Interlift 2023: CANopen Lift is set!

At the Interlift trade show, elevator suppliers showed their CANopen Lift devices. These products are interoperable enabling an easy integration into a lift control system. Besides new lift applications using an open network approach, there are retrofit projects implementing CANopen Lift networks.

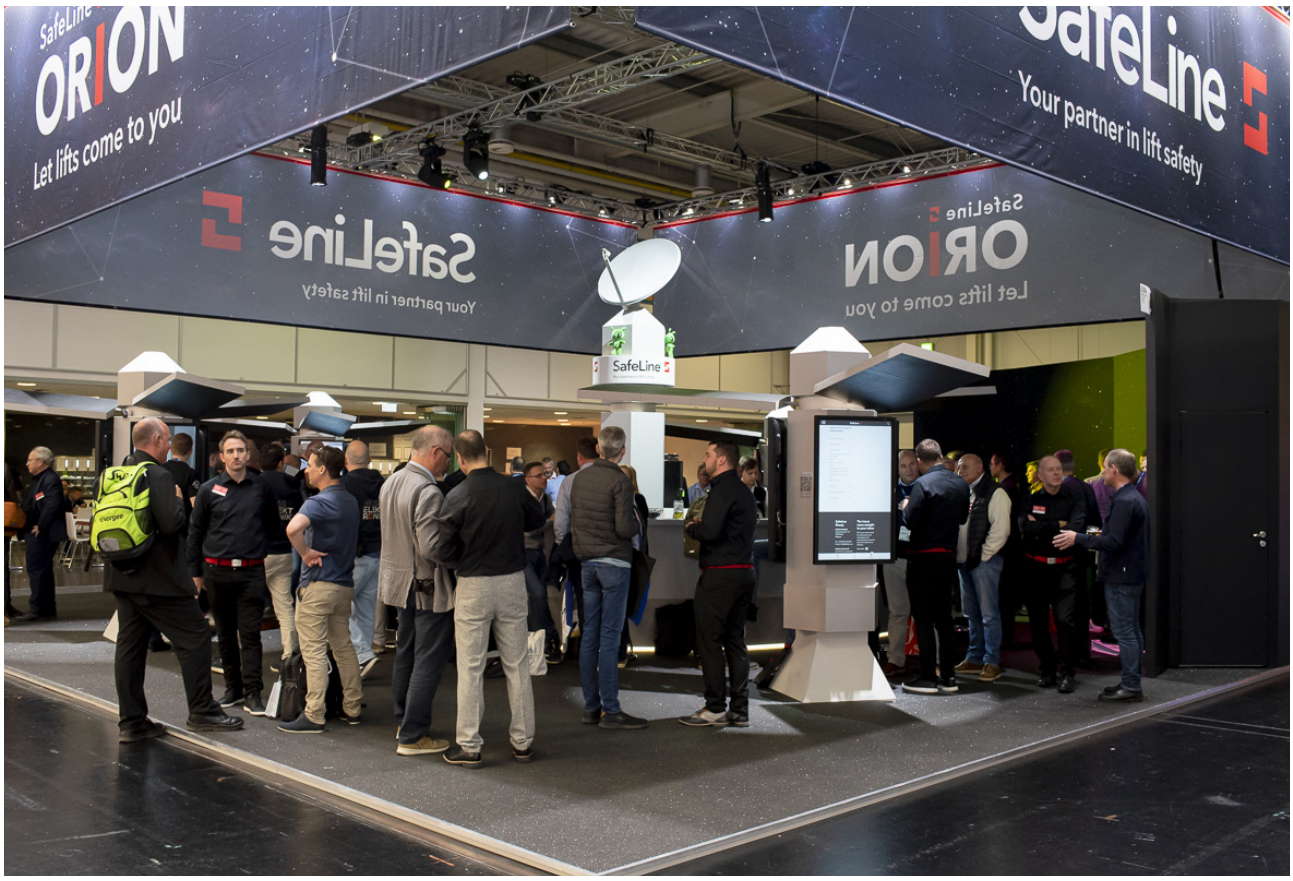

Figure 1: At the Interlift 2023 in Augsburg (Germany), more than 500 companies presented their products to about 19000 visitors coming from 110 countries (Source: Interlift)

Retrofitting is an increasing business in the elevator markets. In Europe, there are installed about 6,6 million elevators (2022). In 2022, circa 140000 new lifts have been positioned according to the European Lift Association. A growing number of CANopen Lift compliant controllers is used in retrofit projects. CANopen Lift is specified in the CiA 417 application profile documents (see insert “CANopen Lift is 20 years old”).

