Thank you for choosing the Hioki SP7001/SP7002 Non-Contact CAN Sensor, SP7100 CAN Interface, and SP9200 Signal Probe. Keep this manual accessible so that you can take full advantage of the product's functionality throughout its service life.

Be sure to review the following documentation before using the product:

- Quick Start Manual (this manual)
- Instruction Manual
- Operating Precautions (this manual)

This is the Quick Start Manual. Be sure to download the most recent version of the Instruction Manual from Hioki's website.


Introduction

The Non-Contact CAN Sensor supports the following communications standards:

<table>
<thead>
<tr>
<th>Model</th>
<th>Communications Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP7001</td>
<td>CAN</td>
</tr>
<tr>
<td>SP7002</td>
<td>CAN FD</td>
</tr>
</tbody>
</table>

Use of the product

Before using the product, review proper handling of the product, bus systems, and related systems.

Only individuals who understand both safe product use and the potential impacts arising from using the product should use the product. Use of the product by others may cause bodily injury or damage to the product or other devices.

Use of the product

The SP7001/SP7002 Non-Contact CAN Sensor can detect CAN communications signals, which are used in control communications in automobiles and in a variety of devices, from outside cables' insulation.

Captured CAN signals can be connected to analyzers, loggers, and other measuring instruments with a CAN interface.

Specifications

Operating environment

Indoors, Pollution Degree 2 altitude up to 2000 m (6562 ft)

Operating temperature and humidity

-40°C to 85°C (~-40°F to 185°F)

Humidity: 40% to 60% RH (40°F to 140°F), 80% RH or less (no condensation)

Storage temperature and humidity

-40°C to 85°C (~-40°F to 185°F)

80% RH or less (no condensation)

Maintenance and Service

Do not attempt to modify, disassemble, or repair the product. Doing so may result in fire, electric shock, or bodily injury.

Troubleshooting

If you believe the product may be malfunctioning, contact your authorized Hioki distributor or reseller after reviewing the contents of downloaded Instruction Manual "Before sending the product to be repaired."

Operating Precautions

WARNING

Do not use the product in locations such as those listed below. Doing so may result in product damage or cause an accident.

- Locations where the product would be subject to direct sunlight or high temperatures
- Locations where corrosive or explosive gases are present
- Locations where there is powerful electromagnetic radiation or that are close to electrically charged objects
- Close to inductive heating equipment (high-frequency inductive heating equipment, I.H. cooktops, etc.)
- Locations with an excessive amount of mechanical vibration
- Locations where the product would be exposed to water, oil, chemicals, solvents, or other liquids
- Locations with excessive humidity or condensation
- Locations with excessive dust

The Non-Contact Sensor is capable of extremely stable CAN frame acquisition. However, the product is not guaranteed to achieve an error rate of 0% under all conditions. Errors may be caused by factors including the condition of the vehicle being tested and the quality of the power supply being used. Please verify that the product functions properly with the vehicle to be tested prior to use.

Product Guide

Be sure to review the following documentation before using the product:

- Quick Start Manual (this manual)
- Instruction Manual
- Operating Precautions (this manual)

The SP9200 Signal Probe is not covered by the warranty.
Preparations

For details, see “2 Preparing Before Use” in the downloaded Instruction Manual.

Detection Procedure

Do not connect the probes to bare conductors with exposed metal or cables with damaged insulation. Do not allow the tips of the probes to come into contact with any energized part. Doing so may damage the equipment you are using (the vehicle) or cause it to malfunction.

IMPORTANT
- The Signal Probe’s connector incorporates a locking mechanism. Always use the probe with the connector in the locked state to ensure signals can be properly detected and to prevent damage to the connector.
- Leave the Signal Probe connected to prevent deterioration of the Signal Probe and Non-Contact CAN Sensor’s connector's contacts and to keep out dirt.
- Any dirt on the cable under test could affect signal detection. Remove any dirt before affixing (connecting) the Signal Probe.
- Proper detection will be impossible if the cable under test is positioned too shallowly or angled in the guard hook.
- Position the probe so that the cable under test is in contact with the back of the detection electrode.
- The Auto setting represents automatic input polarity mode.
- The AUTO setting represents automatic input polarity mode.
- The AUTO setting represents automatic input polarity mode.
- The AUTO setting represents automatic input polarity mode.
- The HIGH setting represents high-sensitivity mode. Use this mode when you encounter detection errors due to low signal levels detected by the Signal Probes.
- The product is more susceptible to vibrations and various types of noise when used in this mode.

