TOSUN同星



TOSUN-TC1022
User Manual

tosunai.com

Product Features & Interface Overview

USB to RS232 Interface

Product Name	Interfaces
TC1022	USB 2.0 × 1 RS232 × 2

Copyright Information

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Typical Application

- Industrial Equipment Debugging: Connects to RS232-equipped devices such as inverters, servo drives, industrial touchscreens, power meters, and industrial PCs for parameter configuration, program downloading, log retrieval, and fault debugging.
- Network Device Configuration: Connects to routers, switches, firewalls, optical network terminals (ONTs), and industrial gateways. Uses the serial command-line interface for device configuration, firmware flashing, factory reset, and network troubleshooting.

Product Highlights

- Dual-Channel Communication: Integrates two RS232 interfaces and supports dual-channel serial communication.
- Flexible Configuration: Supports configuration of the baud rate, data bits, stop bits, and parity to meet different serial communication requirements.
- Full-Duplex Communication: Supports RS232 full-duplex communication and point-to-point connections.
- Driver-Free Design: Connects to a PC via USB 2.0 and supports Windows and Linux operating systems without requiring driver installation.
- USB Power Supply: The device is powered through the USB interface.

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1. Introduction

The TC1022 is a USB-to-RS232 communication device with two integrated RS232 interfaces. It connects to a PC through a USB 2.0 interface and features a driver-free design for Windows and Linux, providing broad operating system compatibility.

1.1. Technical Specifications

➢ Device Specifications

Parameter	Description
Interfaces	USB 2.0 × 1; RS232 × 2
Power Supply	USB-powered

➢ RS232 Interface

Parameter	Description
Connector Type	DB9
Signal Pins	RXD, TXD, GND
Communication Protocol	Asynchronous serial communication
Operating Mode	Full-duplex, point-to-point
Baud Rate	Adjustable, 2400 – 921600 bps
Commonly Supported Baud Rates	2400, 4800, 9600, 19200, 115200, 921600 bps
Data Bits	5, 6, 7, or 8
Stop Bits	1, 1.5, or 2
Parity	None, odd, or even

1.2. Pin Definitions



Figure 1-1 Hardware Interface

The TC1022 RS232 interface uses a DB9 male connector. The pin definitions are shown in the following figure.

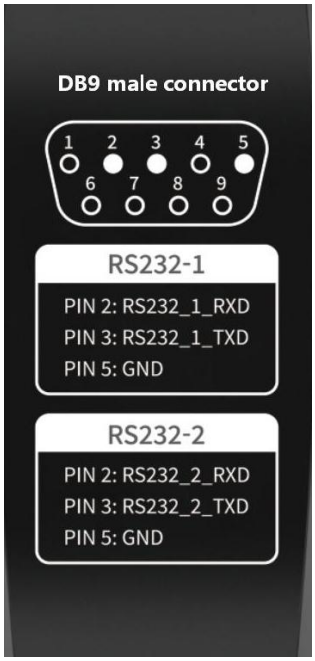


Figure 1-2 Pin Definitions

1.3. LED Indicators



Figure 1-3 Front Panel Layout

➢ LED Color Description

Indicator	Color	Description
RS232	Green	Normal communication
	Red	Communication error
Link	Green	Device connected successfully

1.4. Packing List

Item	Qty.	Illustration	Standard/Optional
TC1022 Main Device	**1**		**Standard**

2. Instructions for Use

The TC1022 supports serial data transmission and reception, as well as serial parameter configuration, through the tsdev library. For sample programs, refer to the accompanying Demo.

2.1. Development APIs

Use the following function to configure serial port parameters:

```
TSDEV_API tsdev_api_uart_cmd_req(
    tsdev_handle_t handle,
const struct tsdev_uart_cmd_req_rsp_t* req_cmd);
```

Use the following function to transmit serial data:

```
TSDEV_API tsdev_api_uart_frm_tx(
    tsdev_handle_t handle,
const struct tsdev_uart_frm_tx_t* tx_frm);
```

In callback functions, use the following structures to obtain command messages and data messages returned by the downstream device:

- `tsdev_uart_cmd_req_rsp_t`: handles command messages and response information related to serial parameter configuration.
- `tsdev_uart_frm_done_t`: handles information related to the completion of serial data transmission or reception.

