

CiA invites its members to the CiA Member Days. On this event, CiA fellows discuss current CAN-related developments and challenges. Among others, it is a good opportunity to (re-)establish personal contacts to further CAN experts. The CiA Member Days start with technical-oriented presentations. Embedded into the CiA Member Days is the CiA General Assembly 2026 at the end of the first day.

Date

March 24 and 25, 2026

Location

Munich Airport Marriott Hotel
Room „Freising 1+2“
Alois-Steinecker-Str. 20
85354 Freising (Germany)

Agenda*

March 24, 2026: 10:00 to 17:00 (UTC+1)

10:00 to 10:25 Registration and welcome coffee
10:25 to 10:30 Welcome - CiA Member Days opening (Holger Zeltwanger, CiA)

Session I: CAN and artificial intelligence (AI) items Chairperson: Reiner Zitzmann, CiA

10:30 to 11:00 Embedded AI and CAN networking (Holger Zeltwanger, CiA)
11:00 to 11:30 MCU for embedded AI devices: On-device learning without the Cloud (Takahiro Nishiyama, ROHM)
11:30 to 12:00 AI and CAN diagnostics (Peter Decker, Vector)

12:00 to 13:30 *Lunch break*

Session II: CAN lower-layer items Chairperson: Holger Zeltwanger, CiA

13:30 to 14:00 The CANsec ecosystem (Dr. Arthur Mutter, Bosch)
14:00 to 14:30 CAN FD and low bit rates (Magnus Hell, Infineon)
14:30 to 15:00 CAN XL simulation (Federico Pereira, c&s group)

15:00 to 15:30 *Coffee break*

15:30 to 17:00 CiA General Assembly

18:00 Get-together dinner
Location
Braustüberl Weißenstephan
Weißenstephaner Berg 10
DE-85354 Freising

March 25, 2026: 9:00 to 16:00 (UTC+1)

Session III: General CAN community items Chairperson: Reiner Zitzmann, CiA

09:00 to 09:30 How to edit and to comment CiA technical documents (Dr. Martin Merkel, CiA)
09:30 to 10:00 CAN-related standards and specifications for embedded networking in mobile machines (Holger Zeltwanger, CiA)
10:00 to 10:30 48-V power supply and impacts on CAN transceivers (Matthias Muth, NXP)
10:30 to 11:00 *Coffee break*

Session IV: CAN applications Chairperson: Holger Zeltwanger, CiA

11:00 to 11:30 Condition Monitoring in Mobile Machines (Dagmar Schymonski-Dederichs, ifm)
11:30 to 12:00 Ethernetification of CAN (Dr. Ken Tindell, JK Energy)
12:00 to 12:30 Fire-fighting and other rescue vehicles (Ingo Boden, Ziegler)
12:30 to 14:00 *Lunch break*
14:00 to 16:00 IG05 J1939 onsite meeting**

* The agenda is subject to be changed.

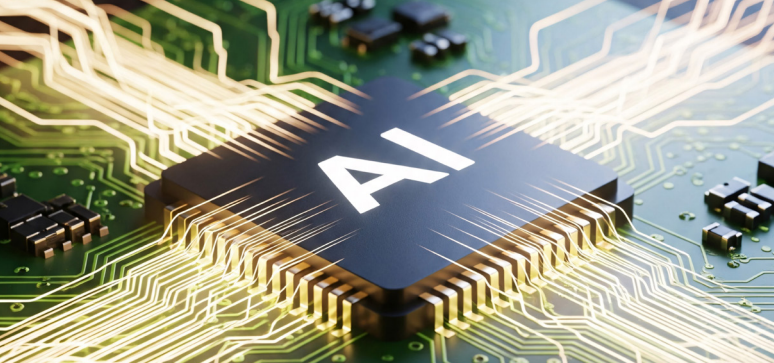
** All members are cordially invited to participate in the group meeting.

Registration

The CiA Member Days are for CiA members, only. For registration please contact Ms. Ruedel and Ms. Dallhammer: [conferences\(at\)can-cia.org](mailto:conferences(at)can-cia.org).

