TOSUN

Tlog Series Product Family

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tosunai.com

Copyright Information

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What Is the Tlog Series Product Family?

TOSUN has a wide range of product series, such as the TC series, TP series, TE series, Tlog series, TTS series, and so on. Among them, the Tlog series is designed for offline recording needs on the bus. It can function both as a bus analyzer and a bus logger, comes with a built-in GPS module for GPS data collection, and can also use GPS for time synchronization.

What Products Are Included in the Tlog Series?

Tlog1002	Tlog1004	Tlog1038	

What Can They Do?

- Bus data monitoring and analysis;
- Bus data offline recording;
- Various automated testing systems;
- UDS diagnostics and calibration with CCP and XCP;
- Offline/online replay for blf and asc format files;
- ECU flashing;
- GPS data collection;
- ...

Contents

1. About this User Manual

1.1 Warranty

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2. Product Overview

2.1 Multi-channel CAN FD/LIN Bus Logger

TLog1002

TLog1004

	Tlog1002	Tlog1004
Channel	2x CAN FD 2x LIN	4x CAN FD 2x LIN
Baud Rate	CAN: 125k-1Mbps CAN FD: max 8Mbps LIN: 0-20Kbps	CAN: 125k-1Mbps CAN FD: max 8Mbps LIN: 0-20Kbps
Transmission Rate (CAN)	20000fps	20000fps
PC Interface	USB 2.0	USB 2.0
Bus Interface	DB9	DB9
Isolate	2500V	2500V
EMC Compatibility	*	*
Power Supply	5V (USB power supply) + 12V (DC power supply)	5V (USB power supply) + 12V (DC power supply)
Case Material	Metal	Metal
Dimension	Approx. 108*96*35mm	Approx. 108*96*35mm
Weight	Approx. 129g	Approx. 263g

*Surge protection can be achieved through the CAN surge protection device described in section 2.2 CAN

Surge Protection Device.

The EMC Electromagnetic Compatibility test standards in the table are as follows: for ESD, the test standard complies with IEC61000-4-2; for EFT, the test standard complies with IEC61000-4-4; and for Surge, the test standard complies with IEC61000-4-5.

Based on the market demand for offline bus recording and GPS functions, TOSUN has developed the Tlog series devices. The series devices not only include analyzer functions for CAN/CAN FD and LIN communication protocols but also feature bus logging and GPS capabilities. The Tlog series devices come with multiple digital and analog I/O interfaces, facilitating various signal measurements and system integration.

In terms of interfaces, it adopts a USB 2.0 port, ensuring fast connection speeds with PCs and greatly enhancing the product's versatility and convenience through this widely used interface. Meanwhile, its driverless design means that users can utilize this series of devices without installing any drivers, significantly improving the plug-and-play functionality and overall user experience.

2.2 CAN Surge Protection Device

The CAN surge protection device is a device used to protect the CAN bus system from damage caused by surges (sudden overvoltage or overcurrent). This device does not require an external power source and is designed with a DB9 interface for good compatibility. It is easy to install and can be used immediately without affecting communication quality.

For the TOSUN products that do not support surge protection, you can achieve CAN channel surge protection by installing the TOSUN DB9 surge protection device, model number TCA00011.

Dimension	Approx. 76*38*25mm
Weight	Approx. 71g
Surge Protection Level	±2KV

3. Tlog1002

3.1 Overview

The Tlog1002 is a multi-channel CAN (FD) and LIN bus logger launched by TOSUN. It features 2 channels of CAN FD and 2 channels of LIN, with a maximum CAN FD bus rate of 8 Mbps and a LIN bus rate of 0 to 20 kbps. Additionally, it includes multiple digital and analog I/O

interfaces for various signal measurements and system integration. The product connects to a PC via USB 2.0 and comes with 64GB built-in storage. Its driverless design for Windows and Linux systems offers excellent system compatibility.

With the powerful TSMaster software, it supports loading DBC and ARXML database files, making it very convenient to monitor, analyze, and simulate CAN bus data, and it also supports functions such as UDS diagnostics, ECU flashing, CCP/XCP calibration, etc.

The secondary development APIs for Windows and Linux can support various development environments such as C++, C#, LabView, Python, etc., making it highly efficient and easy to use, and is convenient to integrate into various testing systems.

3.2 Features

us (microsecond) level hardware message timestamps to meet advanced requirements;

USB 2.0 interface, with a driverless design for Windows and Linux systems, offering excellent system compatibility;

CAN channel DC 2500V isolation;

Automotive-grade design, supporting dbc files, a2l files, blf files, and asc files;

Supports blf format data recording and offline/online playback;

Supports UDS diagnostics and CCP/XCP calibration;

Supports UDS based Bootloader flashing;

Supports secondary development interfaces for Windows and Linux systems;

Capable of loading all paid licenses for TSMaster.;

Can be used independently without a PC;

Supports GPS function;

Built-in 64GB eMMC storage.

3.3 Technical Data

Channel	2 *CAN FD/2 *LIN/3 *DI/2 *DO
PC Interface	USB 2.0
CAN/LIN Interface	DB9
Driver	Driverless design for Windows and Linux systems, offering excellent system compatibility
Cache	Hardware cache to ensure no frame loss
CAN	Supports CAN 2.0 A and B protocols, compliant with the ISO 11898-1 standard, with baud rates from 125Kbps to 1Mbps
CAN FD	Supports CAN FD that complies with both ISO and non-ISO standards, with a maximum baud rates of 8Mbps
LIN	Supports LIN 1.3 and LIN 2.x, with baud rates from 0 to 20Kbps
Timestamp Accuracy	1 us, hardware message timestamp, can meet advanced requirements
Relay type	Magnetic latching relay
Messages Sent per Second*	Up to 20,000 frames per second
Messages Received per	Up to 20,000 frames per second

Second*	
Isolate	CAN channel DC 2500V isolation, with an electrostatic discharge level of ±4KV for contact discharge and ±8KV for air discharge
Power Supply	USB power supply or external 9～32V
Power Consumption	2W
Case Material	Metal
Dimension	Approx. 108*96*35mm
Weight	Approx. 129g (without packaging)/Approx. 646g (with packaging)
Operating Temperature	-20℃～60℃/-40℃～80℃ (no battery)
Operating Humidity	10% ～ 90% (non-condensing)
Operating Environment	Keep away from corrosive gases

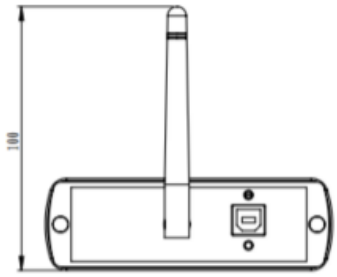
*Single channel 1Mbps, with a 0-byte data field.

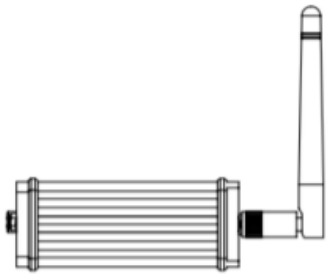
3.4 Electrical Data

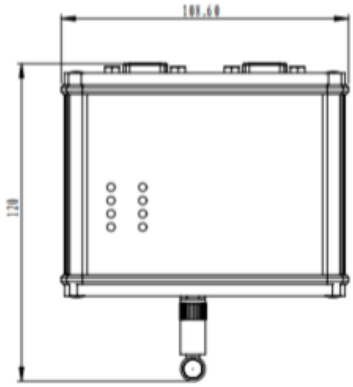
Parameter		Test Condition	Minimum Value	Typical Value	Maximum Value	Unit
Operating Voltage	USB power supply	Analyzer mode CAN/LIN transmission	4.8	5.0	5.2	V
	External DC power supply	Analyzer mode CAN/LIN transmission	9	12	32	V
Operating Current	USB power supply	Analyzer mode CAN/LIN transmission	--	0.04	--	A
	External DC power supply	Analyzer mode CAN/LIN transmission	--	0.15	--	A
Power Consumption	USB/DC total	Analyzer mode CAN/LIN transmission	--	2	--	W
Operating Voltage	External DC power supply	Logger mode CAN/LIN Logging	9	12	32	V
Operating Current	External DC power supply	Logger mode CAN/LIN Logging	--	0.15	--	A
Power	External	Logger mode	--	1.8	--	W

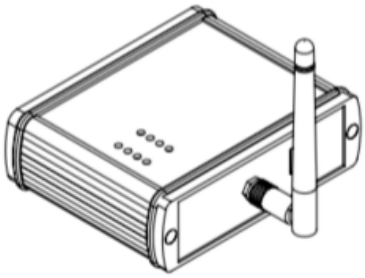
Consumption	DC power supply	CAN/LIN Logging				
CAN Interface	Bus pin voltage resistance	CANH、CAHL	-58	--	58	V
	Terminal resistor	Terminal resistor enabled	--	--	--	Ω
	Isolation withstand voltage	Leakage current less than 1mA	2500	--	--	VDC
LIN Interface	Bus pin voltage resistance	LIN1、LIN2	-40	--	40	V

