2023

Welding & cutting

Be smart – join the initiative!

Profile for arc welding and plasma cutting

Mapping to the standardized CANopen technology

Improving worker safety and regulatory compliance

Industry initiative "Weldbus"

Special Interest Group

www.can-cia.org

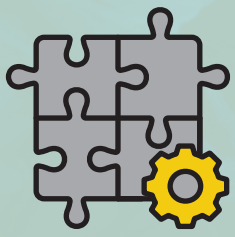
Standardized interface framework for welding and cutting

Benefits of the standardized interface framework for welding and cutting

In June 2023, the nonprofit CAN in Automation (CiA) association has established the Special Interest Group (SIG) welding and cutting, which is going to develop the open CiA 464 interface framework for advanced manual arc welding and plasma cutting systems. The SIG comprises representatives from different manufacturers of related equipment. The framework provides plug-and-play functionality for basic setups, which includes physical layer requirements such as cables and connectors.

This approach has several benefits:

Safety and compliance: It improves worker safety and regulatory compliance by providing functions to minimize worker exposure to harmful conditions, such as automatically maintaining the required fume extraction flow rate of the welding torch in use both during arc ignition and subsequent operation.

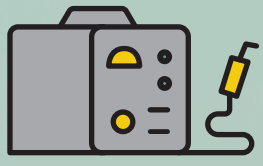


Interoperability: It enables plug-and-play functionality and advanced configurability for welding and cutting equipment during setup and operation. This allows exchangeability of devices, which extends system lifetime and supports the circular economy.

IoT applications: It supports integration into IoT environments by providing standardized and consistent data to higher-layer protocols such as CANopen (EN 50325-4), which creates a coherent view into the entire system landscape regardless of the manufacturer.

Cost: It is cost-effective, there is no license for users. The hardware and software costs are reasonable.

Security of investment: It is intended to submit CiA 464 to ISO. This ensures long-term availability.



Technology: It is specified as a CiA profile mappable to CANopen. The functional entities of the system are independent and can be freely separated or combined in products by the manufacturer. For example, a power source and a wire feeder can be different devices or combined into one.

CiA Special Interest Group (SIG) welding and cutting

Scope of the CiA Special Interest Group (SIG) welding and cutting

The SIG develops and maintains an application profile for advanced manual arc welding and plasma cutting systems; connections to robots and overarching systems are out of scope. The profile provides plug-and-play functionality for basic setups, including physical layer requirements such as compatible cables and connectors. The resulting system provides contradiction-free data to the Asset Administration Shell (AAS) and facilitates regulatory compliance and protecting the worker's health.

Chairperson: Dr. Andreas Matz, Abicor Binzel

Interfaces to be specified

The SIG has identified the interfaces for several functions that will be covered by the CiA 464 application profile for welding and cutting. The functions will be defined by the following Task Forces (TF):

- System architecture and protocols (TF01)
- Power source, wire feeder, cooling, and calibration units (TF02)
- Human machine interface unit (TF03)
- Torch unit (TF04)
- Fume extraction unit (TF05)

Figure sources: Abicor Binzel, Engmar, ESAB, Kemper, Lorch, Miller, Orbitalum, and Thermacut

Mapping to CANopen

In a first step, the CiA 464 application profile for welding and cutting will be mapped to classic CANopen, which is an automation-focused, internationally standardized application layer and communication profile (EN 50325-4). It is based on classical Controller Area Network (CAN), which is specified in the ISO 11898 standard series. CANopen was originally developed in a European research project and is maintained by the CiA nonprofit association established in 1992. CiA has some 740 members worldwide.

Contributing

A growing community of manufacturers works together to enable interoperability of welding and cutting equipment. The SIG welcomes new members; both welding and cutting experts and CANopen specialists can contribute their expertise to the open development activity. Interested companies are welcome to contact the IG03 SIG19 Welding and cutting at headquarters@can-cia.org to join the community and for any further information. This flyer is also available on the CiA website for easy distribution.

Partners and liaisons

CiA cooperates with other non-profit associations to develop and promote the CiA 464 application profile for welding and cutting:

- EWA (European Welding Association)
- ZVEI (German Electro and Digital Industry Association)

Scope

Join the initiative

CAN in Automation (CiA) membership contract

This contract applies to 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:* .....

First name:* .....

Last name:* .....

Street:* .....

Zip, City, State:* .....

Country:* .....

E-mail:* .....

Phone:* .....

Fax: .....

URL: .....

VAT number:* .....

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

* mandatory

Date:* ..... Authorized signature:* .....

Please check off:

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

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