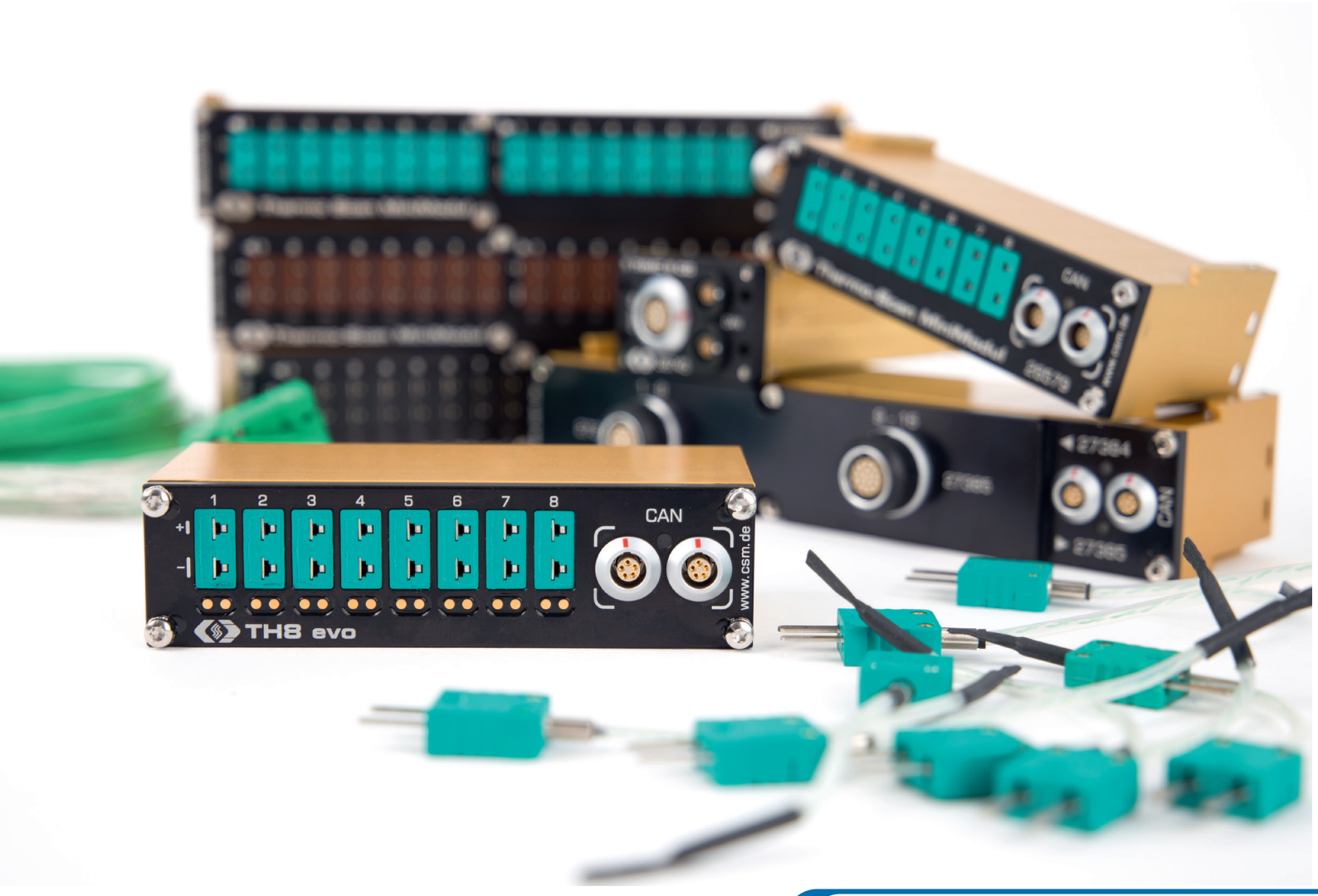
TH CAN MM Series

User Guide



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Product disposal/recycling

If this symbol (crossed-out wheeled bin) appears on the device, this means that the European Directive 2012/19/EU applies to this device.

The correct disposal of old equipment will protect the environment and people from possible negative consequences.

Become familiar with local regulations for separate collection of electrical and electronic equipment.

Follow local regulations and do not dispose of old equipment with household waste.

Contact information

CSM offers support for its products over the entire product life cycle. Updates for the individual components (e.g. documentation, configuration software and firmware) are made available on the CSM website. To keep up to date, it is therefore recommended that you check the download area of the CSM website for updates at least once a month.

Contents

1 Introduction

1.1 About this user guide

This user guide contains important information for handling the product. Please read the entire document carefully before installation and initial operation.

1.2 Symbols and writing conventions

Symbol/note	Meaning	Example of application
☞	User instruction	☞ Click on **OK** to confirm the entry.
⇨	Result of an action	⇨ The following dialog opens:
→	Cross reference to external information source(s)	→ *CSMconfig Online Help, section "Menu commands"*
→	Text highlighted in blue (with or without arrow) refers to a link link/cross reference within the document.	→ Chapter 4.3.2.4 "Ground connection" ☞ Continue with chapter 5.4.3.4 "Creating a new configuration.
i	This pictogram refers to important notes or additional information on a specific topic.	**i** CSM offers a mounting kit for devices in standard housings. For further information please contact our sales department.
Options | Interface	**Menu selection** Menu items, options and buttons are highlighted in bold. The vertical bar "|" separates the menu from the menu command. The example on the right means: Click on the **Options** menu and select **Interface.**	☞ Select **Options | Interface**.
(→ **Options | Interface**)	A menu option integrated into the text.	The CAN interface is selected via the **Interface** dialog (→ **Options | Interface**).

Tab. 1-1: Symbols and writing conventions

1.3 List of abbreviations

Abbreviation	Meaning
ASAM	**A**ssociation for **S**tandardization of **A**utomation and **M**easuring Systems: registered association coordinating the development of technical standards → *asam.net*
CAN	**C**ontroller **A**rea **N**etwork: serial bus system developed by Bosch for networking ECUs in vehicles
CoE	**C**ANopen **o**ver EtherCAT®: protocol for use of the CANopen family of profiles over EtherCAT®
DAQ	**D**ata **A**c**Q**uisition), e.g. DAQ software
ECAT	**E**ther**CAT**®: an Ethernet-based field bus system developed by Beckhoff company and the EtherCAT® Technology Group → *ethercat.org*
EMC	**E**lectro**M**agnetic **C**ompatibility
ESD	**E**lectro**S**tatic **D**ischarge
HV	**H**igh **V**oltage
MC Tool	**M**easurement & **C**alibration Tool
STG	**ST**rain **G**auge
TEDS	**T**ransducer **E**lectronic **D**ata**S**heet: sensor with integrated memory for electronic data sheet
XCP	Universal Measurement and Calibration Protocol → *asam.net*

Tab. 1-2: List of abbreviations

1.5 Warning

A warning indicates specifically or potentially dangerous situations. Failure to follow a warning could result in injury or death to persons and/or damage to property.

This guide contains warnings that the user must observe to ensure safe operation and to prevent injury to persons and damage to property.

Warning design

A warning sign consists of the following components:

- Warning symbol
- Signal word
- Source/type of hazard
- Possible consequences of non-compliance
- Measures to avert the hazard

Warning symbols

Symbol	Meaning
	General risk This symbol indicates a general hazard.
	High voltage! This symbol indicates a risk due to hazardous electrical voltage.
	Hot surface! This symbol indicates a possible risk of burns from hot surfaces.

Tab. 1-3: Warning signs

Signal words

Signal word	Meaning
WARNING	... indicates a potential hazard. Failure to follow this warning may result in serious injury, or possibly death.
CAUTION	... indicates a potential hazard. Failure to follow this warning may result in minor injuries.

Tab. 1-4: Signal words

If several potential hazards originate from one source of danger, then the warning (signal word/symbol) that indicates the greatest potential hazard is used. For example, a warning indicating danger to life or serious injury may also indicate the potential risk of property damage.

1.6 Directive

A directive contains important information about the product described in the guide. Failure to observe a directive may result in malfunction and/or damage to property and material. A directive is indicated by the blue symbol and the signal word **NOTE**.

Example

NOTE!	
	This symbol indicates important information. Failure to observe this information can impair the function or result in damage to the measurement module. ☞ Read the information carefully.

Symbols

Symbol	Meaning
	This symbol indicates important information. Failure to observe this information can impair the function or result in damage to the measurement module.
	Wear suitable safety gloves.
	Disconnect the device before starting to work.

Tab. 1-5: Symbols used in mandatory signs

1.7 Legal disclaimer

This guide and other documents are part of the product and contain important information for its safe and efficient use. To maintain the high quality level the product is continuously being developed, which may result in the product's technical details changing at short notice. As a result, the contents of this documentation may differ from the technical specifications of the product. No claims against the manufacturer can therefore be derived from the contents of the product documentation.

Computer-Systeme-Messtechnik GmbH (hereafter referred to as "CSM") is not liable for technical or editorial errors or missing information.

CSM GmbH assumes no liability for damage resulting from improper use of the product and/or non-observance of the product documentation, in particular the safety instructions.

→ Chapter 2 "Safety Instructions"

1.8 Warranty and exclusion of warranty

The warranty covers the safety and functionality of the product within the warranty period. Excluded from the warranty are claims based on possible consequential damages caused by malfunction or non-function of the product.

The warranty shall become invalid if

- the product is handled improperly
- prescribed maintenance intervals are not observed
- the product is modified by the end-user
- the user does not observe the safety instructions and the product documentation
- the product is operated with accessories or parts which are not explicitly approved for operation by the manufacturer of the product

→ Chapter 2 "Safety Instructions"

1.9 ESD Information

The manufacturer of the product declares that TH CAN MM series measurement modules comply with the requirements of EU Directive 2014/30/EU.

NOTE!	
	Electronic components can be damaged or destroyed by electrostatic discharge (ESD). ☞ Make sure that no electrostatic discharge occurs via the internal contacts of the inputs. ☞ Avoid electrostatic discharge when handling or installing sensors.

2 Safety Instructions

This chapter contains important safety information. Please read the following sections carefully.

2.1 General Safety Instructions

The measurement modules comply with the latest technical developments and the recognized safety standards. The measurement modules may only be used in a technically faultless condition and in accordance with their intended use. To avoid health hazards or damage to the measurement module, please observe the safety instructions in the following chapter and the document "Safety Instructions MiniModules".

