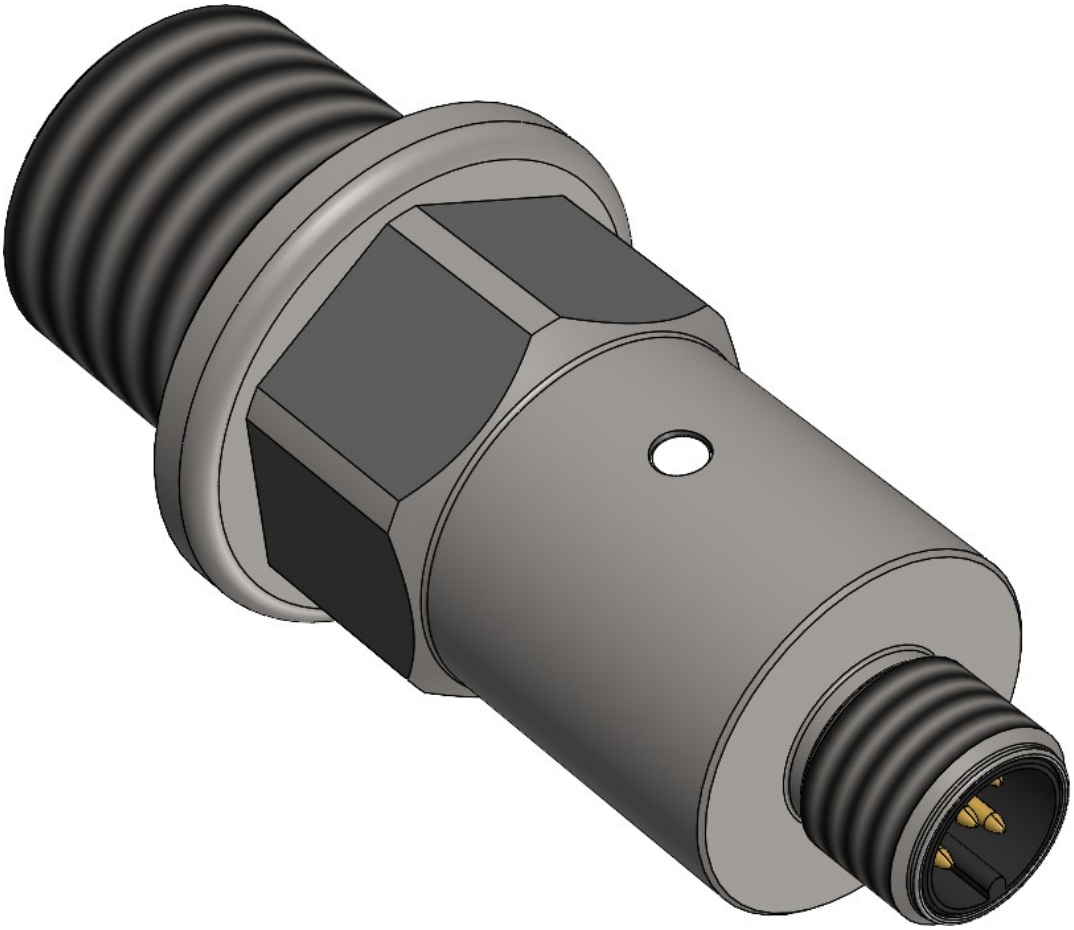
CALIS CAS Series
Original User Manual



CAS-MQDT-S01-xxxx

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1 Foreword

This operating manual was written for installers and operators and should be kept for future reference. Read this operating manual carefully and ensure that you fully understand its contents before installing or working with the probe.

2 Safety

2.1 Notes and symbols used

Warnings regarding personal injury or property damage are designed according to the “SAFE” principle. This means they include information on the nature and source of the hazard, possible consequences, and how to avoid or mitigate the hazard. The following hazard classifications apply to safety instructions:

⚠ DANGER

DANGER indicates a hazardous situation; failure to comply will result in death or serious injury. The symbol preceding the warning indicates the nature and source of the hazard graphically.

⚠ WARNING

Warning indicates a dangerous situation; failure to observe it may result in death or serious injury. The symbol preceding the warning indicates the type and source of the hazard graphically.

⚠ CAUTION

Caution indicates a hazardous situation; failure to observe this warning may result in injury. The symbol preceding the warning indicates the nature and source of the hazard.

NOTE

Note indicates a situation; failure to observe it may result in property damage and impair the product’s function.

TIP

Tip provides additional and useful information on how to use the product.

Symbol	Meaning
▸	Avoiding and preventing the hazard described in the warning
▶	Instruction All instructions for a procedure are always listed in chronological order.
▪	List

⚠ WARNING

If the sensor is used as a safety component, people can be seriously injured or killed!

- Do not use the sensor as a safety component.
- Visually check the fill level in the sandbox.

The CALIS contains a Class 1 laser (DIN EN 60825-1:2015-7).

⚠ WARNING

Improper work on electrical systems!

Electric shock can cause fatal or life-threatening injuries.