3.5 Mechanical Data









3.6 Scope of Delivery

✓ Main device: Tlog1002

✓ USB cable *1

✓ Cigarette lighter power cable *1

✓ DB9 female to dual male signal cable *1

✓ GPS antenna *1

✓ DB9 male *1

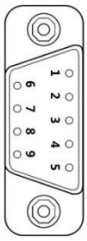
✓ DB9 male to dual banana plugs *1

3.7 Hardware Interface

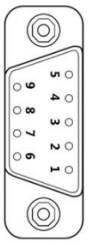
➢ USB 2.0 interface;

➢ DB9 male:

DB9 PIN	Channel	PIN	Definition

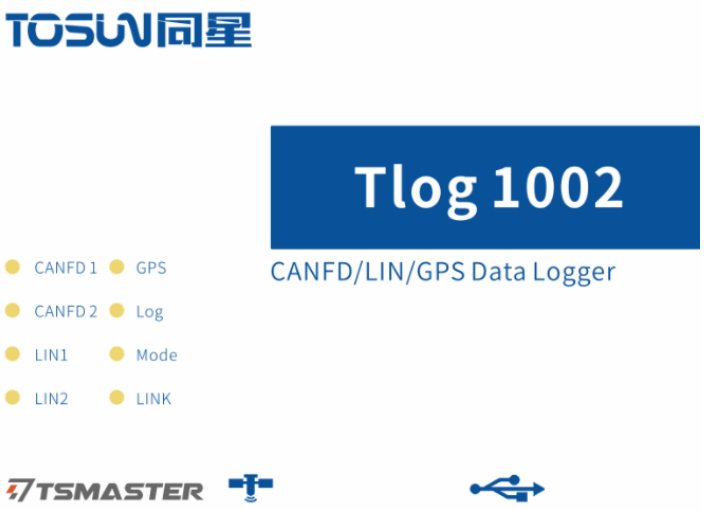
		Number	
	CAN FD 1/2	PIN2	CAN FD1_Low
		PIN3	CAN FD_GND
		PIN4	CAN FD2_Low
		PIN5	CAN FD_Shield
		PIN7	CAN FD1_High
		PIN8	CAN FD2_High

- DB9 female:

DB9 PIN	Channel	PIN Number	Definition
	LIN 1/2 I/O	PIN1	Digital_In1
		PIN2	Digital_In2
		PIN3	GND
		PIN4	Digital_Out1
		PIN5	Digital_Out2
		PIN6	LIN1
		PIN7	Digital_In3
		PIN8	LIN2
		PIN9	V_Bat

3.8 LED

Diagram of LED indicator:



Description of LED color:

Indicator	**Definition**
CAN FD 1	Indicator for CAN FD channel 1
CAN FD 2	Indicator for CAN FD channel 2
LIN 1	Indicator for LIN channel 1
LIN 2	Indicator for LIN channel 2
GPS	Indicator for GPS
Log	Indicator for logging status
Mode	Indicator for logging module
LINK	Indicator for hardware connection

Description of LED color:

Color	**Description**
LINK Green	The device is connected
CAN FD Green	CAN FD channel data frame is sent or received correctly
CAN FD Red	CAN FD channel sends or receives error frames, indicating a configuration, protocol, or wiring error
LIN Green	LIN channel data frame is sent or received correctly
LIN Red	LIN channel sends or receives error frames, indicating a configuration, protocol, or wiring error
GPS Green	GPS is activated

GPS Red	GPS is not activated
Log Green	The device is logging data on the bus
Mode Green	The device enters logging mode

Note: The blinking frequency depends on the bus load.

3.9 Optional Accessories

1.TCA00011 (CAN surge protection device)

4. Tlog1004

4.1 Overview

The Tlog1004 is a multi-channel CAN (FD) and LIN bus logger launched by TOSUN. It features 4 channels of CAN FD and 2 channels of LIN, with a maximum CAN FD bus rate of 8 Mbps and a LIN bus rate of 0 to 20 kbps. Additionally, it includes multiple digital and analog I/O interfaces for various signal measurements and system integration. The product connects to a PC via USB 2.0 and comes with 64GB built-in storage. Its driverless design for Windows and Linux systems offers excellent system compatibility.

With the powerful TSMaster software, it supports loading DBC and ARXML database files, making it very convenient to monitor, analyze, and simulate CAN bus data, and it also supports functions such as UDS diagnostics, ECU flashing, CCP/XCP calibration, etc.

The secondary development APIs for Windows and Linux can support various development environments such as C++, C#, LabView, Python, etc., making it highly efficient and easy to use, and is convenient to integrate into various testing systems.

4.2 Features

us (microsecond) level hardware message timestamps to meet advanced requirements;

USB 2.0 interface, with a driverless design for Windows and Linux systems, offering excellent system compatibility;

CAN channel DC 2500V isolation;

Automotive-grade design, supporting dbc files, a2l files, blf files, and asc files;

Supports blf format data recording and offline/online playback;

Supports UDS diagnostics and CCP/XCP calibration;

Supports UDS based Bootloader flashing;

Supports secondary development interfaces for Windows and Linux systems;

Capable of loading all paid licenses for TSMaster.;

Can be used independently without a PC;

Supports GPS function;

Built-in 64GB eMMC storage.

4.3 Technical Data

Channel	4 *CAN FD/2 *LIN/2 *DIDO/1 *AI
PC Interface	USB2.0

CAN/LIN Interface	DB9
Driver	Driverless design for Windows and Linux systems, offering excellent system compatibility
Cache	Hardware cache to ensure no frame loss
CAN	Supports CAN 2.0 A and B protocols, compliant with the ISO 11898-1 standard, with baud rates from 125Kbps to 1Mbps
CAN FD	Supports CAN FD that complies with both ISO and non-ISO standards, with a maximum baud rates of 8Mbps
LIN	Supports LIN 1.3 and LIN 2.x, with baud rates from 0 to 20Kbps
Timestamp Accuracy	1 us, hardware message timestamp, can meet advanced requirements
Replay Type	Magnetic latching relay
Messages Sent per Second*	Up to 20,000 frames per second
Messages Received per Second*	Up to 20,000 frames per second
Isolate	CAN channel DC 2500V isolation, with an electrostatic discharge level of ±4KV for contact discharge and ±8KV for air discharge
Power Supply	USB power supply or external 9～32V
Power Consumption	3W
Case Material	Metal
Dimension	Approx. 108*96*35mm
Weight	Approx. 263g (without packaging)/Approx. 852g (with packaging)
Operating Temperature	-20℃～60℃/-40℃～80℃ (no battery)
Operating Humidity	10% ～ 90% (non-condensing)
Operating Environment	Keep away from corrosive gases

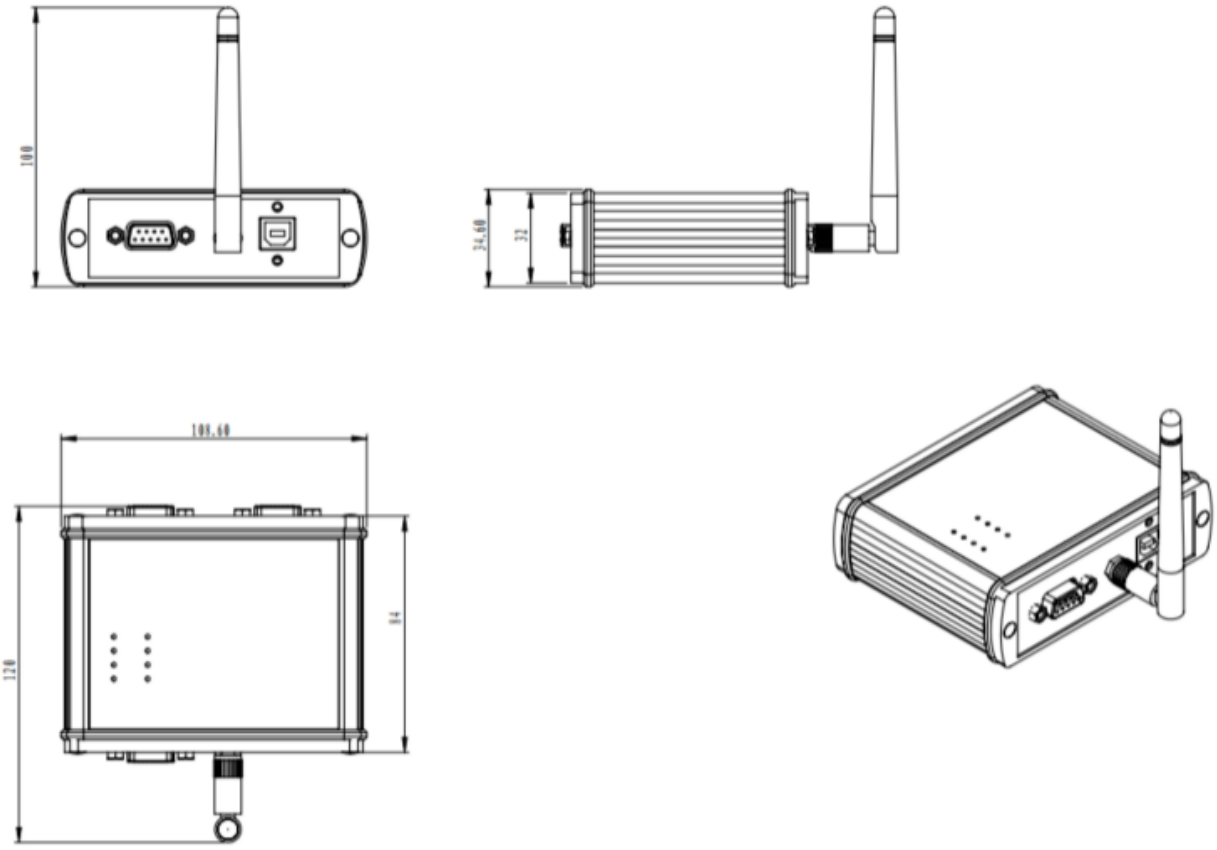
*Single channel 1Mbps, with a 0-byte data field.

