



DB2605 EV Charging Evaluation Kit

CCU Simulator Guide

Rev 1.0.3, July 2024

Please read this user manual carefully before use and retain it for future reference.



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1 Preparation

The Dropbeats CCU (Charge Control Unit) Simulator uses a Raspberry Pi as the CCU platform and ssh client MobaXterm to work with the DB2605 EV Charging Controller to simulate a charging session.

1.1 Raspberry Pi Setup

To find the Raspberry Pi IP address, see

<https://raspberrytips.com/find-current-ip-raspberry-pi/>

1.2 Raspberry Pi SSH Connection via MobaXterm

MobaXterm Installation

1. Go to <https://mobaxterm.mobatek.net/download-home-edition.html> and download the MobaXterm Home Edition. Download the Installer Edition, not the Portable Edition.

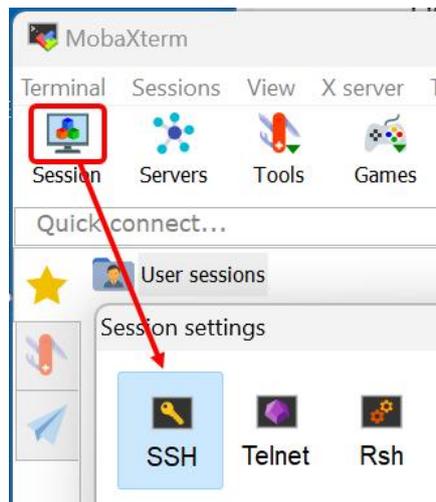




2. Install it as you would any other Windows program
3. Once MobaXterm is installed, start it

Ssh Connection Setup

1. Click the Session icon in the upper left corner



2. Click the SSH icon
3. Enter your Raspberry Pi IP address in the remote host text area, then click OK
4. At the login window, input Raspberry Pi username and password
As default, Username: [dropbeats](#) Password: [db2605](#)

1.3 Pre-installed Image and Tools

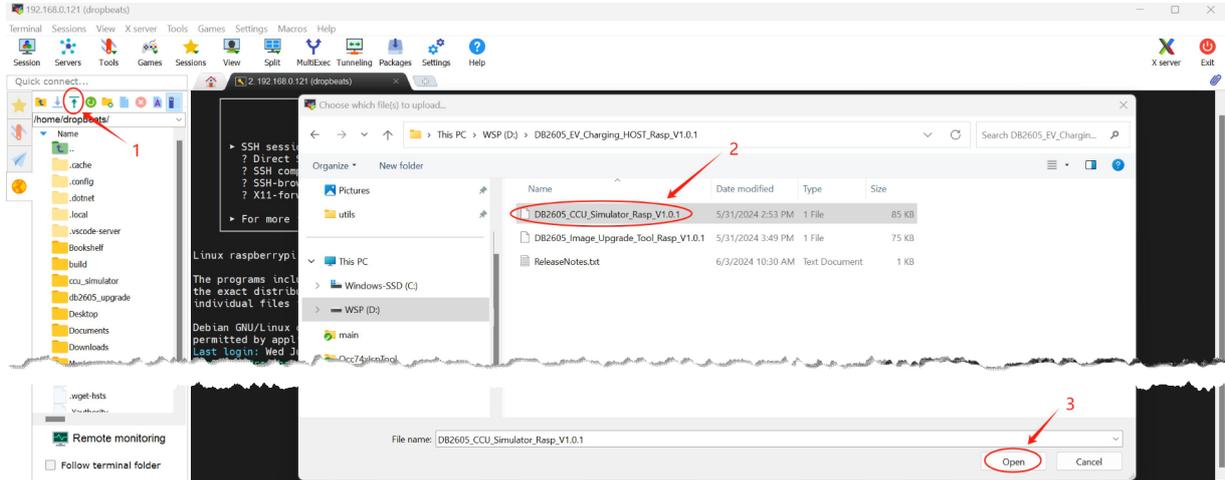
1. CCU Simulator path : [dropbeats/CCU_Simulator/DB2605_CCU_Simulator_Rasp_V1.0.x](#)
2. DB2605 Firmware & File System path : [dropbeats/DB2605/Firmware/DB2605_EV_Charging_FW_GEN_F00_V1.0.x.bin](#)
[DB2605_EV_Charging_FS_GEN_F00_V1.0.x.bin](#)
3. Upgrade Tool path : [dropbeats/DB2605/Upgrade_Tool/DB2605_Image_Upgrade_Tool_Rasp_V1.0.x](#)



1.4 Upgrade CCU Simulator into Raspberry Pi

If new CCU Simulator version is released, the below steps help to upgrade CCU Simulator.

In MobaXterm, click the Upload button (1), select [DB2605_CCU_Simulator_Rasp_V1.0.x](#) (2), and click Open (3).





2 CCU Simulator Usage

2.1 Initial Status

```
Type sudo chmod +x ./DB2605_CCU_Simulator_Rasp_V1.0.x
      sudo ./DB2605_CCU_Simulator_Rasp_V1.0.x
```

The CCU simulator is actively running to facilitate the charging service.

