HIOKI

NON-CONTACT CAN SENSOR
SP7001, SP7002

NEW

CAN FD
CAN

Controller Area Network

Monitor CAN FD/CAN signals without a sub-harness

No modification of vehicle cables
Acquire CAN data immediately, simply by hooking probes to the cables

No impact on the CAN bus or ECUs
Eliminate testing concerns by using non-contact sensing technology

Accurate, reliable signal capture
Use in a diverse array of development and evaluation applications that demand reliability

CE

3 year Warranty

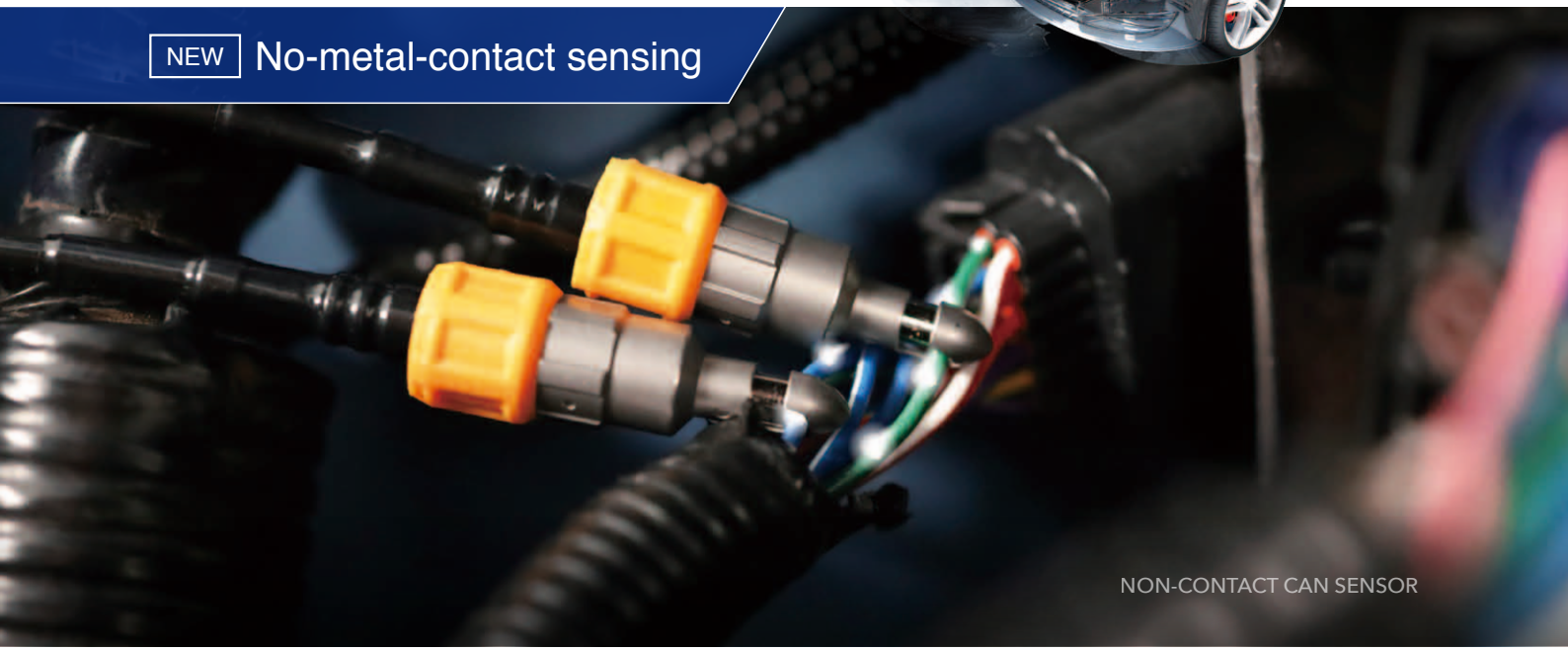
50-sec.
introductory video

0:00 / 0:52

https://www.youtube.com/embed/XdHYFXRklQ4?rel=0

Capture CAN signals without modifying vehicle cables

NEW No-metal-contact sensing



1 No need for a sub-harness--simply hook probes over cable insulation

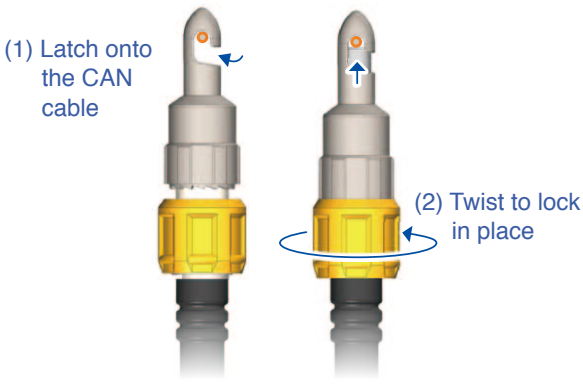
New approach means dramatically fewer man-hours

Capture CAN signals without the need to fabricate sub-harnesses or strip back cable insulation so as to significantly reduce the number of man-hours spent on test preparation.

No metallic contact with CAN signal lines

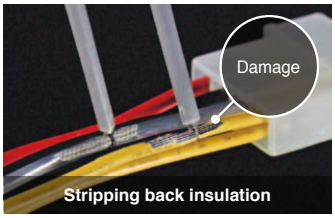
Easy setup

Hook the probes to insulated CAN cables. Now you're ready to acquire signals.



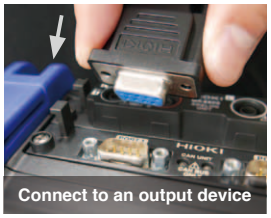
Conventional CAN signal acquisition method

Using a sub-harness

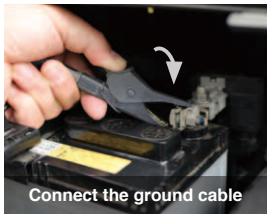


Stripping back insulation

Simply connect and you're all set



