

CANopen Calibrator

Reference Manual

Document no:

177/52503

Rev. A



Partner with Performance™

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Chapter 1: Introduction

About CANopen Calibrator documentation

This version of the manual

This version of the CANopen calibrator manual replaces all previous versions. Sevcon has made every effort to ensure this document is complete and accurate at the time of printing. In accordance with our policy of continuing product improvement, all data in this document is subject to change or correction without prior notice.

Copyright

This manual is copyrighted 2009 by Tech/Ops Sevcon. All rights are reserved. This manual may not be copied in whole or in part, nor transferred to any other media or language, without the express written permission of Tech/Ops Sevcon.

Scope of this manual

This manual provides information on how to use the CANopen calibrator and on which Sevcon products the CANopen calibrator is compatible with. Documents providing further details of contents of the CANopen calibrator trees and system fault help are referenced here.

Related documents

The following documents are available from Sevcon:

- The Object Dictionary providing important information about CANopen communication with the CANopen calibrator.

Drawings and units

Orthographic illustrations in this manual are drawn in Third Angle Projection. SI units are used throughout this manual.

Warnings, cautions and notes

Special attention must be paid to the information presented in Warnings, Cautions and Notes when they appear in this manual. Examples of the style and purpose of each are shown below:



A WARNING is an instruction that draws attention to the risk of injury or death and tells you how to avoid the problem.



A CAUTION is an instruction that draws attention to the risk of damage to the product, process or surroundings.



A NOTE indicates important information that helps you make better use of your Sevcon product.

Product identification label

If you have a customized product your unique identifier will appear at the end of the Type number. When discussing technical issues with Sevcon always have your product's Type number, Part number and Serial number available

Error! Reference source not found. shows a typical product identification label.

Technical support

For technical queries and application engineering support on this or any other Sevcon product please contact your nearest Sevcon sales office listed on the inside front cover of this manual. Alternatively you can submit enquiries and find the details of the nearest support center through the Sevcon website, www.sevcon.com.

Product warranty

Please refer to the terms and conditions of sale or contract under which the CANopen calibrator was purchased for full details of the applicable warranty.



Chapter 2: About the Calibrator

Introduction

The CANopen calibrator can be used to assist in setting up and maintaining Sevcon CANopen compliant devices. It has the following features:

- 240x320, 256 colour display.
- Auto-baud rate detection.
- System status overview.
- Single and multi-node support.
- Reads/writes a wide range of commonly used vehicle system settings.
- Displays I/O + motor/vehicle status information
- Displays any active faults and provides basic diagnostic information.
- Fully flash programmable for calibrator software updates.

Standard features and capabilities

Mechanical package

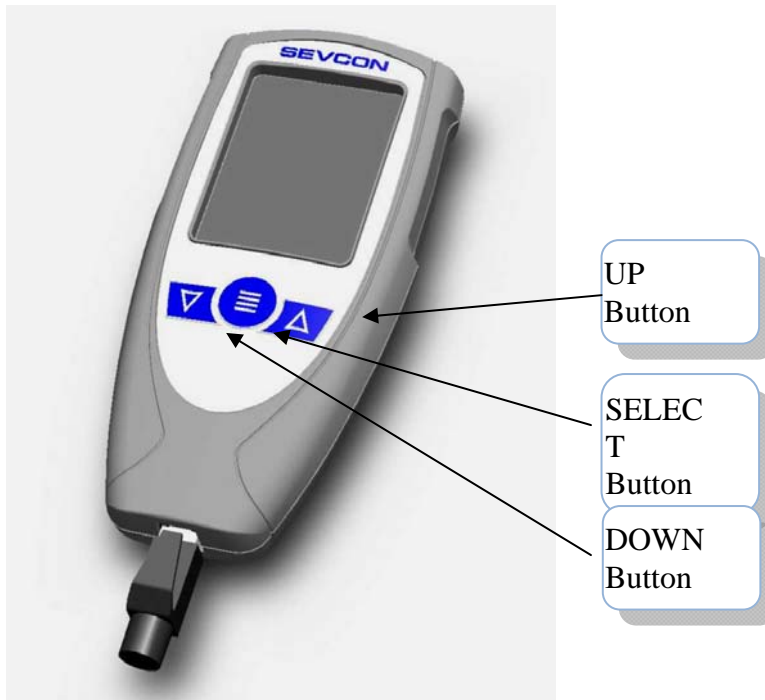


Figure 1 Mechanical package

Available accessories

The following accessories are available from Sevcon:

- External harness to connect to system
- Drive Wizard - PC based configuration tool

Safety and protective functions

General



Do not adjust the value of any parameter unless you fully understand the effect of this change. You should have read and understood the User Manual for all the connected devices before connecting the calibrator to them..