4 Connect the SP7100 CAN Interface’s CAN signal output connector to the CAN interface-equipped device with which you wish to use it.

Pin assignment of CAN signal output connector

<table>
<thead>
<tr>
<th>Pin</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CH2 CAN Low</td>
</tr>
<tr>
<td>2</td>
<td>CH1 CAN Low</td>
</tr>
<tr>
<td>3</td>
<td>CH1 GND</td>
</tr>
<tr>
<td>4</td>
<td>N.C.</td>
</tr>
<tr>
<td>5</td>
<td>Shield</td>
</tr>
<tr>
<td>6</td>
<td>CH2 GND</td>
</tr>
<tr>
<td>7</td>
<td>CH1 CAN High</td>
</tr>
<tr>
<td>8</td>
<td>CH2 CAN High</td>
</tr>
<tr>
<td>9</td>
<td>N.C.</td>
</tr>
</tbody>
</table>

5 Supply power to the SP7100 CAN Interface

6 Rotate the grip of SP9200 Signal Probe to press the cable under test against the detection electrode.

Connect the tips of the SP9200 Signal Probes to the CAN bus. Connect the Signal Probe connected to the terminal labeled HIGH to the CAN_H line and the other Signal Probe to the CAN_L line.

7 Tighten the grip until it no longer rotates.

The probe contains a built-in spring that supports the cable under test.

- Position the probe so that the cable under test is in contact with the back of the detection electrode.
- Proper detection will be impossible if the cable under test is positioned too shallowly or angled in the guard hook.

Functionality

LED lighting/flashing specifications

<table>
<thead>
<tr>
<th>Product status</th>
<th>STATUS LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-test error (failure)</td>
<td>Steady red</td>
</tr>
<tr>
<td>Signal not detected</td>
<td>Steady green</td>
</tr>
<tr>
<td>Signal detected</td>
<td>Flashing green</td>
</tr>
<tr>
<td>Probe high/low reverse connection warning</td>
<td>Flashing red</td>
</tr>
</tbody>
</table>

Important
- The product is more susceptible to vibrations and various types of noise when used in this mode.
- This function will operate in approximately 2 seconds as long as the CAN bus load factor is approximately 5% or greater.

SP7001 or SP7002 Non-Contact CAN Sensor

Product status

SELF-TEST ERROR

- Signal not detected
- Signal detected
- High/low reverse connection warning

SP7100 CAN Interface

Product status

SELF-TEST ERROR

- CAN sensor not connected
- CAN sensor connected
- Output bus error detection

Output Bus Error Detection Function

This function determines that an output error has occurred when the SP7100 CAN Interface is unable to output a proper CAN signal to the bus connected to the CAN signal output connector.

The SP7100 CAN Interface output does not have CAN signal arbitration functionality. CAN communications signals detected by the Non-Contact CAN Sensor are output without modification.

The output bus error detection function operates when the Non-Contact CAN Sensor is connected properly to the CAN_H and CAN_L lines (per the labels on the Non-Contact CAN Sensor inputs).

SP9900 Split Cable

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

Setting | Description
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DEFAULT</td>
<td>The DEFAULT setting represents the normal mode. It is recommended to use DEFAULT mode since it delivers the optimal level of vibration and noise resistance.</td>
</tr>
<tr>
<td>HIGH</td>
<td>The HIGH setting represents high-sensitivity mode. Use this mode when you encounter detection errors due to low signal levels detected by the Signal Probes. The product is more susceptible to vibrations and various types of noise when used in this mode.</td>
</tr>
<tr>
<td>FIXED</td>
<td>The FIXED setting represents fixed input polarity mode. If the Non-Contact CAN Sensor detects that the Signal Probes are connected to the CAN bus in reverse, it will indicate this state with the STATUS LED, which will flash red.</td>
</tr>
<tr>
<td>AUTO</td>
<td>The AUTO setting represents automatic input polarity mode. If the Non-Contact CAN Sensor detects that the Signal Probes are connected to the CAN bus in reverse, it will switch the high and low detected signals via its internal circuitry. This function will operate in approximately 2 seconds as long as the CAN bus load factor is approximately 5% or greater.</td>
</tr>
</tbody>
</table>