Boehncke & Partner, a member of the Schmersal group, is one of the early birds in the CANopen Lift business. The company has installed more than 35000 elevator controllers compliant with CiA 417. The host controllers can communicate via the CANopen Lift network with frequency inverters from different suppliers such as Danfoss, Fuji, and Ziehl-Abegg. The company announces to provide software support for the car drive units from Delta, too. Boehnke & Partner offers also other lift control devices including indication and operator panels, absolute encoders, etc. Some of these products are brand-labelled or jointly developed with partners.

Other suppliers provide also CiA 417 compliant host controllers. Thor Engineering has developed an open CANopen Lift controller hardware platform, which is used by several companies: Hisselektronik, Hydroware, Masora, Mitsubishi, Safeline, Weber, etc. “We believe in the open-source idea, where using software comes with certain rights, but also certain obligations. Because of that we decided to open the CANopen stack used in the Thor system, as well as the Toolbox to all the members of the Next group, giving them the opportunity to use and contribute.” The open-source CiA 417 protocol stack is also used by suppliers of CANopen Lift units such as car door units.

The Toolbox is a Windows-compatible configuration software. It can check, if all intended CANopen Lift devices are in the network. The software tool provides a graphical way of editing inputs and outputs in the panel units. It can ▷

Position & Orientation Data via CAN FD

PCAN-GPS FD: Programmable Sensor Module with CAN FD

The new PCAN-GPS FD from PEAK-System is a programmable sensor module for position and orientation determination with CAN FD connection. It has a satellite receiver, a magnetic field sensor, an accelerometer, and a gyroscope. Incoming sensor data is processed by the NXP microcontroller LPC54618 and then transmitted via CAN or CAN FD.

The behavior of the PCAN-GPS FD can be programmed freely for specific applications. The firmware is created using the included development package with GNU compiler for C and C++ and is then transferred to the module via CAN. Various programming examples facilitate the implementation of own solutions.

On delivery, the PCAN-GPS FD is provided with a standard firmware that transmits the raw data of the sensors periodically on the CAN bus.

Specifications

- High-speed CAN connection (ISO 11898-2)
  - Complies with CAN specifications 2.0 A/B and FD
  - CAN FD bit rates for the data field (64 bytes max.) from 40 kbit/s up to 10 Mbit/s
  - CAN bit rates from 40 kbit/s up to 1 Mbit/s
- NXP TJA1043 CAN transceiver
- CAN termination can be activated through solder jumpers
- Wake-up by CAN bus or by separate input
- Receiver for navigation satellites u-blox MAX-M10S
  - Supported navigation and supplementary systems: GPS, Galileo, BeiDou, GLONASS, SBAS, and QZSS
  - Simultaneous reception of 3 navigation systems
  - 3.3 V supply of active GPS antennas
- NXP LPC54618 microcontroller with Arm® Cortex® M4 core
- Electronic three-axis magnetic field sensor ST IIS2MDC
- Gyroscope and three-axis accelerometer ST ISM330DLC
- 8 MByte QSPI flash
- 3 digital I/Os, each usable as input (High-active) or output with Low-side switch
- LEDs for status signaling
- Connection via a 10-pole terminal strip (Phoenix)
- Voltage supply from 8 to 32 V
- Button cell for preserving the RTC and the GPS data to shorten the TTFF (Time To First Fix)
- Extended operating temperature range from -40 to +85 °C (with exception of the button cell)
- New firmware can be uploaded via a CAN interface

The PCAN-GPS FD is expected to be available at the beginning of Q1 2024.

www.peak-system.com

Take a look at our website for the international sales partners. Scan the QR code on the left to open that page.

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PEAK System

scan the network by using EDS (electronic data sheet) files and save the result as a snapshot into an XML file, which can later be loaded again. This makes it possible to handover a lift configuration to the office and back.

Thor Engineering offers the Thor E2 host controller with eight programmable I/O lines, a lift car panel, and C3 floor displays. Weber Lifttechnik, another CANopen Lift pioneer, uses the Thor E2 platform and has added additional software functions for dedicated applications. The company also offers the WE408 lift controller based on the hardware by Schmersal. Weber Lifttechnik is known for application-specific elevators, especially in power plants. Their lift controllers are also used in the Queen Elizabeth 2 passenger ship.

The Safeline's Nova touch controller series is also based on the open-source hardware platform by Thor Engineering. It comes with a 5,5-inch TFT (thin-film transistor) touch display and with soft menu buttons. The product is suitable for both traction and hydraulic lifts. Using a touch-based graphical interface, the lift controller is intuitive even for inexperienced technicians. It displays connected CANopen devices and CANopen messages. Inputs and outputs can be configured with just a few swipes, explained the company.