SECC CONNECT	IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
<pre>Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats_DB2605 Evaluation Tool Rasp_V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm</pre>		<pre>SECC CHARGE OUTOFSERVICE SECC CHARGE IDLE SECC CHARGE INIT SECC CHARGE HLC INIT SECC CHARGE HLC INIT2 SECC SLAC CM SLAC PARM SECC SLAC CM START ATTEN CHAR IND SECC SLAC CM MNBC SOUND IND SECC SLAC CM ATTEN CHAR IND SECC SLAC CM VALIDATE SECC SLAC CM SLAC MATCH SECC SLAC DATA LINK DETECT SECC SLAC CM AMP MAP SECC SLAC DATA LINK READY IND ESTBL SECC SLAC DATA LINK READY IND NOLINK SECC SDP SECC DISCOVERY PROTOCOL SECC TCP TLS START SECC TCP TLS ESTABLISHED SECC SAP SUPPORTED APP PROTOCOL SECC TCP TLS TERMINATION SECC NO COMMUNICATION SECC STOP COMMUNICATION SECC IS02 SESSION SETUP SECC IS02 SERVICE DISCOVERY SECC IS02 SERVICE PAYMENT SELECTION SECC IS02 SERVICE DETAIL SECC IS02 CERTIFICATE INSTALLTION SECC IS02 CERTIFICATE UPDATE SECC IS02 PAYMENT DETAILS SECC IS02 AUTHORIZATION SECC IS02 CHARGE PARAMETER DISCOVERY SECC IS02 POWER DELIVERY START SECC IS02 CHARGING STATUS SECC IS02 METERING RECEIPT SECC IS02 POWER DELIVERY STOP SECC IS02 SESSION STOP TERMINATE SECC IS02 POWER DELIVERY RENEGOTIATE SECC IS02 SESSION STOP PAUSE</pre>

Keyboard Main Functions:

- F1:** authorize to start a charge session.
- F2:** shutdown to stop a charge session.

Ribbon Indicators:

- SECC CONNECT/RUN:** Indicates SECC connection to Raspberry Pi.
Changes to "RUN" with Green color if a charge session starts
Initial status: **SECC CONNECT**
- IEC 61851-1 Source:** Indicates whether the IEC 61851-1 source is SECC or CCU.
Default Source: **CCU**



IEC 61851-1 State:	Represents the control pilot state with states A, B, C, D, E, F. Initial status: CP STATE A
Contractors Status:	Shows status as OPENED or CLOSED, indicating the contactors status. Initial status: OPENED
Charging Auth:	Displays EIM UNAUTHORIZED or AUTHORIZED, indicating the authorization status for charging. Initial status: EIM UNAUTHORIZED
Shutdown Status:	Indicates NO SHUTDOWN or NORM SHUTDOWN, showing the shutdown status. Initial status: NO SHUTDOWN
Charging Loop:	Shows TRUE or FALSE, indicating whether the charging loop is active. Initial status: FALSE

Views:

SeccChgSessionState	The signal of the message "SECC_Status". set of states that define the current status of an EV charging session within the SECC(DB2605).
SECC Status	The message, SECC_Status
SECC EvChgLimits	The message, EV charging limits which is indicated in charge parameter discovery.
SECC EvEvccId	The message, EV EVCCID which is indicated in Session Setup.
SECC EvTargets	The message, EV targets which is indicated in charge parameter discovery.
SECC SysInfo	The message, System information of DB2605.
SECC DataTransferRes	The message, the response of data transfer.
CCU Status	The message, CCU_Status
CCU EvseChgLimits	The message, EVSE charging limits.
CCU DataTransferReq	The message, the request of data transfer.

For a detailed definition, please refer to the [DB2605 EV Charging Controller Communication Matrix](#).



2.2 SECC Status View

SECC CONNECT	IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
<pre> Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats_DB2605 Evaluation Tool Rasp V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>	<pre> SeccIec61851Source SeccChgSessionState SeccChgPortStatus SeccChgPortCpState SeccChgPortPpState SeccChgPortPlcModemStatus SeccContactorOpReq SeccCpPwmDutyCycleInfo SeccSleepReq SeccSleepCnf SeccDataTransferRes SeccCpPwmDutyCycleSet SeccChgSessionSelectedCtrlMode SeccChgSessionSlacQuality SeccChgSessionSelectedProtocol SeccChgSessionSelectedPayment SeccChgSessionSelectedSecurity SeccChgSessionMessageInfo TroubleCode TroubleType </pre>	<pre> IEC61851 SOURCE CCU SECC CHARGE IDLE CHARGE PORT UNPLUGGED CP STATE A PP STATE UNKNOWN PLC MODEM SLEEPING CONTACTOR_OP_NO 100.0 % FALSE REJECTED REJECTED CP PWM DUTY CYCLE HUND CTRL MODE DYNAMIC SLAC QUALITY XLNT ISO15118-2 IDENT MODE EIM TCP 0 GENERAL TROUBLE CODE GENERAL TROUBLE TYPE </pre>

- [SeccIec61851Source](#) Indicates the source of the IEC 61851-1 control pilot, proximity pilot generation, and measurement.
[IEC61851_SOURCE_CCU/SECC](#)
- [SeccChgSessionState](#) Indicates the current state of a charge session.
- [SeccChgPortStatus](#) Indicates the charge port status
[CHARGE_PORT_UNKNOWN/UNPLUGGED/PLUGGED/DEPRESSED](#)
In case that IEC61851 source is CCU, this status is the mirror of signal, CcuChgPortStatus of the message CCU_Status
- [SeccChgProtCpStatus](#) Indicates the charge port control pilot status
[PILOT_ST_UNKNOWN/CP_STATE_A/B/C/D/E/F/ERROR](#)
In case that IEC61851 source is CCU, this status is the mirror of signal, CcuChgPortCpStatus of the message CCU_Status.
- [SeccChgPortPpStatus](#) Indicates the charge port proximity pilot status
[PP_STATE_UNKNOWN/DISCONNECTED/CONNECTED/CONNECTED](#)
In case that IEC61851 source is CCU, this status is the mirror of signal, CcuChgPortPpStatus of the message CCU_Status
- [SeccChgPortPlcModemStatus](#) Indicates PLC modem status.