For more details please contact CiA office at conferences@can-cia.org

www.can-cia.org



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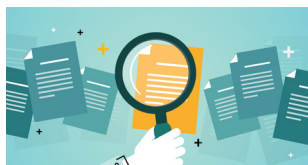
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Artificial intelligence (AI)

AI is based on the assumption that the process of human thinking can be performed by means of “(electronic) machines”. In Greek mythology, Talos was a creature made of bronze, who acted as guardian for the island of Crete; he would throw boulders at ships of invaders. By some means, he was the first AI-based “machine” – although not a real one. Centuries later, the term *AI* was first introduced in a workshop proposal titled “A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence.” The workshop, which took place in summer 1956, is considered as the official birthdate of *AI*. There are many shades of AI: cloud AI, edge AI, embedded AI, etc. In CAN Newsletter, we are focusing on AI-powered devices with CAN connectivity. This includes, in particular, embedded-AI and edge-AI devices. The AI's function is limited to the tasks of that specific device, such as signal filtering or anomaly detection within the device's own data. Embedded-AI devices are often based on specialized, low-power AI-capable semiconductors; but some are completely implemented in AI software. In this issue of the CAN Newsletter, we report about these embedded-AI devices with real-time capability and no need to be connected to big computer farms. *hz*

CAN technology trends in 2026 and beyond

CAN is a mature communication technology comprising three data link layer protocol generations: CAN CC (classic), CAN FD (flexible data rate), and CAN XL (extended data field length). There are still improvements and new functions developed, especially for CAN-based higher-layer protocols. On the following pages, there are several statements reported, providing near-future CAN technology trends.

(Source: Adobe Stock)

Embedded AI is on the agenda

Embodied AI is defined as the integration of artificial intelligence, particularly machine learning (ML) models, directly into embedded systems. Instead of sending data to a centralized cloud server for analysis, embedded AI enables devices to process data locally at the source ("front-end"). The results can be communicated via CAN networks to other AI-based devices or into the cloud.

Embedded-AI algorithms can run on sensors and actuators, without any cloud connection. This significantly reduces requirements on cybersecurity. As a side effect, it is very energy efficient and can be applied to battery-powered systems. Typical examples include sensor-fusion navigation, pre-emptive maintenance, and condition monitoring approaches. The chipmakers have already developed low-power AI processors for embedded AI. These products are scalable, so that even cost-sensitive applications can be realized.

The markets for embedded AI and edge AI are overlapping. They are not mutually exclusive; they often work together in "hierarchical" systems. Embedded AI handles the initial, on-device processing ("intelligent" pre-filtering data). Edge AI then takes this AI-processed data from multiple optionally CAN-connected embedded-AI devices for a more comprehensive analysis and

decision. This approach minimizes the amount of data sent via a CAN network, which saves bandwidth and improves response times, enabling even hard real-time control tasks.

For example, an AI-powered condition-monitoring sensor can detect vibrations continuously in all three spatial directions. From the measured values recorded, the embedded-AI software determines indicators to evaluate the machine condition:

- ◆ information on fatigue,
- ◆ mechanical friction,
- ◆ shocks,
- ◆ early detection of bearing wear,
- ◆ real-time bearing analysis,
- ◆ dynamic unbalance analysis

at the speed of the actuator. As an additional wear indicator, the surface temperature can also be considered and evaluated.

Already, there have been launched several embedded-AI applications in agriculture mobile machines. One of them is an AI-based weed detection and laser-based destroying subsystem, connecting the smart camera to a CAN network. The construction machine industry is also prototyping embedded-AI applications. CiA negotiates with the international nonprofit AI Architecture Group, situated in Germany, joint activities regarding embedded-AI applications in mobile construction machines, e.g., condition monitoring.

The trend to decentralization is a counterbalance to centralization. It is driven by a desire for greater efficiency, quicker responses, and local empowerment. Hybrid approaches centralize mission-critical functions, while decentralize time-critical functions and improve flexibility. CiA is calling for interested parties to develop CiA profile specifications for embedded AI devices. A first approach is the CiA 462 profile for item detection devices, including smart radar sensors. ◀

There is no doubt, AI (artificial intelligence) is on the move. But AI is not AI!

Holger Zeltwanger
(CiA Managing Director)



Improving an over 20 years old CAN-based standard

The CAN implementation of the ISO 11992-2 communication standard, which has been in place for over 20 years, has reached its capacity since the latest edition was released, leaving little room for new parameters. This highlights the need to reconsider traffic management in general. As ISO 11992-2 covers parameters relevant to brakes and running gears, any modifications must be carefully considered in relation to existing implementations.

Recently, industry and legislators organized in UNECE GRVA (United Nations Economic Commission for Europe, Working Party on Automated/Autonomous and Connected Vehicles) formed a task force to establish regulations for e-trailers on public roads. These are common towed vehicles that use electrically driven axles to recuperate energy from braking and propel the trailer, thereby supporting the towing truck. Several studies have proven that converting and reusing energy that would otherwise be lost can significantly reduce carbon dioxide emissions. The ISO TC 22/SC 31/WG 4 working group is currently collaborating closely with regulators to define the necessary parameters.

To address the aforementioned shortcomings, the introduction of Service Data Objects (SDO), as specified in CiA 301 (CANopen application layer and communication profile), is under discussion. This would enable implementers to select the relevant parameter groups from trailers and handle the busload on the network. CiA 510 describes how to handle SAE J1939 29-bit messages using this method, proving its suitability for ISO 11992-2.