Connect to an output device

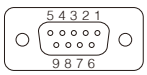


Connect the ground cable

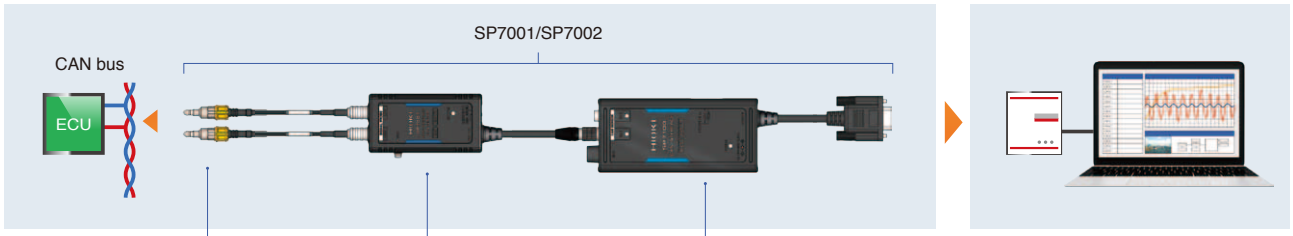
2 Continue using your existing CAN analysis system

Industry-standard CAN output connector pin layout

Customers who already have a CAN analysis system such as those manufactured by Vector Informatik GmbH need only connect the sensor to that system's input terminal (via a D-sub 9-pin connector).



Pin	Assignment
1	CH2 CAN low
2	CH1 CAN low
3	CH1 GND
4	N.C.
5	Shield
6	CH2 GND
7	CH1 CAN High
8	CH2 CAN High
9	N.C.



The probes acquire CAN bus signals via capacitive coupling.

The Non-Contact CAN Sensor rejects noise and waveform distortions in acquired signals.

The CAN Interface outputs acquired signals as CAN signals.

Analyze data using your existing system.

Output CAN bus signals in real time

Manage using industrial CAN analysis systems

3 A Non-Contact CAN Sensor engineered to fully meet professional requirements

Wide -40°C to 85°C operating temperature

Acquire CAN signals in environments from -40°C to 85°C (-40°F to 185°F), the temperature range required in vehicle testing

Use in extreme temperature environments

Power with 12 V and 24 V vehicle batteries and other sources

Use a DC power supply with the Power Cable L9500[*1], a standard accessory. If using commercial AC power, use the AC Adapter Z1008[*2]. *1 Included with the SP7100. *2 Sold separately as an option.