When using these APIs, include the following header files:

- `tsdev_api_ta1015_types.h`
- `tsdev_api_ta1015.h`

2.2. Serial Parameter Structures

2.2.1. tsdev_uart_cmd_req_rsp_t

This structure is used to configure serial port parameters.

Field	Description
`timestamp`	Hardware timestamp with microsecond resolution.

version	Not used in the current version.
cmd_typ	Interface type. This device uses the RS232 standard, so the value should be 0.
cmd_mod	Indicates whether the frame is a request or a response.
Idx_chn	Channel index, ranging from 0 to 1.
baud_rate	Communication baud rate, ranging from 2400 to 921600.
data_prop	Configures detailed serial port parameters: Bits 0 - 1: Data bits — 00: 5; 01: 6; 10: 7; 11: 8. Bits 2 - 3: Stop bits — 00: 1; 01: 1.5; 10: 2. Bits 4 - 6: Parity — 000: none; 001: odd; 010: even; 011: mark; 100: space.
res_prop	Not used in the current version.

2.2.2. tsdev_uart_frm_tx_t

This structure is used to configure transmission frame parameters.

Field	Description
version	Not used in the current version.
frm_typ	Configures the interface standard and frame type: Bits 0 - 1: Interface standard — 00: RS232; 01: RS485; 10: RS422. Bit 7: Frame type — 0: RxTxDone; 1: TxReq.
Idx_chn	Channel index, ranging from 0 to 1.
dlc	Specifies the data length of the current transmission frame.
data	Stores the actual data to be transmitted.

2.2.3. tsdev_uart_frm_done_t

This structure is used to receive information returned by the downstream device.

Field	Description
`timestamp`	Hardware timestamp with microsecond resolution.
`version`	Not used in the current version.
`frm_typ`	Specifies the interface standard and frame type (with the same bit definitions as above).
`Idx_chn`	Channel index, ranging from 0 to 1.
`dlc`	Specifies the data length of the current transmission/reception frame.

The `tsdev_uart_frm_done_data_t` structure stores the actual data that has been transmitted or received and includes the status information field `info`.

Bit	Meaning	Description
Bit 0	Transmission/reception completion status	`0`: Rx Done; `1`: Tx Done
Bit 1	Parity error	Parity Error
Bit 2	Frame error	Frame Error
Bit 3	Overrun error	Overrun Error

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.

