



INVENTURE
AUTOMOTIVE
SIGNALS • DATA • ANALYTICS



CL-CAN™ sensor v2
3.3V User's manual

Inventure

CL-CAN™ sensor v2 – 3.3V

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1 Introduction

Thank you for purchasing an Inventure product. Your new Inventure CL-CAN device is a carefully engineered, high quality durable product with modern features. It is designed to give you the quality and convenience you expect from an automotive measuring instrument.

To familiarize yourself with all the features of your unit, please read the following instructions carefully. Retain this guide for future reference.

2 Function, application fields

Most modern (personal and commercial) vehicles are equipped with CAN communication system, as high-speed CAN (HS-CAN) system. The Inventure CL-CAN device is designed for capturing vehicle data from such CAN system.

The Inventure CL-CAN device is a contactless CAN bus reader, applying non-intrusive technology to acquire vehicle specific data. The usage of the device eliminates any vehicle warranty issue, since avoids galvanic connection to vehicle communication wires.

Inventure CL-CAN device can be useful for any aftermarket device that requires vehicle CAN datas, such as:

- Automatic Vehicle Locating system
- Fleet Management System
- Vehicle status display
- Fuel control
- etc...

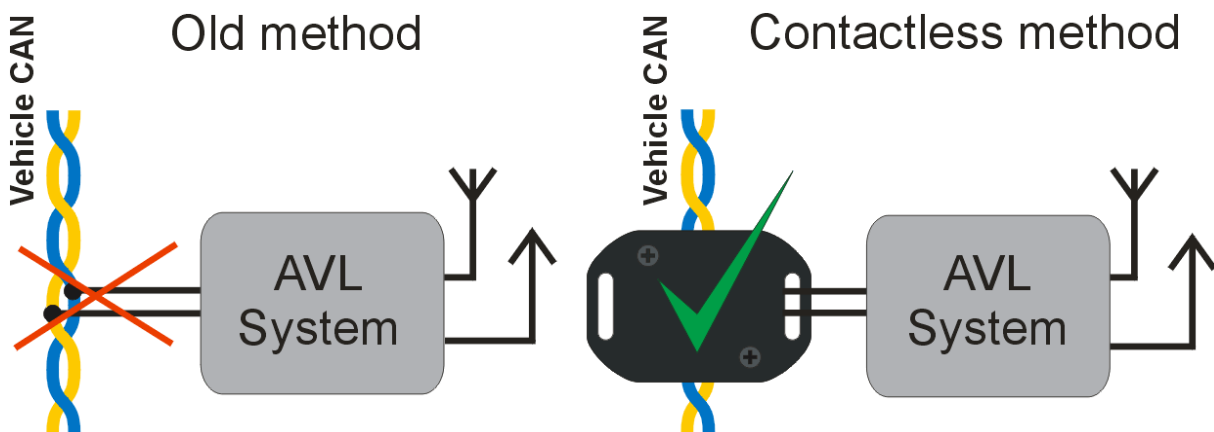


Figure 1. Usage of CL-CAN

3 Notices



- Before starting the installation please read this document carefully! Appropriate operation of the device depends on proper installation.
- Do not remove the silicone rubbers from the cover of the contactless unit during the installation!
- Usage of the device is permitted for industrial purposes only. It must not be used in situations in which human lives depend upon the operation of this equipment.
- The installation of the device may eventually be in conflict with a country's regulations or the vehicle manufacturers (OEM) instructions. The conformance shall solely be the Customer's responsibility. Improper device installation may have an effect on vehicle warranty.
- Inventure takes no responsibility for any damages originated in device installation.
- Aftermarket installed devices connected to CAN bus may affect negatively the operation of CL-CAN.
- Exceeding maximum allowable power supply may impair the device.
- Vehicle ignition must be off at the start of installation.
- Misuse and/or physical damage on device may lead to loss of warranty.
- Vehicle CAN wires must not be cut, pierced, or soldered. CAN wires must be intact for undisturbed vehicle CAN communication. Inadequate connection to vehicle CAN wires may affect vehicle operation and may cause safety issues.
- Fix Inventure CL-CAN device properly to avoid hitting to vehicle elements, or rattling!
- Device should be installed away from direct heat and moisture. Installation in cabin is recommended.
- Avoid installation at steering column and above pedals!
- Although device contains (Multi)fuse, application of a 1...3 Amp fuse at power source is highly recommended.
- Inventure CL-CAN device must be installed by professional skilled in automotive electronics.
- Avoid damaging, polluting or scratching sensor surfaces! Also ensure clean wire surfaces (use isopropyl-alcohol for cleaning if necessary)!
- The AVL system input must not transmit any CAN message, only receiving devices are allowed to connect to CL-CAN output, (eg. FMS Gateway).

