



SURFACE VEHICLE RECOMMENDED PRACTICE

J3068™/1

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Identification of Vehicles and Supply Equipment for Conductive AC Charging

RATIONALE

SAE J3068/1 is an optional addition to SAE J3068 that adds a new Protocol Version (definitions of signals and the associated logical rules) to SAE J3068 to add identification of vehicle and of supply equipment, and affiliation between the vehicle and supply equipment, for applications that are physically secure, such as at home or at a fleet facility ("behind the fence"). It adds monitoring and diagnostic data, and also communication of information required to ensure that a vehicle will have sufficient energy at the time of the next planned departure.

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1. SCOPE

This document is an optional addition to SAE J3068 that adds additional communications (using LIN-CP) between the EV and SE that provide capabilities valuable to commercial fleets. These include the ability of the EV and SE to exchange unique identifiers, to establish which EV is connected to which SE, and to specify requirements for the next trip.

2. REFERENCES

2.1 General

This recommended practice adds additional functionality to SAE J3068 and will, where possible, refer to that document to reduce the potential for conflicting information. However, for completeness, all documents referenced by SAE J3068 are listed here.

All requirements are given level-four section numbers and appear in the text. [APPENDIX C](#) summarizes only the requirements (with links to explanatory text in context) to assist verification planning.

2.2 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1772 SAE Electric Vehicle and Plug In Hybrid Electric Vehicle Conductive Charge Coupler

SAE J2012 Diagnostic Trouble Code Definitions

SAE J3068 Electric Vehicle Power Transfer System Using a Three-Phase Capable Coupler

2.2.2 IEEE Publications

Available from IEEE Operations Center, 445 and 501 Hoes Lane, Piscataway, NJ 08854-4141, Tel: 732-981-0060, www.ieee.org.

IEEE 802.3 IEEE Standard for Ethernet

2.2.3 ISO Publications

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

Copies of these documents are also available online from ANSI Accredited Publications at <https://webstore.ansi.org/>.

ISO/IEC 13239 Information technology – Telecommunications and information exchange between systems – High-level data link control (HDLC) procedures

ISO 17987-1 Road vehicles – Local Interconnect Network (LIN) – Part 1: General information and use case definition

ISO 17987-2 Road vehicles – Local Interconnect Network (LIN) – Part 2: Transport protocol and network layer services

ISO 17987-3 Road vehicles – Local Interconnect Network (LIN) – Part 3: Protocol and specification

ISO 17987-4 Road vehicles – Local Interconnect Network (LIN) – Part 4: Electrical physical layer (ECU specification 12 V/24 V)

- ISO/TR 17987-5 Road vehicles – Local Interconnect Network (LIN) – Part 5: Application programmers interface (API)
- ISO 17987-6 Road vehicles – Local Interconnect Network (LIN) – Part 6: Protocol conformance test specification
- ISO 17987-7 Road vehicles – Local Interconnect Network (LIN) – Part 7: Electrical Physical Layer (EPL) conformance test specification

2.3 Related Publications

The following publications are provided for information purposes only and are not a required part of this recommended practice.

2.3.1 German Institute for Standardisation (DIN) Publications

Available from DIN Deutsches Institut für Normung e. V., Am DIN-Platz, Burggrafenstraße 6, 10787 Berlin, Germany, Tel: +49 30 2601-0, www.din.de.

- DIN Spec 70121 Electromobility – Digital communication between a d.c. EV charging station and an electric vehicle for control of d.c. charging in the Combined Charging System

2.3.2 IEC Publications

Available from IEC Central Office, 3, rue de Verambe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, Tel: +41 22 919 02 11, www.iec.ch.

- IEC 61851-1 Electric vehicle conductive charging system – Part 1: General requirements
- IEC 62196-2 Plugs, Socket-Outlets, Vehicle Connectors and Vehicle Inlets – Conductive Charging of Electric Vehicles – Part 2: Dimensional Compatibility and Interchangeability Requirements for AC Pin and Contact-Tube Accessories
- IEC 62196-3 Plugs, Socket-Outlets, Vehicle Connectors and Vehicle Inlets – Conductive Charging of Electric Vehicles – Part 3: Dimensional Compatibility and Interchangeability Requirements for DC and AC/DC Pin and Contact-Tube Vehicle Couplers

2.3.3 IEEE Publications

Available from IEEE Operations Center, 445 and 501 Hoes Lane, Piscataway, NJ 08854-4141, Tel: 732-981-0060, www.ieee.org.

- IEEE 802.11 IEEE Standard for Information Technology – Telecommunications and Information Exchange between Systems – Local and Metropolitan Area Networks--Specific Requirements – Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications
- IEEE 1547 IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces
- IEEE 2030.5 IEEE Standard for Smart Energy Profile Application Protocol

2.3.4 ISO Publications

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

Copies of these documents are also available online from ANSI Accredited Publications at <https://webstore.ansi.org/>.

- ISO 3779 Road vehicles – Vehicle identification number (VIN) – Content and structure

ISO 15031-6	Road vehicles – Communication Between Vehicle and External Equipment for Emissions-Related Diagnostics – Part 6: Diagnostic Trouble Code Definitions
ISO 15118-2	Road vehicles – Vehicle-to-Grid Communication Interface – Part 2: Network and application protocol requirements
ISO 15118-3	Road vehicles – Vehicle to grid communication interface – Part 3: Physical and data link layer requirements
ISO 15118-8	Road vehicles – Vehicle to grid communication interface – Part 8: Physical layer and data link layer requirements for wireless communication
ISO 15118-20	Road vehicles – Vehicle to grid communication interface – Part 20: 2 nd generation network layer and application layer requirements

2.3.5 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1939	Serial Control and Communications Heavy-Duty Vehicle Network – Top-Level Document
SAE J1939DA	J1939 Digital Annex
SAE J1939/71	Vehicle Application Layer
SAE J2836/3	Use Cases for Plug-In Vehicle Communication as a Distributed Energy Resource
SAE J2931/4	Broadband PLC Communication for Plug-in Electric Vehicles
SAE J3072	Interconnection Requirements for Onboard, Grid Support Inverter Systems

3. DEFINITIONS

3.1 ACCESS POINT

An appliance that permits other wireless appliances to connect to a network.

3.2 AFFILIATION

The process whereby *EV* and *SE* share identifying information (such as *EMAID*, *EVCCID*, *VIN*, *EVSEID*, and *SECCID*) so the *devices* and any associated *remote management system* knows what is connected and where.