WARNING!	
	Connecting CAN bus measurement modules to an existing CAN bus system may affect the CAN bus behavior. **Improper use of a CAN bus system may cause life-threatening situations and material damage.** ☞ Always connect CAN bus measurement modules to a separate CAN bus system (measurement bus). ☞ Make sure that the work is only carried out by qualified and trained personnel.

CAUTION!		
	The surface of the device housing may become very hot when operated in specific environments (e.g. engine compartment). **Touching the surface may cause serious burns.** ☞ Let the device cool down before handling. ☞ Wear appropriate safety gloves, if required.	

NOTE!	
	Differences in potential between the measurement module (= shield of the interface cable) and the mounting location can falsify measurement results or destroy the device. ☞ Make sure that no differences in potential occur when mounting the device. ☞ Isolate the measurement module from the mounting location, if required.

NOTE!	
	Trouble-free operation and electrical safety can only be ensured if the module is correctly installed. ☞ Make sure that the measurement module is correctly installed. ☞ Operate the measurement module only within the specified operation environment. → *Data sheets "TH pro CAN MM Series" and "TH evo CAN MM Series"*

2.2 Obligations of the operator

- The operator must ensure that only qualified and authorized personnel are entrusted with handling the product. This applies to assembly, installation and operation.
- In addition to the product's technical documentation, the operator may also have to provide operating instructions in accordance with the Occupational Safety and Health Act[1] and the Ordinance on the Use of Working Materials[1].

2.3 Intended use

- Measurement module of the TH CAN MM Series have been designed for temperature measurements with thermocouples.
- These measurement modules may only be used under the operating conditions which are defined in the specific product's data sheet.

  → *Data sheets "TH pro CAN MM Series" and "TH evo CAN MM Series"*
- Compliance with the intended use also means that this user guide has to be read carefully and the instructions contained have to be observed.
- The calibration of measurement modules may only be performed by authorized calibration laboratories (e.g. CSM calibration laboratory).
- Inspection and repair work must only be carried out by CSM.
- The operator bears full responsibility if this device is used in any way which does not comply strictly and exclusively with the intended use.

1 Outside the jurisdiction of this Act or this Ordinance, the relevant country-specific directives and ordinances applicable at the product's operating site have to be observed.

3 Product Description

TH CAN MM Series Series measurement modules are rugged and compact CAN-based measurement modules for temperature measurements using thermocouples.

The measurement inputs are equipped with mini thermocouple sockets.[2] By default, TH CAN MM Series measurement modules are equipped with type K measurement inputs. TH pro measurement modules are also available with type J or type T measurement inputs.

- 8 or 16 measurement inputs for temperature measurements with thermocouples
- Measurement ranges
  - Type K (NiCr-Ni): -270 °C to +1372 °C
  - Type J (Fe-CuNi): -210 °C to +1200 °C
  - Type T (Cu-CuNi): -270 °C to +400 °C
- Operating temperature range: -40 °C to +125°C

Basic technical data

Designation	Inputs	Input type			TEDS Support	Measure-ment chan-nel LEDs	Protec-tion class
	Number	K	J	T			
TH8 pro / THMM 8 pro	8	✓	✓	✓		✓	IP65
TH8 evo		✓			✓		
THMC 8		✓					IP67
TH16 pro / THMM 16 pro	16	✓	✓	✓		✓	IP65
THMC 16		✓					IP67

Tab. 3-1: Basic technical data of TH CAN MM Series modules

TEDS Support

As for TH8 evo type measurement modules, the measurement inputs (mini-thermo single sockets) are equipped with additional contacts. This makes it possible to use specially developed thermal connectors with integrated TEDS components.

→ Chapter 5.4.3.7 "Measurement channel settings", section "TEDS functionality"

Further information

→ *Data sheets "TH pro CAN MM Series" and "TH evo CAN MM Series"*

→ *Safety Instructions "MiniModules"*

→ *Technical Information "MiniModules – Types of Housings"*

→ *Technical Information "CAN Accessories for CSM measurement modules"*

2 The module versions THMC 8 and THMC 16 are equipped with multi-connector sockets. By using special connection cables, 8 or 16 thermocouples can be connected to a THMC measurement module. See also "CAN Accessories for CSM measurement modules"

3.1 Connections and components

The following images show connectors of a TH8 pro measurement module[3] in a Slide Case housing (SCS) with type K mini connectors.

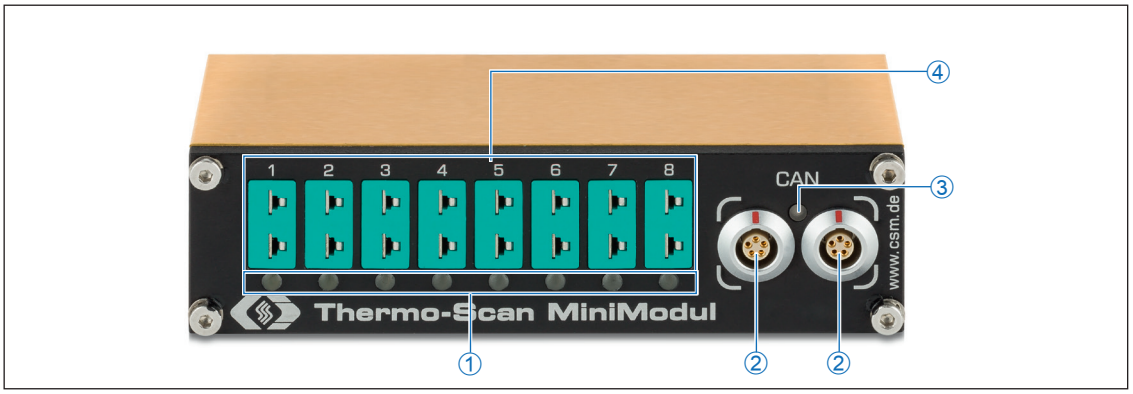


Fig. 3-1: TH8 pro, front view

1. Measurement channel LED indicators 1 - 8[4] (→ Chapter 3.2.2 "Measurement channel LED indicators")
2. CAN/power supply connectors (→ Chapter 4.3.2.1 "CAN sockets")
3. CAN bus LED indicator (→ Chapter 3.2.1 "CAN bus LED indicator")
4. Measurement input sockets 1 - 8 (→ Chapter 4.3.2.2 "Input sockets")

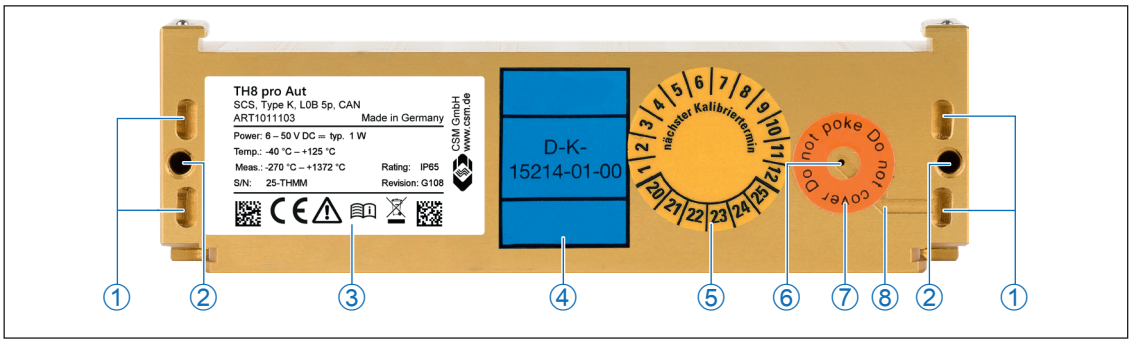


Fig. 3-2: TH8 pro, rear side of the housing

1. Cable tie eyelets (for cable ties with a width of max. 4 mm)
2. Threaded bores for mounting screws [5]
3. Type label (→ Chapter 6.1 "Type label")
4. DIN EN ISO/IEC 17025 calibration label
5. "Next calibration date" label
6. Ventilation opening with GORE™ membrane
7. "Do not poke – Do not cover" label
8. Venting groove

→ Chapter 4.1 "Before mounting"

3 The CAN/power supply connectors in Fig. 3-1 are equipped with 5-pole LEMO 0B sockets. Customer-specific modifications may occur. Further technical specifications remain unaffected.
4 Only available for module version "pro".
5 Either two (slide case housing) or four (standard housing) screws are required depending on the case version.

3.2 Functional description of LED indicators

3.2.1 CAN bus LED indicator

The LED indicator (Fig. 3-1, ③) between the two CAN sockets provides information on the operating status of the measurement module.

LED		Meaning
Color	Status	
–	off	Measurement module not connected or power supply switched off
green	permanently lit	Normal operation
red	permanently lit	Measurement module is in idle mode, either because the configuration software has stopped data acquisition (no error), or because there is a CAN bus or configuration problem.
red	flashing	The measurement module has been selected via the configuration software and is in idle mode.
green/red	flashing	A firmware download is in progress

Tab. 3-2: CAN bus LED indicator

3.2.2 Measurement channel LED indicators

The measurement channel LEDs (Fig. 3-1, ①) provide information on the status of the corresponding measurement channel and the sensor excitation. Only the "pro" modules are equipped with measurement channel LEDs.

LED		Meaning
Color	Status	
red	flashing	Channel selected via configuration software, no sensor connected
green	flashing	Channel selected via the configuration software (single LED) Module selected via the configuration software (all LEDs)
red	permanently lit	Operating mode: no sensor connected or broken sensor
–	off	Operating mode: sensor connected and detected

Tab. 3-3: Measurement channel LED indicators

4 Mounting and installation

For trouble-free operation and a long product life, certain requirements for mounting and installation must be taken into account.

4.1 Before mounting

TH CAN MM Series measurement modules are provided with a GORE™ membrane and a venting groove (Fig. 3-2). These are needed to regulate pressure and humidity. To ensure reliability and performance of the device, it is absolutely essential that the small ventilation inlet it the rear side of the housing is not blocked or restricted in any way. If this happens, condensate will accumulate inside the housing and damage the measurement module.

	NOTE!
	The GORE™ membrane is required to regulate pressure and humidity. ☞ Do not block the ventilation opening for the GORE™ membrane during installation or use.

	NOTE!
	Trouble-free operation and electrical safety can only be ensured if the measurement module is correctly installed. ☞ Ensure correct installation. ☞ Operate the measurement module only within the specified operating environment. → *Datasheets "TH pro CAN MM Series" and "TH evo CAN MM Series"*

4.2 Mounting TH CAN measurement modules

	NOTE!
	Strong magnetic fields, such as those induced by permanent magnets, may impair the trouble-free operation of the measurement module. ☞ Make sure that the mounting position of the measurement module is free from strong magnetic fields.