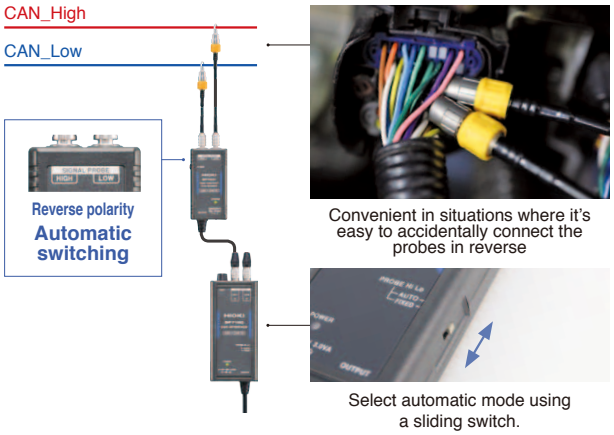
DC power supply | **AC power supply**

Vehicle battery | Power socket | Portable power supply | Outlet

Connect probes without worrying about CAN bus polarity

If you're using automatic input polarity mode, the SP7001/SP7002 will automatically switch the input polarity to ensure you can capture CAN signals properly, even if the probes are connected in reverse relative to the CAN bus's polarity (CAN_High/CAN_Low).

*This function will operate as long as the CAN bus load factor is at least 5%.



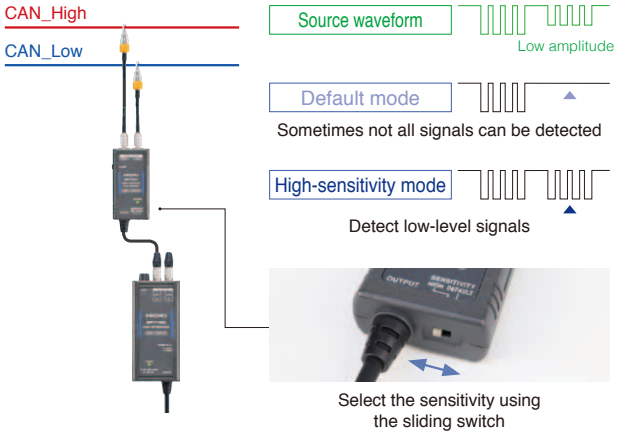
Convenient in situations where it's easy to accidentally connect the probes in reverse

Select automatic mode using a sliding switch.

Adjustable sensitivity accommodates a variety of conditions

Use high-sensitivity mode to broaden the detection level when the CAN signal amplitude is low relative to the CAN standard or when you are unable to detect a signal due to cable conditions.

* It is recommended to use default mode under typical situations since it delivers the optimal level of vibration and noise immunity.

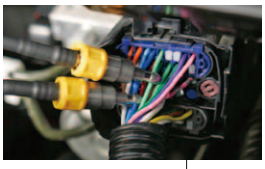


Select the sensitivity using the sliding switch

Eliminate testing concerns by using non-contact sensing technology

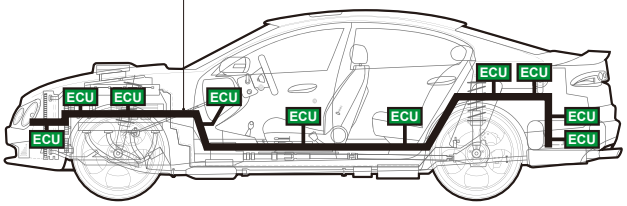
Designed not to trigger ECU security lock-outs

The SP7001/SP7002 acquires signals without changing the electrical characteristics of the CAN bus. Even if the vehicle is equipped with an ECU that has a security lock-out function designed to detect changes in the CAN bus's electrical characteristics, you'll be able to carry out testing without worrying about getting locked out.



No ECU lock during testing

Acquire signals with peace of mind, even from fully assembled vehicles.