3.3 API

Application programming interface.

3.4 APPLICATION PROGRAM

The implementation of the *control sequence* on an *EV* or *SE*.

3.5 ASCII7

7-bit *ASCII*, equivalent to the Basic Latin (single byte) code page of UTF-8. Control codes are not included in *ASCII7* for the purposes of this document. A collection of these values is a string.

3.6 COMBINED CHARGING SYSTEM (CCS)

A system where dedicated DC contacts are added to AC charging *couplers*. *CCS1* refers to SAE J1772 (IEC 62196-2 type 1) *couplers* with DC functionality added. *CCS1* is called “configuration EE” in IEC 62196-3 and “DC Level 2” in SAE J1772. *CCS2* refers to SAE J3068 (IEC 62196-2 type 2) *couplers* with DC functionality added. *CCS2* is called “configuration FF” in IEC 62196-3 and “SAE J3068 DC₈” in SAE J3068. *CCS couplers* may or may not include AC contacts. *CCS connectors* always use a case C (*connector* fixed to the *EVSE*).

3.7 CONNECTION SESSION

A *connection session* starts when the *connector* is inserted into the *inlet* and ends when the *connector* is removed from the *inlet*. A normal *connection session* may contain one or more periods of charging.

3.8 CONNECTOR

A hand-held conductive device at the end of a flexible cable from the *SE*, which is inserted into the *EV inlet* to supply energy to the *HVESS*.

3.9 CONTROL PILOT (CP)

An electrical signal that is sourced by the *SE*, controlled by the *EV* and the *SE*. Refer to SAE J3068.

3.10 CONTROL SEQUENCE

A sequence of automated tasks performed by the *EV* and the *SE* during a *connection session* for the purpose of charging the *EV*. A new *control sequence* occurs after a *restart*, and at the beginning of the *connection session*.

3.11 CONTROLLER AREA NETWORK (CAN)

Communications network commonly used in vehicles and used in SAE J1939. These communications are out of the scope of this document; however, where the definitions of *fields* (which are only communicated via *LIN-CP*) are aligned to SAE J1939, the relevant *PGNs* and *SPNs* are noted.

3.12 COUPLER

A physical and electrical mating system connecting the *SE* to the *EV*. The *coupler* includes the *connector* at the end of the flexible cable of the *SE* and the *inlet* on the *EV*.

3.13 CYCLE

A complete transmission of all *multiplexed* data within a *stage*, beginning with the *control page* and ending with the *CRC page*, if *CRCs* are being transmitted. See [3.25](#), [3.34](#), [3.36](#) and [3.50](#).

3.14 CYCLIC REDUNDANCY CHECK (CRC)

A *cyclic redundancy check* is an error-detecting code used to detect accidental changes to raw data.

3.15 DATA LINK

In general, a digital communication bus such as *LIN*, *CAN*, Ethernet, *PLC*, fiber optic, *Wi-Fi*, etc. The specific *data link* described in this recommended practice is *LIN*.

3.16 DEVICE

Either an *EV* or *SE* capable of SAE J3068/1.

a. Local device: Within an *LIN-CP* session, whichever *device* is running the *application program* being discussed.

b. Remote device: Within an *LIN-CP* session, whichever *device* is connected to the *local device*.

EXAMPLE: In a section describing *SE* functions, the *SE* is the *local device*, and the *EV* is the *remote device*.

3.17 DIAGNOSTIC TROUBLE CODE (DTC)

Uniform alphanumeric trouble codes for vehicle applications are defined in SAE J2012 and ISO 15031-6.

3.18 DYNAMIC DATA

Data, transmitted within the *data stage*, that may change throughout a *control sequence*.

3.19 ELECTRIC VEHICLE (EV)

A vehicle designed to receive energy from *SE*. This term is used to cover *electric vehicles* and plug-in hybrid *electric vehicles*. This includes on-road *electric vehicles*, off-road *electric vehicles*, airport ground support equipment, etc.

3.20 ELECTRIC VEHICLE COMMUNICATION CONTROLLER ID (EVCCID)

Vehicle identifier defined in ISO 15118-20 Annex C. Future editions of SAE J3068/1 may facilitate cryptographic verification of this identifier.

NOTE: *EVCCID* is used in ISO 15118-2 to refer to the *PLC MAC address*. SAE J3068/1 uses only the ISO 15118-20 definition.

NOTE: The first edition of ISO 15118-20:2022 Annex C claims to use augmented Backus-Naur Form (ABNF) to describe *EVCCID*, but does not correctly follow the specification. The definition cannot be used directly in an ABNF parser.

3.21 ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE)

A *device* responsible for safely providing power to the *EV* through the use of certain control functions which are defined in this recommended practice. It may be permanently wired or connected via a cord to the premise wiring. It may have a permanently attached *connector* to supply the *EV*, or a *socket-outlet* with an *EV* cable assembly to supply the *EV*. Contrast this with *SE* which does not encompass the *coupler*.

3.22 ELECTRIC VEHICLE SUPPLY EQUIPMENT ID (EVSEID)

Supply equipment digital identifier defined in ISO 15118-2 Annex H. It is defined such that the *EVSEID* uniquely identifies not only the station but also each *connector* on *supply equipment* with multiple *connectors*. Future editions of SAE J3068/1 may facilitate cryptographic verification of this identifier.

3.23 EXTENDED UNIQUE IDENTIFIER (EUI)

Replacement term for *MAC address*, which is obsolete in some contexts. See [3.33](#).

3.24 E-MOBILITY ACCOUNT IDENTIFIER (EMAID)

Vehicle identifier defined in ISO 15118-2 Annex H. Defined in ISO 15118 to enable *plug & charge*. This identifier is renamed to “e-Mobility Authentication Identifier” in ISO 15118-20. Future editions of SAE J3068/1 may facilitate cryptographic verification of this identifier.

3.25 FIELD

Like a *signal*, but communicated via one or more *signals* in a *paged frame* as determined by the *page* number. See [3.13](#), [3.34](#), [3.36](#) and [3.50](#).

3.26 FRAME

An *LIN* communication entity consisting of a header and response. All *frames* in this document have 8 byte payloads.