SeccContactorOpReq	PLC_MODEM_SLEEPING/SLEEPING Specifies that SECC requests contactors' operation.
SeccCpPwmDutyCycleInfo	CONTACTOR_OP_NO/CLOSE/OPEN Indicates PWM duty cycle information. 0-100%
SeccSleepReq	Specifies whether SECC requests sleep. True/False
SeccSleepCnf	Indicates SECC response status to sleep. Accepted/Rejected
SeccDataTransferRes	Indicates SECC response status to data transfer. Accepted/Rejected
SeccCpPwmDutyCycleSet	Specifies CCU generates the PWM pulse with defined duty cycle. CP_PWM_DUTY_CYCLE_UNCH/HUND/NOML/FIVE/ZERO
SeccChgSessionSelectedCtrlMode	Indicates the control mode of ISO1511-20 charge session. CTRL_MODE_SCHEDULED/DYNAMIC
SeccChgSessionSlacQuality	Indicates SLAC quality of charge session SLAC_QUALITY_XLNT/GOOD/NORM/POOR
SeccChgSessionSelectedProtocol	Indicates which charge protocol is selected for the current charge session. ISO15118_2/20
SeccChgSessionSelectedPayment	Indicates which payment mean is selected for the current charge session. IDENT_MODE_EIM/PNC
SeccChgSessionSelectedSecurity	Indicates which transport layer protocol is selected for the current charge session. TCP/TLS
SeccChgSessionMessageInfo	Indicates whether and how many messages have been received in each state.
TroubleCode	SECC Diagnostic Trouble Code
TroubleType	SECC Diagnostic Trouble Type



2.3 SECC EV Charge Limits View

SECC CONNECT		IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
Secc ChgSessionState		EvMaxChgCurt	0.0 A
SECC Status		EvMinChgCurt	0.0 A
SECC EvChgLimits		EvMaxVoltage	0.0 V
SECC EvEvccId			
SECC EvTargets			
SECC SysInfo			
SECC DataTransferRes			
CCU Status			
CCU EvseChgLimits			
CCU DataTransferReq			
<p>Dropbeats_DB2605 Evaluation Tool Rasp_V1.0.6</p>			
<p>F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm</p>			

EvMaxChgCurt

Indicates Maximum current supported by the EV per phase.

Unit: A; Rang 0-400

EvMinChgCurt

Indicates that charging below this minimum is not energy/cost efficient for the EV. It is recommended that the SECC considers this value during the target setting process (e.g. sale tariff table should account for this value).

Unit: A; Rang 0-400

EvMaxVoltage

Indicates the RMS of the maximal nominal voltage the vehicle can accept, measured between one phase and neutral.

Unit: V; Rang 0-1000



2.4 SECC EV EVCCID View

SECC CONNECT		IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
Secc ChgSessionState	EvccIdLen	0	
SECC Status	EvccId1	0000000	
SECC EvChgLimits	EvccId2	00000	
SECC EVEvccId			
SECC EVTargets			
SECC SysInfo			
SECC DataTransferRes			
CCU Status			
CCU EvseChgLimits			
CCU DataTransferReq			
Dropbeats_DB2605 Evaluation Tool Rasp_V1.0.6			
F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm			

- EvccIdLen** Indicates EVCCID length. This element shall have a length of six bytes of the MAC address of the EVCC.
Unit: bytes
- EvccId1** Indicates EVCC ID for Organizationally Unique Identifier(OUI).
- EvccId2** Indicates EVCC ID for the rest.



2.5 SECC EV Target View

SECC CONNECT		IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
Secc ChgSessionState	EAMount	0 Wh	
SECC Status	DepartureTimeValid	FALSE	
SECC EvChgLimits	DepartureTime	0	
SECC EvEvccId			
SECC EVTargets			
SECC SysInfo			
SECC DataTransferRes			
CCU Status			
CCU EvseChgLimits			
CCU DataTransferReq			
Dropbeats_DB2605 Evaluation_Tool Rasp_V1.0.6			
F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm			

EAMount

Indicates the amount of energy reflecting the EV's estimate how much energy is needed to fulfill the user configured charging goal for the current charging session.

DepartureTimeValid

Indicates whether the value of Departure Time signal is valid.

True/False

DepartureTime

Indicates when the vehicle intends to finish the charging process. Offset in seconds from the point in time of sending this message.



2.6 SECC System Information View

SECC CONNECT		IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
Secc ChgSessionState	HwMcuChipset	HW MCU QCOM	
SECC Status	HwSecurityModuleBuiltin	HSM NO	
SECC EvChgLimits	HwFlashSize	4M BYTES	
SECC EvEvccId	HwVer	0	
SECC EvTargets	FwMajorVer	0	
SECC SysInfo	FwMinorVer	0	
SECC DataTransferRes	FwBuildVer	0	
CCU Status	EvseMaxCurtConfigured	FALSE	
CCU EvseChgLimits	EvseMaxCurt	0.0 A	
CCU DataTransferReq	PlcModemBootFromHost	FALSE	
	HwSecurityModuleBuiltinUsed	FALSE	
	ChgStandardConfigured	FALSE	
	EnergyTransferModeConfigured	FALSE	
	PpEquipped	FALSE	
	LockEquipped	FALSE	
	EvseNominalVoltageConfigured	FALSE	
	EvseIdConfigured	FALSE	
<p>Dropbeats_DB2605 Evaluation Tool Rasp_V1.0.6</p> <p>F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm</p>			

- HwMcuChipset** Indicates which the MCU chipset is used.
[HW_MCU_QCOM](#)
- HwSecurityModuleBuiltin** Indicates which built-in hardware security module is used.
[HSM_NO/TYPE1/TYPE2/TYPE3](#)
- HwFlashSize** Indicates the Flash size.
[4MBytes/8MBytes](#)
- FwMajorVer** Indicates the firmware version(major).
- FwMinorVer** Indicates the firmware version(minor).
- FwbuildVer** Indicates the firmware version(build).
- EvseMaxCurtConfigured** Indicates whether the EVSE maximal current has been configured.
- EvseMaxCurt** Indicates the EVSE maximal current.
- PlcModemBootFromHost** Indicates the PLC modem boots from Host.
- HwSecurityModuleBuiltinUsed** Indicates the built-in hardware security module is used.
- ChgStandardConfigured** Indicates whether the charge standard has been configured.
- EnergyTransferModeConfigured** Indicates whether energy transfer mode has been configured.
- PpEquipped** Indicates whether the proximity pilot has been equipped, and monitored.



