CANopen-certified devices by March 2024

CiA (CAN in Automation) tests as an independent third party the conformity of CANopen devices. This ensures the device's conformance with the CANopen application layer and communication profile as specified in CiA 301.

OEMs (original equipment manufacturers) want to purchase CANopen devices from different suppliers. Standardized CANopen interfaces enable them to overcome single-source problems. It is obvious that a manufacturer would prefer a CANopen-tested device while choosing from devices with the same functionality. Device suppliers, which received a certification from CiA can prove to customers that their product(s) are CANopen compliant.

Certified devices

From March 2023 to March 2024, nine devices/series have passed the CANopen conformance test by CiA and received the appropriate certificates.

The XU Endurance series from the CiA member Sure Grip Controls (Canada) is an ergonomic joystick designed for work in demanding environments such as heavy-duty and off-highway vehicles. Right- and left-specific handles fit a wide range of hand sizes in applications with and without gloves. The IP69K-protected device features a dual-angle faceplate and high-visibility LED buttons. Both can be configured or customized for the required control system. Rated for operation at -40 °C to +85 °C, the CE certified, SIL-2 compatible joystick is rated for up to 5 million cycles or 20 million operations, informs the manufacturer. Beside the tested CANopen interface supporting the CiA 401 profile for I/O devices, it offers connectivity to J1939. In August 2023, the company, which is a subsidiary of Bailey International, has also certified its CANopen JSC joystick. This device also supports the profile parts CiA 401-1 (Generic I/O modules) and CiA 401-2 (Joysticks). The award-winning joystick is designed for high-volume applications. It integrates a Deutsch connector and can be paired with the manufacturer's handle. A J1939 model and analog model are available as well.

Figure 1: XU Endurance and CANopen JSC joysticks (Source: Sure Grip Controls)

Leine & Linde (Sweden), also a long-years CiA member, has certified its IxA RxA 6xx rotary absolute encoders. For example, the IP67-rated 600 series is developed to increase the device's durability in demanding environments due to the inductive scanning method and robust ball bearings. The series features absolute encoders for single- or multi-turn measurements. The 58-mm (diameter) units communicate via CANopen, DeviceNet, and other interfaces. The CiA 406 CANopen device profile for encoders, version 3.0.2 is supported. The devices designed to endure the radial/axial shaft loads of 125 N/100 N are also available in stainless steel, verified for use in saltwater environments, and with certification for explosive environments. Variants for temperature ranges from -40 °C up to +100 °C are available. The company also offers linear encoders, functional safety encoders, and strain sensors.

The Chinese company Shanghai Junqian Sensing Technology (J-Sensor) is engaged in developments and researches of sensing technologies. The enterprise ▷

incorporated in Shanghai has conducted the CANopen-certification process of the VR1X CANopen valve island from Norgren. The device supports the CiA 401 device profile for generic I/O modules. The bit rate and node-ID can be set via a hardware switch or using the layer setting services (LSS). The valve implements the NMT (network management) server functionality. Available in two body sizes (10 mm and 15 mm), the valves can be used in such industrial automation markets as food & beverage, packaging, labelling, textiles, glass production, metal production, paper, and print. Norgren, part of IMI, creates engineering solutions in the fields of precise motion control and fluid technology. The company collaborates with customers across more than 50 countries in such areas as factory automation, material handling, commercial vehicles, rail, life science, energy, and process control.

Another Chinese company Suzhou Shenen Electronic Technology provides rotary and linear encoders with different communication interfaces. The CiA member has certified its SAS/M-CA CANopen encoder in July 2023. The device providing NMT (network management) server functionality supports the CiA 406 CANopen device profile for encoders, version 4.1.0. Setting of the node-ID and bit rate is possible via a software switch or LSS. The manufacturer offers encoders with different mechanical options and electronic connections further supporting DeviceNet and Ethernet-based networks.