3.27 HIGH-VOLTAGE ENERGY STORAGE SYSTEM (HVESS)

The group of components comprising the vehicle’s stored energy source used primarily for propulsion and primary operation, including, but not limited to: lithium-ion batteries, contactors, and battery management systems.

3.28 HVESS TRIP MANAGEMENT

A system whereby a user defines how far a vehicle needs to go and when it will depart. In the simplest configuration, a user enters a distance and a time of departure on the vehicle dashboard, for the next trip only. In an advanced configuration, a user may be able to enter numerous single or recurring trips (days, weeks, or months) in advance, typically using a website or app. Such a system is expected to consider whatever information it has to determine how much range is required for the vehicle before its next departure. This standard supports two configurations: one where the *EV* has access to trip information (*EV-informed*) and one where the *SE* has access to trip information (*SE-informed*). A server may use the information from the *EV* or *SE* to manage charging, provide *APIs* or user interface, etc. These scenarios will be referred to as “*EV-informed HVESS trip management*” and “*SE-informed HVESS trip management*” respectively. See [3.55](#).

NOTE: This usage comes from SAE J1939. The term “rechargeable energy storage system (RESS)” may be encountered in other SAE contexts.

3.29 INLET

The component on the *EV* into which the *connector* mates. This is part of the *coupler*.

3.30 LIN

Local Interconnect Network; refer to ISO 17987.

3.31 LIN-CP

The control method using *LIN signals* and *CP* levels, as described in SAE J3068.

3.32 LIN STACK

A (generally third-party) software package in control of *LIN* communications and implementing the *LIN API* (defined in ISO/TR 17987-5).

3.33 MEDIA ACCESS CONTROL (MAC) ADDRESS

A globally unique identifier assigned to a network interface controller for use as a network address. See [3.23](#).

3.34 MULTIPLEXING

In this document, a system where *signals* within an *LIN frame* hold different data on subsequent *LIN* transfers depending on the value of an index variable, referred to as a *page*. See [3.13](#), [3.25](#), [3.36](#) and [3.50](#).

3.35 NOT AVAILABLE

A special value for a *signal* or *field* that means that a value for this *signal* or *field* is *Not Available* or invalid, and should not be used in calculations or decisions. See *valid value* in [3.57](#).

3.36 PAGE

A group of data, stored in a *paged frame*, indexed by a *page* number. See [3.13](#), [3.25](#), [3.34](#), and [3.50](#).

3.37 PAGED FRAME

A type of *frame* that stores groups of data called *pages* to enable *multiplexing*. See [3.34](#) and [3.36](#).

3.38 PARAMETER GROUP NUMBER (PGN)

CAN message identifier in SAE J1939. The meaning of a particular *PGN* is defined in SAE J1939DA.

3.39 PLUG & CHARGE

A system defined in ISO 15118 to allow a vehicle owner to be billed for public charging without having to interact with the *EVSE* outside of connecting the vehicle.

3.40 POWER-LINE CARRIER (PLC)

The *supplementary communications* mechanism defined in ISO 15118-3 and DIN SPEC 70121. A *PLC* modem facilitates this connection.

3.41 PROPRIETARY DATA

Additional *dynamic data* sent during the *data stage* defined by the *device* manufacturer. In the context of this document, *proprietary* should not necessarily be construed to be trade secret or protected intellectual property. It refers only to extensions not currently defined in an SAE J3068 series document. See [APPENDIX A](#).

3.42 PROTOCOL VERSION

The particular communications format in use. This document defines *Protocol Version* 3₁₀ (and 103₁₀, see [APPENDIX A](#)), which are supersets of *Protocol Version* 2₁₀ defined in SAE J3068. Future editions and/or companion documents may define additional *Protocol Versions*.

3.43 PWM

Pulse-width modulation.

3.44 PWM-CP

The control method using *PWM signals* and *CP* levels, as described in SAE J1772.

3.45 REMOTE MANAGEMENT SYSTEM

A system, separate from the *device*, acting as a portal for management information. For *SE*, this is likely to provide an indirect connection to a grid operator and/or fleet operator via the internet. For an *EV*, this is likely to take the form of manufacturer *vehicle telematics*. See [3.59](#).

3.46 RESTART

An event within a *connection session* where *LIN-CP* communication begins again in a new *control sequence*.

3.47 SCHEDULE

The *schedule* describes the *frames* and the timing of the *frames* transmitted on the *data link*.

Three *schedules* are defined in SAE J3068: *Ver* (*Protocol Version* selection), *Init* (*Initialization*), and *Op* (*Operation*). SAE J3068/1 adds *Op3* (*Operation: Protocol Version 3₁₀*).

3.48 SIGNAL

A datum communicated over the *LIN data link*. One or more *signals* are packaged in an 8 byte *frame*. In this recommended practice, most *signals* contain a minimum of two bits so that even a “binary” *signal* with normal values such as *Incomplete* and *Complete* can also indicate the values of *Error* and *Not Available* for exceptions. Parametric *signals* typically encode a range of data (for example, with 8 bits) with the maximum value encoding *Not Available*. See [3.57](#).

In the SAE J3068 series of documents, *signals* are typeset in monospace font, and groups of *signals* are denoted by an appended x where the x replaces whatever differentiates the different *signals* in the group.

Important *signals* to the understanding of this document include: EvSupportedVersionX, SeSupportedVersionX, SeAvailableCurrentX, EvInfoEntryX, and SeInfoEntryX.

3.49 SOCKET-OUTLET

The component on the *SE* into which the plug of an *EV* cable assembly is inserted. The *socket-outlet* only exists in case A and case B applications, and is referred to as an “EV receptacle” in UL documents.

3.50 STAGE

A section of the information exchange protocol described in this document. See [3.13](#), [3.25](#), [3.34](#), and [3.36](#).

Two *stages* are defined:

- a. *Identification stage*: At the beginning of a *control sequence*, this *stage* allows the *EV* and *SE* to exchange identifiers and other fixed information. This *stage* is completed once all such information has been received.
- b. *Data stage*: After completion of the *identification stage*, this *stage* allows the *EV* and *SE* to exchange other low-frequency real-time information that may be of value to the operator.

The *stages* are realized as ranges of *page* numbers used in the *paged frames* to transfer low speed data.

3.51 START VALUE

A value stored internally in an *LIN* node (usually referring to a *signal* from the other node) at the start of a *control sequence*, before an actual *signal* is received from the other *LIN* node. *Start values* are sometimes defined to set safe start conditions or to set values that can be distinguished from *valid* received *values* (making it clear from the variable value when nothing has yet been received from the other side of the network).

