

Product Information ProCANopen

Table of Contents

1	Introduction	3
1.1	Features and Advantages	3
1.2	Hardware Interfaces	3
2	Supplied Components and Functions	3
3	EDS Formats	4
4	Structuring the Task	4
5	Device Selection	4
6	Definition of Process Data	4
7	Definition of Communication Parameters	4
8	Configuration of Parameters	5
9	Network Management	5
10	Download of Project Data and Start-up	5
11	Documentation	6
12	Add-on Functions	6
13	Training	6

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1 Introduction

CANopen[®] is an open, CAN-based communication protocol. Its wide range of application includes the areas of transport and control technology, measurement systems, medical technology, railway technology, and much more – in short everywhere great flexibility and rapid data transmission are in demand. The specification drew on the experience of many component manufacturers and users, resulting in an established standard that is maintained by the CAN in Automation (CiA[®]) user organization.

ProCANopen is used for the planning of CANopen networks. Additional areas of application are:

- > Configuration of CANopen systems
- > Test tool during development: With interactive configuration and setting of parameters, the functionality of devices can be tested.
- > Start-up and programming of devices
- > Start-up of CANopen networks and diagnostics

1.1 Features and Advantages

ProCANopen enables the efficient and quick planning of complete CANopen networks as well as devices. You are supported in all project phases, including planning, development, start-up, and service. Through the extensive functions, combined with an intuitive user interface, you can concentrate immediately on the definition of the system parameters. ProCANopen executes the concrete and CANopen-conforming implementation of projects automatically. This significantly reduces the configuration effort required for extensive systems. The quality of the configuration thus created is increased, which in turn increases security on the system.

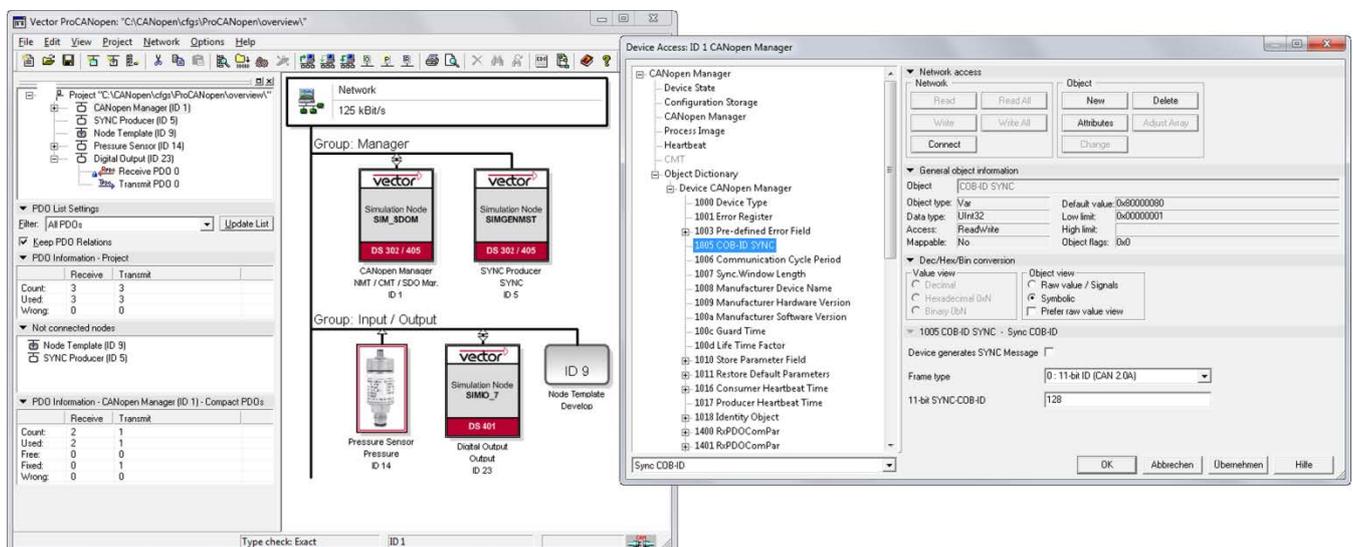


Figure 1: ProCANopen enables clear and rapid configuration of CANopen networks and assigned devices.

1.2 Hardware Interfaces

Connection to the CANopen network is established by means of a Vector hardware interface.

2 Supplied Components and Functions

ProCANopen is based on the process for project management of CANopen networks. The tool contains the **CANeds** EDS editor. With the following functions ProCANopen contributes to the success of your CANopen project development:

- > Generation of a CAN database for use in **CANalyzer.CANopen** or **CANoe.CANopen**

- > Device selection/Device design
- > Definition of process data
- > Definition of communication parameters
- > Definition of device parameters in the object dictionary
- > Download of project data and start-up
- > System analysis and customer service
- > Documentation

The most important functions will be described in detail below.

3 EDS Formats

CANalyzer.CANopen supports the standardized file formats EDS and DCF for data storage and informational exchange. It supports both the conventional INI format and the XML format that is specified in CiA311.

4 Structuring the Task

After analysis of the automation task the system can be structured from different perspectives. At that point the question of system architecture must be answered. For example, is the system to be set up as a simple master slave system, or would a multi-master architecture with decentralized intelligence offer advantages? ProCANopen lets the user organize a system by supporting the formation of groups. These groups can be used to display function groups, but also to view topological features.

5 Device Selection

In the next step, the devices necessary in the system are selected, taking into consideration their function in the system and displayed graphically. Devices are always selected by their EDS file. You can expand the list of available EDS files as desired. Using these standardized device descriptions in CANopen guarantees independence of manufacturer-specific formats.