Figure 2: The MWC25M-L2M-B16- radar sensor (Source: Pepperl + Fuchs)*

Pepperl + Fuchs (Germany), a long-time member of CiA, has received the CANopen certification for the MWC25M-L2M-B16-* radar sensor. The radar is dedicated for distance and velocity (0,1 m/s to 80 m/s) measuring in a sensing range up to 25 m with a sampling rate of 50 Hz. The IP68-/IP69-protected device is available with a bidirectional and rotatable sensor head and robust metal fastening. The 5-pin M12 plug connector provides a pin assignment according to CiA 106 (former CiA 303-1) recommendation. Two LEDs inform about object detection within the measuring range (LED yellow) as well as the CANopen network status (LED red/green). Bit rates up to 1 Mbit/s are programmable via the CANopen interface using the LSS. The device weights 180 g, dimensions 40 mm x 40 mm x 83,3 mm, and works in ambient temperatures from -40 °C to +70 °C.

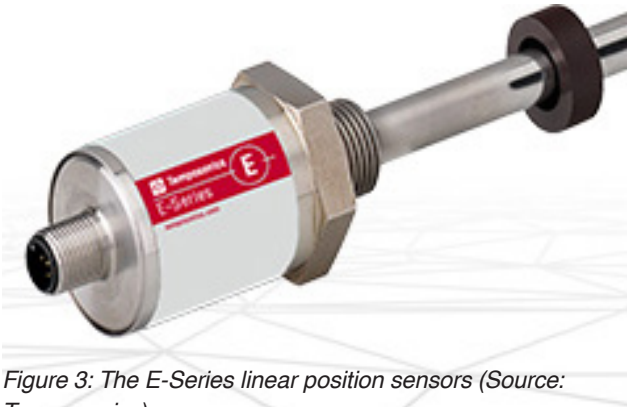

Figure 3: The E-Series linear position sensors (Source: Temposonics)

The CANopen-certified E-Series compact linear position sensors by CiA member Temposonics (Germany) are suitable to meet the needs of various industrial installations when the space is limited. For instance, these are available as rod version (EH) for cylinder integrated position measurement, profile versions (e.g. EP, EL, and EP2) for position measurement of a motion axis, and further. Rod versions for high temperatures and hazardous areas are offered as well. The devices implement the CANopen NMT (network management) server (see CiA 301) and layer setting services (LSS, see CiA 305) to configure sensor's node-ID and bit rate. The CiA 406 (version 3.1) device profile for encoders is implemented, too. The IP67- or IP69K-rated sensors support bit rates of up to 1 Mbit/s.

Another CiA member company Trinamic Motion Control (Germany), now part of Analog Devices, has received the CANopen approval for its TMCM-1690. It is a single-axis FOC servo controller gate driver module for 3-phase brushless direct current (BLDC) and DC motors with up to 1,5 A gate drive current and 10 V to 60 V nominal supply voltage. The servo controller supports incremental encoders, digital hall sensors, and absolute encoders as position feedback. It also provides reference switch inputs. The compact-size board (27 mm x 22,5 mm) implements the CiA 402 device profile for drives and motion control. The possible application fields include servo drives, robotics, laboratory and factory automation, manufacturing as well as motorized tables and chairs.

Danfoss, member of CiA with different subsidiaries, certified the CANopen interface of its DST-P10B CANopen pressure transmitter supporting the CiA 404 CANopen profile for measuring devices and closed-loop controllers. The device is dedicated for water distribution (e.g. water pumps) and air handling (e.g. industrial air compressors with up to 50 bar) applications. MEMS technology, stainless-steel design, and a hermetically sealed media interface ensure that the transmitter can withstand the harsh application environments. The modular electronics platform and the CANopen interface enable customers to configure the sensor according to their application needs and allow for according data acquisition.

Figure 4: The DST-P10B CANopen pressure transmitter (Source: Danfoss)

Additionally, Danfoss Power Solutions has received a CANopen certificate for its KBFRG4 round solenoid valve in February 2024. The device supports the NMT server functionality as well as node-ID and bit-rate settings via software.

of