4.4 Electrical Data

Parameter		Test Condition	Minimum Value	Typical Value	Maximum Value	Unit
Operating Voltage	USB power supply	Analyzer mode CAN/LIN transmission	4.8	5.0	5.2	V

	External DC power supply	Analyzer mode CAN/LIN transmission	9	12	32	V
Operating Current	USB power supply	Analyzer mode CAN/LIN transmission	--	0	--	A
	External DC power supply	Analyzer mode CAN/LIN transmission	--	0.22	--	A
Power Consumption	USB/DC total	Analyzer mode CAN/LIN transmission	--	2.7	--	W
Operating Voltage	External DC power supply	Logger mode CAN/LIN Logging	9	12	32	V
Operating Current	External DC power supply	Logger mode CAN/LIN Logging	--	0.18	--	A
Power Consumption	External DC power supply	Logger mode CAN/LIN Logging	--	2.2	--	W
CAN Interface	Bus pin voltage resistance	CANH、CAHL	-58	--	58	V
	Terminal resistor	Terminal resistor enabled	--	--	--	Ω
	Isolation withstand voltage	Leakage current less than 1mA	2500	--	--	VDC
LIN Interface	Bus pin voltage resistance	LIN1、LIN2	-40	--	40	V

4.5 Mechanical Data



4.6 Scope of Delivery

✓ Main device: Tlog1004

✓ USB cable *1

✓ Cigarette lighter power cable *1

✓ DB9 female to dual male signal cable *2

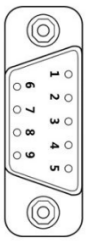
✓ GPS antenna *1

✓ DB9 male *1

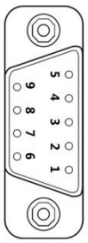
✓ DB9 male to dual banana plugs *1

4.7 Hardware Interface

- USB 2.0 interface;
- DB9 male:

DB9 PIN	Channel	PIN Number	Definition	Channel	PIN Number	Definition
	CAN FD 1/3	PIN2	CAN FD1_Low	CAN FD 2/4	PIN2	CAN FD2_Low
		PIN3	CAN FD_GND		PIN3	CAN FD_GND
		PIN4	CAN FD3_Low		PIN4	CAN FD4_Low
		PIN5	CAN FD_Shield		PIN5	CAN FD_Shield
		PIN7	CAN FD1_High		PIN7	CAN FD2_High
		PIN8	CAN FD3_High		PIN8	CAN FD4_High

- DB9 female:

DB9 PIN	Channel	PIN Number	Definition
	LIN 1/2 I/O	PIN1	Digital_In1
		PIN2	Digital_In2
		PIN3	GND
		PIN4	Digital_Out1
		PIN5	Digital_Out2
		PIN6	LIN1
		PIN7	Analog_In1
		PIN8	LIN2
		PIN9	V_Bat

4.8 LED

Diagram of LED indicator:

Description of indicator:

Indicator	Definition
CAN FD 1	Indicator for CAN FD channel 1
CAN FD 2	Indicator for CAN FD channel 2
CAN FD 3	Indicator for CAN FD channel 3
CAN FD 4	Indicator for CAN FD channel 4
LIN 1	Indicator for LIN channel 1

LIN 2	Indicator for LIN channel 2
GPS	Indicator for GPS
Log	Indicator for logging status

Description of LED color:

Color	**Description**
CAN FD Green	CAN FD channel data frame is sent or received correctly
CAN FD Red	CAN FD channel sends or receives error frames, indicating a configuration, protocol, or wiring error
LIN Green	LIN channel data frame is sent or received correctly
LIN Red	LIN channel sends or receives error frames, indicating a configuration, protocol, or wiring error
GPS Green	GPS is activated
GPS Red	GPS is not activated
Log Green	The device is logging data on the bus

Note: The blinking frequency depends on the bus load.

4.9 Optional Accessories

1.TCA00011 (CAN surge protection device)

5. Tlog1038

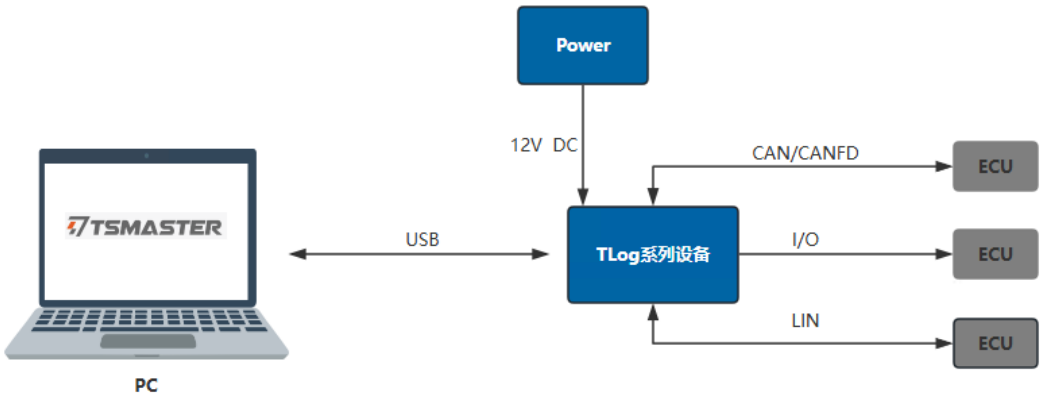
Coming soon. Stay tuned for updates.

6. Quick Start

6.1 System Connection

Connect the Tlog series devices to the computer via USB interface, and connect the communication interface to the ECU. On the PC side, with the powerful TSMaster software, users can control the device to communicate with the ECU using CAN/CAN FD, LIN protocols, and perform I/O communication.

Note: The CAN/CAN FD interface of the Tlog1002 and Tlog1004 devices do not come with a 120Ω terminal resistor.



6.2 Driver Installation

All TOSUN hardware adopts a driverless design, offering excellent system compatibility. The hardware allow for direct use on various operating systems (Windows 7/8/10/11, Linux) without the need to install drivers.

6.3 Software Overview

TSMaster is a powerful and comprehensive tool that can connect, configure, and control all

TOSUN hardware tools and devices, enabling functions such as automotive bus embedded code generation, monitoring, simulation, development, UDS diagnostics, CCP/XCP calibration, ECU flashing, I/O control, test measurement, and so on.

TSMaster supports Matlab Simulink co-simulation and CarSim dynamic model ECU algorithm simulation testing (soft real-time HIL). It provides users with a series of convenient functions and editors, allowing them to directly execute ECU code within TSMaster and supports C script and Python script editing. At the same time, TSMaster also offers a mini-program function, enabling users to customize the simulation test panel, test process, test logic, and even the entire test system, and automatically generate reports. The code written by users based on TSMaster is hardware-independent, and can be easily shared, referenced, and used on different hardware platforms.

TSMaster supports multiple commonly used bus tool brands, including Vector, Kvaser, PEAK, IXXAT, as well as mainstream instruments in the market (such as oscilloscopes, waveform generators, and digital multimeters) and boards (such as AI, DI, DO, etc.). Its design concept is to perfectly integrate with the test system to achieve joint simulation and testing of multiple hardware and multiple channels. This enables TSMaster to meet the PV/DV test verification needs for various automotive electronic components and assemblies, as well as the inspection requirements for the production line.

