



TOSUN-TC1043

User Manual

Product Features & Interface Overview

Product Name	Channel
TC1043	2 × CAN/CAN FD/CAN XL

Copyright Information

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1. Introduction

The TC1043 is a CAN bus simulation and testing tool for automotive electronic system development and validation.

The device provides two CAN channels and fully supports CAN, CAN FD, and CAN XL protocols (CAN up to 1 Mbps, CAN FD up to 8 Mbps, and CAN XL up to 20 Mbps with support for CAN XL FAST mode).

Configurable sampling points are supported, along with various operating modes including loopback mode, listen-only mode, and restricted operation mode.

When used with the TSMaster software, the TC1043 enables efficient message transmission, reception, logging, and analysis.

Included resources:

- TSMaster host software
- Cross-platform secondary development library (with a dedicated programming manual)

1.1. Technical Specifications

➤ Device Specifications

Parameter	Description
PC Interface	USB 3.0, RJ45 Ethernet
Driver	Cross-platform, driver-free design
Connector	Standard D-Sub, 9-pin
License	Supports all TSMaster paid licenses
Relay Type	Latching Relay
Power Supply	USB-powered or external DC 9~26 V (12 V recommended)
Power Consumption	4.2 W
ESD Protection	± 4 kV contact discharge, ± 8 kV air charge
Enclosure Material	Metal

Dimensions	Approx. 113 × 98 × 38 mm
Weight	Approx. 265 g
Operating Temperature	-40°C to +80°C
Operating Humidity	10% ~ 90% RH (no condensing)

➤ CAN Specifications

Parameter	Description
Connection Standard	High-speed CAN (ISO 11898-2:2024 compliant)
Supported Protocols	CAN / CAN FD / CAN XL
CAN Baud Rate	125 kbps ~ 1 Mbps
CAN Frame Data Length	0 ~ 8 bytes
CAN FD Baud Rate	125 kbps ~ 8 Mbps
CAN FD Frame Data Length	0 ~ 64 bytes
CAN XL Bit Rate	Up to 20 Mbps (FAST mode)
CAN XL Data Length	1 ~ 2048 bytes
Termination Resistor	Built-in 120 Ω , software configurable
Relay Type	Latching relay

1.2. Electrical Specifications

➤ Power Characteristics

Parameter	Condition	Min	Typ.	Max	Unit
Supply Voltage	DC	8	12	27	V
Operating Current	DC	—	0.356	—	A

Power Consumption	DC	—	4.2	—	W
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➤ EMC Performance

Test Item	Standard	Condition	Level	Unit
ESD	IEC 61000-4-2	Contact discharge	± 4	kV
		Air discharge	± 8	kV
EFT	IEC 61000-4-4	Burst	± 2	kV

➤ Mechanical Dimensions

Unit: mm

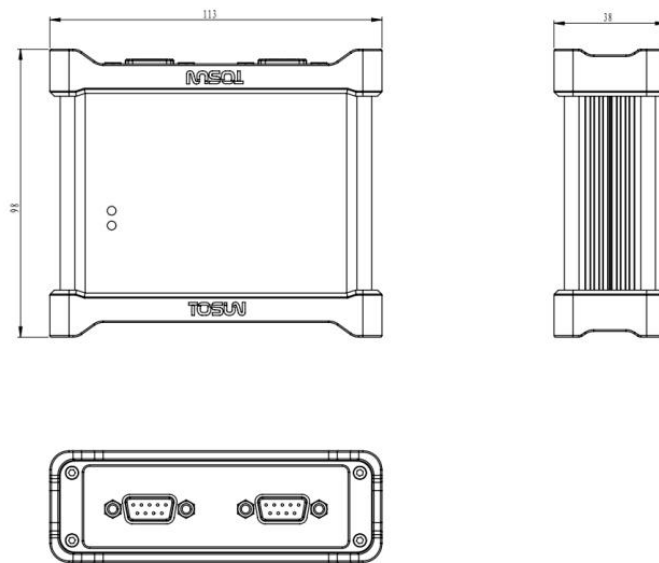


Figure 1-1 Mechanical Dimensions

1.3. Hardware Interface

➤ Control Interface



Figure 1-2 Hardware Interface

- DC power connector
- USB 3.0 interface
- RJ45 Ethernet interface

➤ Bus Interfaces



Figure 1-3 Hardware Interface (CAN / CAN FD / CAN XL)

1.4. LED Indicators



Figure 1-4 Front Panel Label

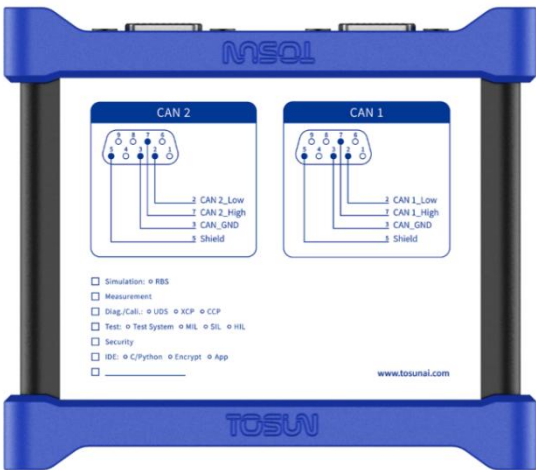


Figure 1-5 Rear Panel Label

➤ LED Definitions

Indicator	Description
CAN 1 ~ 2	Status of CAN channel 1 ~ 2

➤ LED Color Description

Indicator	Color	Description
CAN	Green	Normal frame transmission/reception
	Red	Frame transmission/reception error — configuration, protocol, or wiring fault



The blinking frequency depends on the bus load rate — the higher the bus load, the faster it blinks.

1.5. System Requirements

➤ PC Requirements

- Operating System: Windows or Linux
- One available USB port (USB 3.0 supported), or a powered USB hub

➤ Driver Installation

- The TC1043 features a driver-free design, ensuring outstanding system compatibility. It can be used directly on Windows or Linux without manual driver installation.

