrentPMaxDuration.

The VC-EVCC transmits the PMax value of the subsequent PMaxScheduleEntry within the CAN signals VCVCCU_V2G_NextPMaxValue and VCVCCU_V2G_NextPMaxMultiplier.



Caution

The EV must not exceed the given power limit of the EVSE. Therefore, the PMax value must be considered for the calculation of the target voltage value and target current value.

5.9.2.1 Pause and Resume a Charging Session

The VC-EVCC pauses the current charging session if the PMax value of a PMaxScheduleEntry equals 0W and the duration is greater or equal to 15 minutes.



Note

If the pause time is less than 15 minutes, the VC-EVCC will remain in state CurrentDemand and not stop the charging communication. In this case, the vehicle must still follow the PMax value of the EVSE and set the target current to 0A while charging is paused.

During a charge pause the VC-EVCC could go to sleep or stay awake depending on the active wakeup reasons. If the VC-EVCC goes to sleep during the charge pause, it will wake up automatically after the charge pause has finished.

Once the charge pause is finished the VC-EVCC wakes up the EVSE by performing a BCB-Toggle on the control pilot line and reestablishes a new charging session once the Control Pilot state changes from B1 to B2.



Caution

The VC-EVCC requires a Control pilot state change from B1 to B2 in order to start a new charging session





Note

The VC-EVCC does not store the SAScheduleTuples that was used before the charge pause. Therefore, the VC-EVCC will always request a new/updated SAScheduleTuple when reestablishing a new charging session after a charge pause.

5.9.2.2 Renegotiation of Charging Schedules

The VC-EVCC will initiate a renegotiation of charging schedules with the EVSE if one of the following scenarios applies:

- The EVSE sets the parameter "EVSENotification" of the CurrentDemandRes or MeteringReceiptRes to "ReNegotiation"
- The EV sets the CAN signal VCVCCU_Vehicle_Renegotiate to "Requested"
- The last entry of the charging profile is active and the remaining duration equals the renegotiation time of 2 minutes



Note

A renegotiation of charging schedules can only be triggered by the EV in state CurrentDemand/MeteringReceipt



5.10 Functional Safety

The VC-EVCC follows safety targets according to ASIL B. Details about functional safety are included in the Safety Manual which is part of the delivery content.



6 Electrical Characteristics

This section describes the electronic design of the VC-EVCC.



Note

Options and variants described below shall give an overview of possible project specific adaptions pre considered in the design.

6.1 High-Speed CAN

High speed CAN Bus based on the TJA1043T transceiver which is fully ISO 11898-2:2003 and ISO 11898-5:2007 compliant. It is suitable for 24V applications and capable to wake-up the hardware on bus traffic. A separate pin per CAN Signal is available for shielding of the CAN lines if necessary.

► Electric Strength: -58V ... +58V

Caution

If a CAN channel is configured to work at 1Mbit/s the ECU cannot be woken up via that CAN channel at temperatures below -30°C.

6.2 Control Pilot

Low- and high-level communication between charging infrastructure and vehicle is performed via the CP line.

6.2.1 PLC

Powerline communication Functional Building Block based on the QCA7005 PHY suitable for communication with vehicle charging infrastructure based on ISO 15118.

Interface to the host is a SPI with supported boot from host.

6.2.2 PWM

Low level PWM modulated communication between charging infrastructure and vehicle via the CP line. It is based on a 1 kHz signal with an amplitude of $\pm 12V$ according to IEC 61851 [4] and SAE J1772 [10].

- Meas. Range: -15V...+15V
- Sampling: 100 kHz
- Diagnostics: Short to battery

The Control Pilot input is capable to wake-up the hardware on communication.

The vehicle can indicate readiness for charging with or without ventilation changing the positive amplitude of the signal. The charging infrastructure can indicate the available charging current by changing the duty cycle of the signal between 3% and 97%.



The following figure describes the recommended external wiring of CP and PE between the inlet and the VC-EVCC via a 2-core-twisted-pair cable.