Requirements

- When choosing the mounting position, make sure that the ventilation opening of the GORE™ membrane will not be permanently immersed in water or any other liquid.
- The mounting position must offer sufficient space to connect and disconnect the cables without kinking or pinching them.
- Avoid mounting positions where the modules are permanently exposed to strong vibrations and shocks.

Required parts/material

- two M4 screws[6] and a suitable screwdriver or wrench
- if necessary, further mounting material such as mounting angles

or

- four suitable cable ties

NOTE!	
	Making mechanical modifications to the housing, such as by drilling additional holes, can impair the function of the measurement module or destroy it. Doing so would also invalidate the warranty. ☞ Never drill any holes into the housing. ☞ Observe the mounting instructions.

Mounting the measurement module

☞ Fasten the measurement module at the mounting position.

Mounting of measurement modules using the Slide Case mechanism

If several modules are used in an application, Slide Case housings offer the advantage that not every device has to be mounted individually. After mounting the first module, further modules can be connected to each other via the guide rails on the upper side of the housing and the mounts on the underside of the housing. This forms compact module packages without the need for tools or mounting materials. Adapter plates are available for connecting Slide Case housings of different sizes. The first and the last module of a module package are fixed with one mounting angle each.

→ *"CAN accessories for CSM measurement modules"*

6 The thread depth in the module is 8 mm. The screw length must be chosen according to the thickness of the mounting material. Either two (slide case housing) or four (standard housing) screws are required depending on the module version.

4.3 Installing TH CAN devices

4.3.1 Before installation

WARNING!	
	The behavior of the CAN bus can be influenced by connecting a CAN bus measurement module to an existing CAN bus system. **Improper use of a CAN bus system may cause life-threatening situations and material damage.** ☞ Always connect CAN bus measurement modules to a separate CAN bus system (measurement bus). ☞ Only use qualified and trained personnel.

	CSM provides cables for the connection of CAN modules. → *"CAN accessories for CSM measurement modules"* For further details, please contact the CSM sales department.

	CSM offers maintenance and repair packages for CAN measurement modules. → Chapter 6.2 "Maintenance services"

4.3.2 Connectors

The two connectors embedded in the front panel on the right-hand side of the housing (Fig. 3-1, ②) are used for both CAN signals and power supply. The interface cable connects the measurement module to the data acquisition system and to the power supply.

NOTE!	
	Take special care when connecting third-party devices to a measurement bus with TH CAN MM Series measurement modules. ☞ Ensure that the configuration settings are compatible with all devices (same CAN bit rate, different CAN identifiers). ☞ Only use qualified and trained personnel.

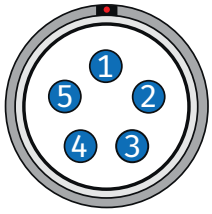
NOTE!	
	The CAN sockets for CAN signals and power supply are connected in parallel and have identical pin assignments. As a result, a signal at a specific pin of one socket (CAN or supply voltage) is also available at the corresponding pin of the other socket. ☞ Only use qualified and trained personnel.

The thermo sensors are connected to the measurement module via the sockets 1 to 8 (or 1 to 16).

4.3.2.1 CAN sockets

CSM uses LEMO 0B sockets as standard for the CAN sockets. To have the device equipped with a different socket, please contact CSM. To connect a cable to this socket, the following plug with plug insert is required:

- **FGG.0B.305.CLA xxxxx**[7]

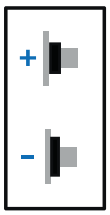
	Pin	Signal	Description
	1	U_{Supply} +	Power supply, plus
	2	U_{Supply} -	Power supply, ground
	3	CAN_H	CAN high
	4	CAN_L	CAN low
	5	CAN_GND	CAN ground
	Housing	Shield	Cable shield

Tab. 4-1: Plug (front view) for CAN socket: pin assignment

NOTE!	
	The CAN sockets for CAN signals and power supply are connected in parallel and have identical pin assignments. As a result, a signal at a specific pin of one socket (CAN or supply voltage) is also available at the corresponding pin of the other socket. Both sockets can be used for either **CAN IN** or **CAN OUT**. This enables simple cabling with only one cable between two measurement modules. At the end of the measurement chain, a CAN termination resistor is plugged into the open CAN socket. ☞ Only use qualified and trained personnel.

4.3.2.2 Input sockets

Miniature thermo-sockets are used as standard for the measurement inputs of TH measurement modules. Depending on the measurement input type (type K, J or T), a corresponding miniature plug is required to connect a thermocouple.

Measurement input socket	Pin	Description
	+	Type K: NiCr signal Type J: FE signal Type T: Cu signal
	-	Type K: Ni signal Type J: CuNi signal Type T: CuNi signal

Tab. 4-2: Measurement input socket pin assignment

7 "xxxxx" is a placeholder here. The actual designation depends on the diameter of the cable that is actually being used.

4.3.2.3 Connecting the cables

Cables of various lengths are available for connection to the data acquisition system and the power supply, as well as for daisy-chaining the measurement modules:

- Cable for connecting CAN measurement modules: K70-xxxx
- Cables for connecting a TH CAN measurement module to the PC and to the power supply: K73-xxxx/K176-xxxx

4.3.2.4 Connecting the power supply

	NOTE!
	Depending on the number of measurement modules and the cable lengths in a measurement setup, an intermediate power supply may be required. An intermediate supply is also required if more current is required than the existing power supply can provide due to the increased power consumption of the measurement modules.

The power supply for a TH CAN MM series measurement module and any other connected measurement modules connected to it is provided via the interface cable. This cable also connects the measurement module to the PC/data acquisition system.

MiniModules are designed for low power consumption. In combination with the connection cables from CSM and due to their compact design, these MiniModules can in most cases be easily installed. To ensure error-free functioning, the following guidelines should be observed when choosing the appropriate power supply.

Minimum supply voltage

The minimum supply voltage is the minimum value that a power supply delivers. For automotive applications, this is usually the vehicle's electrical system voltage (e.g. 12 V for cars). Please note that this minimum value is decisive. In a 12 V vehicle electrical system, for example, this value can drop for a short time (from a few milliseconds to a few seconds) during engine start-up to a value below the minimum value specified for a measurement module. During operation, it has to be ensured that the supply voltage applied to the modules of a measurement chain does not drop below the specified minimum value.[8]

Cable lengths

The resistance of a connection cable causes a voltage loss in the cable. The extent of this voltage loss depends on the length of the cable and the current flowing through it. In a supply chain, the required minimum voltage has to be applied to each module.[8]

i	For further technical information on daisy-chaining measurement measurement modules, please contact the CSM sales department.

→ *"CAN accessories for CSM measurement modules"*

8 The minimum value specified on the type plate of a measuring module is relevant.

5 How to use TH CAN measurement modules

5.1 Example of application

Fig. 5-1 shows an application consisting of three TH CAN MM Series measurement modules, a power supply, a CAN interface, a PC (equipped with the software required for CAN data acquisition and configuration) and the required connection cables.[9]

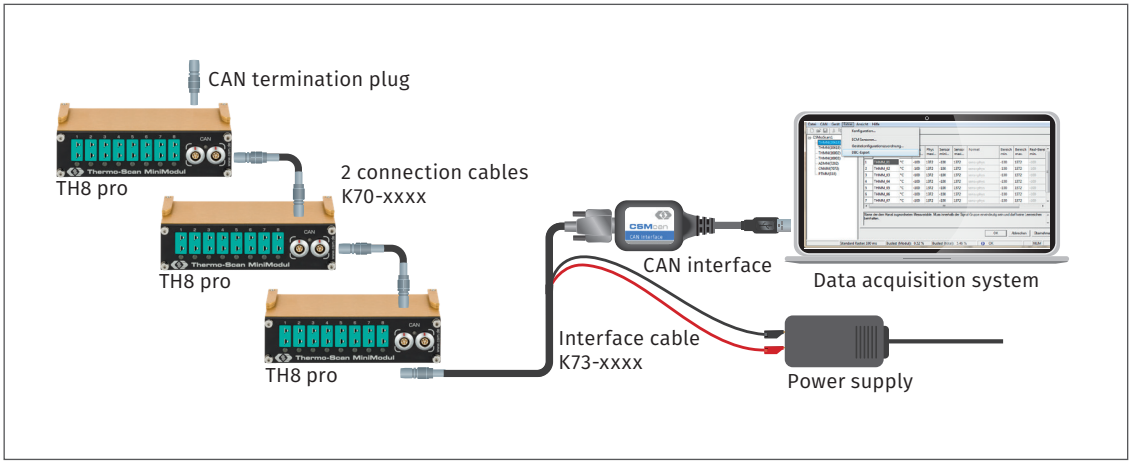


Fig. 5-1: Measurement setup with three TH8 pro measurement modules

The installation consists of the following components:

- 3 TH8 pro CAN measurement modules
- 1 K73-xxxx interface cable with connector for power supply
- 2 K70-xxxx connecting cables
- 1 CAN termination plug
- 1 CAN interface
- 1 data acquisition system (PC) with CSMconfig configuration software
- 1 power supply

Connecting the components

☞ Connect the interface cable to the first measurement module.
☞ Daisy-chain the measurement modules with the connection cables.
☞ Insert the CAN termination plug into the empty CAN socket of the last measurement module.
☞ Connect the CAN interface to the PC.
☞ Connect the other end of the interface cable with the PC via the CAN interface.
☞ Connect the banana plugs of the interface cable to the power supply.

9 The application shown in Fig. 5-1 is only an example. Actual configurations could use different cables and accessories.