LockEquipped	Indicates whether a locker has been equipped.
EvseNominalVoltageConfigured	Indicates whether EVSE nominal voltage has been configured.
EvseIdConfigured	Indicates whether EVSE ID has been configured.

2.7 SECC Data Transfer Response View

SECC CONNECT		IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
<pre> Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats_DB2605 Evaluation Tool Rasp V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>	<pre> VendorId 0 Type GENERAL INFO Index 0 Operation NO OPERATION Status REJECTED </pre>		

VendorID	Indicates data transfer vendor id.
Type	Indicates data transfer type.
Index	Indicates data transfer index.
Operation	Indicates data transfer operation.
Status	Indicates data transfer response operation status. Accepted/Rejected/unknownVendorId/unknownType/unknownIdx/unknownOp/Ongoing /Completed /Failed



2.8 CCU Status View

SECC CONNECT	IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
Secc ChgSessionState	CcuChgPortOcpd	CHARGE PORT AC SINGLE PHASE CORE
SECC Status	CcuChgPortStandard	CCS1
SECC EvChgLimits	CcuChgPaymentMode	IDENT MODE EIM
SECC EvVccId	CcuChgProtocol	PROT BC ISO2
SECC EvTargets	CcuChgBptControlMode	NOT SUPPORTED
SECC SysInfo	CcuChgSessionSeq	NOT SUPPORTED
SECC DataTransferRes	CcuChgSessionPauseResumeTri	FALSE
CCU Status	CcuChgSessionAuth	EIM UNAUTHORIZED
CCU EvseChgLimits	CcuChgSessionStop	NO SHUTDOWN
CCU DataTransferReq	CcuChgSessionRenegoTri	FALSE
	CcuChgPortLockStatus	OPENED
	CcuChgPortContactorStatus	OPENED
	CcuChgPortRcdStatus	FALSE
	CcuChgPortPpEquipped	FALSE
	CcuChgPortMaxCurt	32.0 A
	CcuChgPortStatus	CHARGE PORT UNPLUGGED
	CcuChgPortCpState	CP STATE A
	CcuChgPortPpState	PP STATE UNKNOWN
	CcuSleepReq	FALSE
	CcuDataTransferReq	FALSE
	CcuPwmDutyInfo	100.0 %
	TroubleCode	CCU NO TROUBLE
<p>Dropbeats_DB2605 Evaluation_Tool Rasp_V1.0.6</p> <p>F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm</p>		

- CcuChgPortOcpd** Specifies whether and which type power occupies the charge port.
[CHARGE_PORT_UNOCCUPIED/AC_SINGLE_PHASE_CORE/AC_THREE_PHASE_CORE_CASE_B/EXTENDED](#)
- CcuChgPortStandard** Specifies the charge standard.
[CCS1/CCS2](#)
- CcuChgPaymentMode** Specifies the charge payment mode.
[IDENT_MODE_EIM/IDENT_MODE_PNC/IDENT_MODE_BOTH](#)
- CcuChgProtocol** Specifies the charge protocol.
[PROT_BC_ISO2](#)
- CcuChgBptControlMode** Specifies Scheduled or/and Dynamic control mode
[NOT_SUPPORTED/ CTRL_MODE_SCHEDULED /CTRL_MODE_DYNAMIC/CTRL_MODE_SCHEDULED_DYNAMIC](#)
- CcuChgSessionSeq** Indicates CCU charge session sequence. This shall be provided by CCU. As default:
[Not Supported](#)
- CcuChgSessionPauseResumeTri** Specifies whether CCU Triggers resume from pause.



	True/False
CcuChgSessionAuth	Specifies the charging session authorization status. EIM_UNAUTHORIZED/EIM_AUTHORIZED/FREE_SERVICE
CcuChgSessionStop	Specifies the charging session stop actions. NO_SHUTDOWN/NORM_SHUTDOWN/EMGY_SHUTDOWN/OTHS_SHUTDOWN
CcuChgSessionRenegoTri	Specifies whether CCU Triggers Renegotiation. True/False
CcuChgPortLockStatus	Specifies the locker status in case of that Locker is equipped. OPENED/COLSED
CcuChgPortContactorStatus	Specifies the Contactor's status. OPENED/COLSED
CcuChgPortRcdStatus	Specifies the current status of the Residual Current Device (RCD). If RCD is equal to true, the RCD has detected an error. If RCD is equal to false, the RCD has not detected an error. This status flag is for informational purpose only. True/False
CcuChgPortPpEquipped	Specifies whether the proximity pilot is equipped or not. True/False
CcuChgPortMaxCurt	Specifies the charge port maximal current. 6-80A
CcuChgPortStatus	Indicates the charge port status CHARGE_PORT_UNKNOWN/UNPLUGGED/PLUGGED/DEPRESSED In case that IEC61851 source is SECC, this status shall be the mirror of signal, SeccChgPortStatus of the message SECC_Status
CcuChgPortCpState	Indicates the charge port control pilot status PILOT_ST_UNKNOWN/CP_STATE_A/B/C/D/E/F/ERROR In case that IEC61851 source is SECC, this status shall be the mirror of signal, SeccChgPortCpStatus of the message SECC_Status.
CcuChgPortPpState	Indicates the charge port proximity pilot status PP_STATE_UNKNOWN/DISCONNECTED/CONNECTED/CONNECTED In case that IEC61851 source is SECC, this status shall be the mirror of signal, SeccChgPortPpStatus of the message SECC_Status.
CcuSleepReq	Specifies the CCU requests to sleep. True/False
CcuDataTransferReq	Specifies the CCU requests data transfer. True/False
CcuCpPwmDutyCycleInfo	Indicates PWM duty cycle information in case of that IEC 61851-1 source is CCU. 0-100%
TroubleCode	CCU trouble codes.