Hydroware, another Thor Engineering partner, applied CANopen Lift to several elevator controllers. These controllers can operate with CiA 417 compatible drives, for example with the Unidrive products by Control Techniques, a brand of the Nidec enterprise. Hydroware has modernized many lifts with CiA 417-based devices. Intec, a long-time CiA member, exhibited in Augsburg its MLC-8000 lift host controller featuring CANopen Lift connectivity. The company launched the Digital Safety System (DSS), which is based on a proprietary CAN-based higher-layer protocol. It comprises one safety commander and safety responders. The German company has supplied CAN Lift systems to the Deutsche Bahn, the state-owned German railway company and to the carmakers Audi and Porsche.

The Austrian company Rocket manufactures a CiA 417 compliant elevator controller, as well. One of the sales partners is Variotech. The elevator host controller is suitable for up to 16 floors and supports a double and a triple lift group functionality. It is intended for new elevator installations as well as for modernization projects. Liftern, an Italian company, showed at the Interlift the EON C200 lift controller compliant with CiA 417. It supports up to 64 stops.

Drives moving the car

Elevator cars are moved by electrical motors or by hydraulic actuators. The CiA 417 specifications standardize the CANopen Lift car drive units. Several frequency inverter suppliers offer CiA 417 compliant interfaces. One of them is the Brazilian company Weg, which has acquired Gefran's drive department. At the Interlift, Weg presented its ADL500 CANopen Lift inverter product series. There are three models. The ADL510 is suited to asynchronous motors typical for low-rise buildings or modernization in open and close loop. The ADL530 is designed for both asynchronous and synchronous motors and features an on-board encoder interface. The ADL550 is the high-end model with safety functions. It features a safe brake test and safe brake control in conjunction with the CAN-connectable EBC500 accessory to replace electro-mechanical brakes control.

Figure 2: The Deutsche Bahn uses in many railway stations CANopen Lift controlled elevators (Source: Adobe Stock)

Anniversary: CANopen Lift is 20 years old

At the Interlift 2003 trade show, CiA has had introduced the CiA 417 series of CANopen Lift specifications. Currently, four specifications are available plus an application note.

In 2001, several CiA members started to develop that was is nowadays the state-of-the-art open network approach for elevators: CANopen Lift. Joerg Hellmich chaired the responsible CiA special interest group (SIG) developing the CiA 417 specifications (CANopen application profile for lift control systems). After two years, the documents were launched at the Interlift exhibition as version 1.0.1.

The CANopen Lift demonstration has been shown on several events including the Interlift trade show, it was a real joint activity of competitors (Source: CiA)

In the meantime, the specifications have been several times reviewed and updated (version 2.0.0, 2.1.0, 2.2.0, and 2.3.0). The version 2.0.0 is publicly available and can be downloaded free of charge from the CiA website. The access to the version 2.3.0 is limited to CiA members. The CiA 814-1 CANopen lift bootloader implementation guideline can also be downloaded by everyone from the CiA website.

In the beginning of the CANopen Lift story, CiA organized in cooperation with members the development of a demonstrator to proof the interoperability of CANopen Lift products. Still to today, the CANopen Lift community tests the interoperability of devices compliant with CiA 417. The next CANopen Lift plugfest is scheduled for spring 2024.

The SIG CANopen Lift members discuss currently some functional enhancements. There are also requirements regarding functional safety and cybersecurity on the table. Oskar Kaplun from CiA provided on the Interlift Forum 2023 a presentation about cybersecurity possibilities for CANopen Lift using the not yet used 18-bit extended ID-field in CAN CC (classic) data frames. Another option is to prevent mechanically an access to the CAN network lines and to protect a remote access by means of firewalls.

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Figure 3: The ADL500 frequency inverter family features CANopen Lift connectivity (Source: Weg)

At the Interlift 2023, other inverter suppliers including KEB, Yaskawa, and Ziehl-Abegg presented their CANopen Lift drive units, as well. Ziehl-Abegg exhibited the ZAdyn4Bplus frequency inverter for control cabinet mounting. It features an up to 110-kW nominal power capability, programmable I/O ports, and is compliant with CiA 417. The product provides an STO (safe torque off) function according to IEC 61800-5-2 (SIL 3). Yaskawa launched its LA700 frequency inverter, the successor of the LA500 series. It implements a CANopen Lift interface. The product is quieter in operation than the predecessor and offers an app function for remote programming and monitoring, explained the Japanese company.

Emotron showed its CiA 417 compliant DSV15 (0,25 kW to 2,5 kW) and DSV35 (0,37 kW to 110 kW) frequency inverters. Most of these products have been tested on interoperability in the CiA 417 plugfests organized by CiA. KW-Aufzugstechnik launched the Goliath 921 frequency inverter, which provides a CANopen Lift interface. In view of the coming ISO 8100-1 standard, the product provides already brake ventilation, wear monitoring, and control of a third brake element. The company offers a CANopen Lift host controller, too.