➤ Downloads

- TSMaster software
- PDF user manual
- Programming library (for secondary development)



The download link is available on the official website of Shanghai TOSUN Technology Ltd.: <https://www.tosunai.com/>

1.6. Packing List

Item	Qty.	Illustration	Standard/Optional
TC1043 Main Device	1		Standard
USB Cable (Type-C to Type-C)	1		Standard
Cat6 Gigabit Ethernet cable	1		Standard
12 V / 2 A power adapter (US/ EU/ CN)	1		Standard

2. Application Example in Windows

2.1. System Connection

The TC1043 is powered by a 12 V supply and connects to a PC via Ethernet (RJ45) or USB. The two CAN interfaces are connected to other CAN devices.

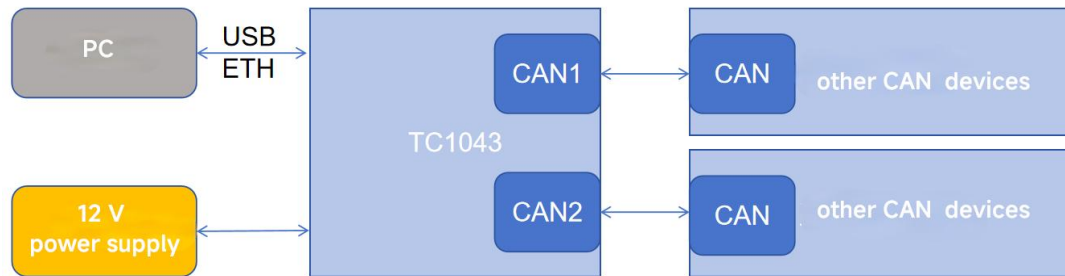


Figure 2-1 System Connection Diagram

2.2. Usage Example

2.2.1. Device Connection

1. Connect the device to the PC via an Ethernet cable. Ensure both are in the same network segment.
2. In TSMaster, go to “Hardware” → “Channel Selection”, click “Settings”, and enable Ethernet interface devices to detect the TC1043.

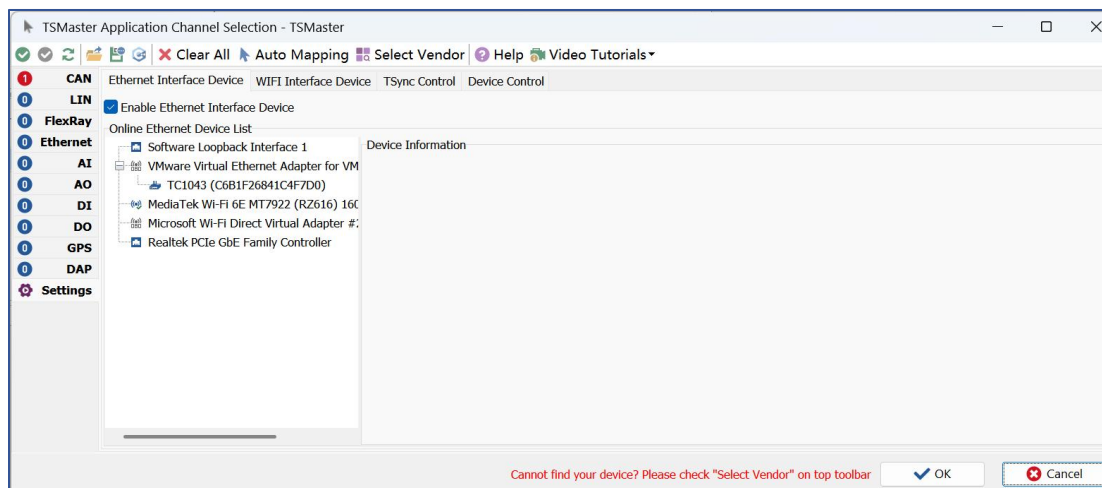


Figure 2-2 Channel Selection

3. Select the bus type and configure the number of channels.

CAN configuration window:

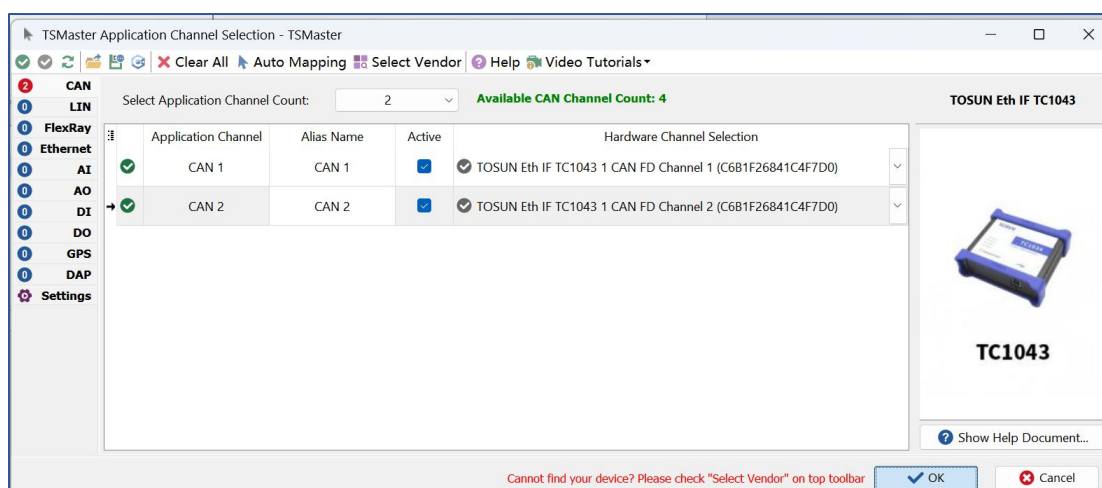


Figure 2-3 Channel Configuration (CAN)

2.2.2. CAN Example

After connecting the device, configure the CAN controller type, bit rate, mode, and termination in “Hardware Configuration”.

