



Hardware IFU—TC1012

Version: V1.10 | English

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Document Revision History:

Documentation Edition	date	Update content	remarks
V1.00	2023.5.5	Create a document	
V1.10	2023.7.5	Modify the document	

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Shanghai TOSUN Technology LTD

6 / 8,4801, Jiading District, Shanghai

In line with the principle of providing better service to users, Shanghai TOSUN Technology LTD (hereinafter referred to as "TOSUN Technology") will present detailed and accurate product information to users as much as possible in this manual. However, since the content of this manual has a certain timeliness, the TOSUN Technology can not fully guarantee the timeliness and applicability of the document at any time period.

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1. Product profile

1.1 Product Overview

TC1012 is a portable, easy to install 1 CANFD / 1 LIN bus to USB interface device launched by same Star Intelligence. CANFD bus rate supports up to 8M bps, LIN bus equipment support rate $0 \sim 20$ Kbps, the product adopts high-speed USB2.0 interface and PC connection, Windows system drive-free design makes the device have excellent system compatibility.

With the powerful TSMaster software, it supports loading DBC and ARXML database files, which can easily monitor, analyze, simulate CAN FD / LIN bus data, and can also support UDS diagnosis, ECU brushing, CCP / XCP calibration and other functions.

Can be used for the secondary development API of Windows and Linux, can support various development environments, such as C + +, C #, LabView, Python, etc., convenient integration into various test systems, efficient and easy to use.

1.2 Typical applications

- ✓ Vehicle CAN FD / CAN / LIN bus data collection
- ✓ Domain Controller Test
- ✓ Various automated test systems

1.3 Functions and parameters

1.3.1 Functional characteristics

- \checkmark us (microsecond) level hardware message timestamp to meet higher order requirements.
- ✓ High-speed USB2.0 interface, Windows, Linux system drive-free design, with excellent system compatibility.
- ✓ CAN channel DC2500V sequestration.
- ✓ Automotive grade design, support LDF, dbc file, a21 file, blf file, asc file, arxml file.
- ✓ CAN channel port rate 125 Kbps- -1Mbps tunable.
- \checkmark The LIN bus master and slave nodes can be software configured.
- ✓ Support for blf, asc format data recording and offline / online playback.
- ✓ UDS diagnosis and CCP and XCP calibration can be supported.
- ✓ Support for the UDS-based Flash Bootloader.
- \checkmark Support for information security testing.

7TSMASTER

- ✓ Support Windows, Linux system secondary development interface.
- \checkmark Built-in 120 euro terminal resistance can be used in software configuration.
- ✓ Loadable TSMaster software all charge license

1.3.2 Technical parameters

channel	1 *CAN FD / 1 * LIN							
PC terminal interface	High-speed of USB2.0							
The CAN / LIN								
terminal interface	DB9							
drive	Windows, Linux system free drive free design, with excellent system compatibility							
cache	Hardware cache, each channel sends buffer support to 1000 frames CAN / CANFD							
CAN	Support CAN2.0A, B protocol, comply with ISO11898-1 specification, port rate 125 Kbps1Mbps							
CAN FD	Support for ISO and non-ISO standard CAN FD, port rate 125 Kbps- -8Mbps							
LIN	Support LIN 1.3 and 2.0, baud rate 020 Kbps							
dispatch list	Support LDF files and run the schedule, or you can configure the schedule yourself							
Time stamp accuracy	lus, the hardware message timestamp, to meet the high-order requirements							
terminal resistance	Built-in 120 euro terminal resistance can be used in software configuration							
Send a message per second *	Maximum of 20,000 frames / s							
Receipt of message messages per second *	Maximum of 20,000 frames / s							
insulate	CAN channel DC 2500V isolation, electrostatic grade contact discharge \pm 8KV							
supply electricity	USB power supply, LIN communication needs external power supply							
Case material	plastics							
working temperature	-40°C~80°C							
Working humidity	$10\% \sim 90\%$ (no condensation)							
work environment	Stay away from the corrosive gases							