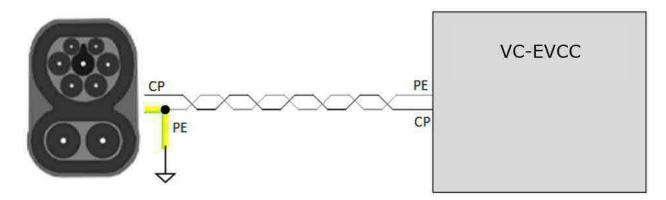


Figure 6-1 Recommended Wiring of CP and PE

6.2.3 LIN

A LIN communication with a data rate of 19.2 kbps between charging infrastructure and vehicle via CP line according to SAE J3068 [9] is available.

6.3 **Proximity Detection Logic (Plug Present)**

A Functional Building Block to detect whether a charging cable is connected and to determine the current load capacity of the connected cable. The FBB reads different resistor values representing different currents the charging infrastructure is capable of and is also capable to wake-up the hardware on communication. The implementation is according to IEC 61851 [4] and SAE J1772 [10].

 $100\Omega \dots 1500\Omega$ based on a vehicle inlet resistor of 4700Ω Meas. Range: or 2700Ω Pull up resistance: 330Ω Filter: Lowpass (200Hz corner frequency) According to IEC 61851 and SAE J1772 Accuracy: Diagnostics: Open Load Short to Ground Short to Battery Out of Range

6.4 PT1000 Temperature Sensor Input

An analog input to connect PT1000 temperature sensors to it. A constant current source is used to supply the temperature dependent sensor. The resulting voltage drop can be measured at an ADC input of the μ C.

- Meas. Range: -50°C ... +150°C (800Ω ... 1,6kΩ)
- Meas. Current: 1mA



Resolution:	12bit ADC input
Tolerance:	±5°C between -50°C +150°C
	±4°C between -30°C +90°C
Diagnostics:	Open Load
	Short to Ground
	Short to Battery

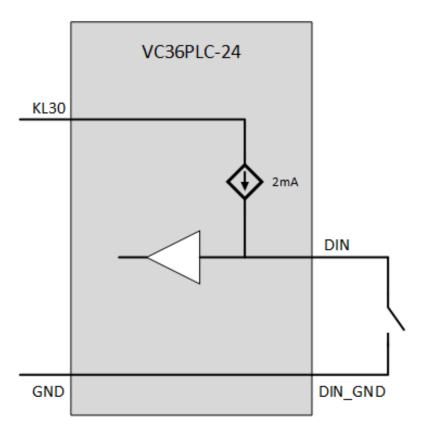
6.5 Digital Input 0...V_{Bat}

The Digital Input FBB is a wake-up capable input with a separate current source for ground switching push buttons and can be used for a charging stop switch.

Input type:	Low active
Input voltage:	0…V _{Bat}
Diagnostics:	Short to battery
Pull up current:	2mA3.6mA
Filter:	Lowpass (1060Hz corner frequency)
Threshold voltage:	typ. 1,65V
Threshold resistance:	\leq 400 Ω (active)
	≥ 1200Ω (inactive)

The following figure shows the schematic of the Digital Input (charging stop switch).







6.6 5A High-Side Output



Caution

If the VC-EVCC suffers from an unintentional GND contact loss, the freewheeling diode inside HSOUT4 may lead to an unexpected flow of current from HSOUT4 via its external load to GND.

As this may lead to undefined behavior of the external load (e.g. a BMS relay), the usage of HSOUT4 must be considered with care.

If in doubt, please contact the Vector support.

The 5A High-Side Output can be used as a digital output. The FBB is suitable for 24V applications to drive different loads such as lamps, contactors, relays, or to power other ECUs.

For diagnostics the Functional Building Block also implements a current and a voltage read back channel. It can be used as a digital or analog input as a population variant.