3.52 SUPPLEMENTARY COMMUNICATIONS CHANNEL

An auxiliary digital connection between the *EV* and *SE*, typically capable of higher bandwidth than *LIN*. Examples of connections considered include those according to SAE J2931/4, ISO 15118-3, DIN SPEC 70121, and ISO 15118-8.

3.53 SUPPLY EQUIPMENT (SE)

Supply equipment (also “Se...” in *signal*, *field*, and *frame* names). In this recommended practice, *supply equipment* does not encompass the *coupler*, which has distinct voltage and current ratings that are not necessarily reflected in the *SE* rating *signals*. Contrast this with *EVSE* (see [3.21](#)) which does encompass the *coupler* ratings in addition to the control box ratings.

3.54 SUPPLY EQUIPMENT COMMUNICATIONS CONTROLLER IDENTIFIER (SECCID)

Supply equipment digital identifier defined in ISO 15118-20 Annex C. Future editions of SAE J3068/1 may facilitate cryptographic verification of this identifier.

NOTE: The first edition of ISO 15118-20:2022 Annex C claims to use augmented Backus-Naur Form (ABNF) to describe *SECCID*, but does not correctly follow the specification. The definition cannot be used directly in an ABNF parser.

3.55 SUPPLY POWER MANAGEMENT

A system whereby the charging rates of *EVs* are limited (or otherwise controlled) to benefit power management at the site. This may be done for reasons including optimizing electricity cost, prevention of overloading of circuits or phases, and/or for the (presumably remunerated) benefit of the local utility or grid operator. See [3.28](#).

3.56 SUSPECT PARAMETER NUMBER (SPN)

CAN signal identifier in SAE J1939. The meaning of a particular *SPN* is defined in the SAE J1939DA.

3.57 VALID VALUE

A *signal* or *field* value that is not set to *Not Available* (binary value of all ones) and not set to *Error*. In other words, a useable value that does not need to be ignored.

3.58 VEHICLE IDENTIFICATION NUMBER (VIN)

A unique identifier assigned to all vehicles. Defined in ISO 3779.

3.59 VEHICLE TELEMATICS

A wireless (normally cellular) system connecting a vehicle to a network administrated on behalf of the vehicle manufacturer or operator. See [3.45](#).

3.60 WI-FI

A family of wireless network protocols, based on the IEEE 802.11 series, which are commonly used for local area networking of appliances, allowing nearby digital appliances to exchange data by radio waves.

4. DOCUMENT OVERVIEW

4.1 Document Overview

This document adds optional additional functionality to the three-phase capable AC charging system defined in SAE J3068 (202207 publication or later). Support for additional communications related to identification of an attached *device* is added, enabling positive *affiliation* between attached *devices*. The changes are added under a new *Protocol Version* 3₁₀. Adherence to SAE J3068/1 implies adherence to SAE J3068 (202207 publications or later) and support for the *Protocol Version* defined therein (2₁₀) is required. All requirements of SAE J3068 (202207 publication or later) are requirements of SAE J3068/1. **This document makes frequent references to SAE J3068 and cannot be understood without it. Most of SAE J3068 is not reproduced here, except where it enhances clarity.**

NOTE: SAE J3068/1 describes a point-to-point communication channel over a single *control pilot* circuit, and all *signals* and *fields* refer only to that connection. Therefore, for configurations with multiple *connectors* or *inlets*, the *signal* or *field* values only refer to that circuit's *connector* or *inlet*.

NOTE: In this document, numerical bases are notated with a subscript after a number, e.g. 14₁₀ is 14 base 10.

Section [5](#) mirrors the similarly named section in SAE J3068 and defines additions and modifications to the *LIN* communication protocol (refer to Section 8 in SAE J3068 202207).

Section [7](#) defines the communication mechanism used for the additional functionality.

Section [6](#) defines the data that can be transmitted with the communication mechanism defined in Section [7](#).

Section [8](#) describes how the additional communication enables *HVESS trip management* constrained by *supply power management*.

Section [9](#) mirrors the similarly named section in SAE J3068 and defines additional `InfoEntryX` values (refer to Section 11 in SAE J3068 202207).

[APPENDIX A](#) defines an optional additional *Protocol Version* where *proprietary data* not defined in SAE J3068 may be transmitted. See [3.41](#).

[APPENDIX B](#) provides requirements and clarifying examples for using the SAE J1772 *coupler* with SAE J3068/1 (or with SAE J3068) as opposed to the *coupler* defined in SAE J3068 202207.

[APPENDIX C](#) summarizes requirements and provides links (all of which have four-level section numbers).

4.2 Protocol Version 3 Overview

The basic charging-related functionality of *Protocol Version* 3₁₀ is unchanged from *Protocol Version* 2₁₀ as defined in SAE J3068 (202207 publication or later). All new features are optional, except *SE* is required to implement *HVESS trip management* if the attached *EV* provides the required information and the *SE* performs *supply power management* (see [8.1.2.1](#) and [8.2.2.1](#)). A *device* may modify its operation based on information exposed by *Protocol Version* 3₁₀, consistent with the requirements in SAE J3068 (202207 publication or later). See [7.3.3.1](#).

Protocol Version 3₁₀ adds a mechanism to transfer additional information in the *Op schedule*. This mechanism is designed to require a minimum number of new *frames*, to facilitate future extensions, and to have minimal effect on *LIN* bus timing. This is accomplished by transferring data in one additional *frame* in each direction, *multiplexed* using a *page* number, such that it contains more information than one *frame* could otherwise contain. The transfer proceeds in two *stages*, beginning with one *stage* for each *device* to provide identification and other static information, followed by a *stage* for generic, low-priority data with minimal timing requirements.

4.2.1 General Requirements for Devices Supporting SAE J3068/1

- 4.2.1.1 A *device* supporting SAE J3068/1 shall include *Protocol Version 3*₁₀ as defined herein in an *EvSupportedVersionX/SeSupportedVersionX* entry.
- 4.2.1.2 A *device* supporting SAE J3068/1 shall support *Protocol Version 2*₁₀ as defined in SAE J3068 (202207 publication or later) and include *Protocol Version 2*₁₀ in an *EvSupportedVersionX/SeSupportedVersionX* entry. This requirement does not apply to *devices* that support only DC power transfer.
- 4.2.1.3 When operating in *Protocol Version 3*₁₀, a *device* supporting SAE J3068/1 shall fulfill all applicable requirements from SAE J3068.
- 4.2.1.4 A *device* supporting SAE J3068/1 shall support sending *EvInfoEntryX/SeInfoEntryX* values to indicate error conditions preventing charging. This is recommended in SAE J3068. This shall not be interpreted as requiring any functionality not explicitly required elsewhere.