5.2 CSMconfig User Interface

The CSMconfig user interface consists of the following sections:

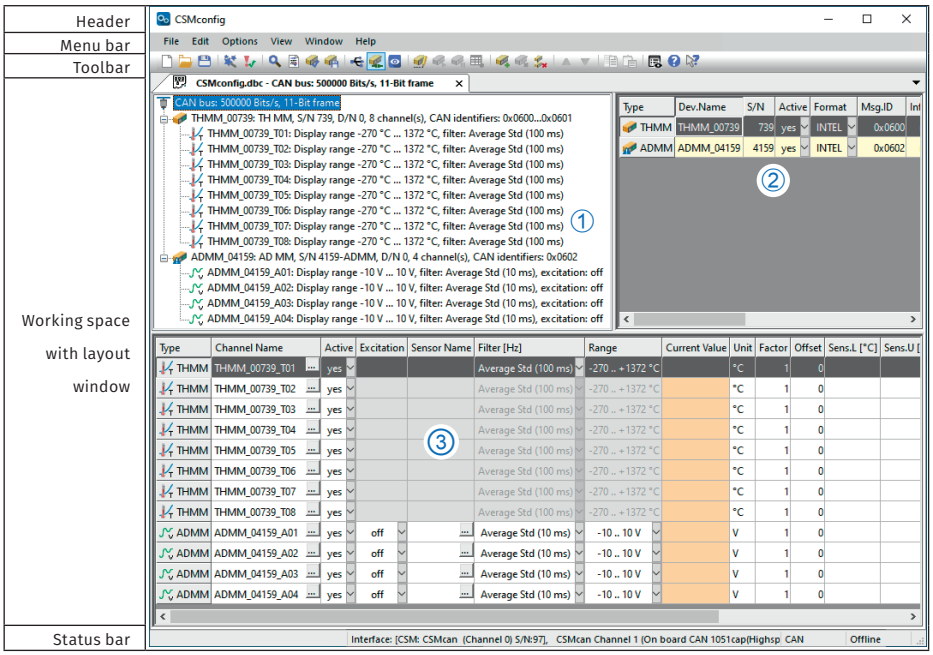


Fig. 5-2: CSMconfig User Interface

5.2.1 Header

Clicking the program icon on the left opens the program menu.

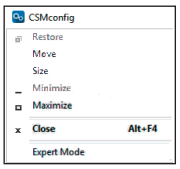


Fig. 5-3: Program menu

In addition to the functions for modifying the position and resizing of the program window, it also contains the option **Expert Mode**.

→ *CSMconfig Online Help, "Expert mode"*

5.2.2 Menu bar

The commands are arranged in the following menus:

Fig. 5-4: Menu bar

→ *CSMconfig Online Help, "Menu commands"*

5.2.3 Toolbar

The toolbar contains the most frequently used menu commands. A command is executed by clicking on the corresponding icon.

Fig. 5-5: Toolbar

→ *CSMconfig Online Help, "Toolbar"*

5.2.4 Working space

The configuration data is stored in a configuration document. Depending on the bus system, the configuration document is either saved as a DBC file (CAN) or an A2L file (XCP-on-Ethernet).

→ *CSMconfig Online Help, "Configuration document (DBC-/A2L-File)"*

CSMconfig provides various configuration views to create or process a configuration document:

- **Tree view** (Fig. 5-2, ①)
- **Device list** (Fig. 5-2, ②)
- **Channel list** (Fig. 5-2, ③)

These views are integrated in a higher-level window, the layout window. The **Select view layout** dialog offers a number of layouts with different combinations of configuration views.

☞ **Select Window | Select View Layout**.

⇨ The **Select view layout** dialog opens.

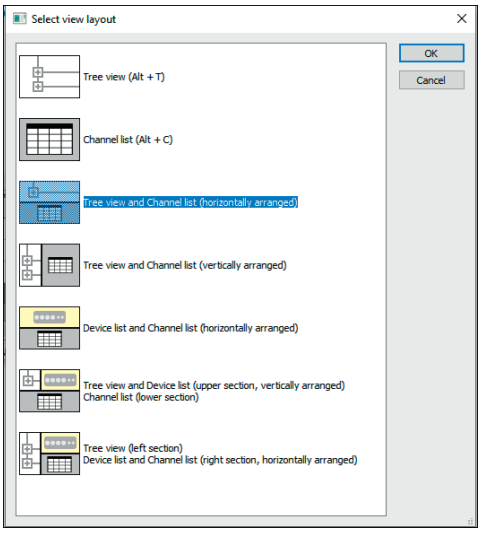


Fig. 5-6: **Select view layout** dialog

☞ Select the matching layout and confirm your choice by clicking on **OK**.

→ *CSMconfig Online Help, "Configuration views and layout window"*

5.2.5 Status bar

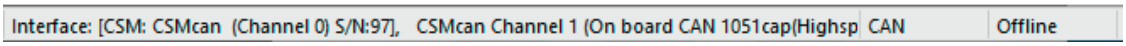


Fig. 5-7: Status bar

The status bar provides the following information:

- The interface currently connected to the PC or the message "No valid interface selected"
- The bus system of the active configuration.
- The configuration status: "Online" or "Offline"

5.3 Keyboard shortcuts used in CSMconfig

Shortcut	Menu command/meaning
Alt + A	Auto Configuration
Alt + INS	Insert Module
Alt + DEL	Delete Module
Alt + F4	Exit
Alt + M	CSMview
Alt + R	Report...
Entry field	Edit
F1	Help
F11	Resize grid columns
Ctrl + 0 (zero)	Deactivate
Ctrl + 1	Activate
Ctrl + B	Scan Bus
Ctrl + C	Copy
Ctrl + F4	Close
Ctrl + D	Move Down
Ctrl + F6	Next (configuration document)
Ctrl + G	Reconfigure All
Ctrl + I	Interface...
Ctrl + K	Check Document
Ctrl + N	New
Ctrl + O	Open
Ctrl + P	Print
Ctrl + R	Read settings from device
Ctrl + S	Save
Ctrl + T	Toggle On/Offline
Ctrl + U	Move Up
Ctrl + V	Insert
Ctrl + W	Write settings to device
Shift + Ctrl + F6	Previous (configuration document)

Tab. 5-1: Shortcuts used in CSMconfig

5.4 Configuring TH CAN measurement modules

The configuration software CSMconfig is used to configure the measurement modules.

	NOTE!
	We recommend always using the latest version of CSMconfig. Old versions may not support all module variants and functions. The latest version of CSMconfig can be found in the download area of the CSM website. → *https://s.csm.de/de-cfg*

The following sections provide information on the following topics:

- Settings of TH CAN MM series measurement modules
- Creating a standard CAN configuration in CSMconfig

In CSMconfig, configurations can be created both *online* and *offline*.

Online configuration

- The measurement modules are linked to the configuration software.
- A configuration can be transferred to a single or to all measurement modules of a measurement chain in CSMconfig immediately after completion.

Offline configuration

- There is no connection between configuration software and measurement module(s). The configuration document is created "offline", which means without connection to the measurement chain.
- If an online connection to the measurement chain is established at a later time, the configuration can then be transferred using CSMconfig.

  → Section "Transferring configuration data to the measurement module"

Configuration views

CSMconfig provides three different views (windows) for configuration: **Tree view**, **Device list** or **Channel list**. The configuration views are integrated in a higher-level window to form configuration layouts.

→ Chapter 5.2.4 "Working space"

The following paragraphs contain the basic steps for a configuration using the **Tree view** window.

5.4.1 Dialogs and windows

i	The views that are available during configuration depend on the configuration layout specified in the **Select view layout** dialog.

Example: The **Select document type** dialog is displayed by default when a new configuration document is created. This is where the file type for the configuration is specified. For a measurement setup with CAN measurement modules use document type **CAN only (DBC)**.

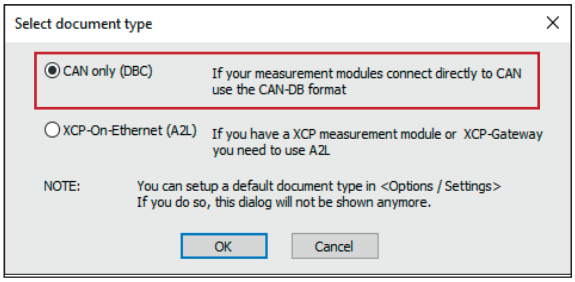


Fig. 5-8: **Select document type** dialog, **CAN only (DBC)** selected

The settings used to create a new configuration file can be specified in the **Program Settings** dialog. The **Default document type** option provides the following setting options:

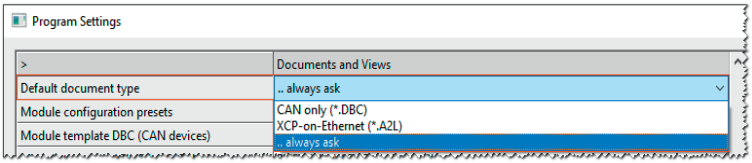


Fig. 5-9: **Program Settings** dialog, **Default document type** options

- **... always ask** (default): The **Select document type** dialog is used.
- **CAN only (*.DBC)**: When a new configuration file is created, the *.DBC file type is automatically used.
- **XCP-on-Ethernet (*.A2L)**: When a new configuration file is created, the *.A2L file type is automatically used.

→ *CSMconfig online help, "Program Settings"*

5.4.2 Offline configuration

The following sections describe the steps for configuration in **offline mode**. The configuration data is stored in a DBC file when configuring CAN measurement modules offline. This file can be transferred to a measurement module at a later time or made available for further use in other tools such as vMeasure CSM, CANape® or INCA.

☞ Start up CSMconfig.

⇨ The CSMconfig program window opens.

☞ Select **File | New.**

⇨ The **Select document type** dialog (Fig. 5-8) opens.

☞ For configurations with CAN measurement modules, select the **CAN only (*.DBC)** option and confirm selection with **OK**.

⇨ The window displaying the **Tree view** opens (**CSMconfig.dbc**).

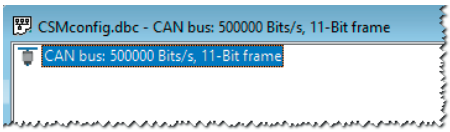


Fig. 5-10: CSMconfig.dbc window, **Tree view**

☞ Move the mouse pointer to the window and right-click.

⇨ The context menu opens.

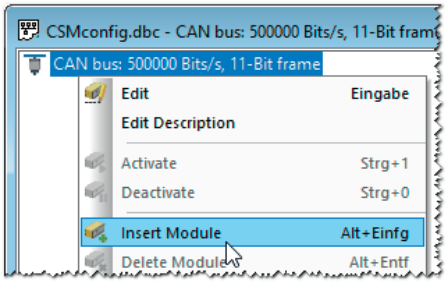


Fig. 5-11: CSMconfig.dbc window, **Tree view**, context menu

☞ Select **Insert Module.**

⇨ The **Select device type** dialog opens.