6.4 Software Installation

TSMaster software download link:

https://www.tosunai.com/downloads

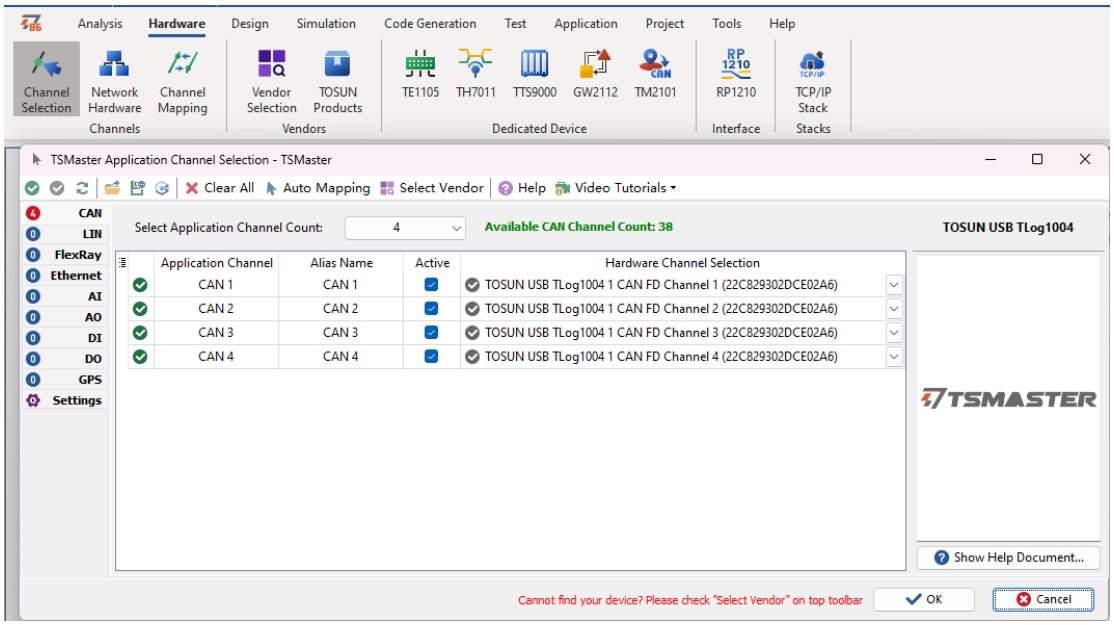
If the link is not accessible, you can contact the corresponding sales personnel or visit the official TOSUN website to obtain the software. Meanwhile, you can scan the QR code to follow the TOSUN official account to get the download link.

After the installation, you can see the following software on the PC..

7. Usage of Tlog Series Device

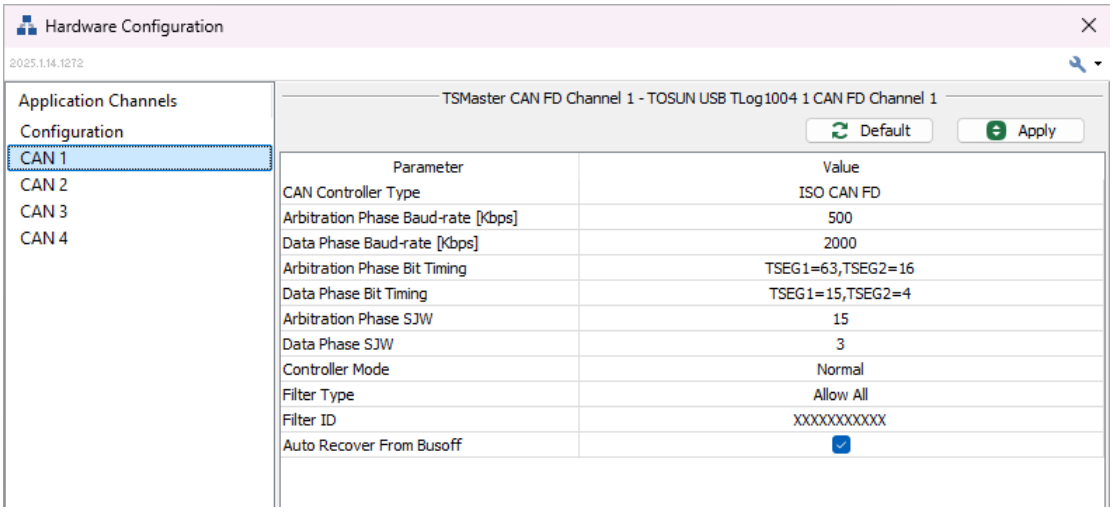
7.1 Analyzer Mode

In analyzer mode, the usage is similar to other TOSUN CAN/LIN bus analysis tools. Simply connect the device to the computer via USB, and in the TSMaster software interface, click Hardware-Channel Selection. In the channel selection GUI, select the device you want to connect.



In Network Hardware, a series of controller parameters can be configured, such as protocol, baud rate, controller mode, etc.

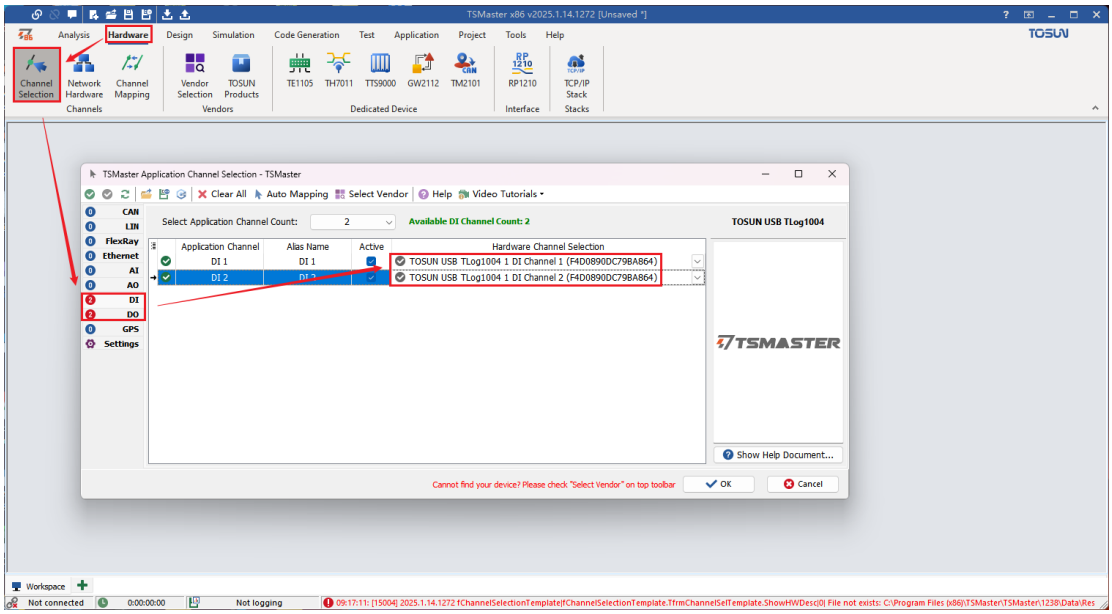
Note: The CAN/CAN FD interface of the Tlog1002 and Tlog1004 devices do not come with a 120Ω terminal resistor. Therefore, terminal resistor enabled/disabled through software is not supported.



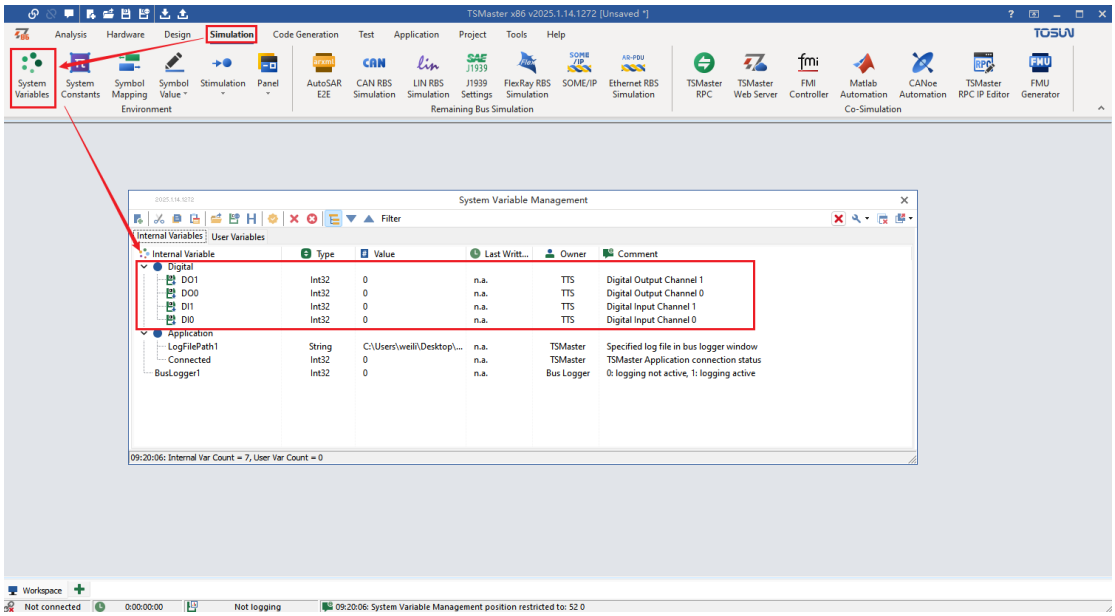
After the configuration, click Analysis->Start and connect the hardware to efficiently carry out works such as bus development, testing, ECU production line, etc. with the powerful TSMaster software. For more detailed instructions on using the TSMaster software, please refer to the TSMaster software manual and the quick start guide.