- Nominal voltage: 24V
- Max current: 5A
- ► Voltage drop: ≤ 0.4V
- Switching freq.: static on-off / up to 400Hz



Diagnostics: Open Load in on state (min. 330mA load required)
 Open Load in off state (min. 50mA load required)
 Short to battery in off state
 Short to Ground in on state

6.7 5A H-Bridge

This FBB represents an H-bridge to drive motor applications such as a latch where a change in the motor direction is necessary. The FBB is capable of active freewheeling and diagnosis in on and off state.

>VBat - 2V for VBat <14V

- Nominal voltage: 12V for V_{Bat} ≥14V
- Max. current: 5A
- Switching freq.: Static on-off
- Diagnostics: Open Load
 Short to Ground

Short to Battery

Short between Pins

6.8 Latch Position Input

This analog input FBB determines the latch state of the inlet connector by measuring the resistor values representing different latch states (unlocked, locked).

- Meas. range: 1kΩ (unlocked) 11kΩ (locked)
 Pull up resistance: 7.5kΩ
 Accuracy: ± 10%
 Diagnostics: Open Load
 - Short to Ground Short to Battery Out of Range

6.9 20mA LED Output

This LED Output FBB is a constant current LED driver with three channels. Dimming can be done via PWM up to 200Hz.

- Output current: 20mA
- Switching freq.: static on-off / up to 200Hz



Diagnostics:

Open Load (limited for V_{Bat} < 22V) Short to ground (limited for V_{Bat} < 22V) Short to battery

Diagnosis is only possible during on state. Furthermore, the following conditions are mandatory in order to ensure all diagnostic functionalities of the LED outputs.

- Minimum voltage drop at the LED (including external circuit): 5V
- Maximum voltage drop at the LED (including external circuit): VBAT 3V
- Maximum voltage drop at the LED (including external circuit): 14V



Note

The maximum voltage drop depends on the system's power supply voltage. In 24V systems the maximum voltage drop at the LED is 14V. In 12V systems the maximum voltage drop at the LED is V_{Bat} – 3V.

The following figure shows the schematic of the LED outputs.

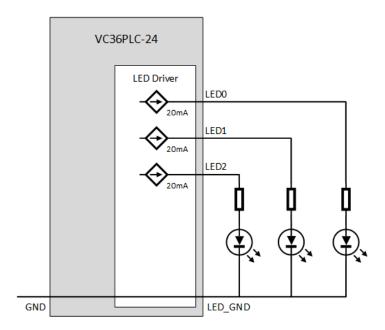


Figure 6-3: LED Outputs Schematic



Caution

The circuit of the LED outputs is designed for the usage of an external LED and a series resistance. Illuminants with internal constant current sources are not supported. Please note that the VC-EVCC has a separate ground pin (pin 4E) for the LED outputs.



6.10 Real Time Clock

An unbuffered real time clock with timer and calendar functions. Alarm and timer functions can additionally trigger a wake-up signal. The FBB ensures that the wake event can be read by the μ C after wake-up.

6.11 200mA High-Side Output



Caution

If the High Side Outputs of the VC-EVCC are used, measures must be taken to ensure a load current greater than 15mA (HSOUT0, HSOUT1) respectively 330mA (HSOUT4).

An appropriate load resistor must be calculated depending on the supply voltage. Otherwise, the VC-EVCC will detect an OpenLoad error which leads to a switch-off of the High Side Output.

If in doubt, please contact the Vector support.

Digital Output for currents up to 200mA, used to drive small loads or as a status output for other ECUs. The outputs have various optional configurations. Each of them can be used as digital or analog inputs as a population variant.

- Nominal voltage: 24V
- Max. current: 200mA
- Switching freq: static on-off / up to 400Hz
- ▶ Diagnostics: Open Load (min. 15mA load required and $V_{Bat} \ge 10V$)

Short to Ground

Short to Battery

6.12 Terminal 15 Signal Input

The VC-EVCC has a Terminal 15 input to wake-up the ECU.

