

CiA documents released

CAN in Automation (CiA) has updated several of its profile specifications and released them as Draft Specifications (DS). They are part of the one-year CiA 4XX sub-subscription.

CiA is known for its profile specifications. They enable an off-the-shelf interoperability and a partly interchangeability. In total, CiA has released more than 20 000 pages of profile specifications. The recently published ones include CiA 450 (CANopen device profile for pumps), CiA 452 (CANopen device profile for PLCopen motion control), CiA 457 (CANopen interface for wireless transmission), and the CiA 459 series (CANopen profile for on-board weighing devices). All these mentioned CiA documents are Draft Specifications (DS), which are part of the annual profile series (CiA 4XX) subscription. Subscribers can download all CiA profile draft specifications for one year – even non-members. CiA members get them free of charge.



CiA profile specifications enable interoperability between a host controller and connected devices (Source: CiA)

The CiA 450 pump profile is based on the VDMA bus-independent profile for vacuum and liquid pumps. It maps the pump information for generic pumps (minimal pump functionality) and for rotodynamic (liquid) pumps to classic CANopen. The document specifies the object dictionary entries and the PDO mapping for both pump types.

The CiA profile for PLCopen motion controller specifies the classic CANopen interface using one TPDO (transmit process data object) and one RPDO (receive process data object). The document also standardizes the parameters (objects) used for PLCopen-specific modes such as gear, jog, and camming functions. Objects specified in IEC 61800-7-201 are referenced in the annex. In opposite to the specifications given in the IEC 61800-7-1/-201/-301 standards, this CiA profile refers to a different power drive system (PDS) finite state automaton (FSA). This PDS FSA is an abstraction to describe the application behavior of the PDS as seen from the IEC 61131-compatible host controller. Due to the requirement that a PDS provides local control, even when the communication network is not working properly, the communication FSA (NMT state machine) as specified in CiA 301 (CANopen application layer and communication profile) and the PDS FSA are loosely coupled.

The CANopen interface profile for wireless transmission media is specified in the CiA 457 document. The document is a gateway specification. The purpose of such a gateway is to provide one CANopen port compliant with CiA 458 and one or multiple ports to the wireless transmission media such as Bluetooth or Zigbee. The gateway function maps the WTM higher-layer protocols to classic CANopen services and vice versa.

The CiA 459 profile series specifies classic CANopen interfaces for on-board weighing devices. Part 1 contains general definitions and a functional overview. Part 2 provides the common communication parameters and Part 3 specifies the application parameters. The on-board weighing device receives measured data from sensors, calculates gross, net, and total weight values and provides weighing data for further evaluation by an on-board or external controller or by any other control equipment on the vehicle network. The following device classes are supported: simple load monitor, load monitor with transaction weighing, and legal-for-trade weighing.

On demand of CiA members, these profiles can be adapted for CANopen FD or J1939 application layers. CiA needs to split the profile specifications into different parts specifying the application parameter in a basic part and the mapping to different application layer approaches in other parts.

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