- Connect CAN Channel 1 and Channel 2 in loopback
- Configure both as CAN mode
- Bit rate: 500 kbit/s

- Sample point: 80%
- Mode: Normal

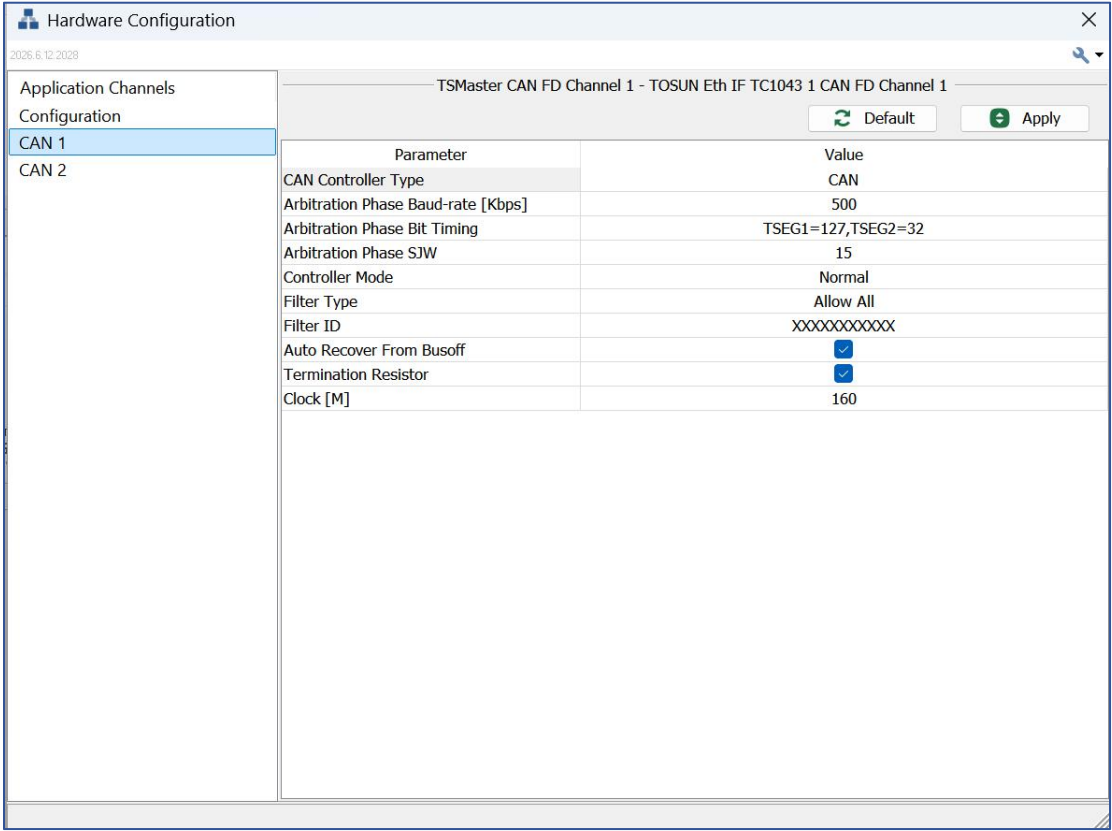


Figure 2-4 CAN Configuration

Start transmission after configuring CAN frames to observe normal message transmission and reception.

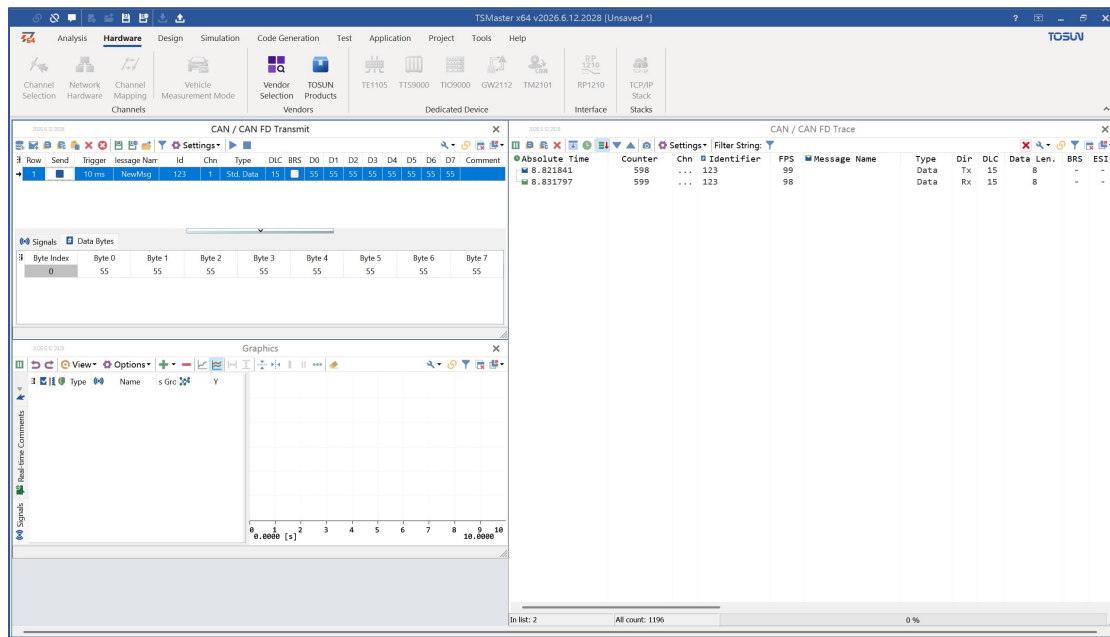


Figure 2-5 CAN Communication Example

2.2.3. CAN FD Example

- Loopback connection between two CAN channels
- Configure both as CAN FD mode
- Arbitration: 1 Mbps (80%)
- Data phase: 8 Mbps (60%)
- Mode: Normal

