



TC201 Product Manual

Version: V1.0 | English

tosunai.com

Copyright Information

Shanghai TOSUN Technology Ltd

No. 9 Building, 1288 Jiasong North Road, Jiading District, Shanghai (Headquarters)

Buildings 14-17, Lane 4849 Cao'an Highway (Shanghai Research Institute)

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What Is a CAN Trigger?

When designing and managing complex Controller Area Network (CAN) bus systems, maintaining signal integrity, ensuring accurate data transmission, and providing physical isolation to prevent electrical interference and ground potential differences are crucial for achieving efficient operation and reliability. Therefore, the use of CAN trigger has become a standard practice across various industries.

These triggers are not just simple connectors. They are critical components of the CAN system. They protect the CAN bus from external interference, minimize data distortion during transmission, and establish secure communication bridges between ground lines with different potentials. Electrical isolation measures further enhance the system's stability and reliability.

The use of CAN isolation triggers not only ensures the accuracy and integrity of data but also improves the system's security. They prevent the spread of potential electrical faults, thereby reducing the risk of system failures.

What Can CAN Isolation Trigger Device Do?

- Electrical isolation: Protects CAN nodes and other devices from electrical interference
- CAN signal triggering
- Waveform conversion
-



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1. About this User Manual

1.1 Warranty

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2. TC201

2.1 Product Overview

The TC201 is a CAN trigger device launched by TOSUN, designed to isolate CAN nodes from interference caused by other devices or nodes. It ensures stable CAN signal triggering and enables waveform conversion from the CAN interface to the RX terminal, facilitating data acquisition by oscilloscopes.

The TC201 features CAN/CAN FD ports, an oscilloscope interface, and a DC power input, making it simple and convenient to use.



2.2 Features

- ✓ Electrical isolation
- ✓ CAN signal triggering
- ✓ Waveform conversion

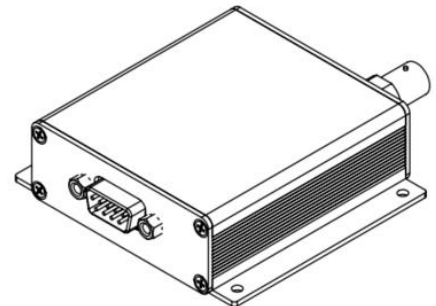
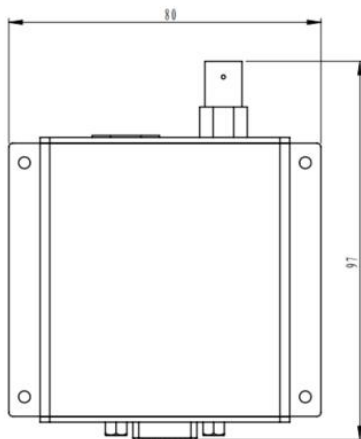
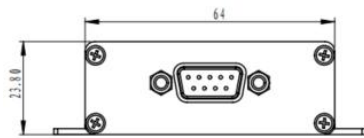
2.3 Technical Data

Channel	1 * CANFD
Power Supply	External DC power supply (8-15V)
Power Consumption	0.2W
Case Material	Metal
Dimension	Approx. 80*113*97mm
Weight	Approx. 144g
Operating Temperature	-40°C~80°C
Operating Humidity	10% ~ 90% (non-condensing)
Operating Environment	Keep away from corrosive gases

2.4 Electrical Data

Parameter		Test Condition	Minimum Value	Typical Value	Maximum Value	Unit
Operating Voltage	External DC power supply	CAN trigger	8	12	15	V
Operating Current	External DC power supply	CAN trigger	--	0.009	--	A
Power Consumption	External DC power supply	CAN trigger	--	0.11	--	W
CAN Interface	Bus pin voltage resistance	CANH、CAHL	-58	--	+58	V
	Isolation withstand voltage	Leakage current less than 1mA	2500	--	--	VDC