* Single-channel 1Mbps, 0-byte data domain case

1.3.3 Electrical parameters

	Parameter	test condition	least value	representative value	crest value	Unit
	External input to the	Two LIN receiving				
working	DC power supply	channels	-	12	-	V
voltage		Two CAN delivery				
	USB supply electricity	channels	5.08	5.10	5.12	V
	External input to the	Two LIN receiving				
working	DC power supply	channels	-	0.01	-	Α
current		Two CAN delivery				
	USB supply electricity	channels	0.13	0.16	0.20	A
	External input to the	Two LIN receiving				
Power	DC power supply	channels	-	0.12	-	W
		Two CAN delivery				
	USB supply electricity	channels	0.67	0.82	1.02	W
	Bus pin pressure					
CAN	resistance	CANH、CAHL	-42		42	v
joggle		Enable terminal				
	terminal resistance	resistance		120		Ω
	Isolation and pressure	The leakage current				
	resistance	is less than 1 mA	2500			VDC
	Bus pin pressure					
LIN joggle	resistance	LINO、LIN1	0		24	V
	VBAT voltage		5	12	24	V

1.4 Shipping list

✓ TC1012 Host machine



2. Hardware interface description

2.1 Interface description



- ➢ USB high-speed 2.0 interface;
- ➢ DB9 Male:

DB9 pin definition:

DB9 pin	pin	definition
	PIN2	CANFD_Low
\bigcirc	PIN3	GND
6 7 8 9 0 0 0 0 0 0 1 2 3 4	PIN5	Shield
8 000 4	PIN7	CANFD_High
\bigcirc	PIN8	LIN
	PIN9	VBAT_LIN

Note: Pin PIN 2 is low CAN, and pin PIN 7 is high CAN, which is consistent with the international standard.

2.2 LED indicator light instructions

Physical picture of the indicator light:



Instructions for indicator light:

pilot lamp	definition
CANFD	The CANFD channel indicator lamp
LIN	The LIN channel indicator light
LINK	Hardware connection indicator light

Description of the indicator light color:

pigment	description
LINK green light	The device hardware is connected
LIN green light	The LIN channel data frame is sent or received correctly
LIN red light	The LIN channel sends or receives incorrect frames,
	configuration, protocol, or wiring errors
CAN FD green	CAN FD Channel data frames are sent or received correctly
light	
CAN FD red light	CAN FD The channel sends or receives error frames,
	configuration, protocol, or wiring errors

Note: The flicker frequency depends on the bus load.

3. Quick use

3.1 Download and install the TSMaster host computer

TSMaster Software download link:

http://www.tosun.tech/TOSUNSoftware/TSMaster_Setup_beta.exe

If not accessible, you can contact the corresponding sales staff or log in to the official website of the same star to get the upper machine, and you can also scan the code to follow the public account to get the download link.



Step 1:				
	选择安装	装语言	×	
	-	选择安装期间要使用的语言:		
		English	×	
		确定	取消	
Step 2:				
Setup - TSMa	ster 2023.6.2	25.906	_	
Please read th	ne following in ne following Li	nportant information before continuing. cense Agreement. You must accept the terms of t ion.	his agreement befo	are 🦉
Please read th Please read th continuing wit	ne following in ne following Li h the installat DSUN TECHNC	cense Agreement. You must accept the terms of t ion. DLOGY LTD. & TSMASTER SOFTWARE LICENSE AG	GREEMENT	a de la companya de la company
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Step 3:

🏹 Setup - TSMaster 2023.6.25.906		-		×
Select Destination Location				_
Where should TSMaster be installed?				-/
Setup will install TSMaster into the following folder.				
To continue, click Next. If you would like to select a different folder,	click Browse.			
C:\ydd\TSMaster			Browse	1
At least 347.3 MB of free disk space is required.				
At least 347.3 MB of free disk space is required.	Back	Next	Can	cel

Step 4:

leady to Install		-
Setup is now ready to begin installing TSMaster on	your computer.	4
Click Install to continue with the installation, or click	Back if you want to review or change any	settings.
Destination location: C:\ydd\TSMaster		
4		₩ ▶

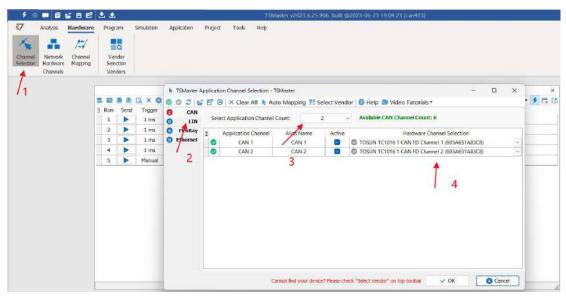
Complete installation:



3.2 Connect devices and configure channels

All TOSUN devices are drive-free, and can connect directly without download driver.