Do not attempt to open the calibrator as there are no serviceable components. Opening the calibrator will invalidate the warranty.



Electric vehicles are subject to national and international standards of construction and operation which must be observed.



Chapter 3: Connection

Connecting the Calibrator

Connector

The calibrator is supplied with a detachable external harness.

CAN bus termination

The calibrators primary function is to connect to an existing multi node fully terminated CAN bus.

The calibrator contains no internal bus termination. The CANbus it connects to should already be properly terminated. If you use the calibrator with a single stand alone device then you should check that the connection is properly terminated by connecting a termination adapter to the external harness as required.



If the calibrator fails to detect a standalone device then you should check that the CAN bus has correct termination

Signal connections

Pin	Name	Type	What to connect	Maximum rating
1	Not connected	n/a	Not connected	
2	Gnd	Power	+24Volt supply return	-35V
3	Not connected	n/a	Not connected	
4	VPos	Power	+24Volt supply	35V
5	CAN Hi	Comms	CAN Hi	35V
6	CAN Lo	Comms	CAN Lo	35V

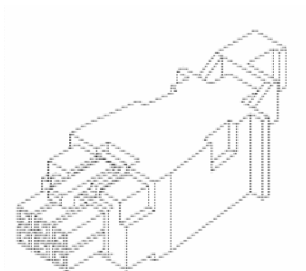


Table 1 Connector A pin out and wiring information

Pins are protected against short-circuits to the battery positive or negative voltages.



Chapter 4: Specification

Electrical

Input voltage

Working voltage limits:	15V to 28.8V
Input protection:	Input protected against reverse connection of supply Maximum current draw 100mA

Output protection

Short-circuit:	Protected against short circuit to supply
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CAN interface

CAN protocol:	CANopen profiles DS301, DS401 and DS402 are supported. Physical layer uses ISO11898-2.
Baud rates supported:	1Mbits/s, 500 kbits/s, 250 kbits/s, 125 kbits/s, 100 kbits/s, 50 kbits/s

Control inputs

User interface	3 button keypad input
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Isolation

Any terminal to the case:	TBD (Gen4:Withstands 2 kV d.c. Meets EN1175-1:1998 and ISO3691 Complies with IEC-60664
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EMC

Radiated emissions:	EN12895 (Industrial Trucks – Electromagnetic Compatibility) EN 55022:1998, 6, class B EN 12895:2000, 4.1 Emissions. When part of a system with a motor operating, FCC Part 15, Radiated Emissions. Meets the standards given in FCC Part 15, Section 15.109:
Conducted emissions:	No mains port, therefore not required
Radiated RF field:	EN 61000-4-3, 5.1 Test Level: user-defined test level of 12 V/m EN 12895:2000, 4.2 Immunity EN 61000-4-6, Table 1 - Test Levels
Electrical fast transient:	EN 61000-4-4, Table 1 - Test Levels, Level 2

Electrostatic discharge:	EN 12895:2000, 4.2 Electrostatic Discharge 4 kV contact discharge 8 kV air discharge
Electrical surge:	EN 61000-4-5:1995, Table A.1 – Selection of Test Levels, Class 3

Regulatory compliance

Designed to meet:	EN1175-1:1998 (which covers EN1726 for the controller) ISO 3691 UL583 ASME/ANSI B56.1:1993
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Mechanical

Operating environment

Operating temperature:	-10°C to +50°C
Non-operation temperature:	-40°C to +85°C (can be stored for up to 12 months in this ambient range)
Humidity:	95% (non-condensing) at 40°C and 3% at 40°C
Ingress of dust and water:	IP42

Weight

Weight including external harness:	0.3 kg
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Dimensions