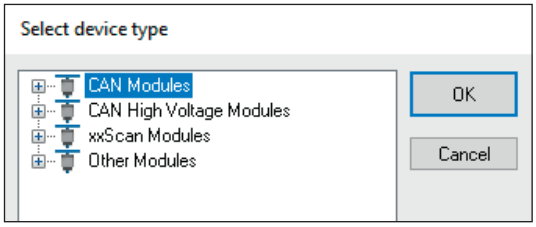


Fig. 5-12: **Select device type** dialog

	NOTE!
	This dialog is designed to select a module series (e.g. AD CAN MM Series or HV AD ECAT MM Series) but not specific module variants (e.g. AD4 MC10 or HV AD4 XW 1000). The options displayed in the dialogs for device and channel configuration comply with the highest configuration level of the corresponding module series. If it turns out, during the transfer of the configuration file to the measurement module, that particular settings are not compatible, an error message will be displayed indicating the incorrect setting (e.g. measurement data rate too high).

☞ If the required measurement module is not displayed in the selection window, click on the corresponding **+** symbol on the left.

⇨ The submenu opens.

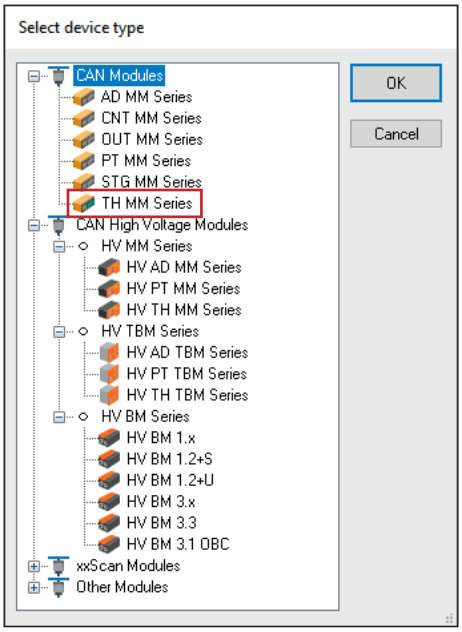


Fig. 5-13: **Select device type** dialog, subentries faded in

☞ Select the module series (here: **CAN Modules | TH MM Series**) and confirm selection with **OK**.

⇨ The **Device configuration dialog** is displayed.

⇨ The layout window **CSMconfig.dbc** appears in the background.

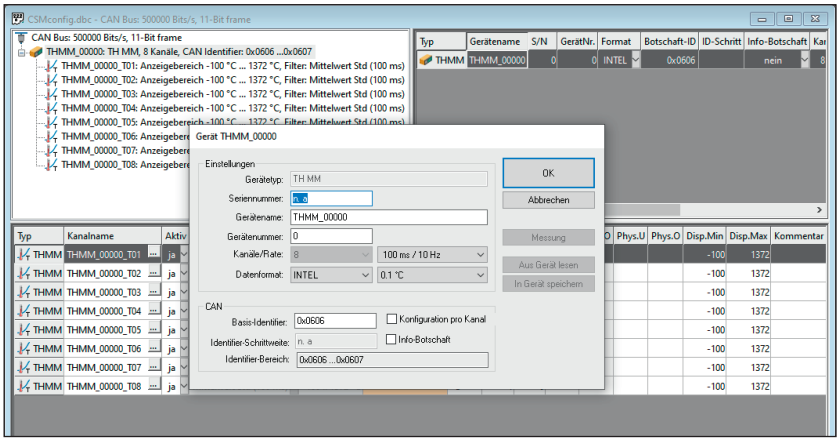


Fig. 5-14: **Device configuration dialog**, configuration window **CSMconfig.dbc** in the background

Notes on the configuration of measurement channels and the measurement module are provided in the online configuration section.

→ Chapter 5.4.3.7 "Measurement channel settings" or chapter 5.4.3.8 "Device settings"

A new or modified configuration finally has to be transferred to the corresponding measurement module.

→ Section "Transferring configuration data to the measurement module"

5.4.3 Online configuration

5.4.3.1 Preparing the configuration

☞ Before starting an online configuration, make sure that

- measurement module and PC are properly connected via a suitable CAN interface
- CSMconfig has been installed on the PC.

5.4.3.2 Starting the program

☞ Start up CSMconfig.

⇨ The program window opens (the previously loaded configuration may be displayed).

☞ If an interface is displayed in the status bar (Fig. 5-15), continue with chapter 5.4.3.4 "Creating a new configuration file".

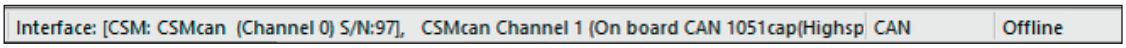


Fig. 5-15: Status bar: “CAN interface”

☞ If no interface is displayed in the status bar (Fig. 5-16), continue with chapter 5.4.3.3 "Selecting a communication interface".

Fig. 5-16: Status bar: “No valid interface selected”

5.4.3.3 Selecting a communication interface

After the program has been started, CSMconfig checks the communication interfaces for available connections. These interfaces are listed in the **Interface** dialog.

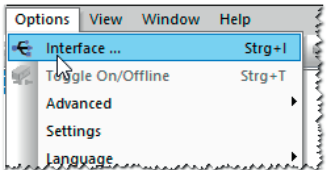


Fig. 5-17: **Options | Interface**

☞ Select **Options | Interface.**

⇨ The **Interface** dialog opens.

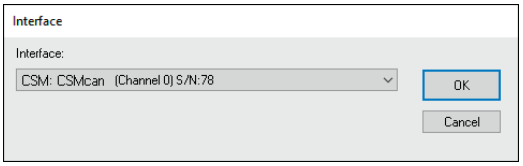


Fig. 5-18: **Interface** dialog

☞ If the required interface is not displayed, click on the arrow ▼ to the right.

⇨ The pull-down menu opens.

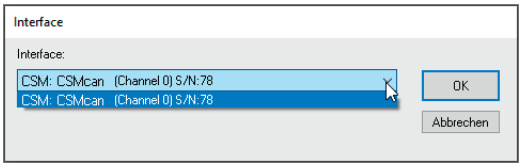


Fig. 5-19: **Interface** dialog, pull-down menu expanded

☞ Select the required interface.

☞ Click **OK** to confirm the selection.

5.4.3.4 Creating a new configuration file

i	The procedure described in the following section is not required if the configuration is performed using **Auto-Configuration**.

→ Chapter 5.4.3.6 "Scan Bus and Auto-Configuration"

☞ Select **File | New.**

⇨ The **Select document type** dialog (Fig. 5-8) opens.

☞ For configurations via CAN interface, select **CAN only (DBC)** and confirm by clicking **OK**.

⇨ The **CSMconfig.dbc** window opens.

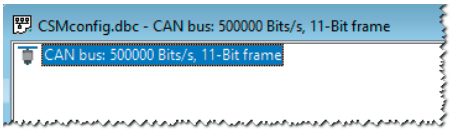


Fig. 5-20: CSMconfig.dbc window, Tree view

5.4.3.5 CAN parameter settings

i	If a new DBC file was created via **Auto-Configuration** or **Scan bus**, a manual setting of the CAN parameters is usually not required.

→ Chapter 5.4.3.6 "Scan Bus and Auto-Configuration"

Changing the CAN parameters may be necessary, for example, if

- high-speed measurement modules using higher measurement data rates are applied in the setup
- data acquisition software requiring other CAN parameters is used.

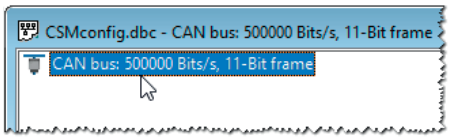


Fig. 5-21: CSMconfig.dbc window, **Tree view**, specifying the CAN Parameters

☞ Move the mouse pointer over the CAN bus entry and double-click with the left mouse button

or

☞ Mark the CAN bus entry and press the **Enter** key.

⇨ The **CAN bus** dialog opens.

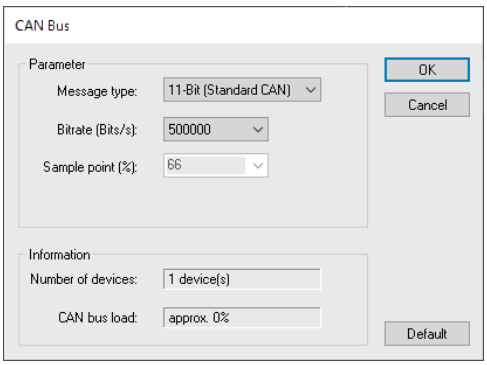


Fig. 5-22: **CAN Bus** dialog

Select the required setting and click **OK** to close the dialog.

→ *CSMconfig online help, "CAN bus dialog"*

If the process was successful, the following message appears:

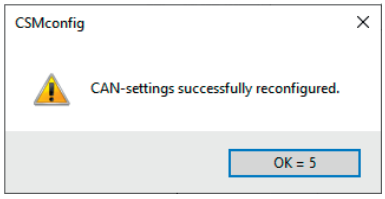


Fig. 5-23: Message "CAN settings successfully reconfigured"

☞ Click **OK** to close the window.

5.4.3.6 Scan Bus and Auto-Configuration

In the next step it will be checked which measurement modules are connected to the bus. This can be done by using **Scan Bus** or **Auto-Configuration**.

Both functions can be used to identify the measurement modules connected to the bus and to read out stored configurations. In addition to simple module recognition, **Auto-Configuration** can also resolve existing conflicts (e.g. CAN ID conflicts or conflicts during name assignment). An automatic channel configuration in its actual sense (e.g. setting of the measurement range), however, is not performed.

i	For an initial configuration with several new CAN measurement modules, it is recommended to use **Auto-Configuration**, as measurement modules in delivery state share the same CAN ID.

Running Scan Bus

Scan Bus checks the CAN bus for connected measurement modules. The configuration data is compiled to be finally saved in a DBC file.

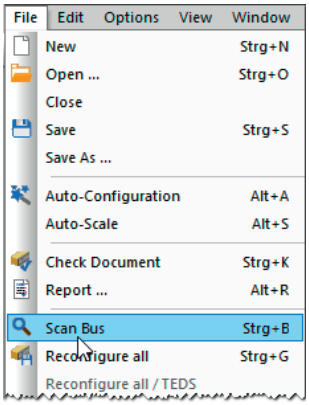


Fig. 5-24: **File | Scan Bus**

☞ Select **File | Scan Bus.**

⇨ The bus is checked for connected measurement modules.

⇨ Detected measurement modules are listed below the bus level.