In TSMaster software interface: Click Hardware-click channel selection-drop-down box Select number of channels-select hardware channel-click OK



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In the hardware configuration, the CAN / CAN FD protocol can be switched, and the baud rate and switch terminal resistance can be adjusted. After the configuration is completed, click application can take effect.

tannel lection	Network Hardware	/::/ Channel Mapping	Ver			×	1			
	Channels		Ven					×		
		[-			Application Channels	TSMaster CAN FD Chann	el 1 - TOSUN TC1016 1 CAN FD Chennel 1	-	
			8	● 影	G × O	E INF CAN 1	Parameter	Value	2 - 1	1
			# Rew	Send	Trigger	Cher 2	CAN Controller Type	ISO CAN FD		
			1		t ms		Arbitration Phase Baud-rate [Kbps]	500		
			2	•	1 ms	-	Data Phase Baud-rate [Kbps]	2000	1	
						-	Arbitration Phase Bit Timing	TSEG1=63,TSEG2=16	-	
			3		1 ms		Data Phase Bit Timing	TSEG1=15,TSEG2=4		
			4		1 ms		Arbitration Phase S3W	15		
			5		Manual		Data Phase SJW	3	100	
					A contract of	-	Controller Mode	Normal		
							Fiter Type	Alow Al		
							Filter ID	300000000X		
							Termination Resistor			

3.3 Message sending

7 An	nalysis	Hardware		Progr	am	Simulation	Application	Project	Tools	Нер														
*		1.1		ł	a																			
election H	Network Hardware Channels	Channel Mapping		Ver Sele	ndor iction idors																			
	an sam saur				4013																			
				_	_							CAN	/ CAN FD T	ransn	nit									ذ
			8			E × O	말많다	🍸 🖸 Set	tings • 🚺	P													٩.	4 D I
				Raw	Send	Trigger		Message Na	sime		Id	Chn	Туре	DLC	BRS	DO	D1	D2	D3 E	4 D5	D6	D7	Comment	
				1		1 ms		NewMsg	63. C		001	1	Std. Data	8		00	00	00	00 0	00 0	00	00		
				2		1 ms		NewMsg	6		002	1	Std. Data	8	D	00	00	00	00 0	0 00	00	00		
				3		1 ms		NewMsg	ES .		003	2	Std. Data	8	D	00	00	00	00 0	0 00	00	00		
				4		1 ms		NewMsg	e		004	2	Std. Data	8	D	00	00	00	00 6	0 00	00	00		
				5	•	Manual		NewMsg	E.		123	1	Std. Data	8	-	00	00	00	00 0	0 00	00	00		

After the hardware connection is completed and the software is configured, the function of message sending can be realized:

operating steps:

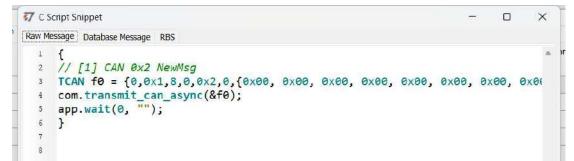
a. Message sending-Add a CAN / CAN FD message for sending

b. Right mouse button to create a new original message / add a message from the database, and set the message name / identifier / channel, etc

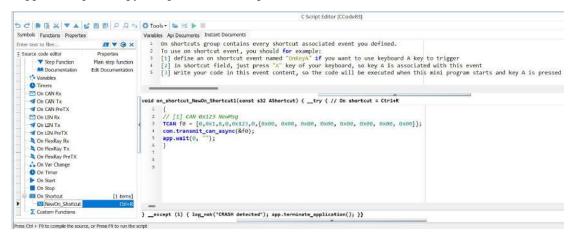
c. Message am trigger setting, manual trigger / cycle trigger, cycle trigger can set the sending cycle

d. Message information right click can generate a C script to quickly add to the C small program for programming

The following is an example of the build-C script:



Support for quick copy and paste to a C script to add send events:



3.4 Help with documentation and video teaching

Various instructions and help manuals are provided in the TSMaster help bar.

