

March 1992

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CAN in Automation

International users' and manufacturers' group



*The nonprofit association
promotes CAN's image
and provides a path
for future developments
of the CAN technology.*

We shape the future!

www.can-newsletter.org

CiA networks not only devices

The international users' and manufacturers' group for Controller Area Network (CAN) – CAN in Automation (CiA) – has been established in March 1992. The non-profit association provides technical, product, and marketing information about CAN, internationally standardized in the ISO 11898 series. The non-profit association promotes CAN's image and provides a path for future developments of the CAN technology. Therefore, CiA takes part in and supports the development of CAN-related standards and specifications. Additionally, an important part of the organization's effort is spent to develop and maintain the CANopen-related specifications.

CiA organizes joint marketing activities in all parts of the world. This includes joint stands at tradeshows, joint

information events, workshops, and contributions to magazines and conferences. An important source of information is the CiA website.

An essential aim of the organization is the social networking of CAN interested parties. In CiA's technical and marketing groups, engineers exchange experiences and knowledge to the benefit of all members. Additionally, CiA organizes different events, such as seminars, conferences, and information days, in which CAN newcomers can meet CAN experts. One of the most important advantages of being a member is the possibility to take part in CiA's social network, to get in touch with CAN experts, and to gain knowledge that helps to manage challenges in your CAN-related projects.



If others can't, we CAN!

The internationally standardized CAN is suitable for all kinds of embedded real-time control systems. Due to its robustness and reliable data transfer, it is not only the dominating communication technology in passenger cars, but also in many other mission-critical applications from the domains transportation, manufacturing, con-

struction, and agriculture over healthcare and science to retail and finances, communication, and last but not least entertainment. Due to the introduction of CAN FD, these application domains will rely in future on this serial communication technique that is available for reasonable prices.

Standardized CAN-based application layer protocols

Internationally standardized CAN-based higher-layer protocols

- ◆ EN 50325-4: CANopen application layer, dedicated for embedded machine control
- ◆ IEC 62026-3: DeviceNet application layer, dedicated for factory automation
- ◆ SAE J1939 series: Surface vehicle recommended practice
- ◆ ARIS-825 series: General standardization of CAN bus protocol for airbourne use
- ◆ IEC 61162-3 (NEMA 2000): Maritime navigation and radiocommunication equipment and systems - Part 3: Serial data instrument network
- ◆ ISO 11783 series (Isobus): J1939-based application profile, dedicated for agriculture and forestry machines
- ◆ ISO 11992 series: J1939-based application profile, dedicated for truck/trailer communication
- ◆ ISO 15765 series: Transport protocol and unified diagnostic services on CAN



Controller Area Network – The embedded network

In 1986, Bosch introduced the serial bus system CAN. In 2012, Bosch presented on 13th CiA's international CAN Conference the CAN FD protocol. The CAN data link layer protocols and the CAN physical layers have been internationally standardized in the series of ISO 11898 standards. The content of former ISO 11898-5 and ISO 11898-6 specifications (low power mode respectively selective wake-up functionality) were moved to the latest edition of ISO 11898-2. ISO 11898-1 specifies the

data link layer (DLL) and physical signaling of the CAN. ISO 11898-2 specifies the high-speed CAN at transmission rates of up to 5 Mbit/s. The CAN success story is going to continue. Many semiconductor manufacturers offer CAN FD controllers and transceivers qualified up to 5 Mbit/s. Some higher-layer protocols are standardized (see the insert above). Some of them are adapted already to the CAN FD data link layer, for example, CANopen FD as specified in CiA 1301.

CiA members are shaping the future of CAN. In CiA interest improvements of the data link layer and physical layer, with sp and non-linear network topologies. Additionally members develop and of CAN-connectable devices. To promote the developed CAN technol

IG layer 1/2

Recommendations for device and system design ease the start with CAN FD. This group provides bit timing recommendations, requirements for signal improvement circuitry, cable parameter definitions, etc. It also develops the next CAN protocol generation (CAN XL).

IG CANopen FD

To pave CANopen FD the road to industrial applications, the group provides all necessary specifications. This includes the CANopen FD application layer, the XML device description, as well as reference topologies that work “out of the box”.

IG profiles

CiA device- and application profiles improve the interoperability of devices. This group also specifies the mapping to classic CANopen, CANopen FD, and to further CAN-based higher-layer protocols on request.

IG safety/security

This group evaluates CAN-related attack vectors and specifies suitable controls. In addition, it takes care on functional safety aspects.

networking – be a part!

groups (IG), members develop jointly solutions. This includes special regard to data throughput, cyber security, functional safety, improve CiA profile specifications, in order to increase interoperability. In addition, CiA establishes marketing groups (MG).

IG CANopen

This group maintains the well-established classic CANopen specifications. It also specifies connecting CANopen networks to TCP/IP-based networks (Internet-of-Things, OPC UA, MQTT, etc.).

MG CANopen FD

In order to promote CANopen FD, this group coordinates and manages joint marketing activities worldwide. This includes plugfests and workshops, image videos and brochures as well as product demonstrations.

IG J1939

Members discuss and review J1939-related documents, in order to submit comments and feature requests to SAE and other standardization bodies (e.g. ISO 11783 series also known as ISOBUS).

MG CANopen Lift

To promote CiA 417, the CANopen application profile for lift control systems, this group organizes joint marketing activities. In particular, it organizes the joint stand at the Interlift tradeshow and bi-annually plugfests.

Simplify your life!