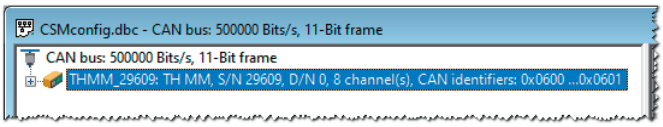


Fig. 5-25: **CSMconfig.dbc** window, **Tree view**, detected measurement module(s)

Running Auto-Configuration

Similar to **Scan Bus**, the **Auto-Configuration** function checks the bus for connected measurement modules. With **Auto-Configuration**, possible conflicts (e.g. CAN ID conflicts or conflicts during naming) are also detected and resolved.

If **Auto-Configuration** is used, a new configuration file will be automatically created, so there is no need to create a new configuration file manually beforehand. Upon process completion, the new configuration file needs to be named and stored.

→ Chapter 5.4.3.9 "Saving a configuration"

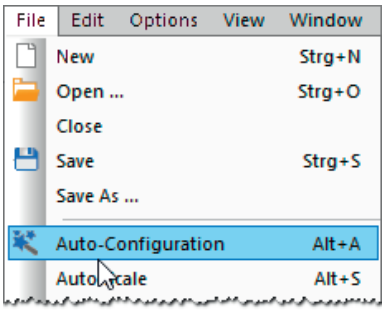


Fig. 5-26: **File | Auto-Configuration**

☞ Select **File | Auto-Configuration**.

⇨ The bus will be scanned for measurement modules and possibly existing conflicts.

⇨ The **AutoConfig** window opens.

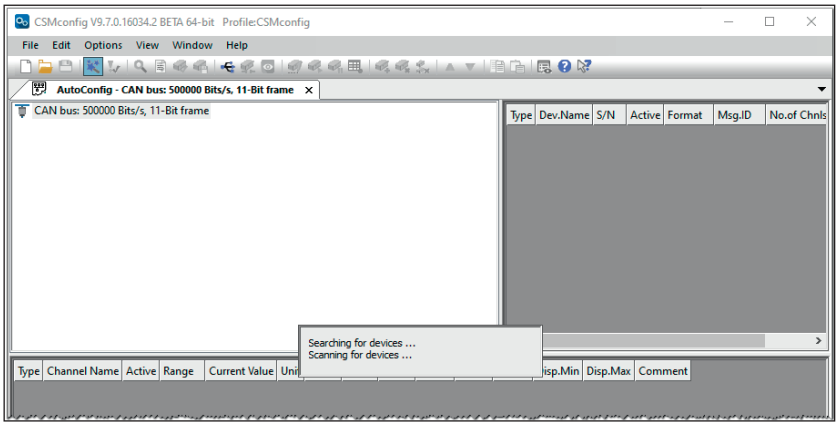


Fig. 5-27: **AutoConfig** window "Searching for devices.../Scanning for devices..."

⇨ **Auto-Configuration** is performed. The message "Searching for devices .../ Scanning for devices ..." is displayed.

⇨ Upon process completion, the following dialogs are displayed:

▸ **AutoConfig**: the connected measurement module(s) is/are displayed.

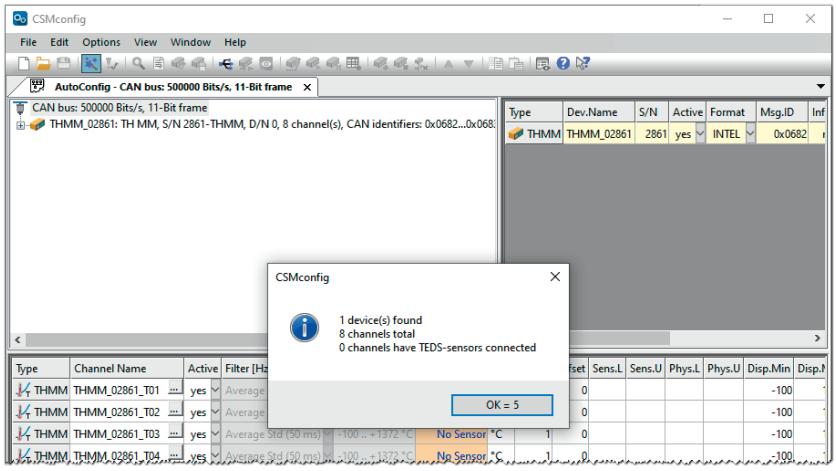


Fig. 5-28: **Auto-Configuration** is performed

▸ In another window, a message appears indicating how many measurement modules and channels have been detected. It is also indicated whether and, if so, how many TEDS sensors are connected.[10]

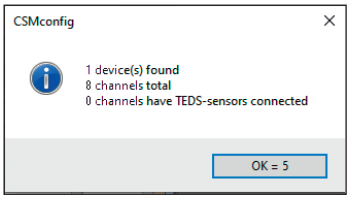


Fig. 5-29: Message window after **Auto-Configuration** has been completed

The **OK** button features an automatic counter counting from "5" to "0". The window closes automatically as soon as the counter reaches "0". The window can be closed immediately by clicking on **OK**.

→ Chapter 5.4.3.9 "Saving a configuration"

10 The TEDS information is only available if the **TEDS mode** option in the **Program Settings** dialog is set to "Automatic".

5.4.3.7 Measurement channel settings

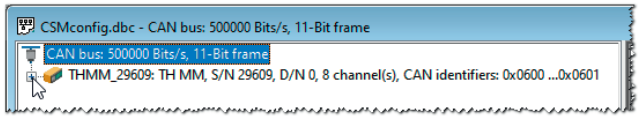


Fig. 5-30: CSMconfig.dbc window, **Tree view**, channel list faded out

☞ If the list of measurement channels is not displayed, click on the **+** symbol to the left of the device entry to open the directory tree.

⇨ The list of measurement channels opens.

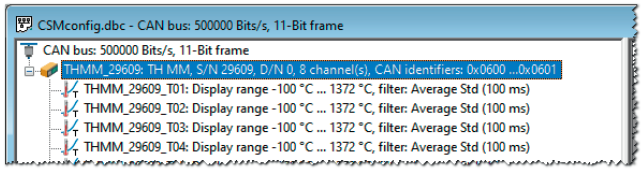


Fig. 5-31: CSMconfig.dbc window, **Tree view**, channel list faded in

☞ Double-click on a channel entry.

or

☞ Mark a channel entry and press the **Enter** key.

⇨ The **Channel configuration dialog** opens.

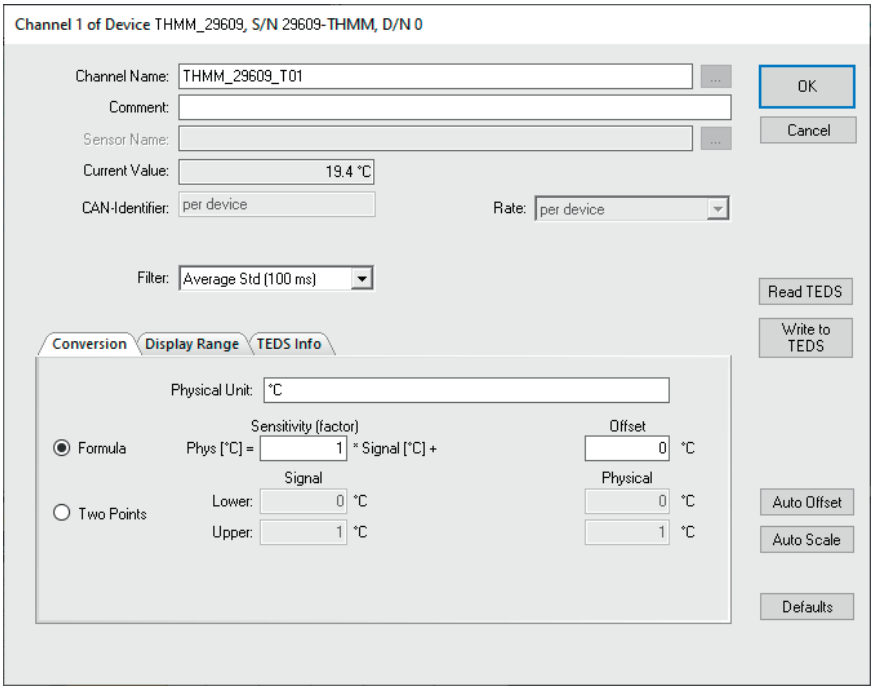


Fig. 5-32: **Channel configuration dialog** (TH CAN MM Series)

☞ Select the required settings (see table "Channel configuration options TH CAN MM Series").

☞ Click on **OK** to close the dialog.

☞ For configuring the remaining device channels, proceed as described above.

Channel configuration options TH CAN MM Series

Field	Function
General Settings	
Channel Name	Input field for channel name. This name is stored in the DBC file and will be used by the DAQ software as identifier. Allowed characters: [a...z], [A...Z], [0...9] and [_]. (max. 32 characters) It is possible to integrate a signal database in CSMconfig. The signal database is called up by clicking the ... button. This database allows signal names (channel names) to be selected and assigned to the measurement channel. A comment may have been assigned to the signal name. If so, it will be displayed in the **Comment** field after the signal name has been selected. A greyed-out button indicates that no signal database is available. → *CSMconfig online help, "Channel configuration dialog"*
Comment	Input field for additional text, e.g. channel-specific notes/comments; Any character may be used (max. 100 characters)
Sensor Name	This functionality is not available for TH CAN MM Series modules and is therefore greyed out.
Current Value	The current measurement value is displayed here.
CAN Identifier	The channel-specific CAN identifier is displayed here. For this feature, the **Per channel configuration** option needs to be enabled in the **Device configuration dialog**. The measurement module must also support this function. → *CSMconfig online help, "Specifying CAN ID and Send Rate per Channel"*
Rate	The channel-specific send rate is specified here. This option is only available if **Per channel configuration** in the **Device configuration dialog** is enabled (→ CAN Identifier).
Filter	TH CAN MM Series modules are equipped with a switchable 6th order Butterworth filter. The options available in the pull-down menu depend on the sampling rate or measurement data rate that has been set. The recommended value for the filter frequency is displayed under **Std.** (e.g. **Std. (1500 Hz)**). The filter is deactivated with the option **SW-Filter off**. The value for the standard filter is adjusted accordingly when the measurement data rate is changed.
Buttons	
Auto-Offset	... calls up the **Auto-Offset** function of the **Auto-Scale** wizard.
Auto-Scale	... calls up the **Auto-Scale** function of the **Auto-Scale** wizard.
Read from TEDS	... reads out the TEDS connected to this channel and shows the differences between the current channel configuration and TEDS parameters in a table. By clicking **OK**, the TEDS parameters will be applied to the channel configuration.
Write Name to TEDS	... writes the channel name of a TEDS-compatible TH CAN measurement module to the TEDS. To be able to save the channel name of a TH CAN measurement module, the option **Allow adding channel name to TEDS** has to be enabled in the **Program settings** dialog. → *CSMconfig online help, "Program Settings"*
Defaults	... resets the settings in the dialog to the factory defaults. The content of some specific fields, however (e.g. **Channel Name**), remain unchanged.