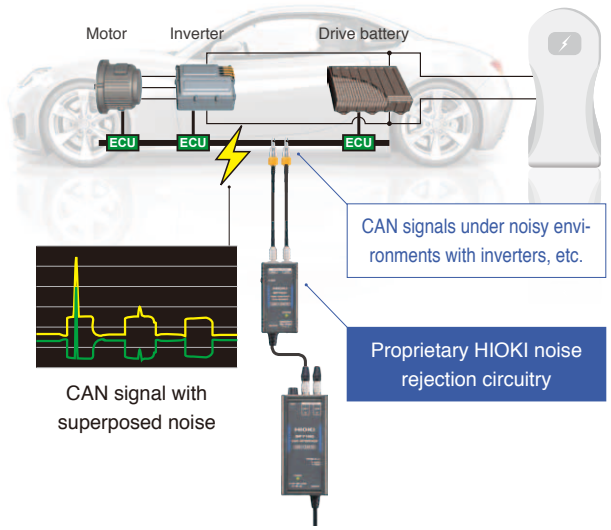


Vibration resistance designed for on-road testing

The sensor delivers noise immunity designed for in-vehicle testing in a variety of road environments. Acquire CAN signals in a stable manner in evaluation testing not only on test courses, but also in vehicles undergoing test-drives on public roads.

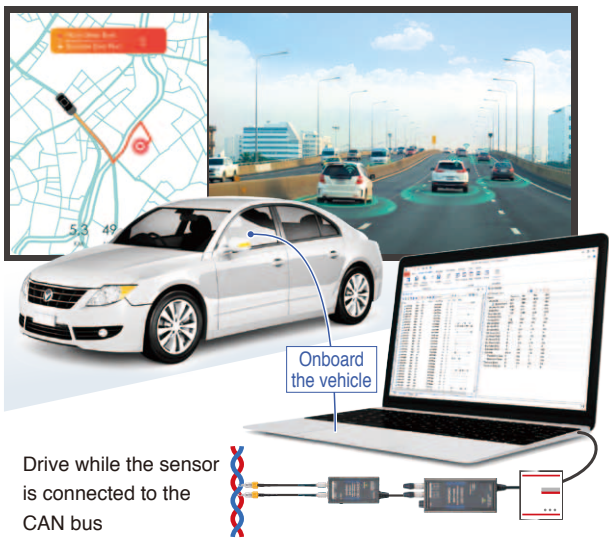
Noise immunity robust enough for use with EVs and HVs

The sensor delivers enough noise immunity to acquire CAN signals in a variety of noise environments. Acquire CAN signals in a stable manner, even with vehicles such as EVs and HVs that rely increasingly on electric equipment.



Carry out testing on public roads with peace of mind since no vehicle modifications are needed

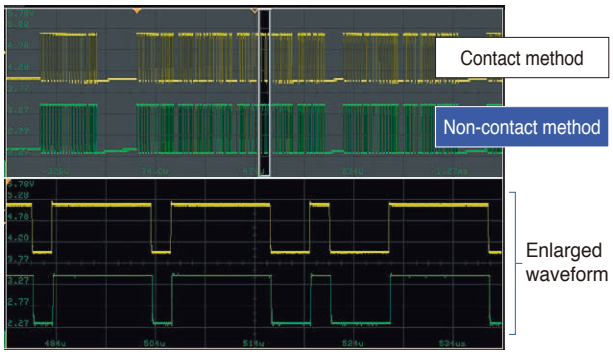
Because it acquires signals without making electrical contact, the SP7001/SP7002 is ideal for use in tests where CAN bus insulation cannot be modified. Also apply in the development of advanced driver assistance systems (ADAS) and self-driving technology.



Accurate, thorough signal capture

Acquire CAN signals with the same accuracy as the contact method

The non-contact method captures CAN signals reliably and accurately, just like the contact method. In addition, with a CAN signal detection delay of just 130 ns, the sensor delivers real-time performance.