2.5 Mechanical Data



2.6 Scope of Delivery

- ✓ Main device: TC201



- ✓ BNC to BNC connection cable * 1



2.7 Hardware Interface

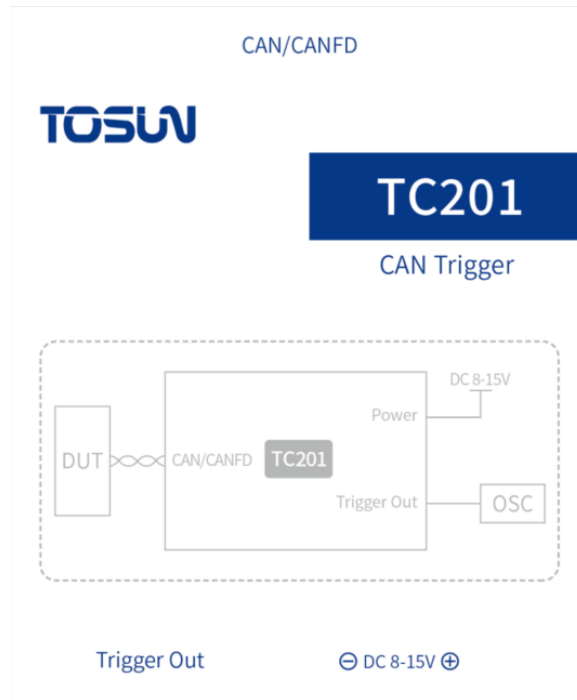


- DC power supply port
- Trigger Out Oscilloscope Interface
- DB9 Pin

DB9 Pin	PIN Number	Definition
CANFD	PIN2	CAN_L
	PIN3	C_GND
	PIN7	CAN_H

2.8 Front View of the Product

Image with protective film:



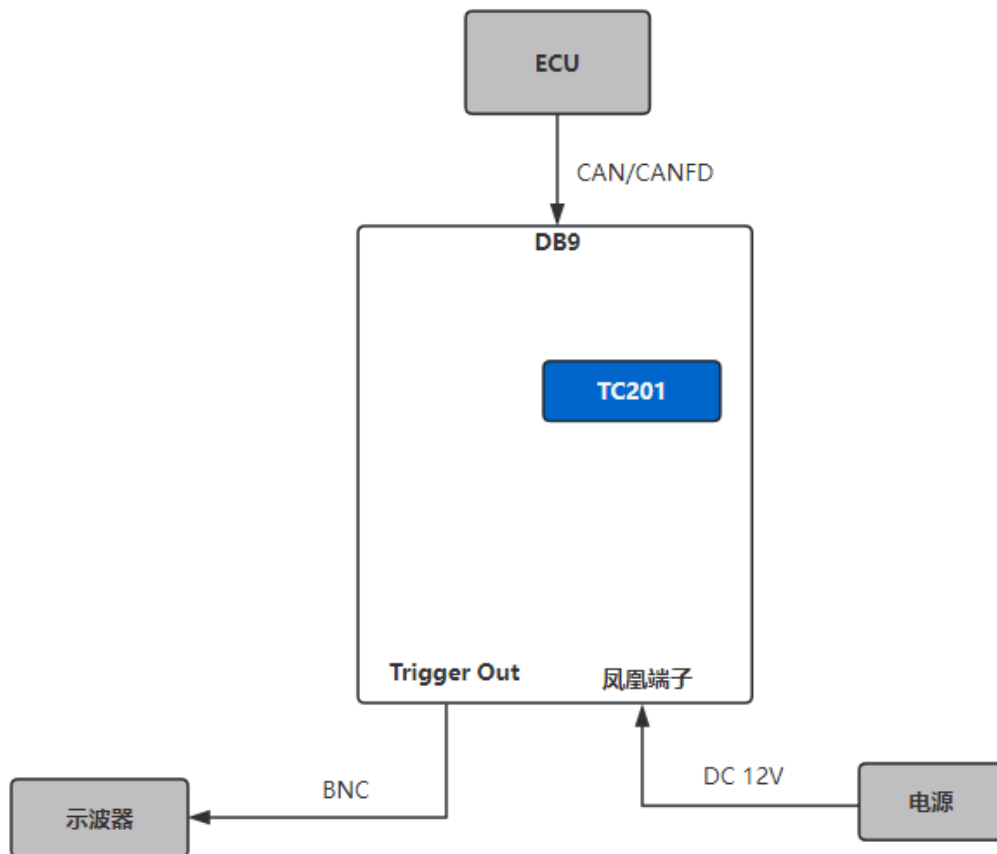
2.9 Optional Accessories

N/A

3. Quick Start

3.1 System Connection

The TC201 features a CAN/CAN FD interface, a DC power interface, and an oscilloscope interface. Refer to the figure below for the system connection:



The device connects to the CAN ECU via DB9 and to the oscilloscope using the matching BNC-to-BNC cable. When a CAN signal is received, it triggers an output to the oscilloscope. Additionally, the device requires DC power for operation.

3.2 Electrical Isolation

In many measurement applications, oscilloscopes are often designed with a common ground, meaning all channels share the same ground line. This design can lead to signal interference and inaccurate measurements when ground potential differences arise between different devices or

system components. When an oscilloscope is affected by interference due to its common-ground design, the CAN isolation trigger (e.g., TC201) provides an effective solution.

The TC201 features electrical isolation capabilities, isolating different sections of the CAN bus to effectively reduce interference caused by ground potential differences. This protects CAN nodes and other devices from electrical interference, ensuring stable data transmission and accurate measurements.

◆ Solution to Common-Ground Interference

- (1) Electrical Isolation Function: The TC201 employs advanced isolation technology to separate the nodes of the CAN bus, making each node's ground line independent. This independence significantly reduces signal interference caused by ground potential differences, particularly in measurement environments using common-ground oscilloscopes.
- (2) Isolation between Oscilloscope and ECU: When using a common-ground oscilloscope, simply connect the TC201 isolation trigger between the oscilloscope and the electronic control unit (ECU). Even if the oscilloscope channels share a ground line, the intervention of TC201 ensures that the ground lines of each channel are isolated from one another, thereby preventing interference caused by ground potential differences.