DIDO Function:

In analyzer mode, configure the DI and DO channels in TSMaster software Hardware->Channel Selection.



Start the connection, and users can see the corresponding DI and DO system variables in Simulation->System Variables.



When the value of the DO variable is modified to 0, the corresponding pin outputs a low level. When changed to 1, it outputs a high level.

If there is no voltage input on the DI pin, the DI variable automatically becomes 0. If there is voltage input on the DI pin, the DI variable automatically becomes 1.

Note: The DO function of Tlog1002 and Tlog1004 is open-drain output, requiring additional voltage input, and the additional voltage input should not exceed 18V. The voltage input for the DI function should not exceed 24V.

7.2 Logger Mode

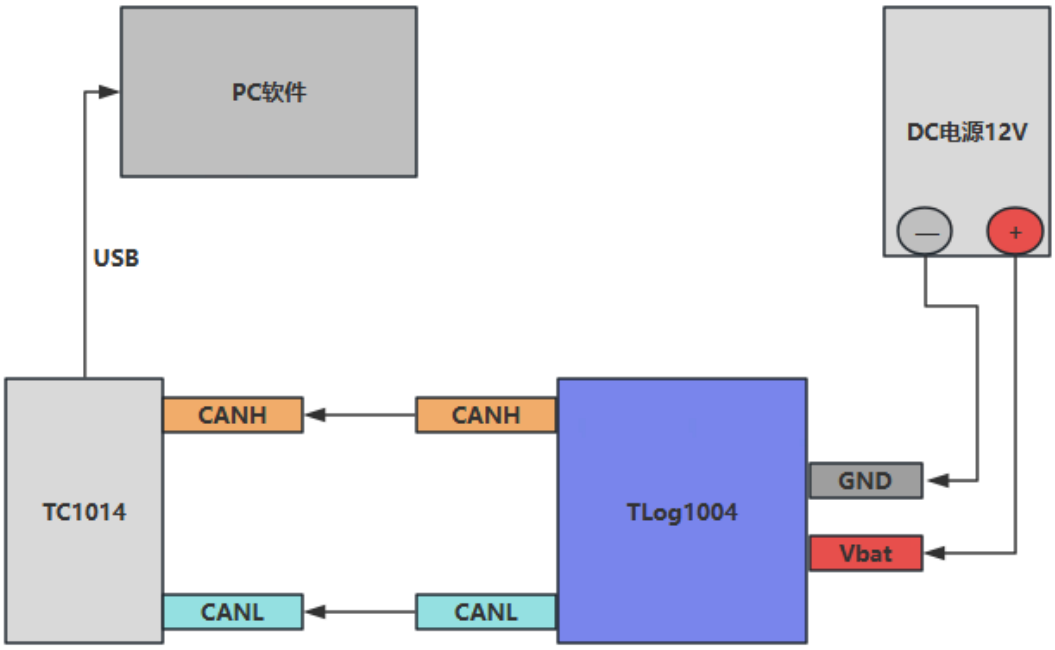
7.2.1 Hardware Connection

Step 1: In logger mode, use TSMaster to configure the controller parameters for the Tlog device (e.g., baud rate, sampling point, and jump width). Start the connection to send the controller parameters to the Tlog device.

Step 2: Connect the CAN FD channels CANH and CANL of the Tlog device to the corresponding CANH and CANL of the CAN ECU device (using the TOSUN TC1014 device as an example).

Step 3: In logger mode, the Tlog device requires a 12V DC power supply and does not need to be connected via USB.

Step 4: On the Tlog device, connect the LIN1/2 I/O DB9 interface, with Pin 9 (Vbat) connected to the positive terminal of the 12V power supply and Pin 3 (GND) connected to the negative terminal. The device will enter logger mode. As shown in the figure below:



7.2.2 Logger Operating Status

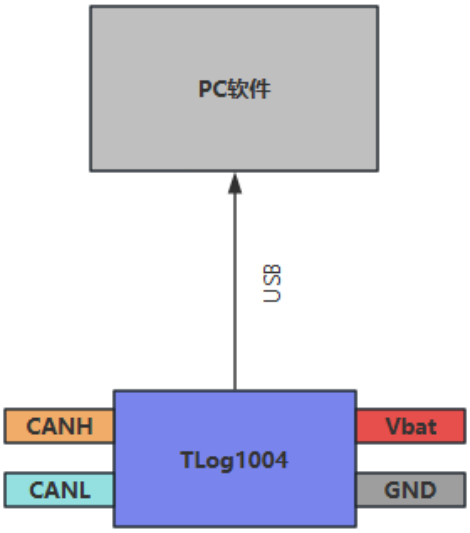
If the hardware connections are correct, when operating in logger mode, the Tlog device will have the log indicator and the corresponding CAN/LIN channel indicator flashing green. The GPS is used for time synchronization and GPS data logging. When the Tlog device is not connected to an antenna, it cannot acquire GPS signals, and the GPS indicator will flashing red. Once the antenna is connected and a GPS signal is acquired, the GPS indicator will start flashing green.

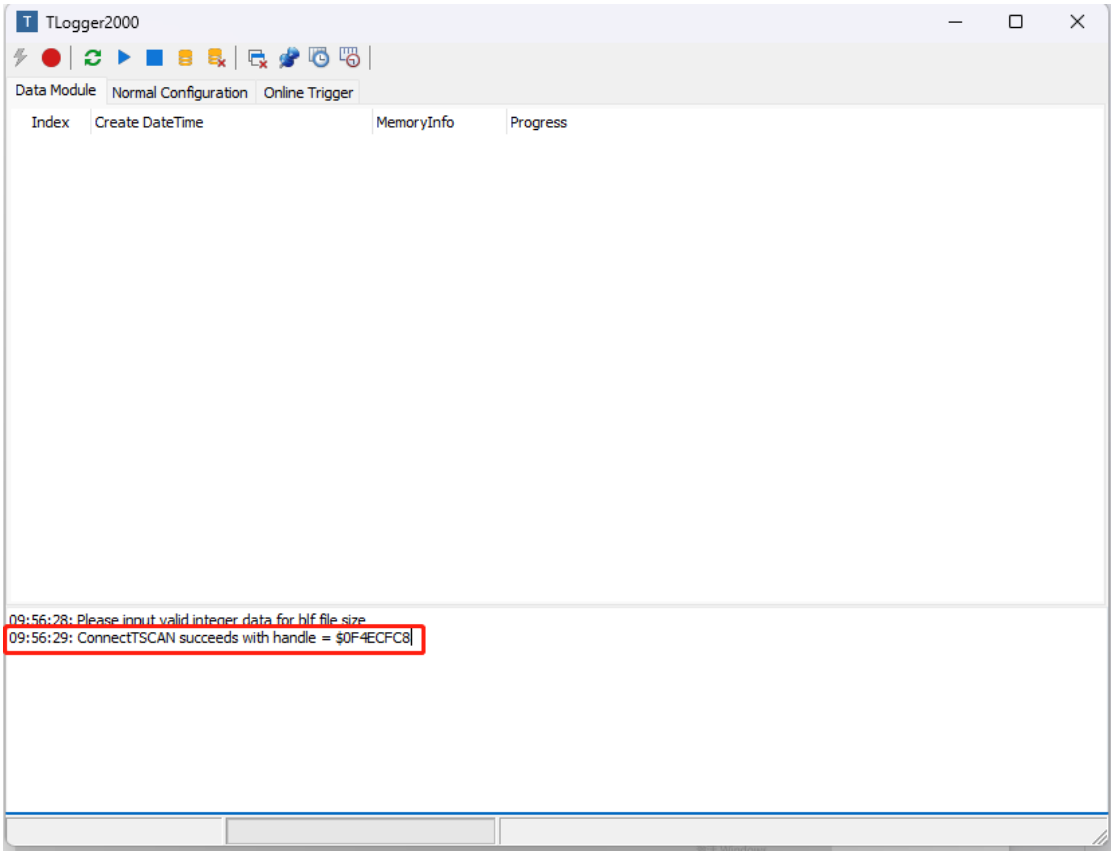
7.3 Usage of TSLogger Software

TSLogger is the accompanying software for the Tlog series devices. Its main functions include logging file export, GPS and clock initialization, and online message activation.