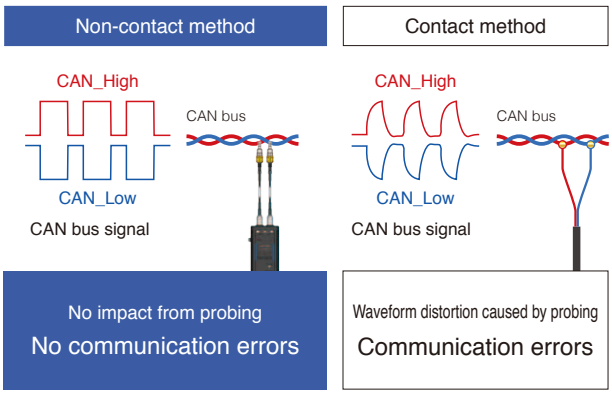


CAN waveform that's identical to one captured using the contact method

Non-contact method also excels with CAN FD high-speed signals

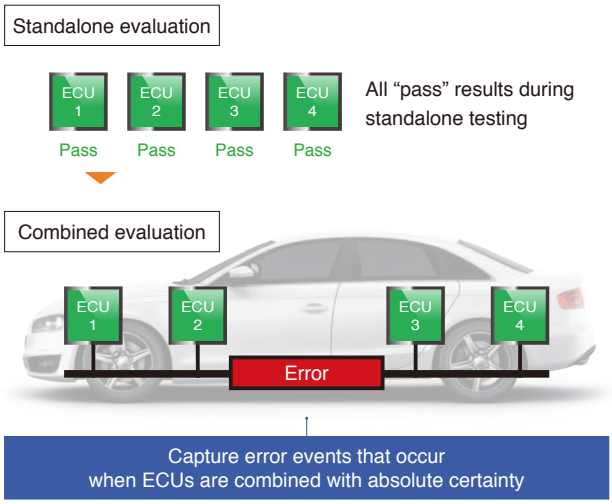
Unlike the contact method, the non-contact method does not distort the original signal when probing the CAN bus. This approach avoids communication errors caused by degraded communications quality.

*Model with CAN FD support: SP7001



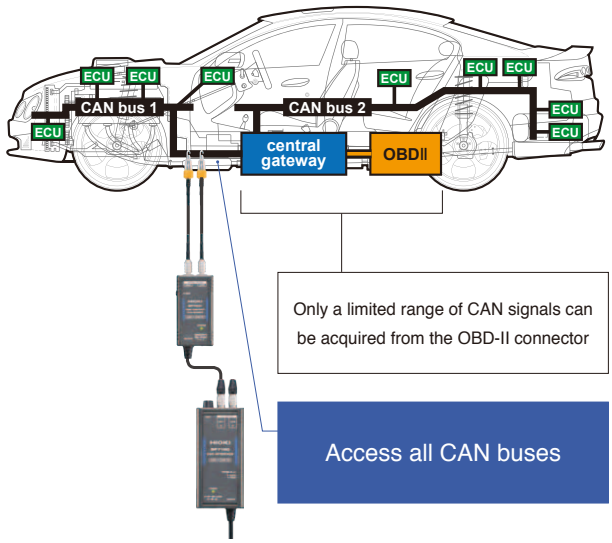
Reliably capture even infrequent events

The Non-Contact CAN Sensor does not affect the electrical characteristics of the CAN bus, allowing you to reliably catch the occasional CAN error events.



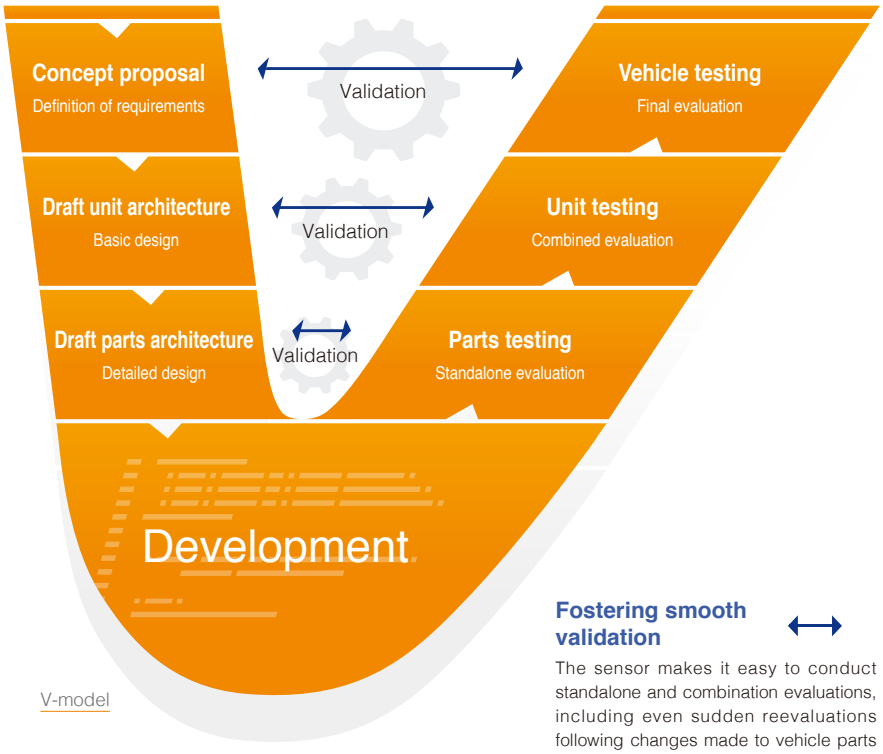
Acquire signals without needing to go through a central gateway