4 Installation

4.1 Connection ports of the Inventure CL-CAN device

- Signal input. Contactless CAN sensor surfaces (horizontal, High and Low stripes)
- Power supply. Black: GND, Green: power (constant power or VDD)
- CAN output. Blue: CAN High, Yellow: CAN Low

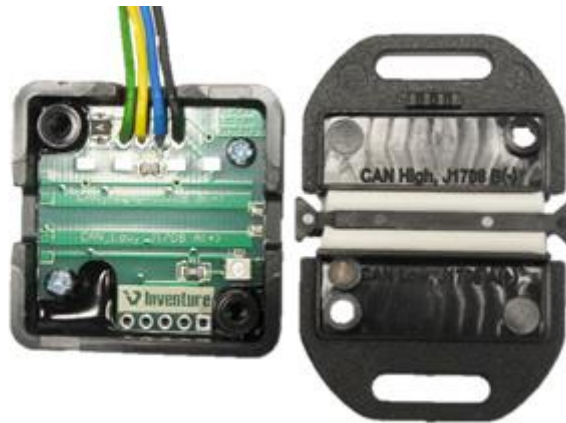


Figure 2. Internal view of CL-CAN

4.2 Installation steps

1. Mount output connector to Inventure CL-CAN device matching to the AVL input!
2. Check voltage level of vehicle CAN H and CAN L wires.
3. Make sure ignition is off
4. Provide power supply connection (3.3...5 V). Recommended to use free points of fuse box.
5. Inventure CL-CAN output installation.
 - a. For Inventure FMS Gateway device: connect the 2x4 pin Minifit connector
 - b. For other telematic device: use the appropriate connector
6. Turn on ignition (optional)
7. Place cover of CL-CAN device under vehicle CAN wires! Ensure vehicle CAN wires not to be strained and/or bended sharply, but run straight in the indicated High and Low slots! **Please do not remove the silicone rubbers from the cover!**

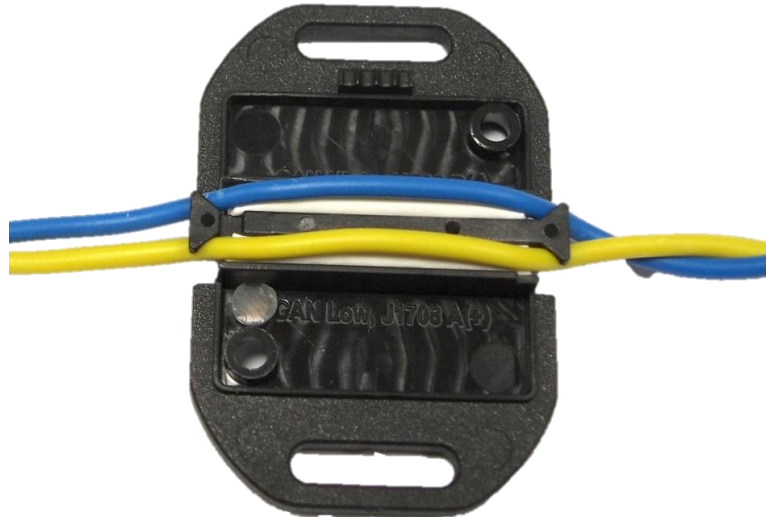


Figure 3. Intended wire paths below the cover

8. Match cover to CL-CAN device! Hole to be placed above the status LED.
9. (Optional) check status LED (section 6)! If ignition is on, red light changes to green indicating proper vehicle CAN polarity
10. Screws must be fixed tightly. Make sure vehicle CAN wires not to be pinched!