Most of items could be modified by “left” key and then “enter” key.



2.10 CCU Data Transfer Request View

SECC CONNECT		IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
Secc ChgSessionState	SendFlag		FALSE
SECC Status	VendorId		0
SECC EvChgLimits	Type		PLC MODEM PIB FILE
SECC EvEvccId	Index		5
SECC EvTargets	Operation		NO OPERATION
SECC SysInfo			
SECC DataTransferRes			
CCU Status			
CCU EvseChgLimits			
CCU DataTransferReq			
<p>Dropbeats DB2605 Evaluation Tool Rasp V1.0.6</p> <p>F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm</p>			

SendFlag	Send Flag
VendorID	Indicates data transfer vendor id.
Type	Indicates data transfer type.
Index	Indicates data transfer index.
Operation	Indicates data transfer operation.

For a detailed definition of [VendorID](#), [Type](#), [Index](#) and [Operation](#), please refer to the [DB2605 EV Charging Controller Communication Matrix](#).

After configuring [VendorID](#), [Type](#), [Index](#), [Operation](#), and then changing [SendFlag](#) to [True](#), the operation actions will be done.



3 User Cases

3.1 First Plug in, Then Authorize

In this user case, the charging session starts with physically connecting the electric vehicle (EV) to the charging system before initiating authorization. Here is a detailed description of the steps:

1. Plug In

- User begins by switching **SW1 ON** on the Vehicle Coupler board to simulate plugging in the EV.
- The system detects the connection, updating the “**IEC 61851-1 State**” to “**CP_STATE_B**”, indicating that the EV is connected and awaiting further instructions to begin charging.
- Successful periods and messages on the system interface change to green, confirming that the charging process is active.

RUN	IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE B Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
<pre> Secc_ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats DB2605 Evaluation Tool Rasp V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>		<pre> SECC CHARGE OUTOFSERVICE SECC CHARGE IDLE SECC CHARGE INIT SECC CHARGE HLC INIT SECC CHARGE HLC INIT2 SECC SLAC CM SLAC PARM SECC SLAC CM START ATTEN CHAR IND SECC SLAC CM MNBC SOUND IND SECC SLAC CM ATTEN CHAR IND SECC SLAC CM VALIDATE SECC SLAC CM SLAC MATCH SECC SLAC DATA LINK DETECT SECC SLAC CM AMP MAP SECC SLAC DATA LINK READY IND ESTBL SECC SLAC DATA LINK READY IND NOLINK SECC SDP SECC DISCOVERY PROTOCOL SECC TCP TLS START SECC TCP TLS ESTABLISHED SECC SAP SUPPORTED APP PROTOCOL SECC TCP TLS TERMINATION SECC NO COMMUNICATION SECC STOP COMMUNICATION SECC IS02 SESSION SETUP SECC IS02 SERVICE DISCOVERY SECC IS02 SERVICE PAYMENT SELECTION SECC IS02 SERVICE DETAIL SECC IS02 CERTIFICATE INSTALLTION SECC IS02 CERTIFICATE UPDATE SECC IS02 PAYMENT DETAILS SECC IS02 AUTHORIZATION SECC IS02 CHARGE PARAMETER DISCOVERY SECC IS02 POWER DELIVERY START SECC IS02 CHARGING STATUS SECC IS02 METERING RECEIPT SECC IS02 POWER DELIVERY STOP SECC IS02 SESSION STOP TERMINATE SECC IS02 POWER DELIVERY RENEGOTIATE SECC IS02 SESSION STOP PAUSE </pre>



2. Authorize to start charging

- User then presses **F1** to authorize and start the charging session.
- The system updates the “Charging Auth” status to “EIM AUTHORIZED”, confirming that the EV has been successfully authorized to begin charging.
- At this point, the “Contactors” remain “OPENED” and the “Charging Loop” status is “FALSE” since the actual charging process has not started yet.

RUN	IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE B Charging Auth: EIM AUTHORIZED Charging Loop: FALSE
-----	--	--

<pre> Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats_DB2605 Evaluation Tool Rasp_V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>		<pre> SECC CHARGE OUTFSERVICE SECC CHARGE IDLE SECC CHARGE INIT SECC CHARGE HLC INIT SECC CHARGE HLC INIT2 SECC SLAC CM SLAC PARM SECC SLAC CM START ATTEN CHAR IND SECC SLAC CM MNBC SOUND IND SECC SLAC CM ATTEN CHAR IND SECC SLAC CM VALIDATE SECC SLAC CM SLAC MATCH SECC SLAC DATA LINK DETECT SECC SLAC CM AMP MAP SECC SLAC DATA LINK READY IND ESTBL SECC SLAC DATA LINK READY IND NOLINK SECC SDP SECC DISCOVERY PROTOCOL SECC TCP TLS START SECC TCP TLS ESTABLISHED SECC SAP SUPPORTED APP PROTOCOL SECC TCP TLS TERMINATION SECC NO COMMUNICATION SECC STOP COMMUNICATION SECC IS02 SESSION SETUP SECC IS02 SERVICE DISCOVERY SECC IS02 SERVICE PAYMENT SELECTION SECC IS02 SERVICE DETAIL SECC IS02 CERTIFICATE INSTALLTION SECC IS02 CERTIFICATE UPDATE SECC IS02 PAYMENT DETAILS SECC IS02 AUTHORIZATION SECC IS02 CHARGE PARAMETER DISCOVERY SECC IS02 POWER DELIVERY START SECC IS02 CHARGING STATUS SECC IS02 METERING RECEIPT SECC IS02 POWER DELIVERY STOP SECC IS02 SESSION STOP TERMINATE SECC IS02 POWER DELIVERY RENEGOTIATE SECC IS02 SESSION STOP PAUSE </pre>
--	--	---



3. Begin Charging Session

- After pressing **F1**, the charging session starts automatically.
- The “IEC 61851-1 State” transitions to “CP_STATE_C”, indicating that the vehicle is ready to receive power.
- The system closes the “Contactors”, and the “Charging Loop” status updates to “TRUE”, showing that charging is in progress.
- Additionally, the “SECC ISO2/20 CHARGING STATUS” shows that the system is in the V2G charging loop period.
- Notes: The “Contactors” are automatically changed to “CLOSE” status in simulator.