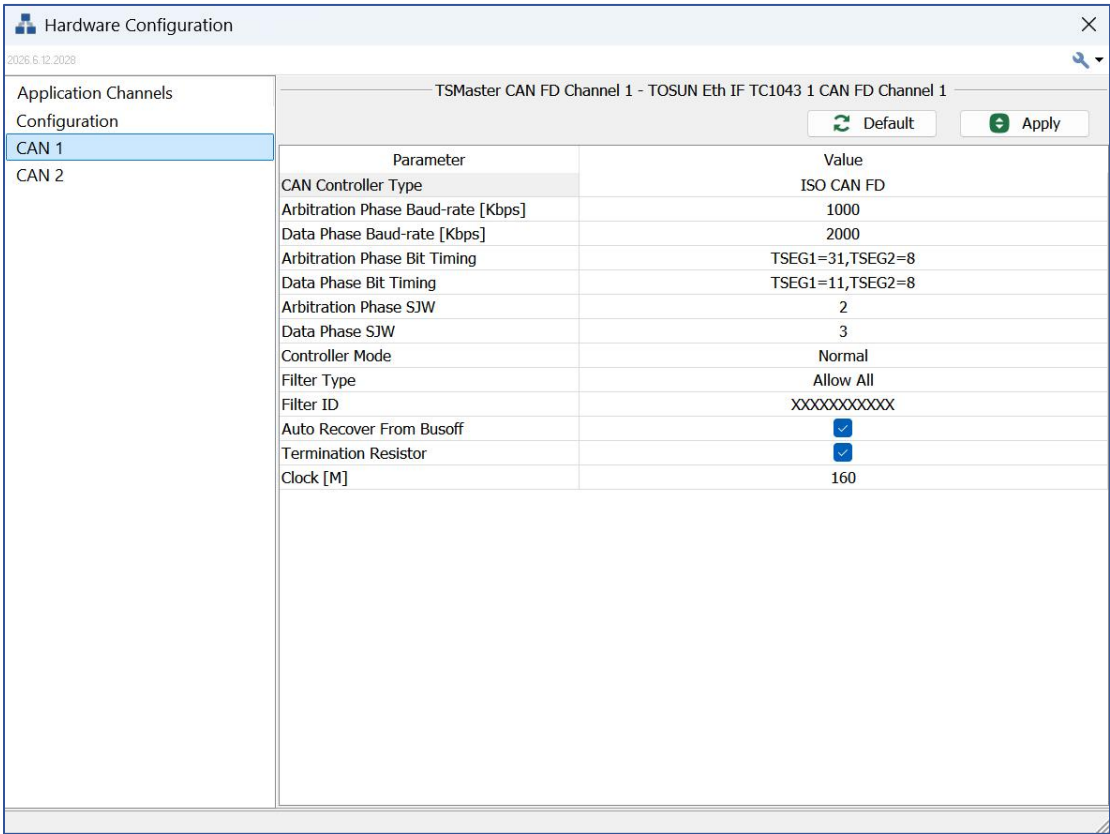


Figure 2-6 CAN FD Configuration

Start transmission to observe normal communication.

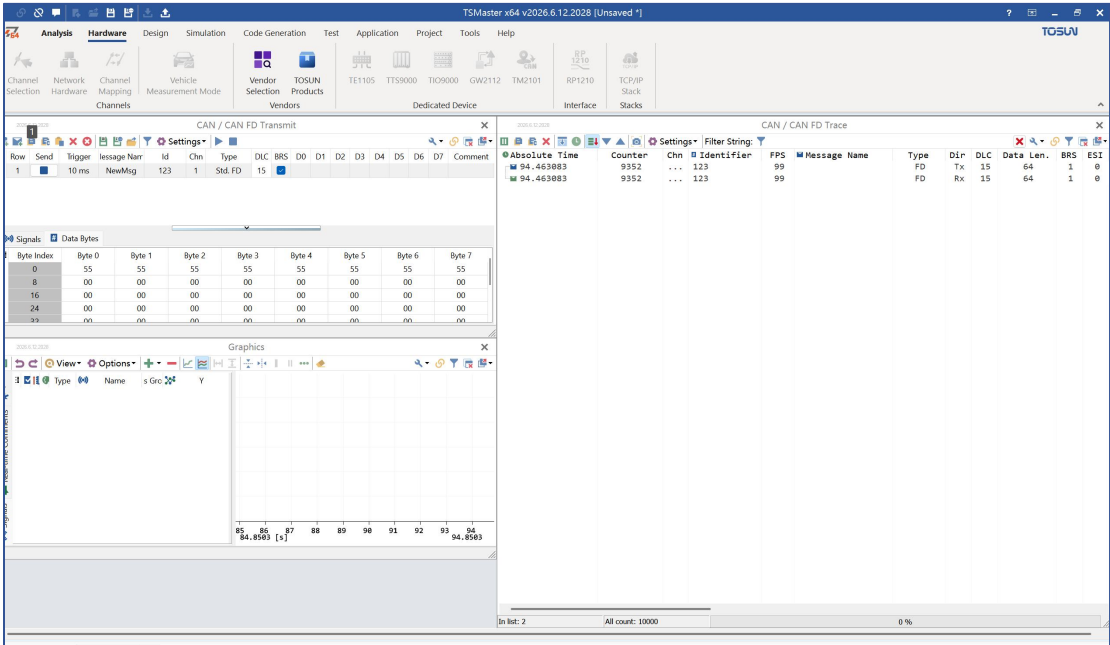


Figure 2-7 CAN FD Communication Example

2.2.4. CAN XL Example

- Loopback connection between two CAN channels
- Configure both as CAN XL mode
- Arbitration: 1 Mbps (80%)
- Data phase: 20 Mbps (62.5%)
- Mode: Normal

