

Standards and specifications



(Source: Adobe Stock)

This section provides news from standardization bodies and nonprofit associations regarding CAN-related documents. Included are also recommended practices, application notes, implementation guidelines, and technical reports.

ISO 11898-1 and ISO 11898-2 are under revision

In January, the ISO Working Group (WG) 3 of Subcommittee (SC) 31 of Technical Committee (TC) 22 started to review the ISO 11898-1 standard (CAN data link layer and physical coding sub-layer). CAN in Automation (CiA) has submitted the CAN XL data link layer specification (CiA 610-1) and the CAN FD Light specification (CiA 604-1) for integration into ISO 11898-1. Editors of the standard, officially called project leaders, are Florian Hartwich and Dr. Arthur Mutter (both are working with Bosch). The new edition will comprise all CAN data link layer protocols (Classical CAN, CAN FD, CAN FD Light, and CAN XL). This includes the specification of the Classical Base Frame Format (CBFF), the Classical Extended Frame Format (CEFF), the FD Base Frame Format (FBFF), the FD Extended Frame Format (FEFF), and the XL Frame Format (XLFF).

The above-mentioned WG 3 convened by Holger Zeltwanger (CiA Managing Director) has also started to revise ISO 11898-2 (CAN physical media attachment (PMA) sub-layer). The new edition will include the documents submitted by CiA: the CAN SIC (signal Improvement capability) PMA specification (CiA 604-1) and the CAN SIC XL PMA specification (CiA 610-3). The CAN SIC XL transceiver supports the optional PWM (pulse-width modulation) coding in the dataphase at the attachment unit interface (AUI). All other CAN transceivers specified in ISO 11898-2 feature an NRZ (non-return-to-zero) coding. Editors of the new document are Yao Yao and Holger Zeltwanger from CiA. ■

CiA specifications to be released

The CiA 610-1 and CiA 610-3 documents specifying the CAN XL data link layer and CAN SIC XL physical layer will be published soon as Draft Specifications (DS). This means, they are part of the 1-year CiA 600 document series subscription. This subscription includes also the CAN FD Light specification (CiA 604-1), also released soon as DS. Subscribers receive for one year all documents of this series released as DS.

The CiA 400 document series subscription comprises all CiA profile specifications in DS state. The CiA profiles for lift control systems (CiA 417 series), for refuse collecting vehicles (CiA 422 series), for medical contrast media injectors (CiA 425-2), and for photovoltaic systems (CiA 437 series) will be released within 2022 as Draft Specifications (DS). Additionally, the CiA profiles for low-voltage switch gear devices (CiA 442), for container-handling systems (CiA 444 series), for RFID devices (CiA 445), and for pump devices (CiA 450) are prepared for publication as Draft Specifications. Further candidates, to be released in DS status are CiA 457 (CANopen profile for wireless communication), CiA 458 (CANopen profile for energy measurements), and the CiA 459 series (CANopen profile for in-board weighing devices). ■

CiA workshops scheduled

CiA organizes several online workshops to initiate further specifications and technical reports. The CiA workshop on aerial working platforms (AWP) and other fire-fighting vehicle body sub-systems is scheduled on March 22. The objective is to identify new profile specification work items. Additionally, the workshop evaluates the requirements for embedded networks in stabilization leg sub-systems. Interested CiA members can register for this free-of-charge workshop.

CiA plans further workshops on cybersecurity, truck body gateways, drilling machines, laboratory automation, and battery management. Furthermore, a workshop on configurable physical layer infrastructure devices (such as bridges and switches) is in the pipeline. It covers also devices connecting Classical CAN, CAN FD, and CAN XL network segments. All these workshops will be scheduled soon. Interested parties may [contact CiA office](#) for more details. ■

SAE J1939 related documents

The new edition of the quarterly updated digital annex (DA) of J1939 has been published in January this year. This spreadsheet comprises Suspect Parameter (SP) and Parameter Group (PG) specifications and other application profile related items. It includes also references to other documents specifying J1939 PGs, for example, those standardized in DIN 4630 for commercial vehicle body applications. Typical DIN 4630 devices control tail lifts, truck-mounted cranes, refrigerators, and tippers. The German standard written in English language also comprises the gateway unit to the in-vehicle networks. This is the base for the DIN 14704 standard, which specifies the gateway for fire-fighting trucks. It is currently under development and will also be published in English language. The CiA SIG (special interest group) fire-fighting is observing this standard.

The J1939/21 (J1939 application layer and mapping to Classical CAN) has been released with improved session information. This allows to indicate, if a segmented message has been aborted by the initiator or the responder node. This was an issue in Isobus applications, when two nodes transmit the same parameter group longer than 8 byte. Recently, there was another finding regarding the pause timing parameters of the transport protocols. In Figure C1 the value needs to be corrected to 10 ms to 200 ms. This will be done in the next release coming shortly.

End of last year, the version 3.00 of the Digital Tachograph Specification for remote company card authentication and remote data downloading has been released by the Heavy Truck Electronic Interfaces Working Group (DTCO). Unfortunately, the references to ISO 16844 series documents are unclear or they point to withdrawn documents (e.g. ISO 15765-3). This will be fixed in the next version to be released as soon as possible. ■

DroneCAN and UAVCAN



Drones use increasingly embedded CAN networks, the DroneCAN higher-layer protocol will support the mapping to CAN FD in the next version (Source: Adobe Stock)

[DroneCAN](#) is the open source higher-layer protocol used by the Ardupilot and PX4 projects for communication with CAN-connectable drone peripherals. It was developed to continue the development of the UAVCAN v0 protocol. The proposed introduction of the UAVCAN v1 protocol involved changes to the original approach that increased complexity and did not offer a smooth migration path for existing deployments. After extended discussions within the UAVCAN consortium, which is a member of CiA, it was decided that the best solution was to continue development of DroneCAN v0 under the name DroneCAN. Starting with DroneCAN v1, the protocol will evolve to add new features to assist in the widespread adoption of CAN throughout the UAV (unmanned aerial vehicle) industry. The DroneCAN project is committed ensuring this evolution is done in a manner, which retains compatibility with existing DroneCAN devices. Key feature for the next version is the support of CAN FD. ■

Status of CiA documents

CiA develops and maintains technical specifications and technical reports. They run through different stages. In the beginning, there are Work Drafts (WD). The first specification release status is called Draft Specification Proposal (DSP). These are only accessible for CiA members. The next stage is Draft Specification (DS). Such documents can be purchased by non-members, too. There are different CiA document series, which can be subscribed for one year. This means, all DS documents released in a calendar year are provided to the subscriber.

The last status is Public Available Specification (PAS). These documents can be downloaded free of charge from CiA's website ((DEEP LINK)). Such specifications are rather mature and have been implemented by many parties.

CiA Technical Reports (TR) comprise recommendations, application notes, and implementation guidelines. Normally, they can be downloaded free of charge from CiA's website. Exceptionally, they can be limited to CiA members and document series subscribers. ■