RUN	IEC 61851-1 Source: CCU Contactors Status: CLOSED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE C Charging Auth: EIM AUTHORIZED Charging Loop & Time: TRUE 00:01:18
<pre> Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats DB2605 Evaluation Tool Rasp V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>		<pre> SECC CHARGE OUTOFSERVICE SECC CHARGE IDLE SECC CHARGE INIT SECC CHARGE HLC INIT SECC CHARGE HLC INIT2 SECC SLAC CM SLAC PARM SECC SLAC CM START ATTEN CHAR IND SECC SLAC CM MNBC SOUND IND SECC SLAC CM ATTEN CHAR IND SECC SLAC CM VALIDATE SECC SLAC CM SLAC MATCH SECC SLAC DATA LINK DETECT SECC SLAC CM AMP MAP SECC SLAC DATA LINK READY IND ESTBL SECC SLAC DATA LINK READY IND NOLINK SECC SDP SECC DISCOVERY PROTOCOL SECC TCP TLS START SECC TCP TLS ESTABLISHED SECC SAP SUPPORTED APP PROTOCOL SECC TCP TLS TERMINATION SECC NO COMMUNICATION SECC STOP COMMUNICATION SECC ISO2 SESSION SETUP SECC ISO2 SERVICE DISCOVERY SECC ISO2 SERVICE PAYMENT SELECTION SECC ISO2 SERVICE DETAIL SECC ISO2 CERTIFICATE INSTALLTION SECC ISO2 CERTIFICATE UPDATE SECC ISO2 PAYMENT DETAILS SECC ISO2 AUTHORIZATION SECC ISO2 CHARGE PARAMETER DISCOVERY SECC ISO2 POWER DELIVERY START SECC ISO2 CHARGING STATUS SECC ISO2 METERING RECEIPT SECC ISO2 POWER DELIVERY STOP SECC ISO2 SESSION STOP TERMINATE SECC ISO2 POWER DELIVERY RENEGOTIATE SECC ISO2 SESSION STOP PAUSE </pre>



4. Stop Charging

- User presses **F2** to stop the charging process.
- The system responds by changing the “IEC 61851-1 State” back to “CP_STATE_B”, indicating that the EV is no longer ready to charge.
- The “Contactors” open, and the “Charging Loop” status returns to “FALSE”.
- The “Charging Auth” status is updated to “EIM UNAUTHORIZED”, indicating that the EV is no longer authorized for charging.

```

RUN
IEC 61851-1 Source: CCU
Contactors Status: OPENED
Shutdown Status: NO SHUTDOWN
IEC 61851-1 State: CP STATE B
Charging Auth: EIM UNAUTHORIZED
Charging Loop: FALSE

Secc ChgSessionState
SECC Status
SECC EvChgLimits
SECC EvEvccId
SECC EvTargets
SECC SysInfo
SECC DataTransferRes
CCU Status
CCU EvseChgLimits
CCU DataTransferReq

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F1: authorize
F2: shutdown
↑ : up
↓ : down
← : left
→ : right
q : return or exit
Enter : confirm

SECC CHARGE OUTOFSERVICE
SECC CHARGE IDLE
SECC CHARGE INIT
SECC CHARGE WAITFOR PLUGOUT
```



5. Plug Out

- Finally, user switches **SW1 OFF** on the Vehicle Coupler board to simulate unplugging the EV.
- The simulator transitions to “**SECC CHARGE IDLE**”, resetting all parameters and indicating that the system is now idle and ready for the next charging session.

SECC CONNECT	IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM UNAUTHORIZED Charging Loop: FALSE
<pre> Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats_DB2605 Evaluation_Tool Rasp_V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>		<pre> SECC CHARGE OUTFSERVICE SECC CHARGE IDLE SECC CHARGE INIT SECC CHARGE HLC INIT SECC CHARGE HLC INIT2 SECC SLAC CM SLAC PARM SECC SLAC CM START ATTEN CHAR IND SECC SLAC CM MNBC SOUND IND SECC SLAC CM ATTEN CHAR IND SECC SLAC CM VALIDATE SECC SLAC CM SLAC MATCH SECC SLAC DATA LINK DETECT SECC SLAC CM AMP MAP SECC SLAC DATA LINK READY IND ESTBL SECC SLAC DATA LINK READY IND NOLINK SECC SDP SECC DISCOVERY PROTOCOL SECC TCP TLS START SECC TCP TLS ESTABLISHED SECC SAP SUPPORTED APP PROTOCOL SECC TCP TLS TERMINATION SECC NO COMMUNICATION SECC STOP COMMUNICATION SECC IS02 SESSION SETUP SECC IS02 SERVICE DISCOVERY SECC IS02 SERVICE PAYMENT SELECTION SECC IS02 SERVICE DETAIL SECC IS02 CERTIFICATE INSTALLTION SECC IS02 CERTIFICATE UPDATE SECC IS02 PAYMENT DETAILS SECC IS02 AUTHORIZATION SECC IS02 CHARGE PARAMETER DISCOVERY SECC IS02 POWER DELIVERY START SECC IS02 CHARGING STATUS SECC IS02 METERING RECEIPT SECC IS02 POWER DELIVERY STOP SECC IS02 SESSION STOP TERMINATE SECC IS02 POWER DELIVERY RENEGOTIATE SECC IS02 SESSION STOP PAUSE </pre>



3.2 First Authorize, Then Plug in

In this user case, the charging session begins with authorization before physically connecting the electric vehicle (EV) to the charging system. Here is a detailed description of the steps:

1. Authorize to start charging session

- User presses **F1** to initiate the authorization process.
- The system updates the “Charging Auth” status to “EIM AUTHORIZED”, indicating that the EV has been successfully authorized to begin charging.
- At this point, the “IEC 61851-1 State” remain “CP_STATE_A”, as the EV is not yet physically connected.