CiA provides professional services for users and manufacturers. CiA assists you interpreting CAN-related standards and specifications. CiA publications and email services provide information about application,

products, and trends in CAN markets. If there is any technical question, CiA answers them or finds the answer in the CiA community. CiA is the social network for CAN fellows.



In-house seminars and consulting

In-house seminars are offered for companies with specific training requirements. The agenda of an in-house seminar is tailored to the customer's needs. CiA trainers can educate device designers, system integrators, sales forces, marketing departments, and technical management.

CiA also provides general consultancy services. This includes evaluation of proprietary CAN-based higher-layer protocols and company-specific CANopen profiles. CiA consultancy services are device-, and manufacturer-independent!

Training and education

CiA provides seminars at reasonable prices. The list of scheduled seminars is available on CiA's website. CiA seminars are product- and vendor-independent. They are mainly addressing newcomers in CAN (FD) and CANopen (FD) technologies.

These training events are recommended for development engineers and system integrators. The training language is either English or German. CiA members are welcome to support the trainings by hands-on demonstrations.

CiA publications

The CAN Newsletter, published since 1992, is the leading worldwide publication for design engineers and CAN users. The magazine appears as online magazine or printable pdf-version. It provides readers with detailed technical articles and reports about new CAN products. The monthly CAN Info Mail (CIM) email service provides an overview on latest trends in CAN-technology as well as on upcoming CiA activities. The CiA product guides for CANopen, J1939, and CAN, assist users in finding devices, software, tools, and development services.

All CiA publications are available free-of-charge.

Marketing opportunities

CiA offers its members the opportunity to take part in several marketing activities to increase the awareness of their brand. The members can promote their products and services on stands at tradeshow, in publications, and in videos provided by CiA. Furthermore, it is possible to sponsor CiA events, for example, the international CAN Conference (iCC). Additionally, members may participate in tabletop exhibitions organized by CiA.

Join the community!

There are benefits to become a CiA member (see list down below). The most important reason is to be part of the community in order to get in touch with other CAN product and service providers. In particular, small and medium

sized companies need to be networked to partners to be successful in a world, which becomes increasingly smaller. In order not to miss the CAN business, you need to be informed well and in time.



We CAN open markets!

CAN is the mainstream network technology for embedded control systems. All carmakers use CAN networks to interconnect many electronic control units (ECUs). CAN was, is, and will be the dominating serial bus system for in-vehicle networking. First road vehicles are already employing CAN FD-connectable ECUs. In the next decade automakers will substitute Classical CAN by CAN FD.

CiA and its members have introduced CAN technology also to many non-automotive application fields. In most of

these applications, CAN networks are used to interconnect generic I/O modules, electrical and hydraulic drives to programmable host controllers. Many of such control systems make use of the internationally standardized CANopen application layer and the well-proven CANopen device and application profiles. In particular, in medium- and low-volume applications the end-users require standardized higher-layer protocols and profiles. System designers benefit by selecting off-the-shelf products for reasonable prices.

Benefits of CiA membership

- ◆ Initiating and influencing CiA specifications
- ◆ Getting credits on CiA training and education events
- ◆ Having access to CiA specifications in any status
- ◆ Getting credits on some CiA publications
- ◆ Getting CANopen vendor-IDs free-of-charge
- ◆ Receiving exclusively the monthly CiA Member News
- ◆ Taking part in a company- and product-neutral information platform
- ◆ Participating in plugfests and workshops
- ◆ Getting the classic CANopen conformance test tool
- ◆ Participating in joint marketing activities
- ◆ Developing partnerships with other CiA members
- ◆ Getting credits on CiA testing services
- ◆ Supporting international standardization of CAN technology
- ◆ Development of CAN markets by region, by application, or by higher-layer protocols

CAN in Automation (CiA) membership contract

This contract applies for the current calendar year. The annual fee depends on the company size as given below. Parties applying for membership after July 1st, pay 50 percent of the membership fee for that year.

If you do not cancel the membership by December 31th of the current calendar year in written form, the contract is renewed automatically for the next calendar year. This means that the membership fee is due for the following calendar year.

Company:* E-mail:*

First name:* Phone:*

Last name:* Fax:

Street:* URL:

Zip, City, State:* VAT number:*

Country:* We do accept CiA's IP policy*.
(As to be seen on CiA's public website www.can-cia.org)

Date:* Authorized signature:*

* mandatory

Please check off:

Number of employees at your company:	Annual fee	incl. 19 % German VAT
<input type="checkbox"/> More than 100.000 employees:	9.900,00 Euro	11.781,00 Euro
<input type="checkbox"/> 10.000 to 99.999 employees:	7.200,00 Euro	8.568,00 Euro
<input type="checkbox"/> 5.000 to 9.999 employees:	5.600,00 Euro	6.664,00 Euro
<input type="checkbox"/> 1.000 to 4.999 employees:	4.300,00 Euro	5.117,00 Euro
<input type="checkbox"/> 500 to 999 employees:	3.200,00 Euro	3.808,00 Euro
<input type="checkbox"/> 100 to 499 employees:	2.350,00 Euro	2.796,00 Euro
<input type="checkbox"/> 50 to 99 employees:	1.700,00 Euro	2.023,00 Euro
<input type="checkbox"/> 10 to 49 employees:	1.100,00 Euro	1.309,00 Euro
<input type="checkbox"/> 1 to 9 employees:	700,00 Euro	833,00 Euro
<input type="checkbox"/> Schools and universities (non-profit):	550,00 Euro	654,50 Euro



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