7 Analysis Hardware	Progra	am Simulation Application	i Pri	oject Tools	Help														
AA 🎄 📓	۲	B	API	2			F			1	(D							
Software Features Application Manual Notes *	Quick Start		API camples	Automation Examples			lelease Nate	TOSU		redita	Ab	out							
Help contents		Q Graphica	. +	🔝 Haw to ada	i real-time com	ment in b	H.				μN								
		 Encrypt Publish 		D TSMaster 8	feature: Real-tr	the contril	ent in Graphi	CS.											
		Q 11939		D T5Master i	eature: How to	plot Bus	load in Graph	nice											-
	5 B	Simulation	+	D TSMaster F	eature: How to	monitor	message cyc	le n Gr	aphics									a -	4 0
	E Row	Matlah Automation		ge Name	Id	Chn	Type	DLC	-								Corm	ment	
	1	S App Publish		wMsg	00:	1	Std. Data	8		00 0	00 00	00 0	00	00	00	00			
	3 2	S Vendor Interface Connectiv	ity +	wMsg	00	2 1	Std. Data	8	\Box	00 0	00 00	00 0	00	00	00	00			
	3	Diagnostics		wMsg	003	3 2	5td. Data	8		00 0	00 00	00 0	00	00	00	00			
	4	O Panel		wMsg	00	1 2	Std. Data	8		00 (00 00	00 0	00	00	00	00			
	5	S Mini Program (C Code Edito	e) +	wMsg	12	1	Std. Data	8	U	00 (00 00	00 (00	00	00	00			
		S Calibration							11										
	(m) Sign	S Toobox Development			-	_	v		-	-									
		System Variables Manager		-			200	_	-		1000	_					-	-	1040
	3 1	Graphic Program		Byte 1 00	Byte : 00	6	Byte 3 00			Byt 0				Byte 00			Byte 6 00		/te 7 00
		S Replay		.00	00		00		-		0.			00			00		00
		C Test System																	

At the same time, a large number of teaching videos can enter B station

<u>http s: / /space.bilibili.com / 2042371333</u>, follow the tosun intelligent official number, watch all the teaching videos.

3.5 TSMaster API Secondary development

In the TSMaster help bar API routine, a variety of common language API is provided to facilitate users' secondary development. Efficient and easy-to-use secondary development functions that can support all kinds of development environments, such as C, Python, C #, Labview, etc.

🔸 🔍 💻 🖬 💕 💾 🖻	🕹 🅹		TSMaster v2023.6.25.906	5. Built @2023-06	-25 19:04:23 (can41	3]
7 Analysis Hardware	Program Simulati	on Application Project Tools	Help			
an 🎄 📓	۰ 🚮	E API 💕	🖸 🏟 📮		6 0	
Software Features Application Manual Notes *	1 Quick Video Start Tutonals *	Software API Automation SDK * Examples Examples	Check What Release Update is New Note	TOSUN Cre Products	edits About	
Help content		Master SDK	Software Update		TOSUN	
	r					
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		1				
(①新建 - 🏑	0 11 10 13 10	1↓ 排序 - □ 查看 -			
÷	🖿	→ 此电脑 → 本地磁盘 (C:) → ydd →	TSMaster > bin > Data > SD	κ.,	~ C	在SDK
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	*** 截图	Calibration	2023/6/19 10:54	文件夹		
	💳 wendang	📜 examples	2023/6/19 10:54	文件夫		1
	🚞 产品手册	🚞 КБ 🔺	2023/6/19 10:54	文件夫		
	2023-06	📁 Mini Program SDK	2023/6/19 10:54	文件夫		
		2				
>	● WPS云盘					
v	💻 此电脑					
3	> 느 本地磁盘 (C:)					
	个项目 洗中1个项目					

3.5.1 Python calls the dynamic library

Windows32-Position Python:

- (1) pip install TSMasterAPI
- (2) Using the TSMasterAPI form TSMasterAPI import * for
- (3) Example synchronous upload github, address: https://

github.com/sy950915/TSMasterAPI.git

Windows64 bit Python / Li nux:

- (1) pip install libTSCANAPI
- (2) Using the TSMasterAPI form libTSCANAPIimport * for
- (3) Example synchronous upload github, address: https://github.com/sy950915/

libTSCANAPI.git

3.5.2 C calls the dynamic library

(1) Include TSMaster in a file with a path of TSMaster $\ bin \ Data \ SDK \ lib \ x86.h$ header file.

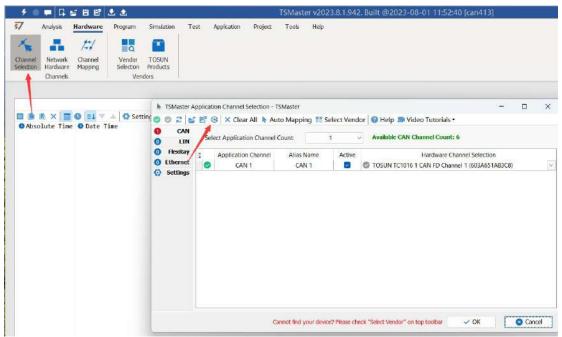
Such as: # include " TSMaster.h"

(2) Include TSMaster in a file with a path of TSMaster $\ bin \ Data \ SDK \ lib \ x86$. The lib file is connected to TSMaster.lib document.