Only a tiny percentage of all CAN signals can be acquired from the OBD-II connector that is used in vehicle diagnostics. By using the product with the vehicle's internal CAN bus, you can acquire all CAN signals.



Integrating the sensor in the V-model

Ideal for all development processes ranging from unit to vehicle testing



V-model

Fostering smooth validation

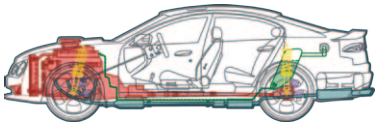
The sensor makes it easy to conduct standalone and combination evaluations, including even sudden reevaluations following changes made to vehicle parts during the validation process.

Test drives

Reduce the number of man-hours needed to prepare the vehicle for testing and then restore to original condition

The SP7001/SP7002 lets you acquire CAN data without time-consuming preparations such as fabricating sub-harnesses and modifying cables. In addition, all you'll need to do after the test is finished is remove the sensors. There's no impact on the vehicle.

Combined evaluations

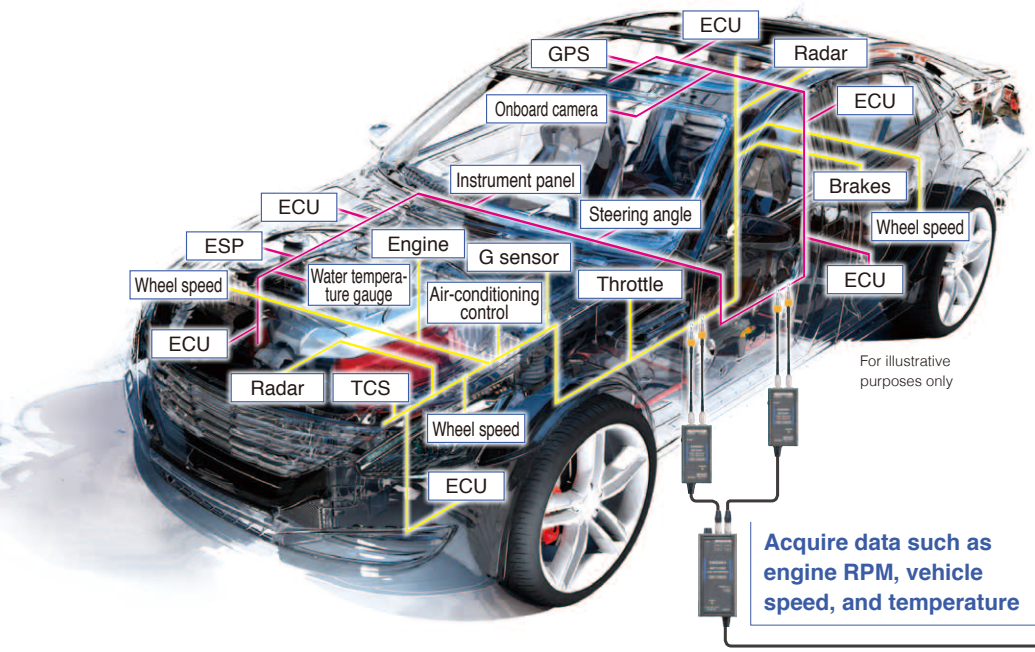


Safely conduct noise application tests thanks to the isolated design

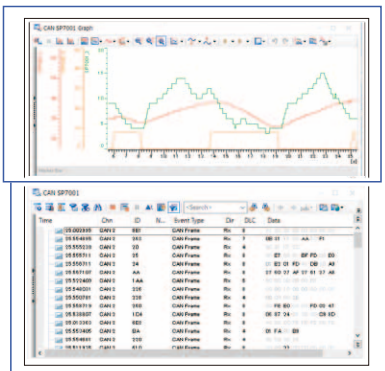
When checking the operation of vehicle sensors and ECUs, for example with tests that apply noise, the sensor protects connected devices from damage and malfunctions caused by noise because it is isolated from CAN signal lines.