The commercial vehicle industry is finding it difficult to bring new functions for trucks and trailers to market.



Andelko Glavinic (Senior System Designer Connectivity for ZF CV Systems Hanover)

Several existing and upcoming standards, such as ISO 11992-2, ISO 11992-3, and ISO 25200, specify specific parameters. To streamline the process and avoid redundant specifications, it is recommended that these parameters are summarized in a single ISO document, similar to the SAE J1939 Digital Annex, an Excel spreadsheet. The SAE group has invited discussion on including these parameters in their digital annex document.

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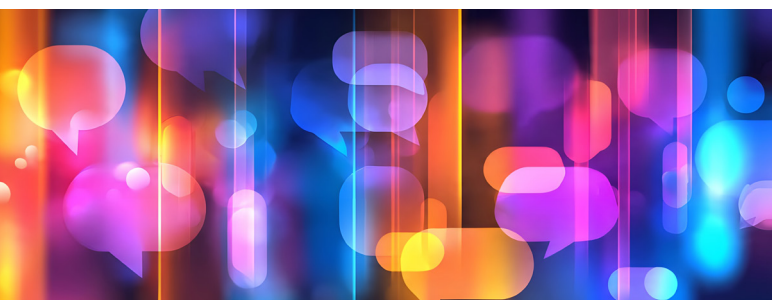
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Functional safety for mobile machines

In 2026, CAN remains a key technology for mobile machines, especially in safety-related applications. With CANopen Safety (EN 50325-5) and the updated SAE J1939-76 safety standard, the CAN CC (classic) data link layer has proven its capability to reliably transmit safety related parameters. This is increasingly important as the Machinery Regulation (EU) 2023/1230 is the new European law replacing the legacy Machinery Directive (2006/42/EC) for machinery safety, becoming mandatory in January 2027. This regulation raises the bar for functional safety in mobile equipment.

“For ifm, CAN is central to the functional-safe networking of sensors, controllers, and actuators in mobile applications.”



Dagmar Schymonski-Dederichs (Director System Support & Consulting ecomatMobile at ifm, chairperson of CiA SIG (special interest group) "fire fighting")

The EN 50325-5 standard is under systematic review to comply with the EU regulation (mainly a matter of wording and terminology) and will be revised in 2026. The updated SAE J1939-76 has been released already in November 2025. For the CAN FD based J1939-22 application layer, the SAE J1939-77 functional safety protocol has been published in November 2025, too.

For ifm, CAN is central to the functional-safe networking of sensors, controllers, and actuators in mobile applications. Using CAN for safety-related functions offers a robust and simple architecture while avoiding unnecessary system complexity. The wide market acceptance, its strong availability, and its proven behavior in harsh environments continue to make it the preferred interface for mobile machines.

The introduction of the updated SAE J1939-76 further supports standardized functional-safe communication in vehicle technology, aligning well with ifm’s strategy for scalable and safe machine architectures. CAN will still remain the default interface in our control systems for reliable, deterministic, and cost efficient sensor to PLC communication. It continues to evolve and remains essential for meeting future safety and functional requirements in mobile machinery. ◀


New CANopen motion control applications

Despite the increasing prevalence of Ethernet-based communication protocols on fieldbus level, CANopen remains one of the most cost-efficient, robust, and especially space-saving options in device engineering. This is, why Maxon has once again relied on CiA 301, CiA 305, and CiA 402 specifications for the new Escon2 servo drive product line. Two recent application examples from completely different industries highlight the advantages of this approach.

In intralogistics, autonomous material-handling vehicles ensure efficient internal flows. These applications require compact and robust electric motors capable of delivering high torque in limited installation space. The same applies to the servo drive and the entire control electronics: highly integrated solutions are needed – solutions that seamlessly fit into the vehicle’s onboard computing infrastructure and make optimal use of existing interfaces. CANopen provides the ideal foundation for this.

Autonomous airborne surveying with Lidar systems, on the other hand, places entirely different demands on motion control. Drones must be extremely lightweight to maximize range and flight time. This means, the motor controller needs to work precise and dynamic, but should also minimize energy consumption and weight. When the application further requires highly accurate, real-time synchronization of dual-laser axes, a powerful CANopen-based controller solution becomes the key missing piece.

“AGVs/AMRs and UAVs with equipment are CANopen motion control applications with potential.”



Daniel Hug (Head Motion Control Services at Maxon)

These examples make it clear: modern motion control is far more than motor regulation. It requires the perfect interaction of mechanics, electronics, and software – supported by specifications like CANopen that enable easy integration, high reliability, and optimal performance. ◀