SECC CONNECT	IEC 61851-1 Source: CCU Contactors Status: OPENED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE A Charging Auth: EIM AUTHORIZED Charging Loop: FALSE
<pre> Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats_DB2605 Evaluation Tool Rasp V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>		<pre> SECC CHARGE OUTOFSERVICE SECC CHARGE IDLE SECC CHARGE INIT SECC CHARGE HLC INIT SECC CHARGE HLC INIT2 SECC SLAC CM SLAC PARM SECC SLAC CM START ATTEN CHAR IND SECC SLAC CM MNBC SOUND IND SECC SLAC CM ATTEN CHAR IND SECC SLAC CM VALIDATE SECC SLAC CM SLAC MATCH SECC SLAC DATA LINK DETECT SECC SLAC CM AMP MAP SECC SLAC DATA LINK READY IND ESTBL SECC SLAC DATA LINK READY IND NOLINK SECC SDP SECC DISCOVERY PROTOCOL SECC TCP TLS START SECC TCP TLS ESTABLISHED SECC SAP SUPPORTED APP PROTOCOL SECC TCP TLS TERMINATION SECC NO COMMUNICATION SECC STOP COMMUNICATION SECC ISO2 SESSION SETUP SECC ISO2 SERVICE DISCOVERY SECC ISO2 SERVICE PAYMENT SELECTION SECC ISO2 SERVICE DETAIL SECC ISO2 CERTIFICATE INSTALLTION SECC ISO2 CERTIFICATE UPDATE SECC ISO2 PAYMENT DETAILS SECC ISO2 AUTHORIZATION SECC ISO2 CHARGE PARAMETER DISCOVERY SECC ISO2 POWER DELIVERY START SECC ISO2 CHARGING STATUS SECC ISO2 METERING RECEIPT SECC ISO2 POWER DELIVERY STOP SECC ISO2 SESSION STOP TERMINATE SECC ISO2 POWER DELIVERY RENEGOTIATE SECC ISO2 SESSION STOP PAUSE </pre>



2. Plug In

- User then switches **SW1 ON** on the Vehicle Coupler board to simulate plugging in the EV.
- The system detects the connection, changing the “IEC 61851-1 State” to “CP_STATE_B”, which indicates that EV is connected and ready to begin charging.

```

RUN
IEC 61851-1 Source: CCU
Contactors Status: OPENED
Shutdown Status: NO SHUTDOWN
IEC 61851-1 State: CP STATE B
Charging Auth: EIM AUTHORIZED
Charging Loop: FALSE

Secc ChgSessionState
SECC Status
SECC EvChgLimits
SECC EvEvccId
SECC EvTargets
SECC SysInfo
SECC DataTransferRes
CCU Status
CCU EvseChgLimits
CCU DataTransferReq

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F1: authorize
F2: shutdown
↑ : up
↓ : down
← : left
→ : right
q : return or exit
Enter : confirm

SECC CHARGE OUTFSERVICE
SECC CHARGE IDLE
SECC CHARGE INIT
SECC CHARGE HLC INIT
SECC CHARGE HLC INIT2
SECC SLAC CM SLAC PARM
SECC SLAC CM START ATTEN CHAR IND
SECC SLAC CM MNBC SOUND IND
SECC SLAC CM ATTEN CHAR IND
SECC SLAC CM VALIDATE
SECC SLAC CM SLAC MATCH
SECC SLAC DATA LINK DETECT
SECC SLAC CM AMP MAP
SECC SLAC DATA LINK READY IND ESTBL
SECC SLAC DATA LINK READY IND NOLINK
SECC SDP SECC DISCOVERY PROTOCOL
SECC TCP TLS START
SECC TCP TLS ESTABLISHED
SECC SAP SUPPORTED APP PROTOCOL
SECC TCP TLS TERMINATION
SECC NO COMMUNICATION
SECC STOP COMMUNICATION
SECC IS02 SESSION SETUP
SECC IS02 SERVICE DISCOVERY
SECC IS02 SERVICE PAYMENT SELECTION
SECC IS02 SERVICE DETAIL
SECC IS02 CERTIFICATE INSTALLTION
SECC IS02 CERTIFICATE UPDATE
SECC IS02 PAYMENT DETAILS
SECC IS02 AUTHORIZATION
SECC IS02 CHARGE PARAMETER DISCOVERY
SECC IS02 POWER DELIVERY START
SECC IS02 CHARGING STATUS
SECC IS02 METERING RECEIPT
SECC IS02 POWER DELIVERY STOP
SECC IS02 SESSION STOP TERMINATE
SECC IS02 POWER DELIVERY RENEGOTIATE
SECC IS02 SESSION STOP PAUSE
```



3. Begin charging session

- Once EV is plugged in, the charging session continues automatically.
- The “IEC 61851-1 State” transitions to “CP_STATE_C”, signaling that the EV is ready to receive power.
- The system then closes the “Contactors”, and the “Charging Loop” status updates to “TRUE”, indicating that charging is in progress.
- Additionally, the “SECC ISO2/20 CHARGING STATUS” shows that the system is in the V2G charging loop period.