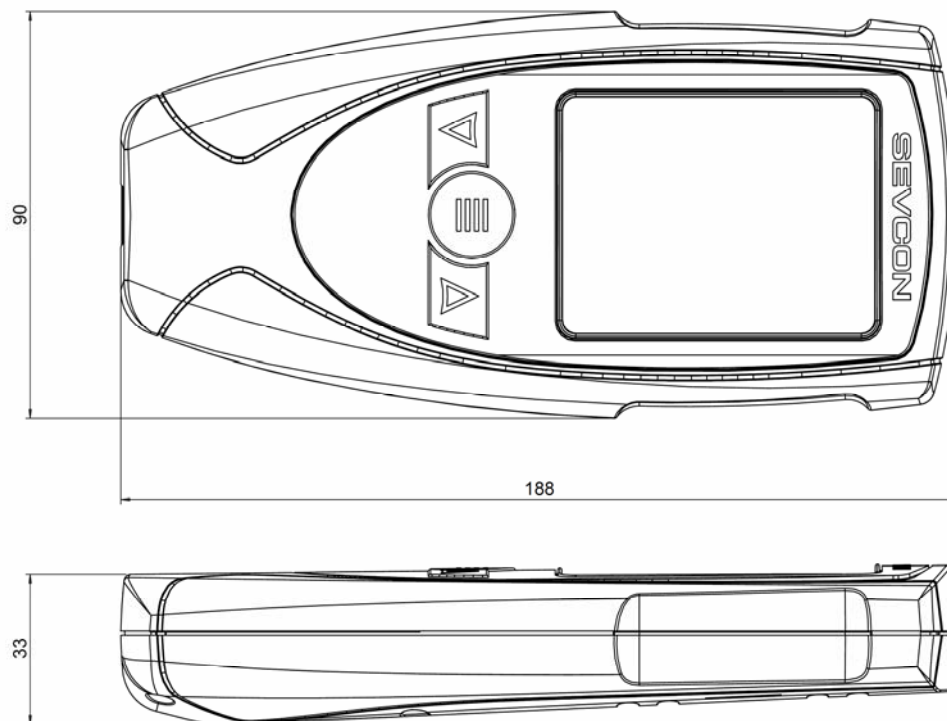


Figure 2 Dimensions



Chapter 5: Calibrator Usage

Principle of operation

Functional description

The CANopen calibrator allows users to modify common settings on Sevcon devices and to provide basic diagnostic and fault finding capability.

At power up or when connected to a CANbus, the calibrator can auto-detect the CANbus baud-rate by listening for heartbeat messages from other devices.

Navigation

To change between calibrator screens, press and hold the Select button until the calibrator menu appears.

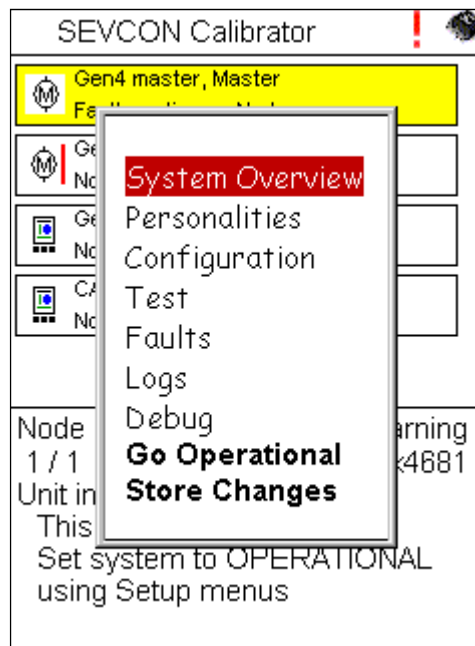


Figure 3 Calibrator Menu

Release the Select button, then select the appropriate screen using the Up/Down buttons and press Select again.

This can be done on any calibrator screen.



As well as accessing screens, the menu can also be used to change a CANopen network from pre-operational to operational. Some configuration items can only be changed in pre-

operational. The system will not drive or close it's line contactor if pre-operational, so always ensure the system is set back to operational after all changes are made.

Most of the screens utilize tree structures to display information. To navigate the trees, use the Up/Down buttons to select tree nodes and branches and the Select button to expand/collapse branches. To change values, use the Select button to select the value, then Up/Down to change the value, then Select again to transmit the value to the controller.

