



CANopen for manual welding

A torch from Lorch: The German company is one of the CiA members participating in the SIG specifying the CiA 464 profile for manual arc welding and laser cutting (Source: Lorch Schweißtechnik)

CiA has established the Special Interest Group (SIG) welding and cutting. CiA promoted this specification development on the “Schweissen & Schneiden 2023” trade show in Germany.

Embedded CAN networks are used since many years in the welding and cutting industry. ESAB and other welding equipment manufacturers provide also CANopen interfaces to connect their products to CANopen host controllers. The ESAB Aristo CANopen gateway features NMT (network management) server functionality, for example. The Swedish company uses in some automated equipment embedded CAN networks running proprietary higher-layer protocols. Welding robots also provide CAN-based interfaces and communicate internally via embedded CAN networks.

Abicor Binzel has initiated the development of a CANopen profile for manual welding and cutting devices. Usually, these manual arc welding and laser cutting systems comprise several devices supplied by different companies. This means, there is a need to specify device interfaces, in order to provide interoperability between them. Some of these interfaces can use CANopen as communication technology, while in other use cases communication systems with more bandwidth are necessary. All these

joint developments have been started under the “Weldbus” term. The related CANopen profile is the CiA 464 series. It is intended to develop a multi-part application profile specifying the parameters for different units and the mapping to CANopen.

CiA presented this joint development on the Abicor Binzel booth on the “Schweissen & Schneiden” exhibition in Essen, Germany. This trade show focuses on joining, cutting, and surfacing technologies. It is market-leading with over 800 exhibitors from 40 countries and about 40000 visitors from 124 nations. According to Reiner Zitzmann from CiA, the interest in the CiA 464 profile was high, especially, because Abicor Binzel has provided a very first demonstrator on the fairground.

The CiA 464 profile will specify CANopen interfaces for torch units, fume extraction units, power units, wire-feeder units, cooling units, and calibration units. Additionally, human machine interface units are in the scope of the CiA 464 profile. In a first step, the generic profile will be mapped to CANopen CC (classic). Proposals for some ▶

CNC plasma cutting



Figure: The K 200 plasma power source (Source: Kjellberg)

Kjellberg (Germany) produces CNC cutting and welding systems. Some products use host controllers and actuators from Eckelmann, a long-time CiA member. The E°EXC 66, E°ECX 89, and E°EXC 880/882 controllers feature Codesys programming software compliant with IEC 61131 (also known as PLCopen). Eckelmann also provides CNC cutting software developed in close cooperation with its customers. Kjellberg is one of them. On the “Schweissen & Schneiden 2023” trade show, the German machine builder demonstrated for the first time the K 200 power source for plasma cutting. The product can be integrated into CNC guidance systems. Eckelmann supplies CNC plasma cutting solutions also to ERL Automation and Sato Schneid-systeme, for example.

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parameters to be specified are already reviewed by the SIG members. They also discuss the need of unit status information to be exchanged between the devices via CANopen CC.

CiA cooperates with other nonprofit associations to develop and to promote the profile for welding and cutting. The EWA (European Welding Association) and the ZVEI (German Electro and Digital Industry Association) are the first partners. Representatives participate in the SIG meetings. Interoperable interfaces for manual arc welding and laser cutting improve worker’s safety and regulatory compliance functions to minimize the 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. Engmar, situated in France, has presented on the “Schweissen & Schneiden” fair the Atmoflow fume extraction system. The company is going to support CiA 464, when the profile is ready to be released.

The welding market is in general expanding. Manual welding is growing, too: Especially for portable and light-weight equipment. Furthermore, the market is experiencing a surge in the development of eco-friendly manual welders with reduced emissions and energy consumption. This is where CiA 464 comes into the game: Interoperable manual welding devices with smart functions are needed.

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