Interlift 2025 in Nuremberg

The next Interlift will take place at the Nuremberg Exhibition Center from October 14 to 17, 2025. Since 1991, Augsburg has been the home of the bi-annual trade show. “With the move to Nuremberg we are setting the course for the further development of the Interlift, which is not given at the current location,” said Achim Hütter, chairman of the VFA-Interlift association, one of the exhibition organizers. The Interlift 2025 will be located in five halls and two congress centers with numerous rooms offering possibilities for lectures and meetings. ◀

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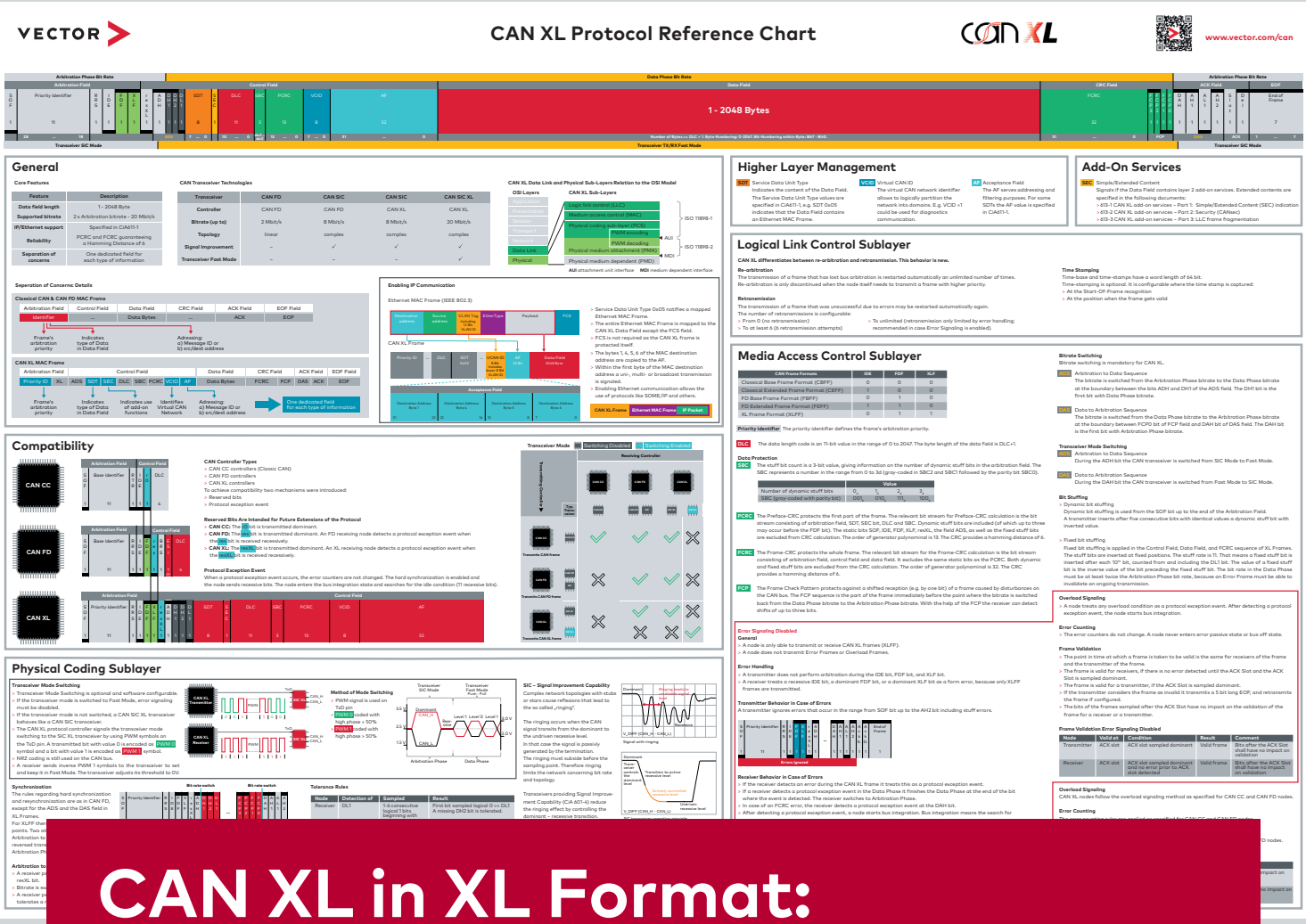

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