Field	Function
Conversion tab	
Using physical scaling, the measured values supplied by a sensor can be scaled into any measured variable using downstream DAQ software (e.g. vMeasure CSM, INCA or CANape®). CSMconfig provides the options **Formula** (scaling as a linear function) and **Two Points** (scaling over two points) here.	
Physical Unit	Input field for the channel measurement unit. Allowed characters: [a...z], [A...Z], [0...9], [_], [°], [µ], [²] and [³] (max. 32 characters) The unit entered here is automatically displayed as measurement unit in the tabs **Conversion** and **Display Range**.
Formula	The **Formula** section provides options to create a formula in order to convert a value into another measured variable using **Sensitivity (factor)** and **Offset**.
Sensitivity (factor)	Input field for the scaling parameter
Offset	Input field for the offset value
Two Points	The **Two Points** function converts sensor readings into another measured variable by defining two points on one axis.
Signal	Measured values supplied by the sensor
Lower	Lower sensor reading
Upper	Upper sensor reading
Physical	Scaled measured values in the measured variable set under **Physical Unit**.
Lower	Lower value to be defined by the user
Upper	Upper value to be defined by the user
Display Range tab	
The default values for the display of the measured values can be defined in a downstream MC or DAQ tool here.	
Device	The lower and upper limit values of the scaled measurement range are displayed in the greyed-out fields.
Minimum	Display of the lower limit value of the scaled measurement range
Maximum	Display of the upper limit value of the scaled measurement range
User	These parameters are used to set the lower and upper limits for the display of the measured value range in the downstream MC or DAQ software. By default, the minimum and maximum value of the measurement range displayed in the **Device** area will be used.
Minimum	Minimum value to be defined by the user and used in the MC or DAQ software.
Maximum	Maximum value to be defined by the user and used in the MC or DAQ software.
TEDS Info tab	
This tab is only displayed if the currently active configuration document contains TEDS-related information for this measurement channel.	
TEDS ID	shows the vendor/product ID and version identifier.

Field	Function
TEDS Info tab (cont.)	
TEDS Serial Number	shows the serial number of the TEDS memory.
Date of calibration	shows the calibration date specified in the TEDS.
Calibration expiration date	shows the calculated expiration date of the calibration.

Tab. 5-2: Channel configuration options (TH CAN MM Series)

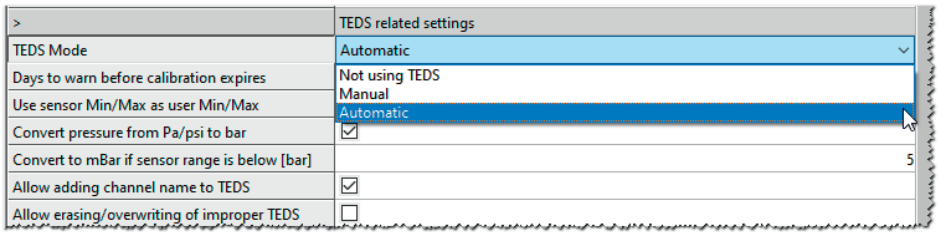
TEDS functionality

The Institute of Electrical and Electronics Engineers (IEEE) has introduced a standard by which the parameters of a sensor are stored in the sensor itself. The parameters are stored in a sensor equipped with an integrated electronic datasheet, a so-called Transducer Electronic Data Sheet (TEDS).

TEDS functionality is currently only available for a few specific CSM measurement modules.

→ *See CSM website for the up-to-date list.*

The **Program Settings** dialog contains various TEDS-related setting options applicable for TEDS-capable CSM measurement modules.



Program Settings dialog, TEDS-related settings

The **TEDS Mode** option, for example, allows the user to define how TEDS sensors are handled when a module configuration is read.

- **Automatic**: TEDS contents are automatically read out when the bus configuration is read in and compared with the module configuration.
- **Manual**: The readout of TEDS information has to be performed manually by the user.
- **Not using TEDS**: TEDS data will be ignored.

	NOTE!
	If cables are exchanged or reconnected during configuration or during measurement operation, the measurement module cannot detect this automatically. The TEDS contents must then be read out manually in CSMconfig and the new configuration has to be saved in the module.

→ *CSMconfig online help, "Sensor with integrated memory for electronic data sheet (TEDS)"*

5.4.3.8 Device settings

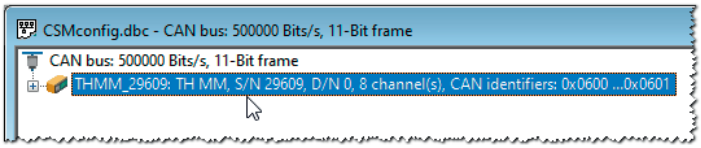


Fig. 5-33: CSMconfig.dbc window, Tree view, **measurement module selected**

☞ Double-click on the device entry using the left mouse button.

⇨ The **Device configuration dialog** opens.

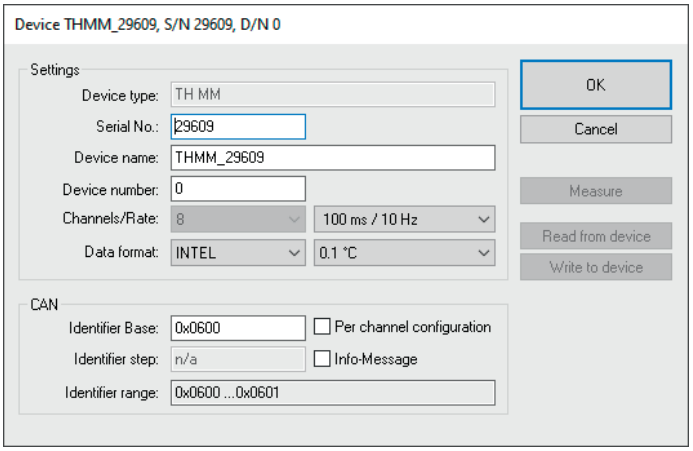


Fig. 5-34: **Device configuration dialog** (TH CAN MM Series)

Settings section

After having executed **Scan Bus** or **Auto-Configuration**, the device type that has been identified is displayed in the **Device type** field. The serial number that has been identified is displayed in the **Serial No.** field.

In an offline configuration, the **Device type** selected in the **Select device type** dialog will be displayed (Fig. 5-12). The serial number of the measurement device for which the configuration is created must be entered manually in the **Serial No.** field.

A default name is displayed under **Device name**. It consists of the name of the device type and the serial number. Alternatively, an individual, user-defined name can be entered.

The following conditions/limitations must be observed when assigning names:

- The maximum length of the name is 24 characters.
- Allowed characters: [a...z], [A...Z], [0...9] and [_].
- The name has to start with a letter or [_].
- The name needs to be unique. It may only be used once per configuration (DBC file).

If the default name is remains unchanged, it will be automatically adjusted as soon as the serial number is changed. The name entered in this field is also used as a component for the channel designation (Fig. 5-34).

The **Device number** field is provided for entering a device number. The use of this number is, however, not mandatory. This option is not available for ECAT measurement modules. The input field is thus greyed out.

The number of available measurement channels is specified in the **Channels** selection menu. As the number of measurement channels cannot be changed for TH CAN measurement modules, the default setting is always "8".[11] The selection menu is greyed out.

The selection menu **Rate** is used to specify the measurement data rate which is valid for all measurement channels.

The selection menu **Data format** provides two formats for the transmission of CAN messages:

- INTEL (LSB first, Little Endian)
- MOTOROLA (MSB first, Big Endian)

For temperature measurement modules (TH/HV TH and PT/HV PT), the resolution can be set by using the selection menu on the right (Fig. 5-34):

- 0.1 °C (default)
- 1 °C
- 16 bit

CAN section

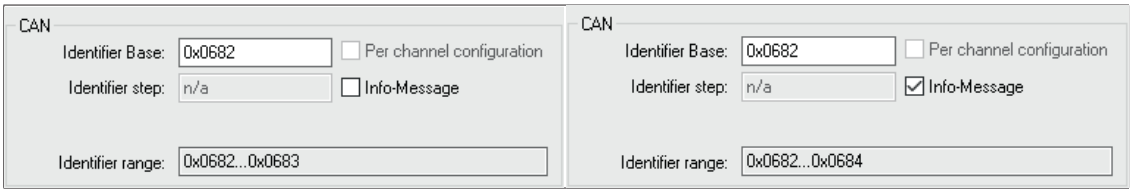


Fig. 5-35: **CAN** section, **Info-Message** disabled (left) and enabled (right)

The start identifier is displayed in the **Identifier Base** field. The initial value displayed here depends on the settings made in the **Program Settings** dialog in section **CAN: Identifier base**. If required (e.g. in case of a CAN-ID conflict), this value can be modified accordingly.

As for measurement modules of the TH CAN MM Series, the **Identifier step** field has no function. The field is greyed out and the value "n/a" is displayed.

The range of the CAN identifiers used is displayed in the **Identifier range** field.

CAN identifiers and transmission rate are by default specified per device. The option **Per channel configuration** enables CAN identifier and transmission rate to be set individually for each channel. If enabled, the pull-down menu **Rate** and the **Identifier base** field will be disabled. Both options can then be set individually for each channel in the **Channel Configuration Dialog**. This functionality is only available for specific CAN measurement modules. A list of the measurement modules supporting this functionality can be found in the CSMconfig online help.

→ *CSMconfig online help, "CAN ID and send rate per channel"*

11 CSMconfig interprets a 16-channel TH CAN measurement module as two individual 8-channel TH CAN modules in one housing.

Info Message provides the means to send signals with additional data in a separate message. These signals contain information on the device type, device status, software version, serial number and the internal temperature of the measurement module. If **Info message** is enabled, another CAN identifier is required.