Ever-increasing vehicle electrification and data volume

The number of ECUs in vehicles is growing rapidly as ADAS and other safety features are enhanced and as adoption of self-driving vehicles increases, leading to more complex CAN buses. The convenience of the Non-Contact CAN Sensor makes it easy to acquire the information you need.



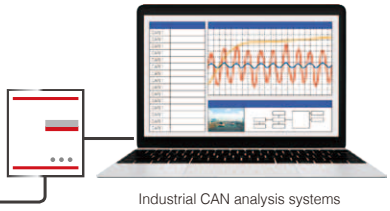
For illustrative purposes only



Sensor data decoded from CAN

Example display from Vector's CANalyzer

Acquire data such as engine RPM, vehicle speed, and temperature



Industrial CAN analysis systems

Acquire CAN signals used in a broad range of industries

Aircraft

Construction and farming machinery

Motorcycles

Industrial robots

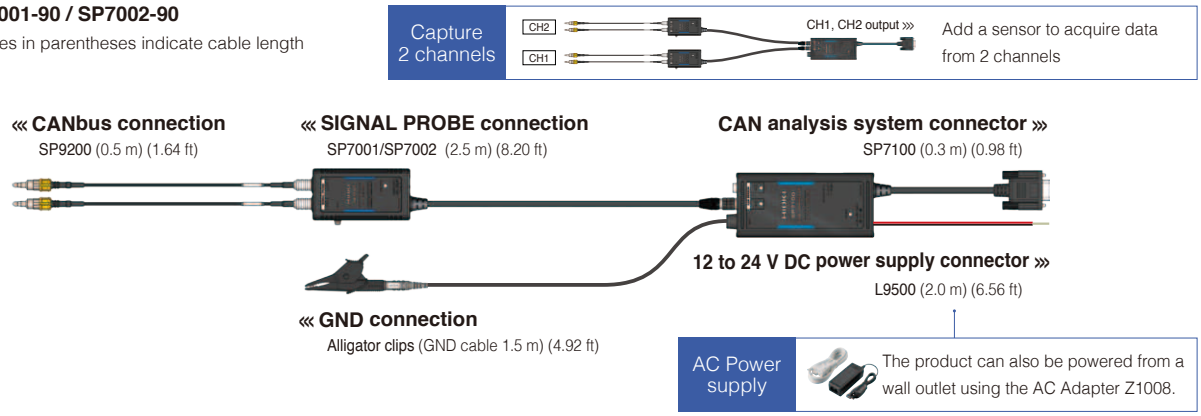
Medical devices

IoT systems

Basic configuration

SP7001-90 / SP7002-90

Figures in parentheses indicate cable length



Specifications

Detection method	Capacitive-coupled signal detection *No bare-wire connections
Detectable cables	AVS/AVSS-compliant cables External diameter: 1.2 to 2.0 mm (0.05 to 0.08 in)
Number of channels	2 (SP7100)
Compatible communications speeds	SP7001, SP7002: CAN 125 kbit/s to 1 Mbit/s
	SP7001: CAN FD 125 kbit/s to 3 Mbit/s
Total delay time	130 ns (typical)
CAN terminal resistance	60 Ω (typical), built-in
Signal output connector	D-sub 9-pin female (CH1, CH2)
Operating temperature and humidity range	Temperature: -40°C to 85°C (-40°F to 185°F) Humidity: -40°C to 60°C (-40°F to 140°F), 80% RH or less (non-condensing) 60°C to 85°C (140°F to 185°F), 60% RH or less (non-condensing)
Storage temperature and humidity range	-40°C to 85°C (-40°F to 185°F), 80% RH or less (non-condensing)
Compliant standards	Safety: EN 61010 EMC: EN 61326
Vibration resistance	JIS D 1601:1995 5.3 (1) Class 1: passenger cars; conditions: Class A equivalent 4h along X-axis and 2h along Y- and Z-axes at a vibration acceleration of 45 m/s² (4.6G)