◆ Waveform Displaying

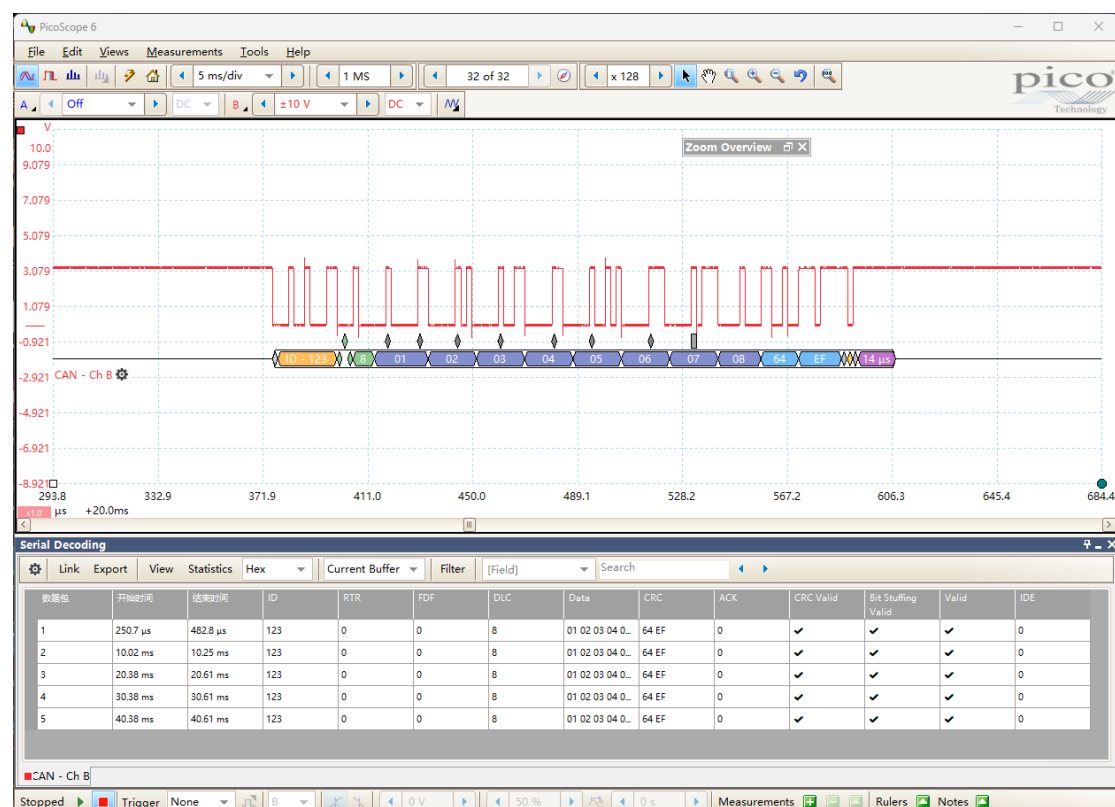
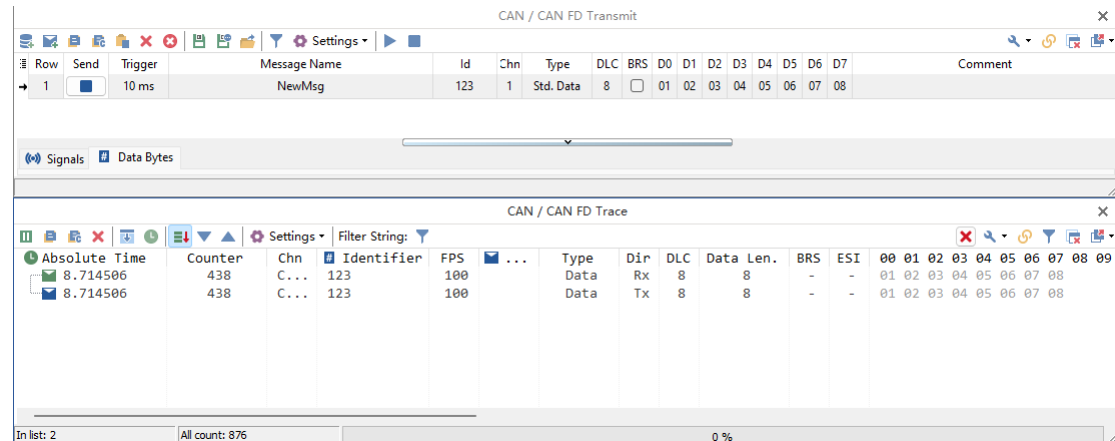
Refer to the 3.1 System Connection section. That is, the ECU device is transmitting messages normally, and the ECU connects to the TC201 via DB9. The TC201 is then connected to the oscilloscope using a BNC-to-BNC cable. A single oscilloscope channel is sufficient to display the complete message waveform.

As shown in the example below, the waveform represents a single CAN message. Typically, viewing a CAN message requires two channels, separately connected to CAN_H and CAN_L. However, with the CAN isolation trigger, a single channel is enough to display a complete CAN

message waveform.

Waveform for Reference:

The waveform for message with ID 0x123, DLC of 8, and data segment from 0x1 to 0x8 is shown below:



4. Inspection and Maintenance

The main electrical components of the TC201 product are semiconductor components. Although the equipment has a long service life, they may also accelerate aging and significantly reduce their service life under an incorrect environment. Therefore, during the use of the equipment, periodic inspection should be carried out to ensure that the use environment maintains the required conditions.