- Nominal voltage: 24V
- Input signal range: 0V...36V
 - Low: ≤ 3.5V

Wake threshold: $> V_{Bat} - 2.5V$

Filter: Lowpass (870Hz corner frequency)

6.13 Core

The Core FBB is defined by the microcontroller the external Watchdog and the supply of the electronics.



 Microcontroller: SPC564B74L7C9EC Up to 120Mhz with a 32-bit e200z4d Power Architecture® core
 3MB Flash and 192KB RAM
 Watchdog: Window Watchdog TPS3813-Q1K33
 Supply: 8 ... 32 VDC

6.14 Sensor Supply

The sensor supply FBB is a 5V high side output for external sensors. It can be switched by the Core.

- Output voltage: 5V ± 3%
- Max current: 70mA

6.15 Miscellaneous

- PCB
 - > 6 layers
 - > PCB size, 120mm x 80mm
 - > No conformal coating
- Quiescent Current (typ. / max.):
 - > Without Inlet
 - 203µA / 324µA
 - > With 4.7kΩ Inlet
 - 994µA / 1,2mA (with Inlet)
 - 3,61mA / 4,10mA (with 1.5k Ω within the charging cable)
 - 11,88mA / 12.53mA (with 100Ω within the charging cable)
 - > With 2.7kΩ Inlet
 - 1,84mA / 2,16mA
 - 4,06mA / 4,58mA (with $1.5k\Omega$ within the charging cable)
 - 11,92mA / 12,57mA (with 100Ω within the charging cable)



7 Mechanical Characteristics

This section describes the housing and connector of the VC-EVCC.

	Material:	Die cast housing: ADC12
		Metal sheet cover: AIMg3 (EN AW 5754)
	Connector:	Molex CMC 36 Hybrid sealed
	Size:	156 x 145 x 40 mm
	Weight:	455g (560g ± 5% including PCB)
•	IP protection class:	IP6K6K / IP6K7 / IP6K9K (not valid for unsealed evaluation hardware)
	Mounting:	23550 mm² / 3 x M6

7.1 Connector

The following table lists the mating connector for the wiring harness and its necessary parts:

Housing	MOLEX, 0643202311	
Wire Cap	MOLEX, 0643201301	
Contacts	MOLEX, 0643221019	0,635mm Terminal 0,35mm ²
	MOLEX, 0643221039	0,635mm Terminal 0,50mm ²
	MOLEX, 0643231029	1,5mm Terminal 1,0mm²
	MOLEX, 0643231039	1,5mm Terminal 2,0mm ²
Blind Plug	MOLEX, 0643251010	0,635mm
	MOLEX, 0643251023	1,5mm

Table 7-1 Mating Connector



Caution

The MOLEX connector does not provide sufficient protection against intruding water. It is recommended by Vector to perform a risk assessment if additional measures are necessary to protect the MOLEX connector.



8 Device Installation

Directly install the device using three M6 hex socket head screws with a minimum engagement length of 7.2 mm. Tighten the installation screws with a torque of M = 9.5 - 11.5 Nm. It is recommended to use spring washers or lock washers to secure the screws.

In general, the following minimum requirements for fastening the VC-EVCC to the vehicle must be observed.

- Screw connection: M6
- Minimum engagement length of 7.2 mm in a steal thread/ nut M6 DIN934
- Strength class screw: 8.8
- ▶ Tightening torque: 9.5 11.5 Nm

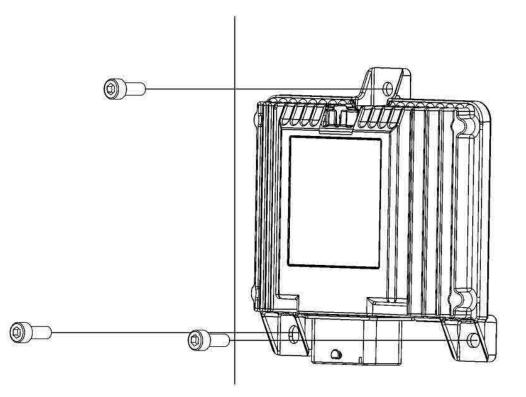


Figure 8-1: Installation



The following illustration shows the recommended installation positions of the VC-EVCC relative to the vehicle coordinate system.

