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**Digital Communication Protocols Between Off-Board
Conductive Charger and Electric Vehicle**
非车载传导式充电机与电动汽车之间的数字通信协议

(English Translation)

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Digital Communication Protocols Between Off-Board Conductive Charger and Electric Vehicle

1 SCOPE

This document specifies the definitions of and requirements for physical layer, data link layer, transport layer, and application layer of the Controller Area Network (CAN)-based communication between the supply equipment communication controller (SECC) of off-board conductive charger (hereinafter referred to as "charger") and the electric vehicle communication controller (EVCC).

This document is applicable to the communication between the charger or bi-directional charger and the EV in Charging Mode 4, and the communication between the charger or bi-directional charger and the EV electronic control unit (ECU) with charging control function. The EVCC includes, but not limited to, the battery management system (BMS), and the in-vehicle system which needs to communicate with the charger to achieve other special functions.

Clause 5 to Clause 11 of this document apply to the charging system specified in Annex B of GB/T 18487.1-2023 (hereinafter referred to as "Category A System"), and Clause 12 to Clause 17 apply to the charging system specified in Annex C of GB/T 18487.1-2023 and the bi-directional charging system specified in Annex E of GB/T 18487.1-2023 (hereinafter referred to as "Category B System").

The "vehicle" in this document refers in particular to the "electric vehicle".

2 NORMATIVE REFERENCES

The following normative documents contain provisions which, through normative reference in this text, constitute essential provision of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendment) applies.

GB/T 18487.1-2023	Electric vehicle conductive charging system—Part 1: General requirements
GB/T 19596	Terminology of electric vehicles
GB/T 29317	Terminology of electric vehicle charging/battery swap infrastructure
GB/T 32960.3-2016	Technical specifications of remote service and management system for electric vehicles—Part 3: Communication protocol and data format
NB/T 10905-2021	Fault classification and code of charging facilities for electric vehicles
SAE J1939-11:2006	Recommended practice for serial control and communication vehicle network—Part 11: Physical Layer, 250K bits/s, Twisted Shielded Pair
SAE J1939-11:2016	Recommended practice for serial control and communication vehicle network—Part 11: Physical Layer, 250K bits/s, Twisted Shielded Pair
SAE J1939-15:2018	Recommended practice for serial control and communication vehicle network—Part 15: Physical Layer, 250 Kbps, Un-Shielded Twisted Pair (UTP)
SAE J1939-21:2006	Recommended practice for serial control and communication vehicle network—Part 21: Data Link Layer
SAE J1939-21:2021	Recommended practice for serial control and communication vehicle network—Part 21: Data Link Layer

3 TERMS AND DEFINITIONS

For the purpose of this document, the terms and definitions given in GB/T 19596, GB/T 29317, and GB/T 18487.1, as well as the following apply.

3.1 Data Link Layer

3.1.1 frame

A series of data bits that make up a complete information

3.1.2 CAN data frame

Ordered bit fields necessary for the CAN protocol for data transmission, starting with the Start of Frame (SOF) and ending with the End of Frame (EOF)

3.1.3 CAN message

An instance of sending or receiving a parameter group and its parameter data

Note: The transmission of a message may require the exchange of one or more “CAN data frames”.

3.1.4 identifier

The identified part of the CAN arbitration field

3.1.5 extended frame

A CAN data frame using a 29-bit identifier as defined in the CAN2.0B specifications

3.1.6 priority

A 3-bit field in the identifier to set the arbitration priority (0 to 7, from highest to lowest) in the transmission process

3.1.7 parameter group (PG)

A set of parameters transmitted at the application layer

3.1.8 parameter group number (PGN)

A 24-bit value used to uniquely identify a PG

Note: PGN is represented by an extended data page, a data page, a protocol data unit (PDU) format field, and a PDU specific field.

3.1.9 suspect parameter number (SPN)

A 19-bit value used to identify the ECU related specific elements, parts or parameters

3.1.10 protocol data unit (PDU)

A specific CAN data frame format

3.1.11 information frame (IF)

A CAN data frame on the data link layer, used to transmit valid information or data

3.1.12 control frame (CF)

A CAN data frame on the data link layer, used for flow control, error management, and receipt acknowledgment

3.1.13 transport protocol

A part of data link layer, which is a mechanism provided for transmitting a PGN with a data length of 9 to 1,785 bytes

3.2 Transport Layer

3.2.1 multi-information frame transport mode

A mode used to transmit multi-frame data with frame numbers by using automatic repeat request mode

3.2.2 long message (LM)

A message with a data length greater than 8 bytes transmitted by using multi-information frame transport mode

3.2.3 short message



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