In the C environment, add TSMaster to the Configuration Property connector input additional dependencies in the project property page.lib document.

3.5.3 Example of the calling of the interface

Windows, The Linux system provides the secondary development interface, easy to connect and use the equipment. The operation step are: select channel-generate C code-use C code / python code to call the interface. Take the code C as an example:



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C Script Fragments:

```
7 C脚本片段
     initialize lib tsmaster("TSMaster");
  1
     tsapp_set_can_channel_count(1);
  2
     tsapp set lin channel count(0);
  3
     tsapp set flexray channel count(0);
  4
     tsapp_set_ethernet_channel_count(0);
  5
  6
  7
     TLIBTSMapping m;
  8
     // TSMaster CAN FD 通道 1 - TOSUN TC1012 1 CAN FD 通道 1
  9
     m.init();
 10
     sprintf_s(m.FAppName, "%s", "TSMaster");
 11
     sprintf s(m.FHWDeviceName, "%s", "TOSUN TC1012");
 12
 13
     m.FAppChannelIndex = 0;
     m.FAppChannelType = (TLIBApplicationChannelType)0;
 14
     m.FHWDeviceType = (TLIBBusToolDeviceType)3;
 15
     m.FHWDeviceSubType = 12;
 16
     m.FHWIndex = 0;
 17
     m.FHWChannelIndex = 0;
 18
     if (0 != tsapp_set_mapping(&m)) { /* handle error */ };
 19
 20
     if (0 != tsapp_connect()){ /* handle error */ };
 21
 22
     /* do your work here */
 23
 24
     tsapp disconnect();
 25
     finalize lib tsmaster();
 26
```

C script call function description:

initialize _ lib _ tsmaster ("TSMaster"); // TSMaster initialization function
Tsapp _ set _ can _ channel _ count (1); // Set the number of can channels
The tsapp _ set _ lin _ channel _ count (0); // Set the number of lin channels
The tsapp _ set _ flexray _ channel _ count (0); // Set the number of flexray channels
The tsapp _ set _ ethernet _ channel _ count (0); // Set the number of ethernet channels

TLIBTSMapping m; / / Initialize the construct

/ / Set the TSMaster CAN FD channel 1-TOSUN TC1012 CAN FD channel 1 channel mapping

m. The init (); / / initial construct m

sprintf_s(m. FAppName, "%s", "TSMaster"); // Print the application name "TSMaster"

sprintf_s(m. FHWDeviceName, "%s", "TOSUN TC1012"); / / Print the hardware device name

m. FAppChannelIndex = 0; / / Application channel index

m. FAppChannelType = (TLIBApplicationChannelType) 0; // Application channel type

m. FHWDeviceType = (TLIBBusToolDeviceType) 3; / / Hardware device type

m. FHWDeviceSubType = 12; / / corresponding parameters of hardware equipment *

m. FHWIndex = 0; / / Hardware index

m. FHWChannelIndex = 0; / / Hardware channel index

if (0 != Tsapp _ set _ mapping (& m)) {/ * handle error * /}; / / If the return value is not equal to 0 mapping failure

The tsapp disconnect(); / / Disconnect the device

finalize _ lib _ tsmaster(); / / Release the C script module

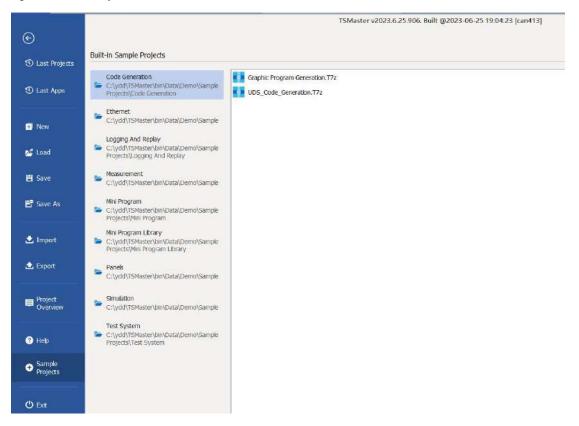
* Note: The corresponding parameters of the hardware equipment can be found in the TSMaster-Help-Software Development Package : TSMasterAPI_Hardware_Map.pdf



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3. 6 Sample Works

The example project provides a lot of Demo for user reference, greatly improving the user development efficiency.