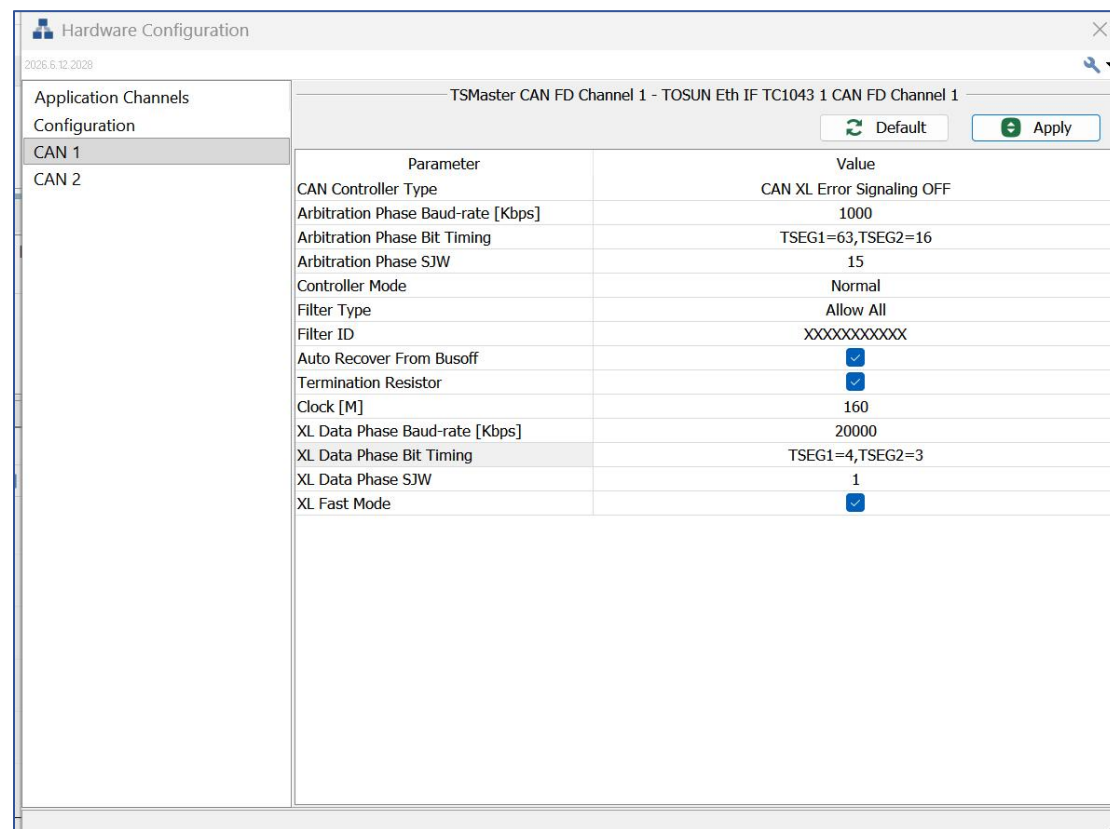


Figure 2-8 CAN XL Configuration

Start transmission to observe normal communication.

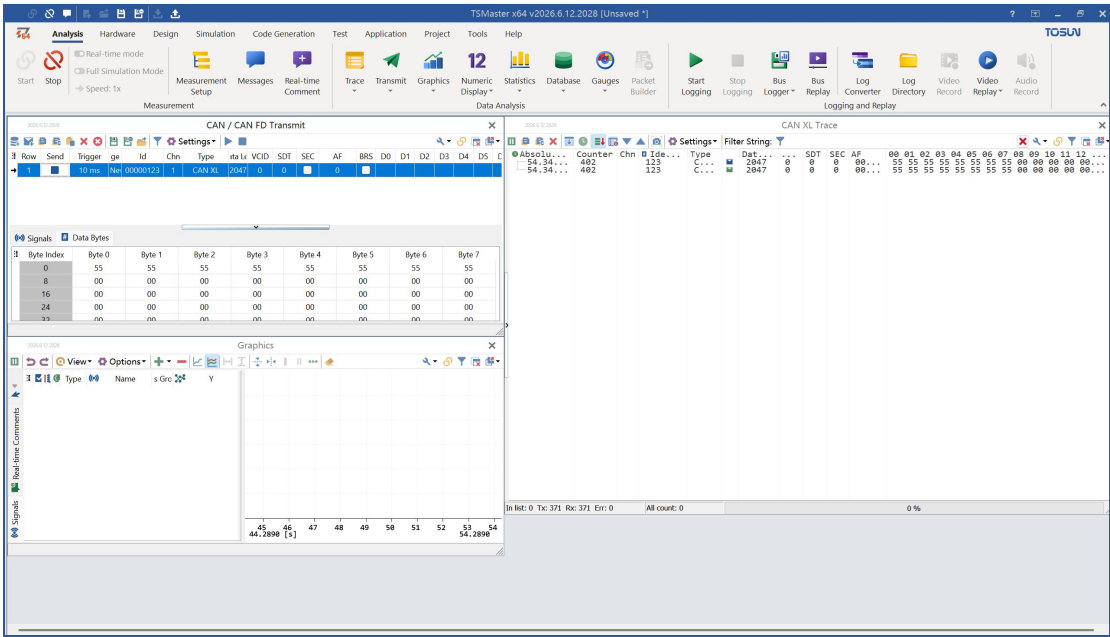


Figure 2-9 CAN XL Communication Example

3. Appendix

3.1. Software Installation

The section describes the steps for installing the TSMaster software on a Windows PC.

➤ TSMaster Software Download

<https://www.tosunai.com/downloads/>

If the site is unavailable, contact your sales representative or visit the TOSUN official website.

You may also scan the QR code below to follow the official WeChat account and obtain download links.