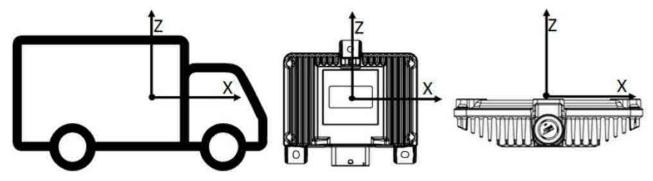


Figure 8-2: Environmental Tested Installation Positions of the VC-EVCC



Note

Please note that all mechanical and environmental tests were performed in the installation positions shown in the figure above. Therefore, all information about qualification of the VC-EVCC is only valid for these installation positions.



9 Support, Aftersales, Return Material and Replacement

For any inquiries of this chapter, please feel free to contact our product experts directly or through your sales representative:

- support@vector.com
- Online via http://vector.com/support/

9.1 Support

Vectors' support for the VC-EVCC is provided free of charge via E-Mail, Phone and Web. All questions related to the product are welcome to be asked.

In case of a technical issue while commissioning the ECU, we may ask you to provide us with your trace file for analyzation. Please share this with us to be able to respond as efficient as possible. Trace files can be shared with Vector in any of the following formats:

- > .asc
- > .blf
- > .mf4
- > .trc
- > .xml
- .pcap / .pcapng
- > .CSV
- > .mat
- > .mdf

If the problems can't be solved online, Vector can provide onsite commissioning. Please contact your sales representative for detailed information.

9.2 Aftersales, Return Material and Replacement

In the unlikely event of a defective ECU, we will support with our aftersales, return material and replacement procedure.

- 1. A support case must be created through the contact forms mentioned at the beginning of this chapter
- 2. Your request will be aligned to a support case with a unique tracking number, e.g. CS1234567. You can follow all details to this case online.
- 3. The technical support verifies whether a return shipment of the controller is necessary. In case of a positive outcome, you will receive a Return Material Allowance.
- 4. With the Return Material Allowance, you will be asked to provide:
 - a. The serial number of the defective device



- b. The delivery note number
- c. The sender's name
- d. An error description
- e. Error protocols and/or error log files

Note: Return shipment will be at your expenses.

5. The defective unit will then be analyzed and reported back to you. After the analysis of the defect at Vector and definition of the next steps, we will either send you the unit back (in case of No Warranty issue) or replace the defective unit. A refund or a credit voucher is not foreseen. Please allow us a maximum of 15 to 20 working days of time between receiving your unit, checking the defects and define the next steps to proceed.

To avoid any delays in the above-mentioned scenario, we recommend holding a replacement unit for series production on your stock.

9.2.1 Warranty Regulation

The warranty regulation is available in the contractual documents.