Sample project panel:

 Examples Es TSMaster SDK 	Ramel Basics	eck What Relea	ase TOSUN C Products Abou Signal Relation or for Gear	redks About at TOSUN	Q v I Page 9 V
Graphiles D for Gear ck to set Gear to 1 ck to set Gear to 2		UI Trigger Events	Signal Relation of for Gear Gear		Page 9
for Gear ck to set Gear to 1 ck to set Gear to 2			or for Gear Gear	Page 8	Page 9
for Gear ck to set Gear to 1 ck to set Gear to 2	Data Manipulation		or for Gear Gear	Page 8	Page 9
ck to set Gear to 1 ck to set Gear to 2		Data Selecto	Gear		*
			Gear n.a.		
			J switch right to set Eng	gTemp to 120 deg.	
					- EngSpeed - Gear
			,	witch right to set En	twitch right to set EingTamp to 120 deg. if EngTemp is 120 deg, this LED will become RED

4. Inspection and maintenance

TC1012 The main electrical component is the semiconductor component, although it has a long life, it may accelerate aging in the incorrect environment, greatly reducing the life. Therefore, regular inspections should be conducted during the use of the equipment to ensure that the use environment maintains the required conditions. It is recommended to check it up at least once every 6 months to a year. Under adverse environmental conditions, more frequent examinations should be performed. In the table below, if you encounter problems during maintenance, read below to find the possible cause of the problem. If the problem is still not solved, please contact Shanghai TOSUN Intelligent Technology Co., LTD.

project	check up	standard	move about
			Use the voltmeter to check
			the source at the power
	Check the voltage		supply input end. Take the
	fluctuation at the power		necessary measures to make
power supply	supply side	7~18V DC	the voltage fluctuation
			within the range
	Check the ambient		Use a thermometer to check
	temperature		the temperature and ensure
	(Including the internal		that the ambient temperature
	temperature of the enclosed	-40°C~+80°C	remains within the allowable
	environment)		range
		Without air	Use a humidity meter to
	Check ambient humidity	conditioning, the	check the humidity and
surrounding	(Including the internal	relative humidity	ensure that the ambient
environment	humidity in the closed	must be at	humidity remains within the
	environment)	10%~90%	allowable range
	Check for the accumulation		
	of dust, powder, salt, and		Clean and protect the
	metal debris	No accumulation	equipment
	Check water, oil, or		If the cleaning and
	chemical spray collision	No spray touched	protection equipment is
	into the device	the device	required
	Check for corrosive or	No easily	Check by smelling or using

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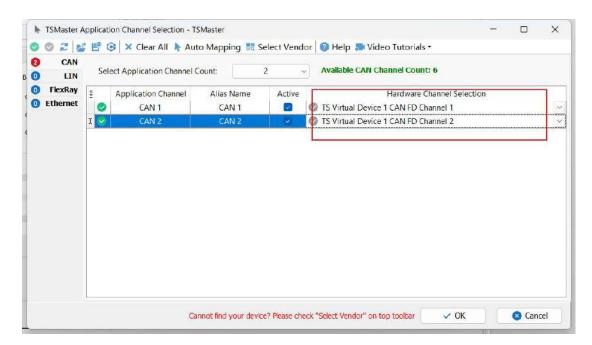


	flammable gases in the	corrosive or	a sensor
	equipment area	flammable gases	
		The vibration and	
		shock are within	
	Check the vibration and	the specified	Install the liner or other
	shock levels	limits	shock absorber, if required
		There are no	Isolation equipment and
	Check the noise sources	significant noise	noise sources or protection
	near the equipment	signal source	equipment
	Check the compression	There is sufficient	
	connector in the external	space between the	Visual scopic inspection
	wiring	connectors	adjust if necessary
Install wiring	Check for the damage to		Visual inspection and
	the external wiring	No damage	replace wiring if necessary

5. Common questions and answers

5.1 The line is connected correctly but cannot communicate properly:

Solution: Check if the number of channels is set. If CAN Channel Count = 0, of course no online hardware cannot display. And the software is configured by default virtual channel, you need to select the hardware real channel.