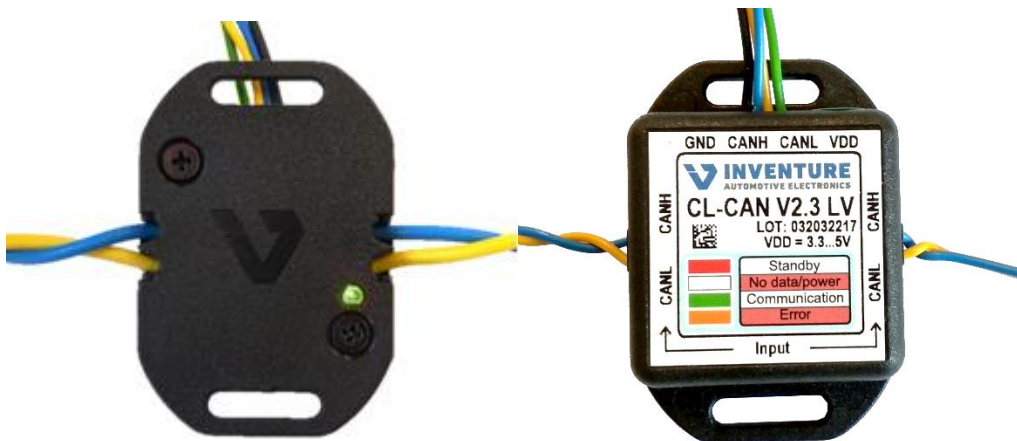


Figure 4. Illustration of device installation on vehicle CAN bus

5 Checking device function

- Turn ignition on
- LED must be light green (see section 6, LED status!)
- Green light indicates data reception. To make sure data received correctly, check Inventure FMS Gateway LED status / your telematic device function connected with Inventure CL-CAN.
- FMS output data (e.g: rpm, etc) checking with any PC CAN Tool (optional).

6 Operating states

The Inventure CL-CAN has a status LED on the back of the enclosure, which indicates the current operational mode.

Table 1. The states of the status LED:

Status		Status LED	
Standby (in case no CAN communication for at least 2 seconds)		red	
No communication, or no power supply		no light	
Communication		green	
CAN polarity error		orange	
Overheating (above 85°C)	communication	blinking orange andgreen
	no communication		...red

The label on the box shows explanation to make understanding the signs easy:

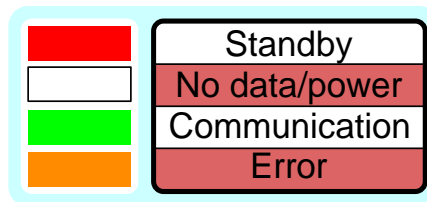


Figure 5. Short explanation of color signs, printed on the device label.

6.1 Description of the states

- **Standby (red light):** the device goes to this low consumption mode 2 seconds after ending communication on vehicle CAN bus, or after power on.
- **No light on LED:**
 - no communication (up to 2 seconds, then device goes to standby mode)
 - no power supply, or incorrect power polarity.
- **CAN polarity error (orange LED):** reversed CAN High and Low wires
- **Overheating (alternating orange/green or orange/red):** Temperature too high in the box (85°C). Possible reasons:
 - Heat in the environment
 - Bus overload or multiple terminating resistor or short circuit on Inventure CL-CAN output.

7 System Characteristics

Table 2. Operation and storage characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply					
Voltage supply	V _{BAT}	3.3		5	V
Operating current	I _{op}	20	36	50	mA
Standby current	I _{sb}		11		mA
CAN interface					
Baud rate		50	250	1000	kBaud
Terminating resistor	R _t	60	120*, ∞	∞	Ohm
Environmental characteristics					
Storage temperature	T _{storage}	-40		85	°C
Operating temperature	T _{op}	-40		75	°C
Humidity	RH	5		80	%

Other characteristics:

- protected against incorrect polarity
- protected against transient overvoltage
- ESD protection up to at least 8 kV (HBM) on any port

8 Warranty

There is a one-year warranty on the Inventure CL-CAN device from the date of the original purchase. The warranty covers any defect in materials or workmanship. The warranty is valid only if the device was operated under normal circumstances in regular use. The warranty does not include damage from misuse or neglect.

As the Inventure CL-CAN has a well thought design, it is thoroughly tested before release and it is composed of high quality parts, there should be no need for maintenance of any parts of the Inventure CL-CAN during normal operation. Should the product be damaged or corrupted, the warranty for the Inventure CL-CAN is no longer valid.

Remember to save your sales receipt in case you ever need warranty service. Please refer to the serial number of your Inventure CL-CAN in case of any problems. The serial number can be found on a label outside the box. In case of warranty claims contact your local dealer or directly Inventure, Inc.

9 How to contact Inventure?

Inventure provides customer support via its World Wide Web (WWW) site. The Inventure web site is available by using your favorite Internet browser to attach to:

www.inventure-automotive.com

Our web site provides a variety of services. Read up-to-date information about the company, the products, application possibilities and the services. Frequently asked questions and the corresponding answers are also available on the Inventure site.

If you have problems, questions, suggestions, or you just want to express your opinion about us or our products, please feel free to write an email to us, and we surely will find a way to the solution.

support@inventure-automotive.com

Come and visit our web site, tell us your experience concerning our product, fill out the registration form to be able to inform you directly about the latest results of research and development and the continuously improving customer services.

Your comments are also welcome under the following address:

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