EXAMPLE: During *Protocol Version* selection, if the *EV* determines that no mutually compatible *Protocol Versions* exist, the *EV* sets an *EvInfoEntryX* to “*EV* determines that *Protocol Version* selection fails” [11₁₆].

EXAMPLE: During *Initialization*, if the *SE* determines that the *EV*'s maximum voltage (*EvMaxVoltage*) is less than the *EVSE*'s nominal voltage (*SeNomVoltage*), the *SE* sets an *SeInfoEntryX* to “minimum available voltage too high (lowest *SeNomVoltage* > *EvMaxVoltage*)” [1C₁₆].

EXAMPLE: During *Operation*, if so equipped, if the *SE* measures its *connector* has exceeded its safe operating temperature, the *SE* sets an *SeInfoEntryX* to “over-temperature in *connector*” [1F₁₆].

EXAMPLE: During *Operation*, if the *EV* has finished charging, the *EV* sets an *EvInfoEntryX* to “*EV* requires no additional energy during this *connection session* (e.g., *HVESS* full)” [26₁₆].

NOTE: Manufacturers may detect conditions that prevent or interrupt charging that do not correspond to a specific *EvInfoEntryX/SeInfoEntryX* value. In such a condition, the *EV* may set an *EvInfoEntryX* to “fatal error prevents charging – *EV* may require service” [28₁₆] or the *SE* may set an *SeInfoEntryX* to “internal *EVSE* fault - Call for service” [32₁₆].

4.2.2 General Requirements for EVSE Supporting SAE J3068/1

- 4.2.2.1 *EVSE* supporting SAE J3068/1 shall not enable *PWM-CP* when the connected *EV* lists *Protocol Version 3*₁₀ in *EvSupportedVersionX* but does not list *Protocol Version 0*₁₀ (*PWM-CP*) in *EvSupportedVersionX*.
- 4.2.2.2 Three-phase wired *EVSE* supporting SAE J3068/1 shall have their supply phases wired in time sequence for clockwise rotation and this sequence shall be maintained on the charging *connector*. It is strongly recommended the *EVSE* check this at startup and set “input miswired” [27₁₆] in an *SeInfoEntryX* if the phasing is incorrect.

NOTE: Refer to the *EVSE* General Requirements section of SAE J3068 (202207 publication or later) (also refer to 5.3.1 in SAE J3068 202207).

5. DIGITAL COMMUNICATION PROTOCOL

5.1 LIN Signals

This section defines new *signals* to be used with the *Protocol Version 3₁₀* defined in SAE J3068/1. Refer to the similarly named section in SAE J3068 for definitions of existing *signals* (refer to 8.3 in SAE J3068 202207).

All *signal* names are shown in `monospace` font, and *signal* values are shown in *italic* font.

All *signal* names have a prefix indicating its publisher, as follows:

Ca: Cable Assembly (CA)

Ev: *Electric Vehicle (EV)*

Se: *Supply Equipment (SE)*

Start values are defined for all *signals*.

5.1.1 EvIDByteX

EvIDByteX refers to a group of seven *signals* the EV may use to identify itself, consistent with several existing conventions for EV identifiers. The information these *signals* can contain and the encoding thereof are described in Section 6.

Signal	Bits	Values	Description	Schedule
EvIDByteA	8	00 ₁₆ to FF ₁₆	Data in <i>fields</i> , as determined by EvIDPage as described in Section 7	Op3
EvIDByteB		FF ₁₆	<i>Not Available</i> , also a <i>valid value</i> in some positions (<i>start value</i>)	
EvIDByteC				
EvIDByteD				
EvIDByteE				
EvIDByteF				
EvIDByteG				

5.1.2 EvIDPage

The EV indicates the information contained in EvID via this *signal*. The meaning of the defined values is described in 7.3. An EV may skip *pages* that will not contain any *valid data*, but *valid pages* are to be transmitted in order. See 7.2.2.6.

5.1.2.1 An EV shall not set EvIDPage to reserved values. If EvIDPage is set to a reserved value, the SE shall ignore EvIDByteX values in that *frame*. The SE shall write “Paging error” [34₁₆] to an SeInfoEntryX.

Signal	Bits	Values	Description	Schedule
EvIDPage	8	0 ₁₀	<i>Control page</i>	Op3
		1 ₁₀ to 38 ₁₀	<i>ID stage pages</i>	
		97 ₁₀ to 110 ₁₀	<i>Data stage pages</i>	
		193 ₁₀ to 250 ₁₀	<i>Proprietary pages</i> . See APPENDIX A.	
		251 ₁₀	<i>CRC page</i>	
		FE ₁₆	<i>Error</i>	
		FF ₁₆	<i>Not Available (SE start value)</i>	
		All Others	<i>Reserved</i>	

5.1.3 EvConnectionType

The *EV* may use this *signal* to specify its *inlet* type, or that the *EV* is case A. This information may be used to detect *coupler* adapters and may influence *inlet* and/or *socket-outlet* locking. Use of this *signal* is highly recommended.

Signal	Bits	Values	Description	Schedule
EvConnectionType	8	0 ₁₀	SAE J3068 AC ₆ (IEC 62196-2) case A plug	Init
		1 ₁₀	SAE J1772 (IEC 62196-2 type 1) <i>inlet</i>	
		2 ₁₀	SAE J3068 AC ₆ (IEC 62196-2 type 2) <i>inlet</i>	
		3 ₁₀	CCS1 <i>inlet</i>	
		4 ₁₀	CCS2 (SAE J3068 DC ₈ /AC ₆ or DC ₈) <i>inlet</i>	
		5 ₁₀	SAE J3400 <i>inlet</i>	
		6 ₁₀	GB/T 20234.2 <i>inlet</i>	
		FE ₁₆	Error	
		FF ₁₆	Not Available/Not Specified (<i>SE start value</i>)	
		All Others	Reserved	

In conjunction with *SeConnectionType*, this *signal* may be used to detect potentially incompatible configurations. This determination is manufacturer-specific. See [5.1.4](#).