Automatically map or manually click to select the hardware real channel:

9	CAN		-		lor 🔞 Help 🎫 Video Tutorials		
0	LIN	Sel	ect Application Chandel (ol Automatic Mapping of u	nmapped channels thannel Count	: 6	
0	FlexRay Ethernet	1	Application Channel CAN 1	Alias Name Active	Hardware C TOSUN TC1016 1 CAN FD Char	hannel Selection nnel 1 (603A651A83C8)	
		1 🗸	CAN 2	CAN 2 🖌	S TOSUN TC1016 1 CAN FD Char	nnel 2 (603A651A83C8)	 Ý

If the channel is selected correctly, it is necessary to ensure consistent port communication between the two channels, as shown in the figure below:

🔸 🔍 📮 🖬 🖬 🗳 🖽 🔡	2 2		TSMaster v2023.6.25.906. Built @2023-06-	25 19:04:23 [Panel Basics]
7 Analysis Hardware	Program Simulat	ion Application Project Tool	s Help	
Channel Network Channel Selection Hardware Mapping Channels	Vendor Selection Vendors		Hardware Configurati	ion)
T		Application Channels	TSMaster CAN FD Channe	el 1 - TOSUN TC1016 1 CAN FD Channel 1
		Onfiguration		🛃 Default 💿 Apply
		INNY CAN 1	Parameter	Value
Text Contain	rs Buttons	thin CAN 2	CAN Controler Type	ISO CAN FD
			Arbitration Phase Baud-rate [Kbps]	500
📋 Check to set Gear to 1, uncheck	to set Gear to D	GroupBox to	Data Phase Baud-rate [Kbps]	2000
		O Chec	Arbitration Phase Bit Timing	TSEG1=63,TSEG2=16
Check to set Gear to 2, uncheck	to set Gear to 0		Data Phase Bit Timing	TSEG1=15,TSEG2=4
		() Chec	Arbitration Phase SJW	15
Check to set Gear to 3, uncheck	hand Cranke D	() Chec	Data Phase SJW	3
I_I check to set dear to 5, uncheck	to set Gear to 0		Controler Mode	Normal
			Filter Type	Alow Al
			Filter ID	X000000000X
			Termination Resistor	

5.2 Inconvenient message observation and signal filtering:

	Setting	s * Filter String:		3	< 7												2 -	4	
Absolute Time Counter	Chn	I Identifier	FPS	Message Name	Туре	Dir	DLC	Data	BRS	ESI	00	01 0	2 03	04	05	06	07 0		
C1 0.016474 18 C2 40.651222 318587 G4 14ERunning 518587 G4 14ERunning 518587 G4 14ERunning 52000 G4 14ERunning 52000 G4 14ERunning 52000 G4 14ERunning 52000 G5 1617 18000 G5 1617	CAN 2 CAN 1	51A 964 Running -50 degC 0 1 0 4 0 kW 0 rpm 0 rpm 0 5hift_Request_Off 0 0 0 0 0 0	0 10	M/_Gateway_P EngineData 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	398869 398869 398869 398869	Rx Tx	4	4 64	1	0	00	80 0 00 0	0 00						

Solution: display in a fixed display or time order, expand or fold the signal display, and filter the string, click the following icon to operate:

	-	1	-		CAN / CAN FD	Trace														×
	0 =1 🗸 🔺	🔹 💭 Settings	Filter String:			×T											2.	. 4		1
Absolute time	Counter		🖻 Identifier	FPS	🖾 Message Name	Туре	Dir		Data	BRS	ESI	00 0	1 02	03 1	84 8	5 06	07	08	09 1	10
- 🖸 91.841186	719904	CAN 2	003			Data	Tx	8	8	10			8 90	.90	90 90	0 00	00			
91.843474	719921	CAN 1	094			Data	Rx	8	8	24	1	68 0	8 80	90	90 06	0 00	98			
2 91.844999	719934	CAN Z	004			Data	Tx	8	8 8	32	120	6 99	6 60	00	80 B	0 00	00			
91.846778	719951	CAN 1	003			Data	Rx	8	8	13		00 00	00:0	.00	0 06	0 00	00			
2 91.751739	719201	CAN 1	064	9	EngineData	FD	Tx	15	64	1	Ø	0.99	0.0	80	80 06	0 00	00	00	00 0	96
2 91.851486	719984	CAN Z	054	9	EngineData	FD	Rx	15	64	1	Ø	0 89	0 00	80	99 96	0 00	00	00	00 0	30
- 🖾 91.855829	720021	CAN 1	001	957		Data	Tx	8				08 0	8 86	88	80 86	0.00	00			
2 91.857871	720034	CAN 2	001	957		Data	Rx	8	8 8 8	2	1	68 0	0 8 9	80	80 8	0 00	00			
2 91.860169	720051	CAN 1	002	950		Data	Tx	8	8	32	120	02 0	8 80	00	00 06	0 00	00			
91.861701	720064	CAN 2	082	950		Data	Rx	8	8			88.0	8-90	00	30 8	0.00	00			
st	AI Mess	ages						0 %												

5.3 How to load the database:

Select the can / lin / flexray database, click the upper left corner icon to add the database file, or drag the file directly into this window to be automatically loaded, and then click the left channel to associate the database.