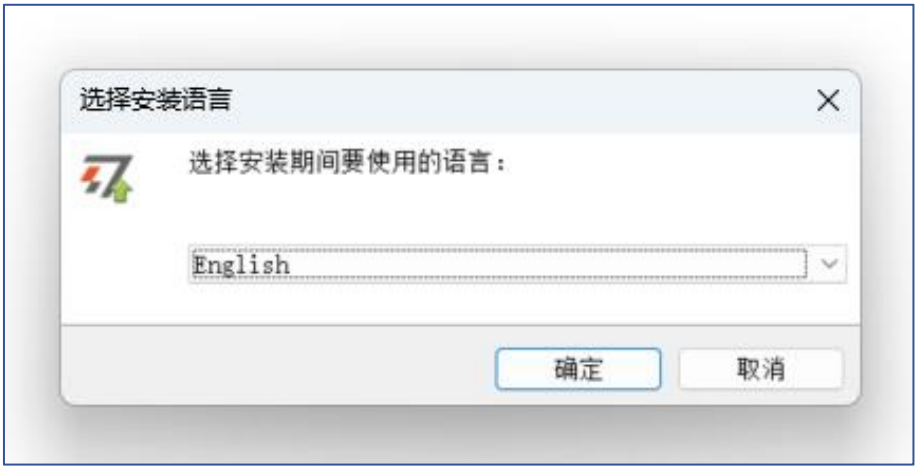


Figure 3-2 TSMaster Installation

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

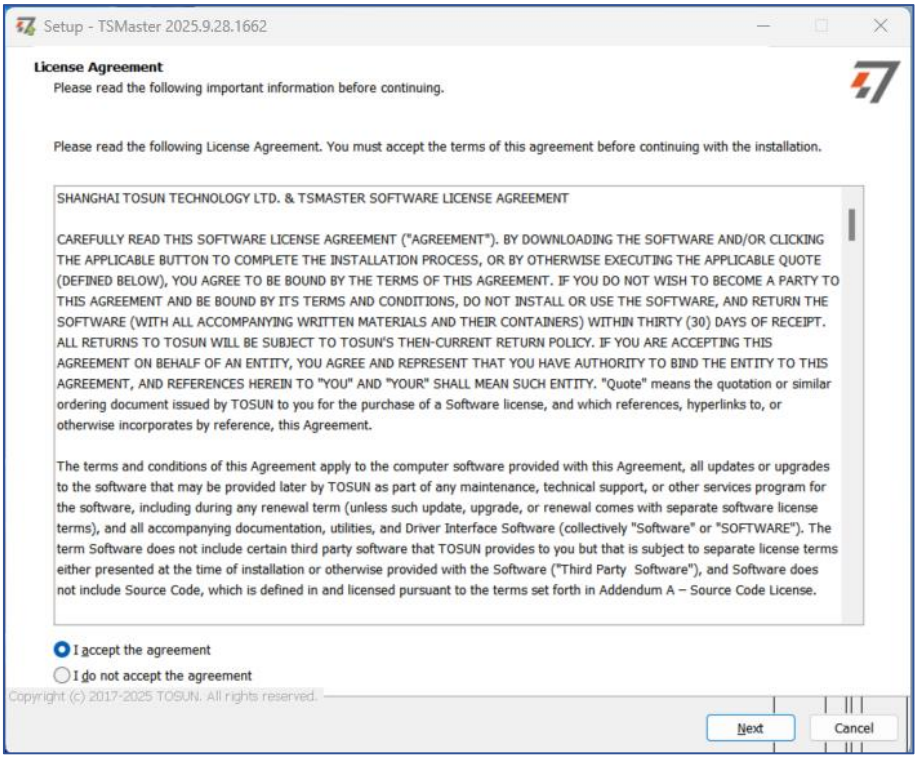


Figure 3-3 TSMaster Installation

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

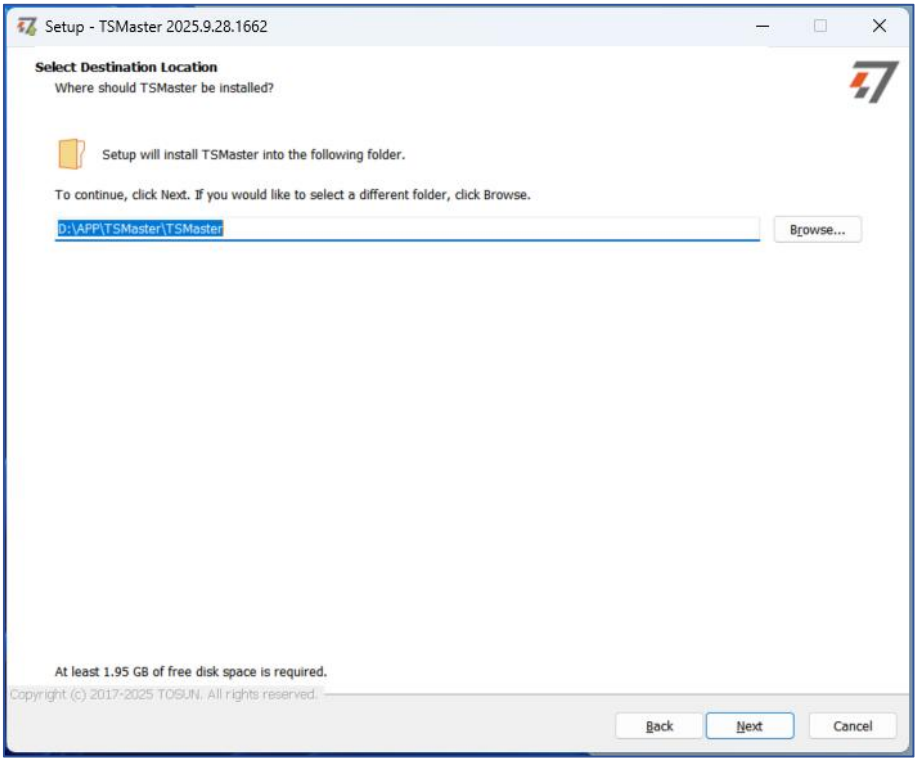


Figure 3-4 TSMaster Installation

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

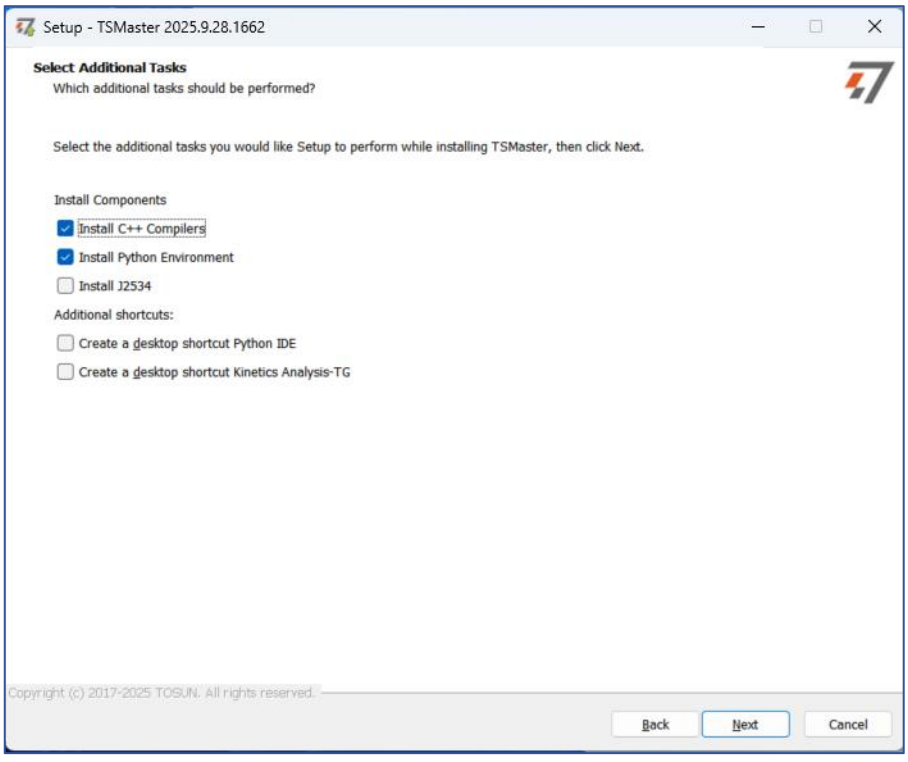


Figure 3-5 TSMaster Installation