7.3.1 TSLogger Software Connection

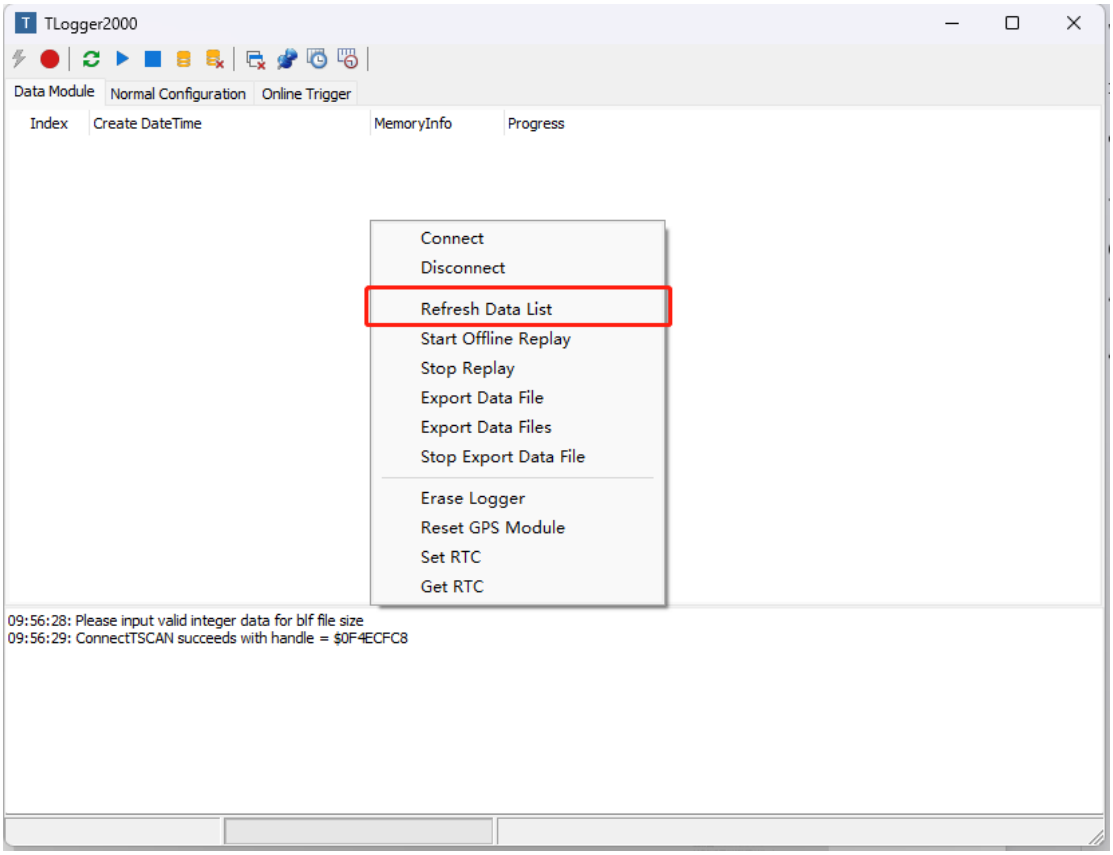
Connect the Tlog device to the computer via USB (no DC power supply is needed). Open the TSLogger software and click the connect button. If the message box displays "ConnectTSCAN succeeds with handle," it means the connection is successful.



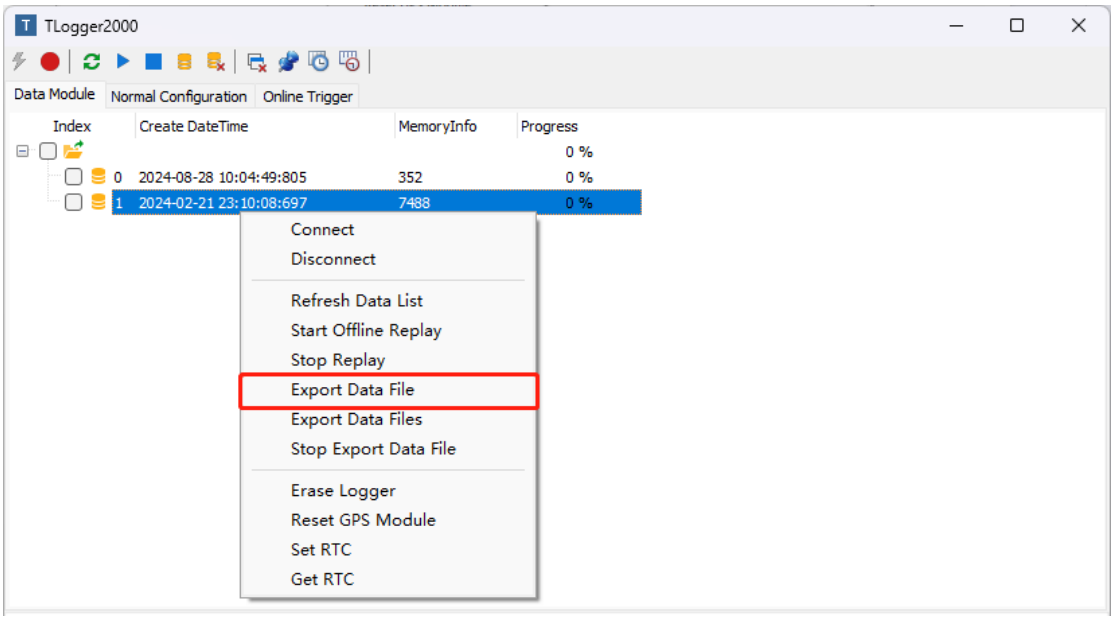


7.3.2 Export Logging File

After connecting the device with TSLogger, right-click on the blank area and select "Refresh Data List" to view the logging files in the Tlog device.

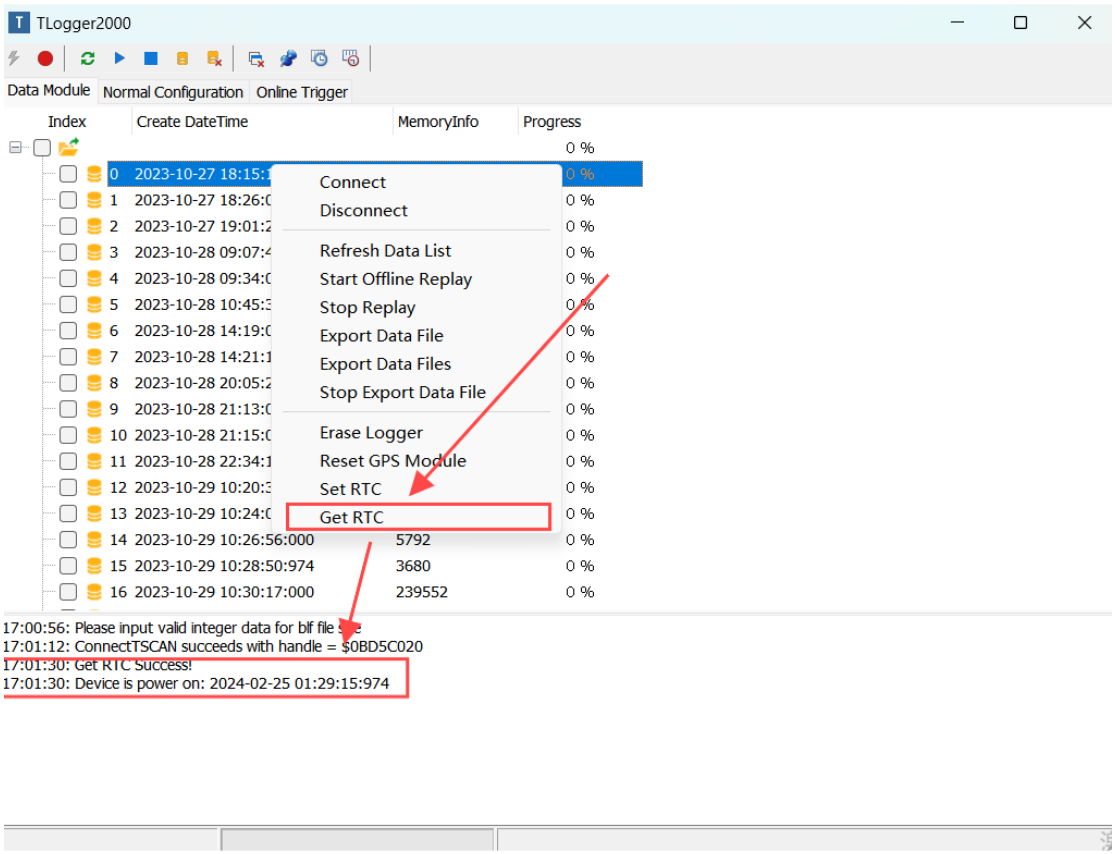


Select the message log you want to export, right-click, and choose "Export Data File." Then, select the export file path to save the log file in BLF format at the specified location. To export multiple logging files at once, select multiple message logs and choose "Export Data Files."