10 Appendix

10.1 Pin Allocation

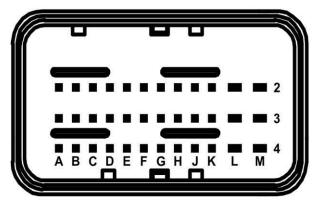


Figure 10-1 Connector Drawing

Pin	Name	Function	Assignment	EV-T1GBIE12 EV-T2GBIE12
2A	PTC0	Analog IN Threshold	PTC AC	AC-Temp + (VT)
2B	VCC_SS	Sensor-Supply 5V	Not Used	-
2C	CAN0_H	High Speed CAN	Diagnostic CAN	-
2D	CAN0_L	High Speed CAN	Diagnostic CAN	-
2E	CAN1_H	High Speed CAN	J1939 Vehicle CAN	-
2F	CAN1_L	High Speed CAN	J1939 Vehicle CAN	-
2G	CAN2_H	High Speed CAN	Not Used	-
2H	CAN2_L	High Speed CAN	Not Used	-
2J	CP	Control Pilot	Control Pilot	CP (WH)
2K	PP	Proximity Pin	Proximity Detection	PP (WHBU)
2L	PE	Protected Earth	PE	PE (GNYE)
2M	GND	ECU Ground	Terminal 31	-
3A	PTC1	Analog IN PT1000	PT1000 DC+	DC-Temp+ (YE)
3B	SS_GND	Analog Ground	GND PT1000	DC-Temp- (YEBN) AC-Temp- (VTBN) GND Pos. FB (BU/YE)
3C	CAN0 SHIELD 0	CAN Shield	Diagnostic CAN	-
3D	CAN0 SHIELD 1	CAN Shield	Diagnostic CAN	-
3E	CAN1_SHIELD 0	CAN Shield	J1939 Vehicle CAN	-
3F	CAN1_SHIELD 1	CAN Shield	J1939 Vehicle CAN	-
3G	CAN2_SHIELD 0	CAN Shield	Not Used	-
3H	CAN2_SHIELD 1	CAN Shield	Not Used	-
ЗJ	HS_OUT0	High Side Out 200mA	High Side Output 0	-
3K	HS_OUT1	High Side Out 200mA	High Side Output 1	-
3L	FB_OUT0	Full Bridge 12V	Plug Lock +	+ (BU/RD)
3M	FB_OUT1	Full Bridge 12V	Plug Lock -	- (BU/BN)
4A	PTC2	Analog IN PT1000	PT1000 DC-	-



4B	POS_FB	Lock Position	Position Detection	(BU/GN)
4C	DIN_GND	DIN Ground	Charging Stop Switch GND	-
4D	DIN	Digital Input	Charging Stop Switch	-
4E	LED_GND	LED Ground	LED GND	-
4F	LED0	LED Output 20mA	Status LED	-
4G	LED1	LED Output 20mA	Status LED	-
4H	LED2	LED Output 20mA	Status LED	-
4J	HS_OUT2	High Side Out 200mA	Generic Switch Input	-
4K	CLAMP 15	Terminal 15 Signal Input	Terminal 15 Wake Input	-
4L	HS_OUT4	High Side Out 5A	High Side Output 4	-
4M	VCC_KL30	ECU Supply	Terminal 30	-

 Table 10-1
 Pin Allocation Table

10.2 CAN Signals and Messages



Reference

An overview of the relevant CAN signals and messages is included in the provided CAN database which can be found in the delivered folder via the following link: Release_3_0_0\CANoe\Database.

10.3 Diagnostic Trouble Codes (DTC)

DTC	SPN	FMI	Fault Source Name	Fault Description
0x00E0E3	7E000	3	Control Pilot	Short to VBat
0x01E0E4	7E001	4	Proximity Pin	Short to GND
0x01E0E3	7E001	3	Proximity Pin	Short to VBat
0x01E0E5	7E001	5	Proximity Pin	Open load
0x01E0E2	7E001	2	Proximity Pin	Out of range
0x02E0E4	7E002	4	Position Feedback	Short to GND
0x02E0E3	7E002	3	Position Feedback	Short to VBat
0x02E0E5	7E002	5	Position Feedback	Open load
0x03E0E6	7E003	6	Full Bridge 12V	Short to GND
0x03E0E3	7E003	3	Full Bridge 12V	Short to VBat
0x03E0E4	7E003	4	Full Bridge 12V	Short between pins
0x03E0E5	7E003	5	Full Bridge 12V	Open load
0x04E0E3	7E004	3	Charging Stop Switch (DIN)	Short to VBat
0x05E0E2*	7E005	2	PTC0	Out of range
0x05E0E4*	7E005	4	PTC0	Short to GND