5.1.3.1 If the *EV* determines it is incompatible with connected *SE* in a given configuration via *EvConnectionType* and *SeConnectionType*, it shall write “EV determines connection with *SE* is incompatible” [29₁₆] to an *EvInfoEntryX*.

5.1.3.2 If the *EV* uses a connection type not listed, it shall set *EvConnectionType* to *Not Available*.

NOTE: Presence or absence of AC contacts on *CCS couplers* is signaled via *LIN-CP*. Refer to *EvMaxCurrentX* and *SeMaxCurrentX* in SAE J3068 (8.3.5.3 and 8.3.24.2 in SAE J3068 202207).

5.1.4 SeConnectionType

The *SE* may use this *signal* to specify its *connector* type, or that it has a *socket-outlet*. This information may be used to detect *coupler* adapters and may influence *inlet* and/or *socket-outlet* locking. Use of this *signal* is highly recommended.

Signal	Bits	Values	Description	Schedule
SeConnectionType	8	0 ₁₀	SAE J3068 AC ₆ (IEC 62196-2 type 2 or GB/T 20234.2) <i>socket-outlet</i>	Init
		1 ₁₀	SAE J1772 (IEC 62196-2 type 1) <i>connector</i>	
		2 ₁₀	SAE J3068 AC ₆ (IEC 62196-2 type 2) <i>connector</i>	
		3 ₁₀	CCS1 <i>connector</i>	
		4 ₁₀	CCS2 (SAE J3068 DC ₈) <i>connector</i>	
		5 ₁₀	SAE J3400 <i>connector</i>	
		6 ₁₀	GB/T 20234.2 <i>connector</i>	
		FE ₁₆	Error	
		FF ₁₆	Not Available/Not Specified (<i>EV start value</i>)	
		All Others	Reserved	

In conjunction with *EvConnectionType*, this *signal* may be used to detect potentially incompatible configurations. This determination is manufacturer-specific. See [5.1.3](#).

5.1.4.1 If the *EV* determines it is incompatible with connected *SE* in a given configuration via *EvConnectionType* and *SeConnectionType*, it shall write “*SE* determines connection with *EV* is incompatible” [35₁₆] to an *SeInfoEntryX*.

5.1.4.2 If the *SE* uses a connection type not listed, it shall set *SeConnectionType* to *Not Available*.

NOTE: Presence or absence of AC contacts on *CCS couplers* is signaled via *LIN-CP*. Refer to *EvMaxCurrentX* and *SeMaxCurrentX* in SAE J3068 (refer to 8.3.5.3 and 8.3.24.2 in SAE J3068 202207).

5.1.5 SeIDByteX

SeIDByteX refers to a group of seven *signals* the *SE* may use to identify itself, consistent with several existing conventions. The information these *signals* can contain and the encoding thereof are described in Section 6.

Signal	Bits	Values	Description	Schedule
SeIDByteA	8	00 ₁₆ to FF ₁₆	Data in <i>fields</i> , as determined by SeIDPage as described in Section 7	Op3
SeIDByteB		FF ₁₆	<i>Not Available</i> , also a <i>valid value</i> in some positions (<i>start value</i>)	
SeIDByteC				
SeIDByteD				
SeIDByteE				
SeIDByteF				
SeIDByteG				

5.1.6 SeIDPage

The *SE* indicates the information contained in *SeID* via this *signal*. The meaning of the defined values is described in 7.4. The *SE* may skip *pages* that will not contain any *valid* data, but *pages* are to be transmitted in order. See 7.2.2.6.

5.1.6.1 *SE* shall not set *SeIDPage* to reserved values. If *SeIDPage* is set to a reserved value, the *EV* shall ignore *SeIDByteX* values in that *frame*. The *EV* shall write “*Paging error*” [24₁₆] to an *EvInfoEntryX*.

Signal	Bits	Values	Description	Schedule
SeIDPage	8	0 ₁₀	Control page	Op3
		1 ₁₀ to 47 ₁₀	ID stage pages	
		97 ₁₀ to 99 ₁₀	Data stage pages	
		193 ₁₀ to 250 ₁₀	Proprietary pages. See APPENDIX A	
		251 ₁₀	CRC page	
		FE ₁₆	Error	
		FF ₁₆	Not Available (EV start value)	
		All Others	Reserved	

5.2 LIN Frames

This section defines new *frames* to be used with the *Protocol Version 3*₁₀ defined in SAE J3068/1. Refer to the similarly named section in SAE J3068 for definitions of existing *frames* (refer to 8.4 in SAE J3068 202207).

[Table 1](#) shows a list of defined *LIN frames* and the contained *signals*. The entirety of the “Frames” table from SAE J3068 is reproduced here (refer to Table 14 in SAE J3068 202207). Changes are typeset in **bold**.

All *frame* and *signal* names are shown in monospace font.

All *frame* names have a prefix that indicates the publisher of the *frame*:

Ca: Cable Assembly (CA)

Ev: *Electric Vehicle (EV)*

Se: *Supply Equipment (SE)*

Table 1 - Frames

Frame Identifier	Frame Name	Contained Signals
0	SeVersionList	Byte 0: SeSelectedVersion Byte 1: Bit 0: reserved (= 1) Bits 1-2: SeStatusVer Bits 3-4: SeStatusInit Bits 5-6: SeStatusOp Bit 7: reserved (= 1) Byte 2: SeVersionPageNumber (typically 00 ₁₆) Byte 3: SeSupportedVersion1 (typically 02 ₁₆) Byte 4: SeSupportedVersion2 (typically 03 ₁₆) Byte 5: SeSupportedVersion3 (typically FF ₁₆) Byte 6: SeSupportedVersion4 (typically FF ₁₆) Byte 7: SeSupportedVersion5 (typically FF ₁₆)
1	EvVersionList	Byte 0: EvSelectedVersion (typically 03 ₁₆) Byte 1: Bit 0: EvResponseError Bits 1-2: EvStatusVer Bits 3-4: EvStatusInit Bits 5-6: EvStatusOp Bit 7: EvAwake Byte 2: EvVersionPageNumber (typically 00 ₁₆) Byte 3: EvSupportedVersion1 (typically 02 ₁₆) Byte 4: EvSupportedVersion2 (typically 03 ₁₆) Byte 5: EvSupportedVersion3 (typically FF ₁₆) Byte 6: EvSupportedVersion4 (typically FF ₁₆) Byte 7: EvSupportedVersion5 (typically FF ₁₆)
2	SeStatus	Byte 0: SeSelectedVersion (typically 03 ₁₆) Byte 1: Bit 0: reserved (= 1) Bits 1-2: SeStatusVer Bits 3-4: SeStatusInit Bits 5-6: SeStatusOp Bit 7: reserved (= 1) Byte 2: SeAvailableCurrentL1 Byte 3: SeAvailableCurrentL2 Byte 4: SeAvailableCurrentL3 Byte 5: SeAvailableCurrentN Bytes 6-7: reserved (all FF ₁₆)