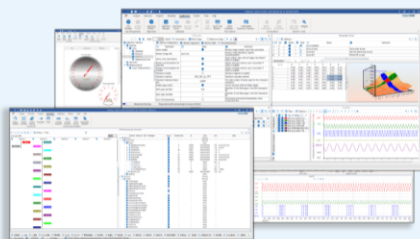
It is recommended to conduct inspections at least once every 6 months to 1 year. Under improper environmental, more frequent inspections should be conducted. As shown in the table below, if you encounter problems during maintenance, please read the following content to find the possible causes of the problem. If the problem still cannot be solved, please contact Shanghai TOSUN Technology Ltd.

Item	Inspection	Standard	Action
Power Supply	Inspect for voltage fluctuations at the power supply end	Power supply port +12V DC	Use a voltage meter to check the power input end. Take necessary actions to keep the voltage fluctuations within the acceptable range.
Surrounding Environment	Check the ambient temperature of the surrounding environment. (Including the internal temperature of enclosed environments)	-40°C~+80°C	Use a thermometer to check the temperature and ensure that the ambient temperature within in the acceptable range.
	Check the ambient humidity. (Including the internal humidity of enclosed environments)	The relative humidity must be within the range of 10% to 90%	Use a hygrometer to check the humidity and ensure that the ambient humidity within the acceptable range.
	Check for the accumulation of dust, powder, salt, and metal shavings	No accumulation	Clean and protect the equipment.

	Check for any contact with water, oil, or chemical sprays on the equipment	No contact	Clean and protect the equipment if necessary.
	Check for the presence of corrosive or flammable gases in the equipment area	No presence	Inspect by the smell, or using a sensor.
	Check for levels of vibration and shock	Vibration and shock are within the acceptable range	Install padding or other shock-absorbing devices if necessary.
	Check for noise sources near the equipment	No significant noise source	Isolate the equipment from noise sources or protect the equipment.
Wiring Installation	Check the crimped connectors in the external wiring	Ensure enough space between the connectors	Visually inspect and adjust if necessary.
	Check for damage in the external wiring	No damage	Visually inspect and replace the wiring if necessary.

Software

Support CAN(FD)/LIN/FlexRay/SOME/IP and DoIP
 UDS diagnostics/ECU flashing/CCP/XCP calibration
 Embedded code generation/Application builder
 Encrypted release/Logging and bus replay
 Graphical programming/Residual bus simulation
 C and Python scripting
 Bus monitoring/Transmitting/Automated testing



TSMaster

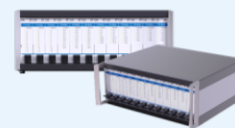
Hardware

1/2/4/8/12-channel CAN FD/CAN to USB/PCIe device
 1/2/6-channel LIN to USB/PCIe device
 Multi channel FlexRay/CAN FD to USB/PCIe device
 Multi channel automotive Ethernet/CAN FD to USB/PCIe device
 Automotive Ethernet media conversion device (T1 to Tx)
 Multi-channel CAN FD/Ethernet/LIN datalogger



TTS test systems

- CAN FD/CAN/FlexRay/LIN communication boards
- Relay and fault injection boards
- Resistors for sensor simulation
- Digital I/O, Analog I/O boards available



Solutions

- Bus Conformance
- Network Automation Testing System
- Charging Testing System
- EMB Calibration Testing Equipment
- Information Security Solutions
- Steer-by-Wire Chassis Testing Solutions
- EOL Testing Equipment
- Motor Performance
- Durability Testing Solutions
- FCT



About TOSUN

The core product, TSMaster, is a comprehensive tool for automotive R&D, testing, production, and after-sales. It integrates essential functions with hardware support to streamline processes and ensure precision, making it ideal for automotive professionals.

International Organization



Quality Assurance
ISO9001:2015

CE Certification



Contact Us :

+86 21-5956 0506
 sales@tosunai.com

website :

www.tosunai.com