Figure 3-1 TOSUN Official WeChat Account

➤ Software Installation

1. Double-click the TSMaster installer and select the installation language.

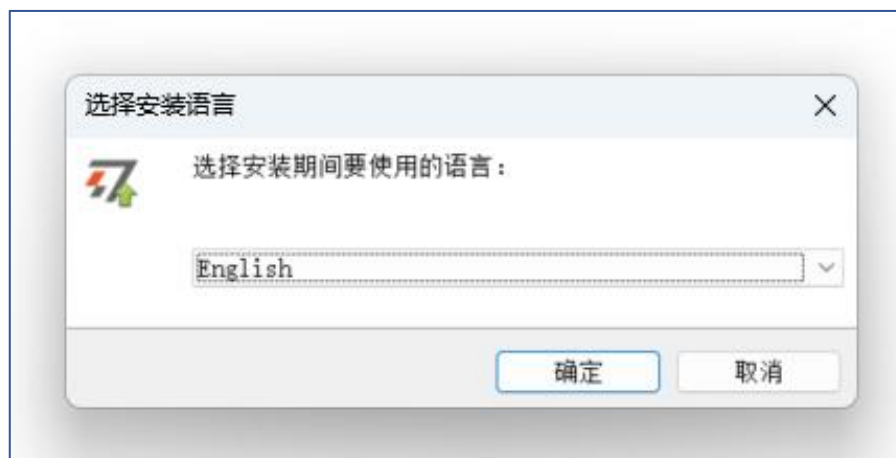


Figure 3-2 TSMaster Installation

2. Accept the license agreement and click “Next”.

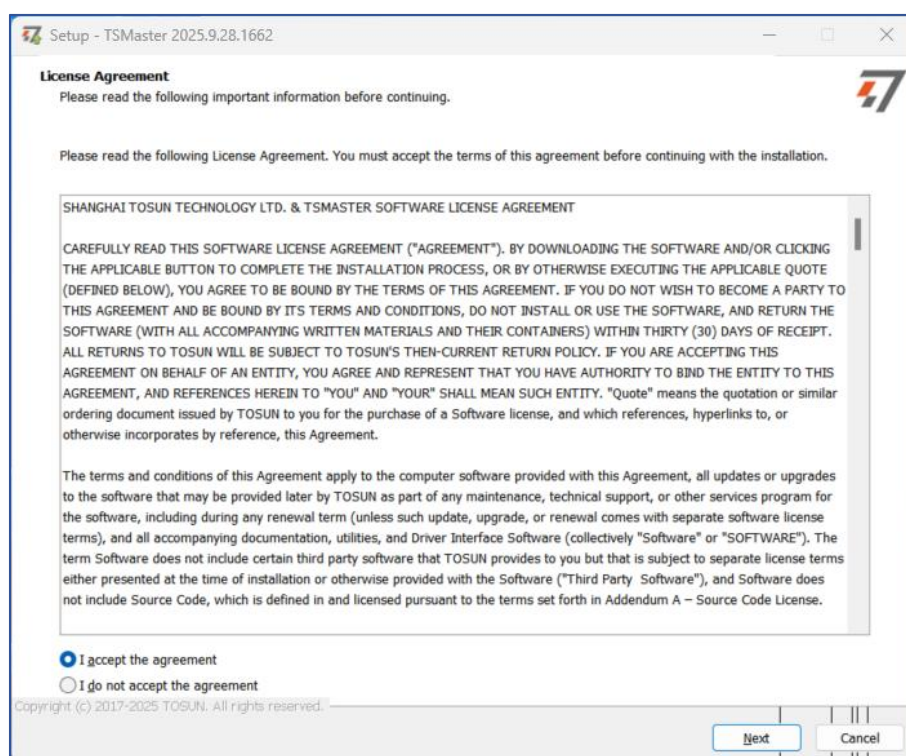


Figure 3-3 TSMaster Installation

3. Choose an installation directory and click “Next”.

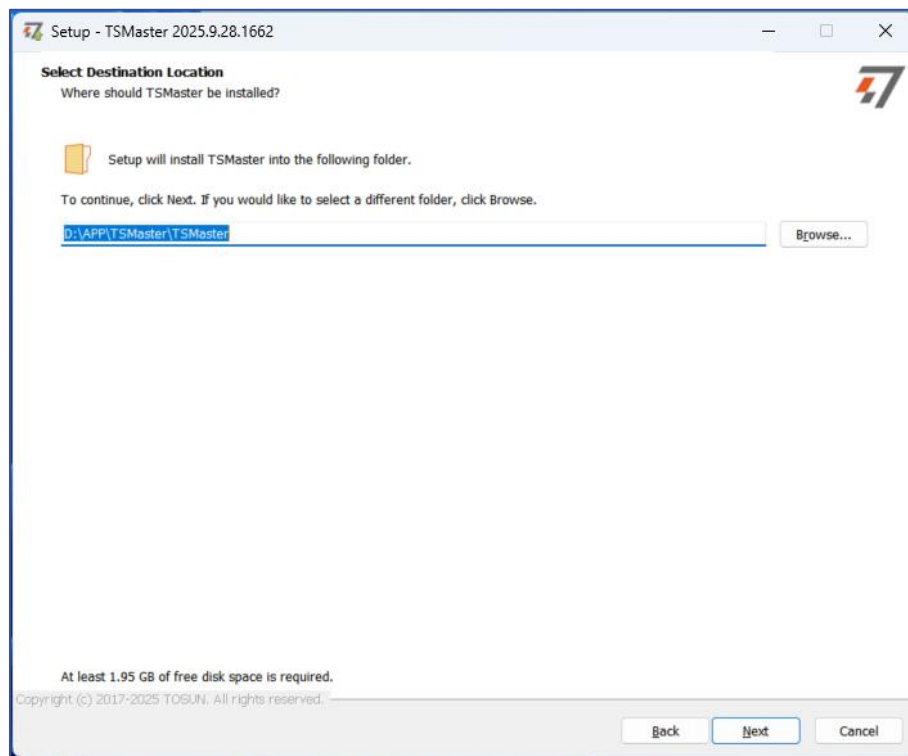


Figure 3-4 TSMaster Installation

4. Select additional tasks as needed and click “Next”.

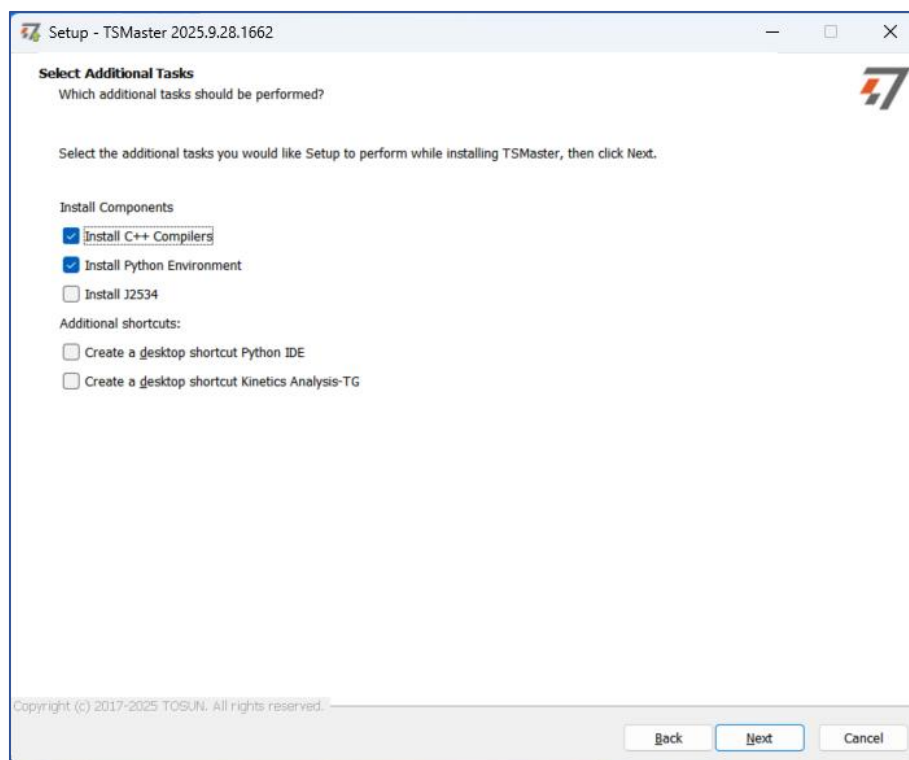


Figure 3-5 TSMaster Installation

5. Click “Install” and wait for completion.

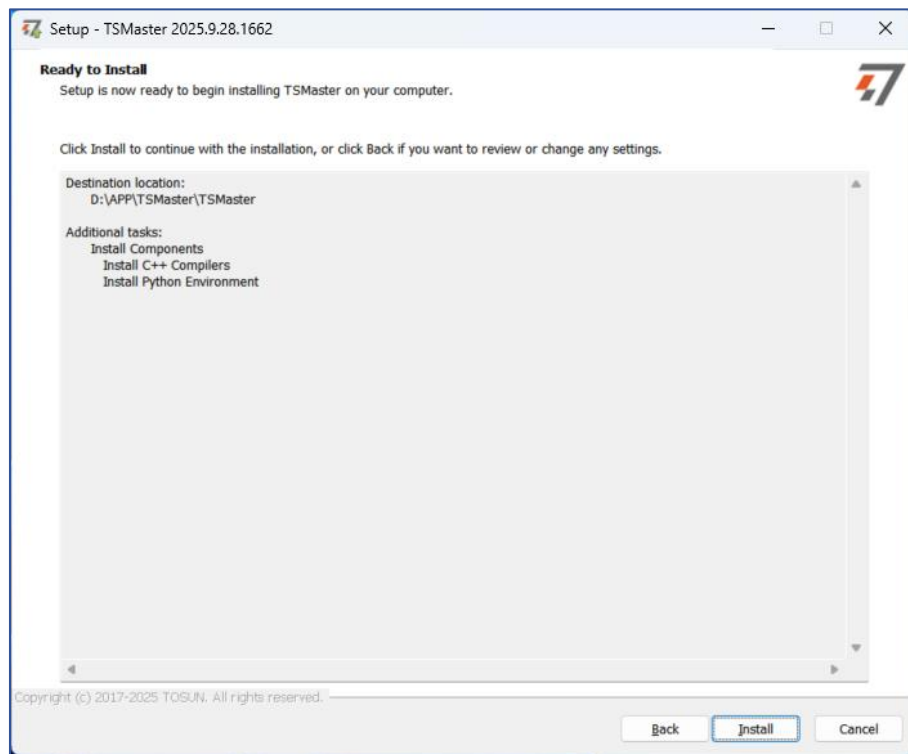


Figure 3-6 TSMaster Installation

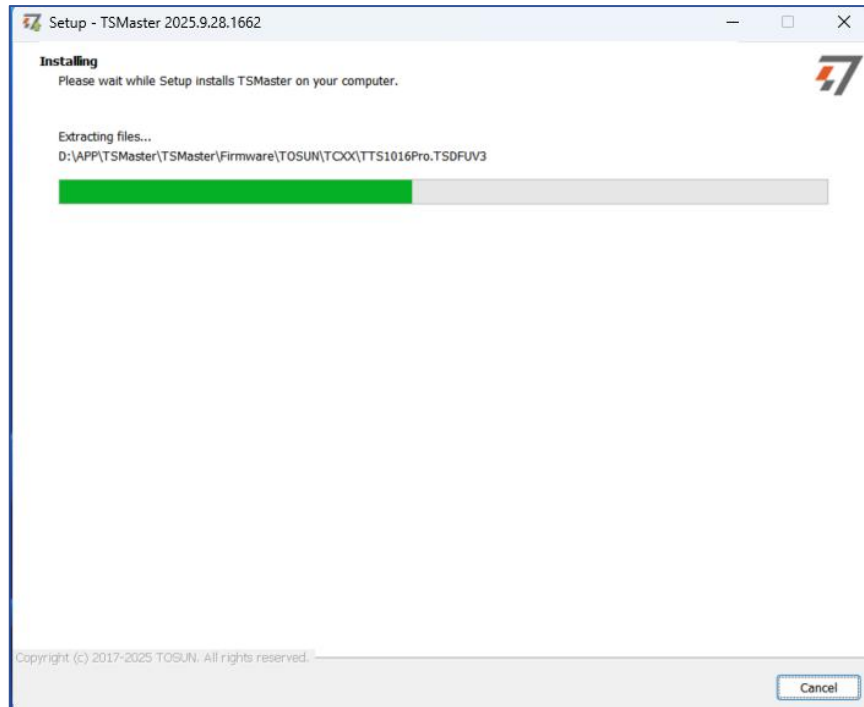


Figure 3-7 TSMaster Installation

6. Click “Finish” to complete installation.

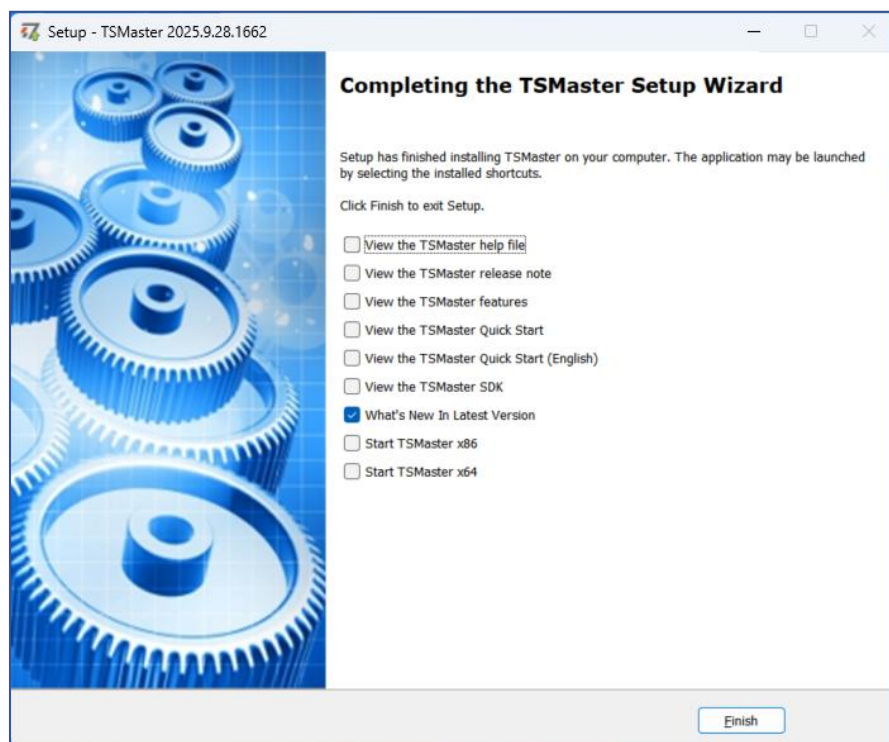


Figure 3-8 TSMaster Installation

4. Inspection and Maintenance

The TC1043 primarily contains semiconductor components, which typically have a long service life. However, adverse environmental conditions may accelerate aging and degrade performance. To ensure proper operation, regular inspections are recommended to maintain the required environmental conditions.