Frame Identifier	Frame Name	Contained Signals
3	EvStatus	Byte 0: EvSelectedVersion (typically 03 ₁₆) Byte 1: Bit 0: EvResponseError Bits 1-2: EvStatusVer Bits 3-4: EvStatusInit Bits 5-6: EvStatusOp Bit 7: EvAwake Byte 2: EvRequestedCurrentL1 Byte 3: EvRequestedCurrentL2 Byte 4: EvRequestedCurrentL3 Byte 5: EvRequestedCurrentN Bytes 6-7: reserved (all FF ₁₆)
4	EvPresentCurrents	Byte 0: EvSelectedVersion (typically 03 ₁₆) Byte 1: EvPresentCurrentL1 Byte 2: EvPresentCurrentL2 Byte 3: EvPresentCurrentL3 Byte 4: EvPresentCurrentN Bytes 5-7: reserved (all FF ₁₆)
5	SeNomVoltages	Byte 0: SeSelectedVersion (typically 03 ₁₆) Bytes 1-2: SeNomVoltageL1N Bytes 3-4: SeNomVoltageLL Byte 5: SeFrequency Bytes 6-7: reserved for N to Gnd voltage (all FF ₁₆)
6	SeMaxCurrents	Byte 0: SeSelectedVersion (typically 03 ₁₆) Byte 1: SeMaxCurrentL1 Byte 2: SeMaxCurrentL2 Byte 3: SeMaxCurrentL3 Byte 4: SeMaxCurrentN Byte 5: SeConnectionType Bytes 6-7: reserved (all FF ₁₆)
7	EvMaxVoltages	Byte 0: EvSelectedVersion (typically 03 ₁₆) Bytes 1-2: EvMaxVoltageL1N Bytes 3-4: EvMaxVoltageLL Byte 5: EvFrequencies Bytes 6-7: reserved for max N to Gnd voltage (all FF ₁₆)
8	EvMinVoltages	Byte 0: EvSelectedVersion (typically 03 ₁₆) Bytes 1-2: EvMinVoltageL1N Bytes 3-4: EvMinVoltageLL Byte 5: EvConnectionType Bytes 6-7: reserved (all FF ₁₆)
9	EvMaxMinCurrents	Byte 0: EvSelectedVersion (typically 03 ₁₆) Byte 1: EvMaxCurrentL1 Byte 2: EvMaxCurrentL2 Byte 3: EvMaxCurrentL3 Byte 4: EvMaxCurrentN Byte 5: EvMinCurrentL1 Byte 6: EvMinCurrentL2 Byte 7: EvMinCurrentL3
10	CaProperties Not used in SAE J3068 202207. Reserved for future implementation of cable assembly nodes.	Byte 0: CaVersion (typically 01 ₁₆) Byte 1: Bit 0: CaResponseError Bits 1-7: reserved (= all ones) Byte 2-3: CaMaxVoltage Byte 4: CaMaxCurrentL1 Byte 5: CaMaxCurrentL2 Byte 6: CaMaxCurrentL3 Byte 7: CaMaxCurrentN

Frame Identifier	Frame Name	Contained Signals
11	SeInfoList	Byte 0: SeSelectedVersion (typically 03 ₁₆) Byte 1: SeInfoPageNumber Byte 2: SeInfoEntry1 Byte 3: SeInfoEntry2 Byte 4: SeInfoEntry3 Byte 5: SeInfoEntry4 Byte 6: SeInfoEntry5 Byte 7: SeInfoEntry6
12	EvInfoList	Byte 0: EvSelectedVersion (typically 03 ₁₆) Byte 1: EvInfoPageNumber Byte 2: EvInfoEntry1 Byte 3: EvInfoEntry2 Byte 4: EvInfoEntry3 Byte 5: EvInfoEntry4 Byte 6: EvInfoEntry5 Byte 7: EvInfoEntry6
13	SeErrorList	Reserved
14	EvErrorList	Reserved
15	EvID	Byte 0: EvIDPage Byte 1: EvIDByteA Byte 2: EvIDByteB Byte 3: EvIDByteC Byte 4: EvIDByteD Byte 5: EvIDByteE Byte 6: EvIDByteF Byte 7: EvIDByteG
16	SeID	Byte 0: SeIDPage Byte 1: SeIDByteA Byte 2: SeIDByteB Byte 3: SeIDByteC Byte 4: SeIDByteD Byte 5: SeIDByteE Byte 6: SeIDByteF Byte 7: SeIDByteG
17 to 49	Reserved	
50 to 59	Available for application-specific <i>frames</i>	
60	Refer to ISO 17987, used in SAE J3068 for the <i>LIN</i> go-to-sleep command.	
61 to 63	Refer to ISO 17987, not used in SAE J3068	

5.3 LIN Schedules

This section adds *frames* to the *schedules* defined in SAE J3068 to support the *Protocol Version* defined in SAE J3068/1. Refer to the similarly named section in SAE J3068 (refer to 8.5 in SAE J3068 202207).

NOTE: The *schedules Ver*, *Init*, and *Op* are unchanged. All changes are in a new *schedule* specific to SAE J3068/1: *Op3*.

5.3.1.1 If *Protocol Version* 2₁₀ is selected in *Protocol Version* selection, the *SE* shall use the *schedule Operation (Op)* as defined in SAE J3068.

5.3.1.2 If *Protocol Version* 3₁₀ is selected in *Protocol Version* selection, the *SE* shall use the *schedule Operation (Op3)* as defined in [Table 2](#).

The entirety of the “Chain of control: status, task, schedule, frame” table from SAE J3068 is reproduced here (refer to Table 15 in SAE J3068 202207). Changes are typeset in **bold**.