Names, node ID, and a textual description can be assigned to the selected nodes. The task of the respective node is thus defined and documented exactly. The comparison of the corresponding object directories is performed automatically. In addition, it is possible to assign a bitmap file to each node. These bitmaps are then displayed in the topology window

6 Definition of Process Data

ProCANopen supports the assignment of symbolic names to process data. Incomprehensible designations such as "Node 3, Object Index 6000H, Subindex 3" can thus be replaced by easily understood names such as "Emergency Off" or "Contact Pressure". This makes it significantly easier to work with the process data and greatly reduces the danger that the user will connect devices incorrectly.

7 Definition of Communication Parameters

One of the main tasks of ProCANopen is the convenient generation and clear display of communication channels. Network nodes can be controlled by dialog or linked graphically. In the case of a graphical link, the desired nodes are selected with the mouse. A graphical display appears of all process data for these devices. They can be connected directly with the mouse (see figure).

ProCANopen automatically performs the implementation of these links to the corresponding CANopen mapping tables. There is no need for you to become involved in the complex interconnections and details of these tables. ProCANopen generally makes standard settings that can be used universally for attributes and connections such as priority and transmission type. If necessary, these settings can be conveniently changed.

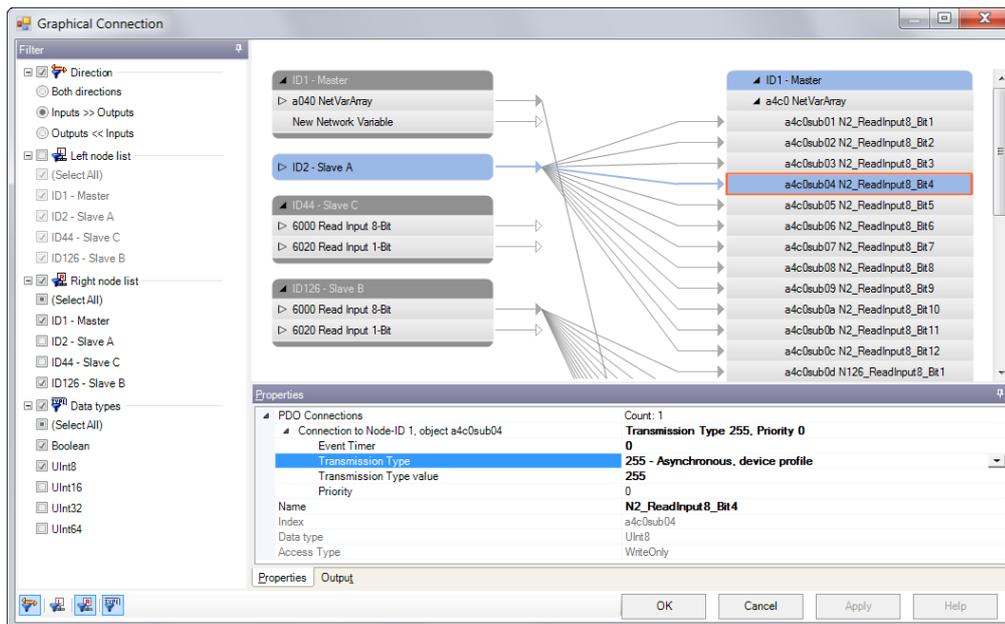


Figure 2: The linking of process variables is easy to realize with the aid of drag & drop and is displayed clearly.

8 Configuration of Parameters

Many devices offer the configurability of a series of application parameters – for example limit values for analog I/Os or edge parameters for drives. ProCANopen allows for direct access to all device parameters via the CANopen network. The parameters can be read, modified, or written back.

A tree structure that is laid out according to user inputs represents the object dictionary for an individual device. The EDS file specifies the objects for the specific device. ProCANopen displays the attributes of each individual object in an easy to read format. Device parameters that are mapped to a device by object dictionary entries can easily be read-out and modified here. This enables the user to configure necessary settings in a device. In the modification of PDO parameters the access dialog considers the access sequence defined by the DS301 communication profile.

If no EDS file exists for a device, it is still possible to access the object dictionary by a special dialog. Changes to device parameters are saved separately for each device in a Device Configuration File (DCF). Unfortunately, in practice it is often the case that the EDS files for devices are incomplete. ProCANopen lets you create new objects or assign the proper attributes to existing objects using the CANeds EDS editor that is included with the product. EDS files can be checked by the integrated EDS Checker. This is the same test program that is also used for conformity testing of a CANopen device.

9 Network Management

Node monitoring features such as heartbeat or guarding mechanisms can be started and stopped at any time – including for multiple nodes simultaneously. NMT commands can be executed to monitor the device status.

10 Download of Project Data and Start-up

ProCANopen saves all project planning data in standardized file formats (DCF). This ensures compatibility with other software packages. In addition, ProCANopen allows for direct download of all data onto the individual devices of the network.

Master functions integrated into ProCANopen such as starting individual nodes and booting the entire network make it possible to start up a system quickly and reliably.

11 Documentation

Complete documentation is an extremely important component of project planning. ProCANopen offers a print function for printing out documentation on paper. Export functions make it possible to transfer project planning data to other programs, for example text processing or spreadsheets, where it can be further processed.

12 Add-on Functions

ProCANopen contains a wealth of functions that relieve the user of workload. In particular, existing networks can be read, reconfigured, or compared with a scan function. EDS files can be created using the Editor CANeds supplied with the product. CANeds is integrated in the ProCANopen environment.

13 Training

As part of our training program, we offer a range of classes and workshops on CANopen in our classrooms and on-site at our customers. For more information and the dates of our training courses, please visit our website www.vector-academy.com

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