- ▸ Before working on electrical systems, disconnect them from the power supply and secure them against being switched back on.
- ▸ Work on electrical systems must only be performed by qualified personnel in accordance with local and national electrical codes and regulations.

2.2 Personnel Qualifications

A qualified electrician is a person with appropriate technical training, knowledge, and experience, as well as knowledge of relevant standards, who can properly assess the work assigned to them and identify potential hazards.

2.3 Intended Use

The sensor continuously measures the level of brake sand in the brake sand box of the railcar. The brake sand box is mounted beneath the car body. The sensor is intended for use in accordance with the points listed here and the values specified in the Technical Data section.

- Connect only to an overcurrent protection device
- Connect only to an SELV source in accordance with HD 60364-4-41:2007, 414.3 or equivalent.

2.4 Reasonably foreseeable misuse

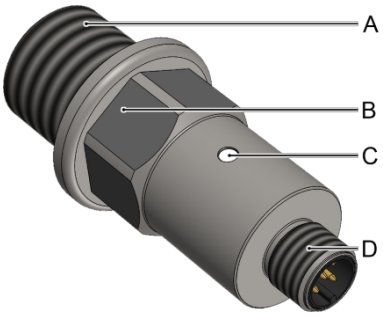
Any use other than that specified in the "Intended Use" section or exceeding the scope thereof is considered improper.

The sensor is not suitable for:

- use with media other than brake sand.
- use in potentially explosive atmospheres.
- Direct connection to the battery.

3 General Description

A	Process connection
B	Key width 23
C	Status indicator ▪ LED is on: Ready for operation ▪ LED flashing: Error message
D	M12 connection



4 Installation

NOTE

Improper installation can lead to incorrect measurement results or damage to the sensor.

- Maintain the minimum distance between the sensor and the side walls of the sandbox.
- During installation, apply a chemical threadlocker suitable for the operating conditions to the process connection.

Requirements: The mounting surface must be level and clean.

► Turn off the power to the system and secure it against being turned back on.

► Screw the sensor into the designated thread on the sandbox (at least 110 mm from the side walls).

► Check the plug and socket for cleanliness and clean if necessary.

► Connect the probe electrically according to the pin assignment.

5 Operation

Continuous measurement begins after <1 second. If no valid value is measured within 5 minutes, the sensor restarts.

5.1 Restart the sensor

► Disconnect the sensor from the power supply.

► Restore power to the sensor after one second.

✔ The sensor restarts.

6 Maintenance

The sensor is maintenance-free.

7 Disassembly

► Turn off the power to the system and secure it against being turned back on.

► Disconnect the electrical connection and remove the sensor.

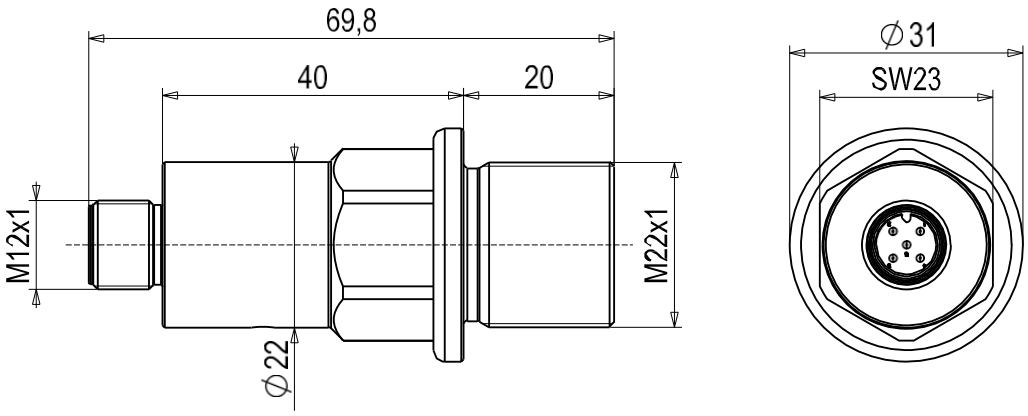
8 Disposal

Sort electrical and electronic components of various types and send them for recycling. In doing so, comply fully with all applicable federal, state, and local laws and regulations.

9 Technical Data

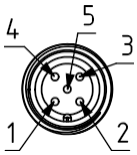
Operating voltage	⎓ DC 24 V (16.8…30.0 V) 14.4 V for max. 0.1 s, 33.6 V for max. 1.0 s
Process connection	V4A
Operating temperature	-40 °C (-40 °F)…+55 °C (131 °F)
Protection class IP	IP65
Communication interface	Analog output 4...20 mA
Measuring principle	ToF
Laser class (IEC 60825-1:2015-7)	940 nm, Class 1
Measurement range	as specified in the range of 40mm to 1200mm
Accuracy	typically +/- 20mm at 20 °C
MTBF	>175,000 h

9.1 Dimensional drawing



9.2 Pin assignment

M12 connector, 5-pin



Pin	Signal	Description
1	V	Operating voltage
2	Analog level signal	4...20 mA analog output
3	GND	0V
4	Do not connect	Applying a voltage may damage the sensor.
5	n.c.	-

10 Legal Notice

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