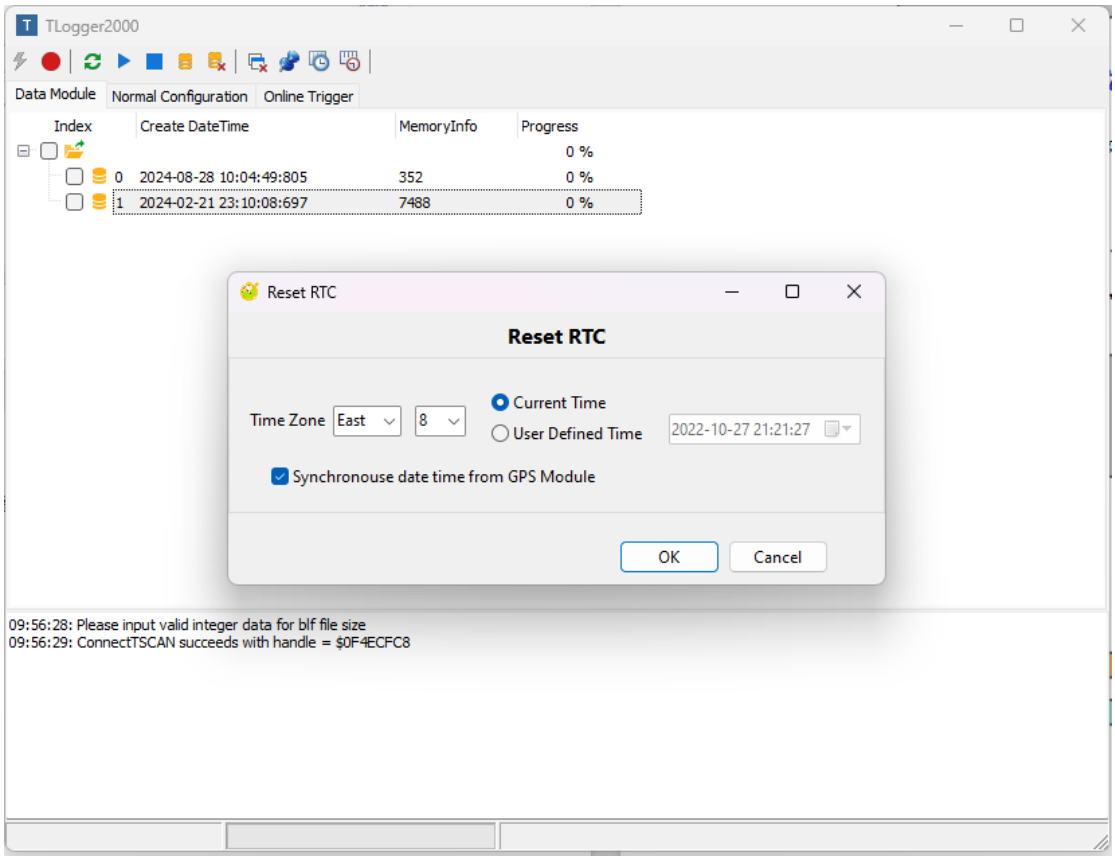


7.3.3 Initialize GPS and Internal RTC

Right-click and select "Get RTC" to retrieve the internal clock of the hardware, as shown in the figure below.

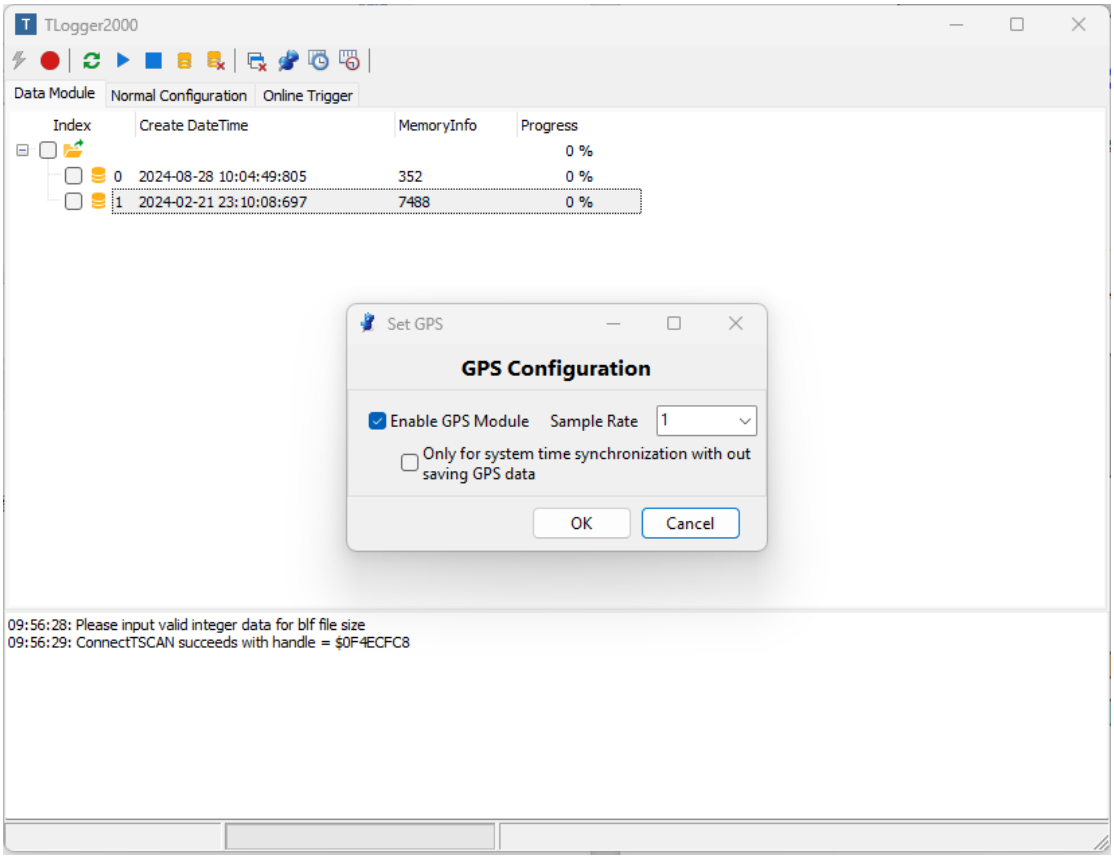


Right-click and select "Set RTC" to choose the time zone and set the time zone to East Eight Zone (Beijing Time). By checking "User Defined Time," users can manually set the time, or users can check "Synchronize date time from GPS Module" to obtain the time via GPS.



7.3.4 GPS Module Initialization

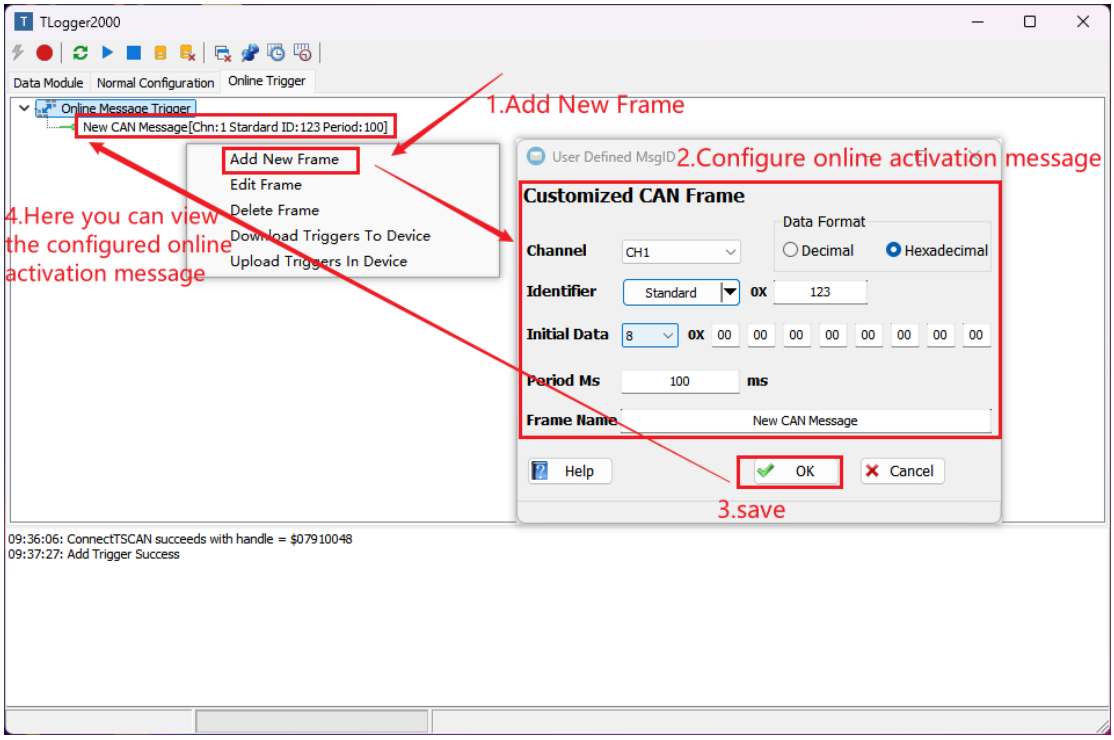
Right-click and select "Reset GPS Module" to enable or disable the GPS module. Disabling the GPS module will stop it from logging GPS data as well as using it for time synchronization. When enabling the GPS module, if users check "Only for system time synchronization without saving GPS data," the GPS will only be used for time synchronization without logging data. The configuration page also allows the users to set the GPS sampling rate. For example, selecting 5 means sampling 5 times per second, while selecting 1 means sampling once per second