Table 2 - Chain of control: status, task, schedule, frame

Protocol Version	Present SE Status Signal Values			Required Task	Required Schedule	Required Frames (Frame ID)
	SeStatusVer	SeStatusInit	SeStatusOp			
All	Incomplete or Error	Incomplete	Deny_V	Protocol Version selection SE and EV establish LIN communication SE and EV exchange information about supported communication <i>Protocol Versions</i> until a <i>Protocol Version</i> is selected	Ver	SeVersionList (0) EvVersionList (1) SeInfoList (11) EvInfoList (12)
All	Complete	Incomplete or Error	Deny_V	Initialization SE and EV exchange information about the power supply and the EV load until compatibility is verified	Init	SeStatus (2) EvStatus (3) SeNomVoltages (5) SeMaxCurrentList (6) EvMaxVoltageList (7) EvMinVoltageList (8) EvMaxMinCurrents (9) SeInfoList (11) EvInfoList (12)
2	Complete	Complete	Any value except Not Available	Operation SE and EV exchange frames to control the SE supply voltage and the EV load current	Op	SeStatus (2) EvStatus (3) EvPresentCurrentList (4) SeInfoList (11) EvInfoList (12)
3	Complete	Complete	Any value except Not Available	Operation SE and EV exchange frames to control the SE supply voltage and the EV load current and exchange <i>identification/affiliation</i> and other data	Op3	SeStatus (2) EvStatus (3) EvPresentCurrentList (4) SeInfoList (11) EvInfoList (12) EvID (15) SeID (16)

6. MULTIPLEXED INFORMATION EXCHANGE DATA DEFINITIONS

6.1 Field Definitions

This section defines the *fields* that can be transmitted via *EvID* and *SeID*. *Fields* are typeset in *italic monospace*.

All *fields* have *start values* of *Not Available* unless otherwise specified.

Where reasonable, the *fields* have been defined to align with SAE J1939. For more information, refer to SAE J1939DA.

For *fields* larger than 8 bits where an *Error* value is specified, "x" may be any valid digit in base-16.

All unspecified values are Reserved.

6.1.1 EvACActivePower

The *EV*-metered active power in or out of the AC charge port. A positive value represents current into the grid (discharging the *HVESS*). A negative value represents current from the grid (charging the *HVESS*). Refer to SAE J2836/3 "Active Power."

Field	Bits	Values	Description	Scale	Offset	Stage
<i>EvACActivePower</i>	16	0 ₁₀ to 64255 ₁₀	AC power at <i>inlet</i>	16 W	-500000 W	<i>Data</i>
		FEx ₁₆	<i>Error</i>	N/A	N/A	
		FFFF ₁₆	<i>Not Available</i>	N/A	N/A	

NOTE: The sign convention for this *signal* is opposite to *EvHVESSCurrent*. See [6.1.22](#). This *signal* aligns to SAE J2836/3 as required by SAE J3072.

6.1.2 EvACFrequency

AC line frequency as measured at the inverter.

Field	Bits	Values	Description	Scale	Offset	Stage
<i>EvACFrequency</i>	8	0 ₁₀ to 250 ₁₀	AC line frequency	0.1 Hz	42.5 Hz	<i>Data</i>
		FE ₁₆	<i>Error</i>	N/A	N/A	
		FF ₁₆	<i>Not Available</i>	N/A	N/A	

6.1.3 EvActiveCellBal

Indicates whether or not the cells in the *high-voltage energy storage system* are currently being balanced.

Field	Bits	Values	Description	Scale	Offset	Stage
<i>EvActiveCellBal</i>	2	00 ₂	Cell balancing active	N/A	N/A	<i>Data</i>
		01 ₂	Cell balancing not active	N/A	N/A	
		10 ₂	<i>Error</i>	N/A	N/A	
		11 ₂	<i>Not Available</i>	N/A	N/A	

In vehicles that use SAE J1939, *EvActiveCellBal* is equivalent to the parameter with *SPN* 8102 in *PGN* 61590.

NOTE: *EvActiveCellBal* may represent a single pack in systems with only one pack or represent aggregate data from several packs in systems with multiple packs.

6.1.4 EvACReactivePower

The reactive power in or out of the AC charge port. *EvACReactivePower* uses generator sign convention, which is opposite to load sign convention. In generator sign convention, a positive value represents lagging reactive power (provided, injected, over-excited), and a negative value represents leading reactive power (consumed, absorbed, under-excited). Refer to IEEE 1547-2018.

Field	Bits	Values	Description	Scale	Offset	Stage
<i>EvACReactivePower</i>	16	0 ₁₀ to 64255 ₁₀	AC reactive power at inlet	16 VA	-500000 VA	Data
		FExx ₁₆	Error	N/A	N/A	
		FFFF ₁₆	Not Available	N/A	N/A	

6.1.5 EvAmbientTemp

Temperature of air surrounding the vehicle.

Field	Bits	Values	Description	Scale	Offset	Stage
<i>EvAmbientTemp</i>	16	0 ₁₀ to 64255 ₁₀	Ambient temperature	0.03125 °C	-273 °C	Data
		FExx ₁₆	Error	N/A	N/A	
		FFFF ₁₆	Not Available	N/A	N/A	

In vehicles that use SAE J1939, *EvAmbientTemp* is equivalent to the parameter with SPN 171 in PGN 65269.

6.1.6 EvCabinTemp

Temperature of air inside the part of the vehicle that encloses the driver and vehicle operating controls.

Field	Bits	Values	Description	Scale	Offset	Stage
<i>EvCabinTemp</i>	16	0 ₁₀ to 64255 ₁₀	Vehicle cabin temperature	0.03125 °C	-273 °C	Data
		FExx ₁₆	Error	N/A	N/A	
		FFFF ₁₆	Not Available	N/A	N/A	

In vehicles that use SAE J1939, *EvCabinTemp* is equivalent to the parameter with SPN 170 in PGN 65269.

6.1.7 EvChaDurMax

Duration maximum charge rate can be maintained. Refer to SAE J2836/3 Duration Maximum Forward Power.

Field	Bits	Values	Description	Scale	Offset	Stage
<i>EvChaDurMax</i>	16	0 ₁₀ to 64255 ₁₀	Duration maximum charge rate can be maintained	10 s	0	Data
		FExx ₁₆	Error	N/A	N/A	
		FFFF ₁₆	Not Available	N/A	N/A	