RUN	IEC 61851-1 Source: CCU Contactors Status: CLOSED Shutdown Status: NO SHUTDOWN	IEC 61851-1 State: CP STATE C Charging Auth: EIM AUTHORIZED Charging Loop & Time: TRUE 00:01:18
<pre> Secc ChgSessionState SECC Status SECC EvChgLimits SECC EvEvccId SECC EvTargets SECC SysInfo SECC DataTransferRes CCU Status CCU EvseChgLimits CCU DataTransferReq Dropbeats_DB2605 Evaluation Tool Rasp_V1.0.6 F1: authorize F2: shutdown ↑ : up ↓ : down ← : left → : right q : return or exit Enter : confirm </pre>		<pre> SECC CHARGE OUTOFSERVICE SECC CHARGE IDLE SECC CHARGE INIT SECC CHARGE HLC INIT SECC CHARGE HLC INIT2 SECC SLAC CM SLAC PARM SECC SLAC CM START ATTEN CHAR IND SECC SLAC CM MNBC SOUND IND SECC SLAC CM ATTEN CHAR IND SECC SLAC CM VALIDATE SECC SLAC CM SLAC MATCH SECC SLAC DATA LINK DETECT SECC SLAC CM AMP MAP SECC SLAC DATA LINK READY IND ESTBL SECC SLAC DATA LINK READY IND NOLINK SECC SDP SECC DISCOVERY PROTOCOL SECC TCP TLS START SECC TCP TLS ESTABLISHED SECC SAP SUPPORTED APP PROTOCOL SECC TCP TLS TERMINATION SECC NO COMMUNICATION SECC STOP COMMUNICATION SECC ISO2 SESSION SETUP SECC ISO2 SERVICE DISCOVERY SECC ISO2 SERVICE PAYMENT SELECTION SECC ISO2 SERVICE DETAIL SECC ISO2 CERTIFICATE INSTALLTION SECC ISO2 CERTIFICATE UPDATE SECC ISO2 PAYMENT DETAILS SECC ISO2 AUTHORIZATION SECC ISO2 CHARGE PARAMETER DISCOVERY SECC ISO2 POWER DELIVERY START SECC ISO2 CHARGING STATUS SECC ISO2 METERING RECEIPT SECC ISO2 POWER DELIVERY STOP SECC ISO2 SESSION STOP TERMINATE SECC ISO2 POWER DELIVERY RENEGOTIATE SECC ISO2 SESSION STOP PAUSE </pre>



4. Stop Charging

- User presses **F2** to stop the charging session.
- The system responds by changing the “IEC 61851-1 State” back to “CP_STATE_B”, showing that the EV is no longer ready to charge.
- The “Contactors” open, and the “Charging Loop” status returns to “FALSE”.

```

RUN
IEC 61851-1 Source: CCU
Contactors Status: OPENED
Shutdown Status: NORM SHUTDOWN
IEC 61851-1 State: CP STATE B
Charging Auth: EIM AUTHORIZED
Charging Loop: FALSE

Secc ChgSessionState
SECC Status
SECC EvChgLimits
SECC EvEvccId
SECC EvTargets
SECC SysInfo
SECC DataTransferRes
CCU Status
CCU EvseChgLimits
CCU DataTransferReq

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F1: authorize
F2: shutdown
↑ : up
↓ : down
← : left
→ : right
q : return or exit
Enter : confirm

SECC CHARGE OUTOFSERVICE
SECC CHARGE IDLE
SECC CHARGE INIT
SECC CHARGE HLC INIT
SECC CHARGE HLC INIT2
SECC SLAC CM SLAC PARM
SECC SLAC CM START ATTEN CHAR IND
SECC SLAC CM MNBC SOUND IND
SECC SLAC CM ATTEN CHAR IND
SECC SLAC CM VALIDATE
SECC SLAC CM SLAC MATCH
SECC SLAC DATA LINK DETECT
SECC SLAC CM AMP MAP
SECC SLAC DATA LINK READY IND ESTBL
SECC SLAC DATA LINK READY IND NOLINK
SECC SDP SECC DISCOVERY PROTOCOL
SECC TCP TLS START
SECC TCP TLS ESTABLISHED
SECC SAP SUPPORTED APP PROTOCOL
SECC TCP TLS TERMINATION
SECC NO COMMUNICATION
SECC STOP COMMUNICATION
SECC ISO2 SESSION SETUP
SECC ISO2 SERVICE DISCOVERY
SECC ISO2 SERVICE PAYMENT SELECTION
SECC ISO2 SERVICE DETAIL
SECC ISO2 CERTIFICATE INSTALLTION
SECC ISO2 CERTIFICATE UPDATE
SECC ISO2 PAYMENT DETAILS
SECC ISO2 AUTHORIZATION
SECC ISO2 CHARGE PARAMETER DISCOVERY
SECC ISO2 POWER DELIVERY START
SECC ISO2 CHARGING STATUS
SECC ISO2 METERING RECEIPT
SECC ISO2 POWER DELIVERY STOP
SECC ISO2 SESSION STOP TERMINATE
SECC ISO2 POWER DELIVERY RENEGOTIATE
SECC ISO2 SESSION STOP PAUSE
```

5. Plug Out

- Finally, user switches **SW1 OFF** on the Vehicle Coupler board to simulate unplugging the EV.
- The simulator transitions to “SECC CHARGE IDLE”, resetting all parameters and indicating that the system is now idle and ready for the next charging session.



3.3 EV initiates shutdown

When the system is in the [Charging Loop](#), press "STOP" button on panel of Kits to shutdown.



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Revision History

Revision	Date	Descriptions
1.0.0	2024.5.31	Initial
1.0.1	2024.6.4	Changed "DB2605 module" to "DB2605 EV Charging Controller"
1.0.2	2024.7.8	Updated user case
1.0.3	2024.7.18	Added views and updated user cases