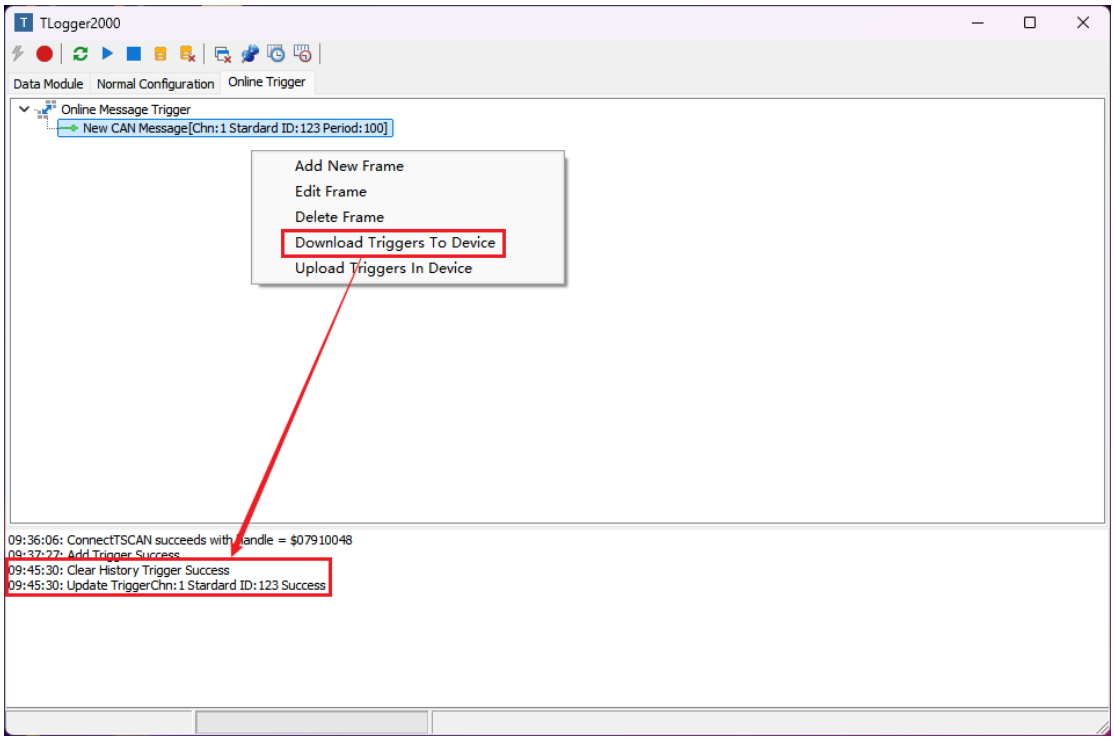


7.3.5 Online Trigger Message

Online trigger message allows the Tlog device to periodically send messages on the bus while logging messages. This is useful for waking up or keeping specific ECUs online that require receiving messages to trigger.

In the TSLogger software interface, select "Online Trigger", right-click, and choose "Add New Frame". In the configuration page, users can set parameters such as channel, frame format, frame ID, message data, message cycle, etc. Once completed, the message window at the bottom will indicate that the trigger message has been successfully added.





8. Inspection and Maintenance

The main electrical components of Tlog series devices 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.

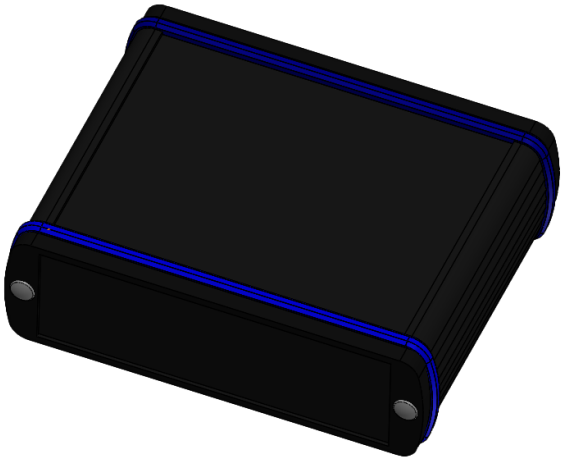
It is recommended to conduct inspections at least once every 6 months to 1 year. Under improper environmental, more frequent inspections should be conducted. As shown in the table below, if you encounter problems during maintenance, please read the following content to find the possible causes of the 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	USB port +5V DC Power supply port +12V DC	Use a USB power meter/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℃~+80℃	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.

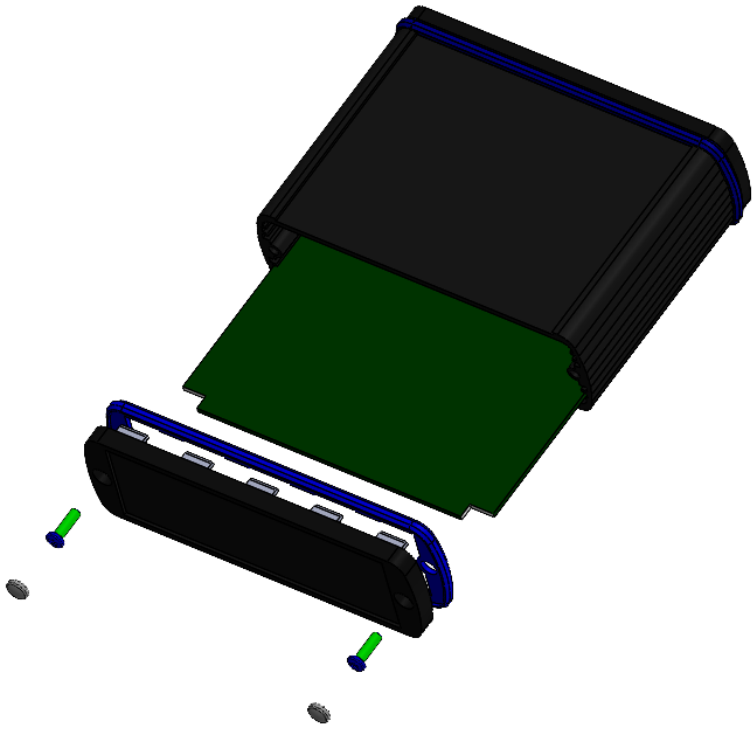
	Check for any contact with water, oil, or chemical sprays on the equipment	No contact	Clean and protect the equipment if necessary.
	Check for the presence of corrosive or flammable gases in the equipment area	No presence	Inspect by the smell, or using a sensor.
	Check for levels of vibration and shock	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.

* The Tlog series of devices maintain RTC clock information through an internal button cell battery after time calibration is complete. To ensure that the device always maintains the best time accuracy, we recommend that the users periodically replace the button cell battery in the device. Here are the steps for battery replacement:

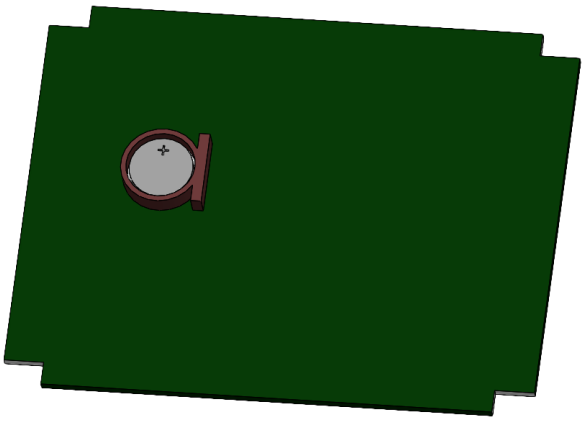
（1）Remove the screw protective cap from the bottom cover of the Tlog device (on the side with the GPS antenna), then unscrew and remove the two screws securing the bottom cover.



（2） Open the bottom cover and gently slide out the PCB board.



（3） Locate the battery on the PCB board, gently push aside the battery retention clip, and the battery will pop up from the socket. Remove the old battery and replace it with a new CR1220 model battery.



Battery model: CR1220

(4) Place the PCB board back into the device enclosure, reinstall the bottom end cover, and use the TSLogger software to recalibrate the time.

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Software

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

UDS diagnostics/ECU flashing/CCP/XCP calibration

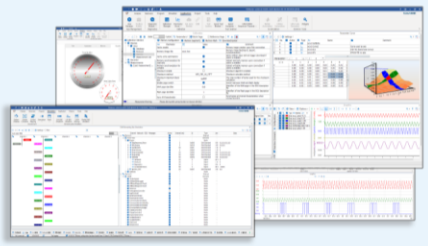
Embedded code generation/Application builder

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

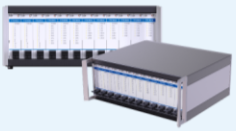
TTS test systems

-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
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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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