5. Click “Install” and wait for completion.

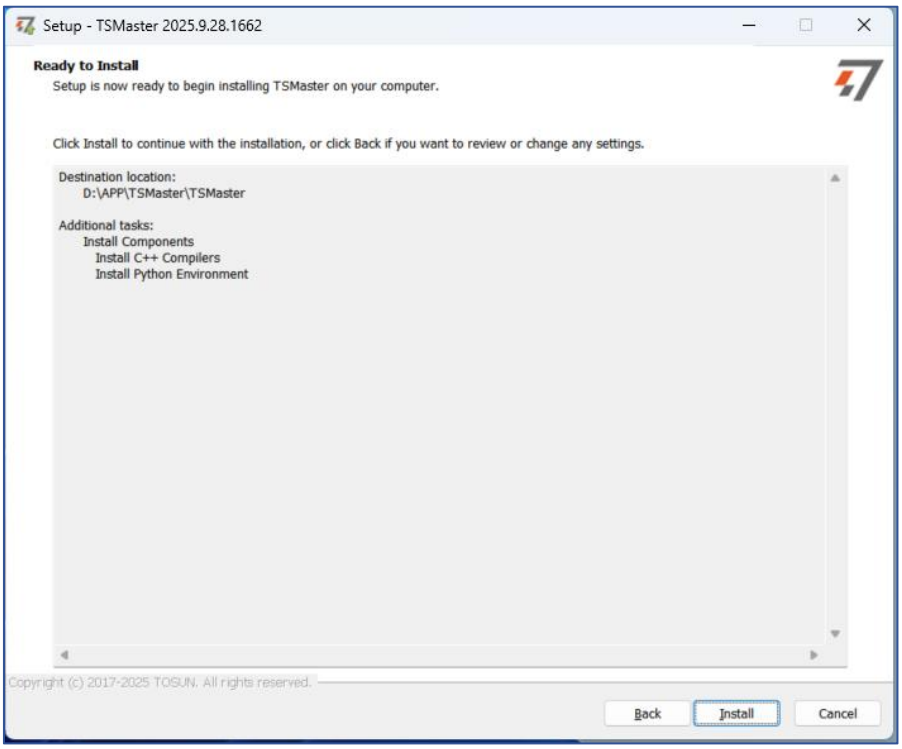


Figure 3-6 TSMaster Installation

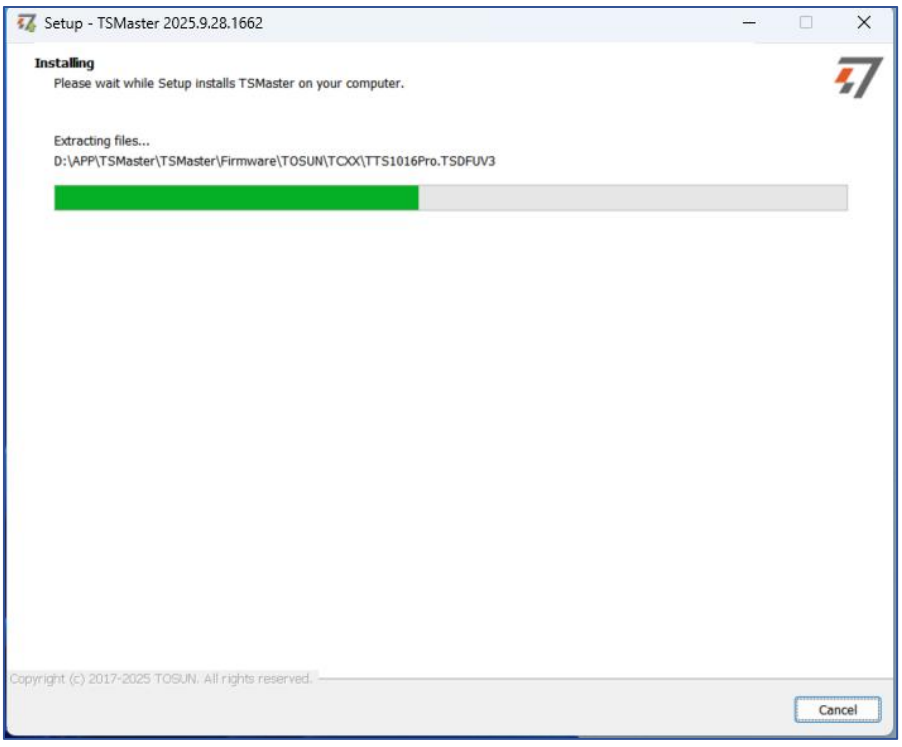


Figure 3-7 TSMaster Installation

6. Click “Finish” to complete installation.

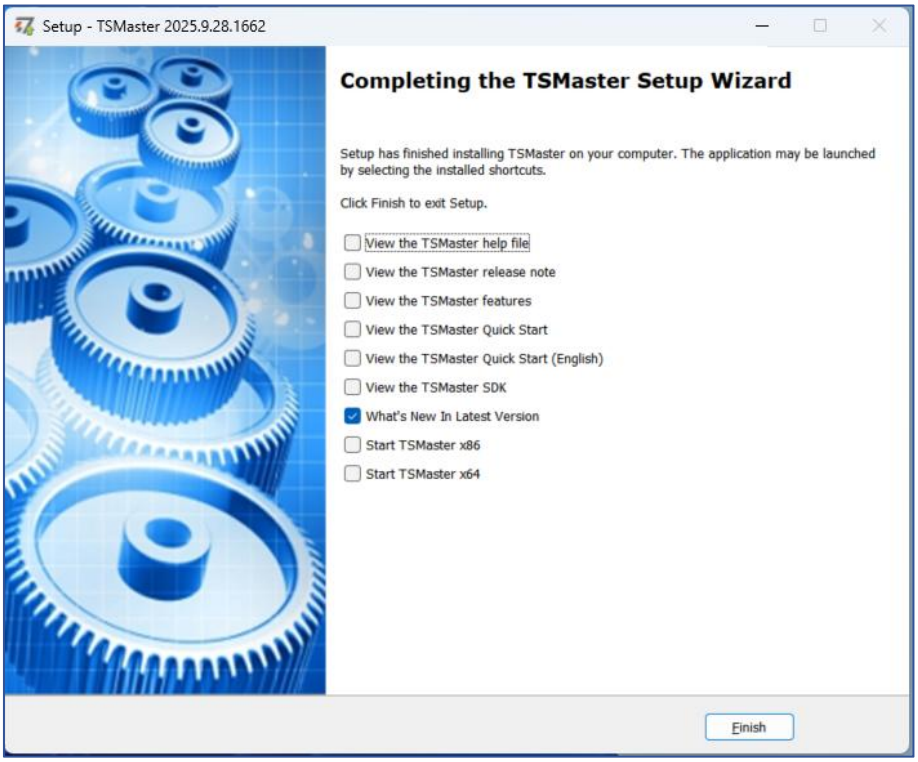


Figure 3-8 TSMaster Installation

4. Inspection and Maintenance

The TC1022 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	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℃ ~ +80℃	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

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

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Engineer Everything !

Software

Support CAN(FD)/LIN/FlexRay/SOME/IP and DoIP

UDS diagnostics/ECU flashing/CCP/XCP calibration

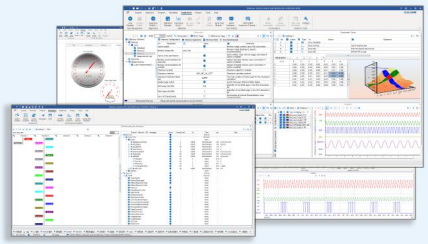
Embedded code generation/Application builder

Encrypted release/Logging and bus replay

Graphical programming/Residual bus simulation

C and Python scripting

Bus monitoring/Transmiting/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



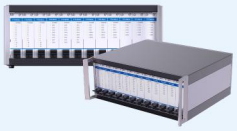
TTS test systems

-CAN FD/CAN/FlexRay/LIN communication boards

-Relay and fault injection boards

-Resistors for sensor simulation

-Digital I/O, Analog I/O boards available



CAN CAN FD LIN FlexRay OPEN ALLIANCE

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

ASAM CiA

Quality Assurance

ISO9001:2015

CE Certification

CE



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