External dimensions	SP7001, SP7002: 44 mm (1.73 in) W × 85 mm (3.35 in) H × 20 mm (0.79 in) D SP7100: 55 mm (2.17 in) W × 120 mm (4.72 in) H × 25 mm (0.98 in) D SP9200: Probe: ϕ 11.6 mm (0.46 in) × 33.7 mm (1.33 in) H Guard hook: Approx. ϕ 5 mm (0.20 in) × 11.8 mm (0.46 in) H
Mass	SP7001, SP7002: 180 g SP7100: 130 g SP9200: 26 g *Including cables
Cable length	SP7001, SP7002: 2.5 m (8.20 ft) SP7100: 0.3 m (0.98 ft) SP9200: 0.5 m (1.64 ft)
GND terminal	Banana input terminal
Power supply	Z1008 AC Adapter Rated supply voltage: 100 to 240 V AC Assuming voltage fluctuations of ±10% of the rated supply voltage Anticipated transient overvoltage: 2500 V Maximum rated power: 8 VA (including AC adapter), 3 VA (product only) External power supply Rated supply voltage: 10 to 30 V DC Maximum rated power: 3 VA
Product warranty	SP7001, SP7002, SP7100: 3 years

Example bundles

Number of channels	Capture 1 channel		Capture 2 channels		
CAN standard	CAN FD/CAN	CAN	CAN FD/CAN CAN FD/CAN	CAN FD/CAN CAN	CAN CAN
Model number (order code)	 *CAN FD / CAN* SP7001-90	 *CAN* Value SP7002-90	 *CAN FD / CAN* SP7001-90	 *CAN* Value SP7002-90	 *CAN* Value SP7002-90
	—	—	 SP9200	 SP9200	 SP9200
	—	—	 *CAN FD / CAN* SP7001	 *CAN FD / CAN* SP7001	 *CAN* SP7002

Bundles

NON-CONTACT CAN SENSOR **SP7001-90** (contents: NON-CONTACT CAN SENSOR **SP7001**, CAN INTERFACE **SP7100**, SIGNAL PROBE **SP9200** × **1 each**)
NON-CONTACT CAN SENSOR **SP7002-90** (contents: NON-CONTACT CAN SENSOR **SP7002**, CAN INTERFACE **SP7100**, SIGNAL PROBE **SP9200** × **1 each**)
Value ...Take advantage of bundled pricing rather than purchasing individual products separately.

System components and options

SIGNAL PROBE
SP9200
Set of 2

NON-CONTACT
CAN SENSOR
SP7001
CAN FD/CAN support

NON-CONTACT
CAN SENSOR
SP7002
CAN support

CAN INTERFACE
SP7100
Includes L9500 and
GND cable.

POWER CABLE
L9500
For supplying
12 to 24 V DC

AC Adapter
Z1008
For supplying
100 to 240 V AC

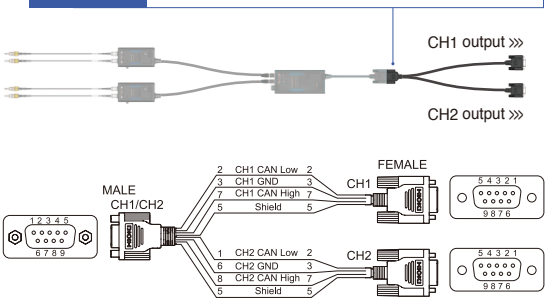
SPLIT CABLE
SP9900
For branched
CH1/CH2 output

CARRYING CASE
C1013
Hard case
with space for 2 channels

About the Split Cable SP9900

If the input interface provided by the device you plan to use does not support 2-channel input, use the SP9900 Branch Cable.

Output Branch  Supports branched output for acquiring 2 channels with the Split Cable SP9900



Note: Company names and product names appearing in this catalog are trademarks or registered trademarks of various companies.

DISTRIBUTED BY

HIOKI
HIOKI E.E. CORPORATION
HEADQUARTERS
81 Koizumi,
Ueda, Nagano 386-1192 Japan
https://www.hioki.com/

Scan for all regional contact information

All information correct as of Feb. 12, 2020. All specifications are subject to change without notice.
SP7001_7002E1-02M Printed in Japan