Example: If "8" is specified in the **Channels** menu, the **Identifier Range** consists of two CAN identifiers (e. g. "0x0682…0x0683"). If **Info-Message** is enabled, another CAN identifier will be added to the identifier range ("0x0682…0x0684") (Fig. 5-35).

i	Normally, **info messages** cannot be sent if **Per channel configuration** is enabled. However, some modules provide the option to use **Info-Message** and **Per channel configuration** simultaneously, provided that the required firmware is installed. A list of the measurement modules supporting this functionality can be found in the CSMconfig online help. → *CSMconfig online help, "CAN ID and send rate per channel"*

Buttons

- **Read from device** is reading a configuration from a measurement module. The firmware version and the hardware revision number are also taken into account.
- **Write to device** writes a configuration to a measurement module.

→ *CSMconfig online help, "Device configuration dialog"*

Transferring configuration data to the measurement module

Once the channels and measurement modules are configured, the data has to be transferred to the measurement module.

	NOTE!
	This step is required for both offline and online configurations.

☞ Click on the **Write to device** button.

⇨ The following message is displayed:

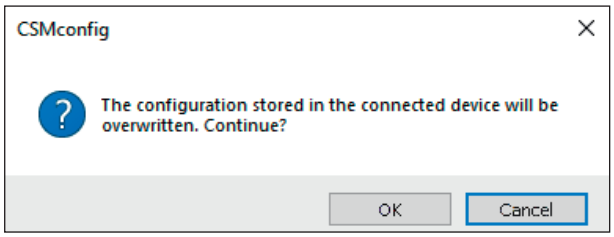


Fig. 5-36: Safety prompt before overwriting the old configuration

☞ Click on **OK** to save the configuration.

⇨ A message indicates the successful reconfiguration of the measurement module.

or

☞ Click **Cancel** to keep the old configuration.

Check measured values

The **Measure** function in the **Device configuration dialog** provides the means to check the plausibility of measurements.

☞ Click on **Measure** (Fig. 5-34).

⇨ The **Measurement Values** window opens.

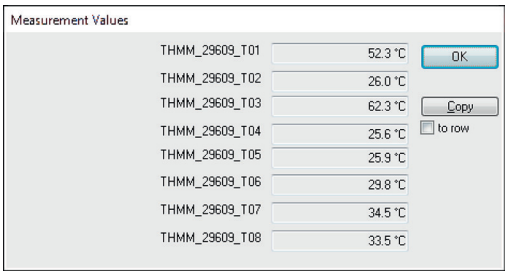


Fig. 5-37: **Measurement values** window

☞ Click **OK** to close the **Measurement Values** window.

☞ Click on **OK** to close the **Device configuration dialog**.

5.4.3.9 Saving a configuration

The configuration has to be saved in a DBC file. The default path for the storage of configuration files refers to the CSMconfig installation directory. If user rights are restricted, the program prompts the user to save the file in the corresponding user directory.

Changing the path for file storage

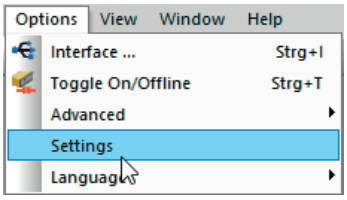


Fig. 5-38: **Options | Settings**

☞ Select **Options | Settings**.

⇨ The **Program Settings** dialog opens.

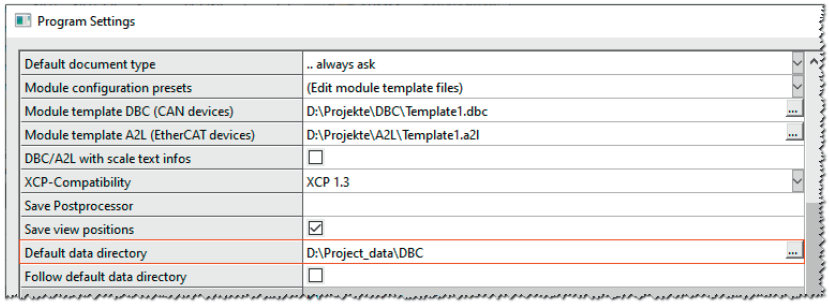


Fig. 5-39: **Program Settings** dialog, option **Default data directory**

☞ Enter the new path in the **Default data directory** field.

☞ Click on **OK** to close the **Program Settings** dialog.

i	If **Follow default data directory** is enabled (Fig. 5-39), CSMconfig always sets the **Default data directory** path to the path that the user last used for storing a DBC or A2L file.

Save DBC file

☞ Select **File | Save.**

⇨ The **Save As** dialog opens.

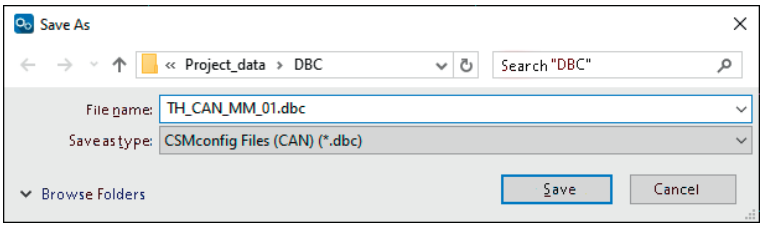


Fig. 5-40: Dialog **Save As**

☞ Select a directory, enter the name in the **File name** field and confirm with **Save**.

⇨ The configuration file with the extension `*.dbc` is stored in the current directory.

⇨ The name of the newly created configuration file appears in the header of the **Tree View** window (here: TH CAN MM_MM_01.dbc).

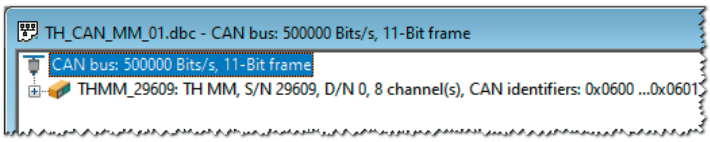
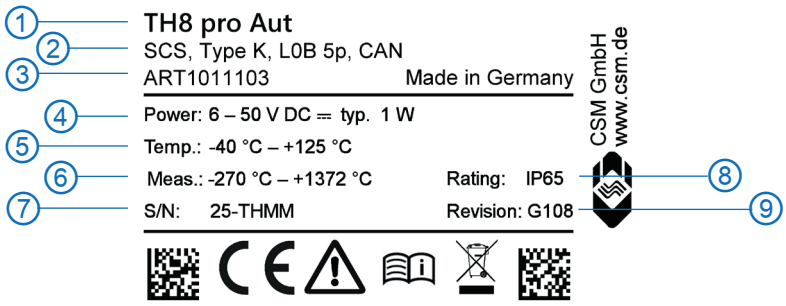


Fig. 5-41: New file name in header: **TH CAN MM_01.dbc**

6 Maintenance and Cleaning

6.1 Type label

The type label contains the following technical data:



①	TH8 pro Aut	Device Type
②	SCS, Type K, L0B 5p, CAN	Device details: ▸ SCS - housing type "Slide Case Small" ▸ Type K – Thermo-measurement input, 2-pole ▸ L0B 5p – CAN/power supply sockets: LEMO 0B, 5-pole ▸ CAN – Bus system
③	ART1011103	Part number of the measurement module
④	Power: 6 – 50 V DC, typ. 1 W	Power supply range, typical power consumption
⑤	Temp.: -40 °C – +125 °C	Operating temperature range
⑥	Meas.: -270 °C – +1372 °C	Range
⑦	S/N: 25-THMM	Measurement module serial number
⑧	Rating: IP65	Protection class
⑨	Revision: G108	Hardware revision number

Tab. 6-1: Type label

6.2 Maintenance services

The following testing certificates are issued for TH CAN measurement modules:

- Calibration certificate in accordance with DIN EN ISO/IEC17025 (type K)
- Calibration certificate (type J and T)

This is documented by corresponding stickers attached to the rear or the top side of the module housing.

Fig. 6-1: Calibration sticker

Fig. 6-2: Sticker for calibration in accordance with DIN EN ISO/IEC17025[12]

Fig. 6-3: "Next calibration date" sticker

To ensure reliability and functionality, a measurement module should be checked at least every 12 months. CSM offers maintenance packages and a repair service for this purpose.

- Calibration test (including function test)
- Repair service

Monitoring of calibration due date[13]

The feature for calibration due date monitoring provides the option to specify the period of time for which the calibration of a module is valid (**Calibration interval**). In addition, it is possible to define the period of time during which CSMconfig indicates the impending expiration of the validity of the calibration with recurring messages (**Lead warn time**).

☞ Select **Options | Settings**.

⇨ The **Program Settings** dialog opens.

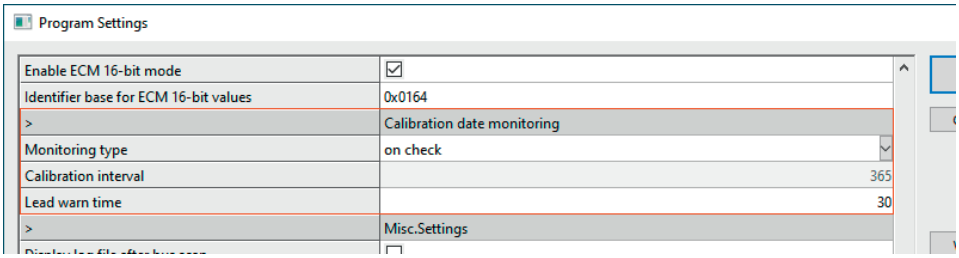


Fig. 6-4: **Program Settings** dialog, section **Calibration date monitoring**

☞ Make the required settings in section **Calibration date monitoring**.

→ *CSMconfig Online help, section "Program Settings"*

12 Only for modules with type K measurement inputs

13 When monitoring the calibration date, CSMconfig checks the date that has been written to the measurement module during calibration. The calibration date is only available if the measurement module has been calibrated at the CSM calibration laboratory.

6.3 Cleaning instructions

NOTE!	
	☞ Disconnect the measurement module before starting to work.

NOTE!	
	The surface of the housing is sensitive to aggressive cleaning agents, solvents and abrasive media. ☞ Do not use aggressive cleaning agents or solvents to clean the measurement module. ☞ Use only a slightly moist cloth.

Requirements

- All cable connections have been removed.

Required parts/materials

- Soft cloth
- Mild detergent, if necessary.

Cleaning the measurement module

☞ Clean the measurement module with a moist cloth. Use mild detergent if necessary.

7 Appendix

7.1 List of figures

7.2 List of tables

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