Splash Screen

At power up the calibrator displays a splash whilst it analyses the CANbus network, identifies nodes and logs in to the system. Progress is shown at the bottom of the splash screen.



Figure 4 Splash Screen



The splash screen image can be made customer dependant. The example above is the generic Sevcon splash screen.

System Overview

The system overview screen is shown below.

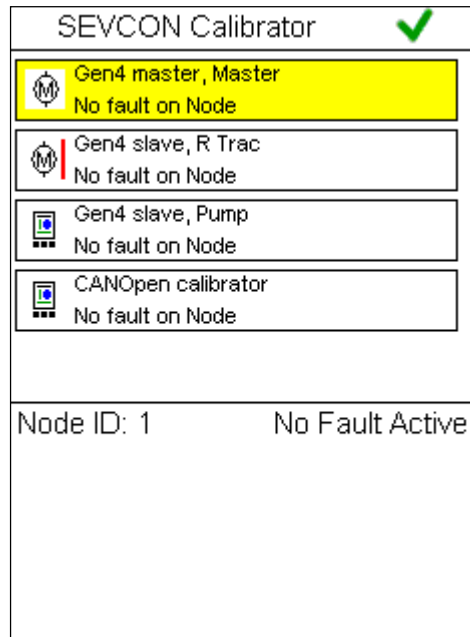





Figure 5 System Overview

System status is represented by one of the following icons at the top of screen:

	The system is operational, with no active faults
	The system is operational, with active faults
	The system is pre-operational mode. This mode is used to set up parameters that cannot safely be change during normal operation.

Each device in the network is displayed. Select a device to display more information and fault status. Press Select to cycle through each active fault on the selected device.

Personalities and Configuration

Both these screens allow the system configuration to be modified. The Personalities screen displays the most commonly modified parameters. The Configuration screen displays additional parameters which can be modified.

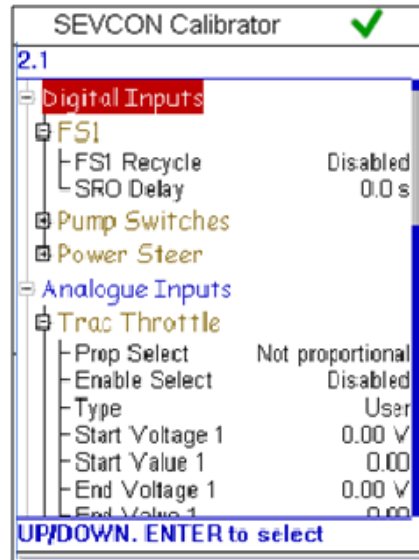


Figure 6 Personalities and Configuration

Test

This screen displays the state of all analogue and digital I/O. Only I/O which is configured for use in the system is displayed.

This screen also displays battery voltage, hours counters and motor status.

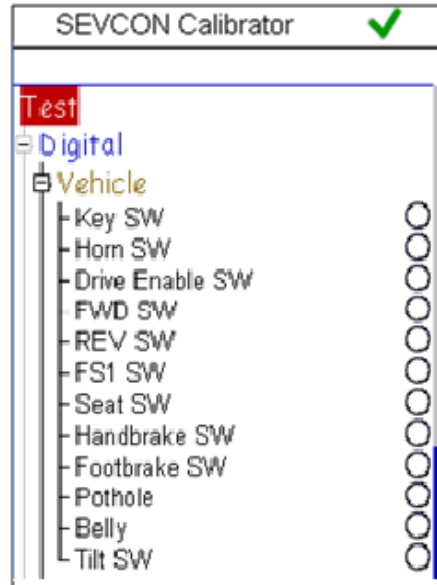


Figure 7 Test

Debug

This screen displays debug information for each device to assist with detailed performance or problem analysis.

Faults and Logs

These screens are reserved for future use to display fault and service log information. They are not yet available. Use DriveWizard to display this information instead.

Calibrator Configuration and Software Update

Configuration

To change calibrator configuration, power up the calibrator with no CANbus connected. Use the Configuration menu to change calibrator settings.



The CANbus and Calibrator branches in the Configuration tree are reserved for the calibrator. These branches are still available even when other devices are connected to the CANbus.

Software Update

It is possible to update the firmware of the calibrator controller, using Sevcon's DriveWizard configuration tool.

Please contact Sevcon for assistance with this process.