It is recommended to inspect the device at least once every 6 to 12 months. In harsher environments, inspections should be performed more frequently. Refer to the table below for inspection criteria and recommended actions. If issues persist, please contact Shanghai TOSUN Technology Ltd.

➤ Power Environment Inspection

Item	Check Content	Standard/ Range	Action/Measure
Power Supply	Check voltage fluctuation at power input	USB port: +5V DC Power port: +12V DC	Use a power meter or voltmeter at the input; ensure voltage fluctuation is within range
Ambient Conditions	Check ambient temperature (including internal temperature within enclosures)	-40°C ~ +80°C	Use a thermometer to ensure temperature is within specified range
	Check the ambient humidity (including internal humidity within enclosures)	10% ~ 90% RH	Use a hygrometer to ensure humidity is within specified range

➤ Contamination & Protection Check

Item	Check Content	Standard/ Range	Action/Measure
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Contamination	Check for accumulation of dust, powder, salt, and metal debris	None	Clean the device and prevent future contamination
	Check for exposure to water, oil, or chemicals	None	Clean and shield if necessary
Hazardous Gases	Check for corrosive or flammable gases	None	Use sensors or odor detection to verify

➤ Mechanical Stress & EMI Check

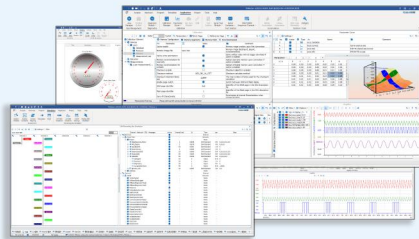
Item	Check Content	Standard/Range	Action/Measure
Mechanical Stress	Check vibration and shock levels	Within specified limits	Install padding or vibration isolation measures if necessary
Electromagnetic Environment	Check for noise sources near the device	No significant noise sources	Isolate or shield the device from noise sources

➤ Installation & Wiring Check

Item	Check Content	Standard/Range	Action/Measure
Wiring	Check crimped connectors in external wiring	Adequate clearance between connectors	Visually inspect and adjust as needed
	Check for damage to external wiring	No damage	Visually inspect and replace damaged cables 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



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