0x05E0E3*	7E005	3	PTC0	Short to VBat
0x05E0E5*	7E005	5	PTC0	Open load
0x06E0E4*	7E006	4	PTC1	Short to GND
0x06E0E3*	7E006	3	PTC1	Short to VBat
0x06E0E5*	7E006	5	PTC1	Open load
0x07E0E4*	7E007	4	PTC2	Short to GND
0x07E0E3*	7E007	3	PTC2	Short to VBat
0x07E0E5*	7E007	5	PTC2	Open load
0x0EE0EB	7E00E	0B	Diagnostic CAN (CAN0)	Bus off
0x0FE0EB	7E00F	0B	J1939 Vehicle CAN (CAN1)	Bus off
0x20E0E2	7E020	2	VCVCCU_ChargeFromVehicle	Message Timeout
0x20E0EA	7E020	0A	VCVCCU_ChargeFromVehicle	E2E Fault
0x21E0E2	7E021	2	VCVCCU_V2G_EVMaximumCurrentLimit	Message Timeout
0x22E0E2	7E022	2	VCVCCU_V2G_EVMaximumVoltageLimit	Message Timeout
0x23E0E2	7E023	2	VCVCCU_V2G_EVTargetCurrent	Message Timeout
0x24E0E2	7E024	2	VCVCCU_V2G_EVTargetVoltage	Message Timeout
0x25E0E2	7E025	2	VCVCCU_V2G_VehicleStatus	Message Timeout
0x26E0E2*	7E026	2	V2ICP_WrongConfiguration	Wrong Configuration
0x27E0E2*	7E027	2	V2ICP_CommunicationError	Communication Error
0x28E0E2*	7E028	2	VCVCCU_V2ICP_VehicleToBackend_Timeout	Message Timeout
0x29E0E2*	7E029	2	VD_Timeout	Message Timeout
0x2AE0E2*	7E02A	2	Plug and Charge Configuration Error	Wrong Configuration
0x2BE0E2	7E02B	2	Protective Earth (PE) to GND offset	Out of range
0x40E0E2	7E040	2	Hardware Software Incompatibility	Incompatibility
0x41E0E2*	7E041	2	VCVCCU_LIN_EvMaxMinCurrents	Timeout
0x42E0E2*	7E042	2	VCVCCU_LIN_EvMaxVoltageList	Timeout
0x43E0E2*	7E043	2	VCVCCU_LIN_EvMinVoltageList	Timeout
0x44E0E2*	7E044	2	VCVCCU_LIN_EvPresentCurrentList	Timeout
0x45E0E2*	7E045	2	VCVCCU_LIN_EvStatus	Timeout

 Table 10-2
 Diagnostic Trouble Codes

*DTC is only relevant if the feature is activated

11 Glossary and Abbreviations

11.1 Glossary

Term	Description
Functional Building Block	An electronic component representing a specific functionality. It consists not only of the schematic but also of further documentation.

11.2 Abbreviations

Abbreviation	Description
AC	Alternating Current
ADC	Analog to Digital Converter
AUTOSAR	AUTomotive Open System ARchitecture
BMS	Battery Management System
CAN	Controller Area Network
CCS	Combined Charging Standard
.cdd	CANdela Diagnostic Description File
СР	Control Pilot
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
DC	Direct Current
DTC	Diagnostic Trouble Code
ECU	Electronic Control Unit
EVSE	Electric Vehicle Supply Equipment
FBB	Functional Building Block
HS	High Side
HW	Hardware
LED	Light Emitting Diode
LIN	Local Interconnect Network
μC	Microcontroller
PCB	Printed Circuit Board
PE	Protective Earth
PLC	Power Line Communication
PnC	Plug and Charge
PP	Proximity Pin / Plug Present
PTC	Positive Temperature Coefficient
PWM	Pulse-Width Modulation
RAM	Random Access Memory
RTC	Real Time Clock



SID	Service Identifier
SPI	Serial Parallel Interface
UDS	Unified Diagnostic Services
V2G	Vehicle-to-Grid
VAS	Value Added Services
VCU	Vehicle Control Unit
VC-EVCC	Vector Controller – Electric Vehicle Communication Controller



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