5 0 = 0 5 B	e 🕹 🕭	TSMaster v2023.6.25.906	. Huilt @2023-06-25-15	104:23 [can413]	4			1 00	
47 Analysis Hardw	are Program Simulation Application Project	Taols Help						1	OSUNIME
5 Statt Stop	Messages Residence Convert Document COUNTRY Mess		arsonit Graphics Nuc Data	enc Statatos	Database Garges	2 · · · · ·		Cog Converter Cog Directory Video Replay *	•
		CAN Detabase			🛢 Show Flexibing Data	base			
	8 8 = 8 0 + - 1 V A Filtered by:	Show All	× Channelt	All ×	8.0B				
Image: The second sec	Definitions Layout Database Feld Definition	Datase Eletra: (% Synd Can Synd Yantase Eletra: (% Synd Yantase Eletration (% Synd Yantase Eletration (% Synd Yantase Eletration)) Second Synd Yantase Electration (% Synd Yantase Electration) Second Synd Yantase Electration (% Synd Yantase Electration)					٩	× • f th (2)	

5.4 How to automatically record the message messages:

0 - 0 5 5 5 ± ±		TSMaster v2023.6.25.906 Built @	2023-06-25 19:04:23 [con413*]			* # *
Analysis Hardware Program Simulation	Application Project Tools	Help				TOSUMBER
Thip Measurement Messages Real-time C	Context Decompart Start BEDs HEUR Measurement Pro		Graphics 12 Juli Display Statistics Data Analysis	Database Gauges		Converter Log Orectory Video Replay =
		Bus Loggin		×		
	🛃 Enable Module 🕨 🔟 🗏 🔕 Se	ettings • Log file: can4132023_06	27_17_51_41.bH	- B - C - 1		
	Data File Folder Cilyddygc(can413)	iLogging)Busi		Defaut		
	Oata File Name Configuration Nam	aellSustan Timel		Name Rule		
	Course Harde Teengenterriers	nellevinni i nel		Panie Noc 17		8
		项目试想 给农田期		7	4	- F B B
🛛 Timo 💭 Mossage		BLF 文件 2023/4/20 13:23 BLF 文件 2023/4/20 17:57				
09:31:26.173 CAN 2 bit rate 09:31:26.182 Bus Statistics		BLF 文件 2023/5/4 15:27		21 I I I I I I I I I I I I I I I I I I I		
09:31:26.185 Application con		811 文件 2023/5/5 9:34				
09:31:35.185 TC1016 1 31039	can4132823_06_23 194108	BLF 元件 2023/5/23 15:52				
09:31:26.185 TC1016 1 31939		BLF 文件 2023/5/23 15:55				
09:32:40.936 Trace is in chr		BLF 文件 2023/5/23 16:34				
09:32:47.430 Trace is in fix 09:32:51.605 Trace is in rel	[1 [1] remarkenen [40 [40 [40 [40 [40 [40					
00:32:53.005 Trace is in chr	can4132023_05_30 25.9 MB					
00:32:54,674 Trace is in fix	an4132623_65_30 1.64 ME					
09:32:55.143 Trace is in rea		BLF 文件 2023/5/30 13:46 BLF 文件 2023/6/5 t6:06				
09:33:31.635 Application dis	can4132023_06_05 1.96 MB can4132023_06_06 112 KB	BLF 文件 2023/6/6 11:05		0.		
09:33:31.635 Bus Statistics 09:33:59.004 CAN Database po		HL 文件 2023/6/7 17:00				
Wissission, we CAN Database pe		BLF 2/F 2023/6/7 17:00				
		BLF 11 2023/6/12 9:46				
		BLF 大件 2023/6/12 9:49				

operating steps:

- a. Analysis- -bus record
- b. Add a name rule to distinguish between different save files
- c. Add the self-start function
- d. Start the record

5.5 How to replay messages (offline and online playback):

7 Analysis Hardware Program	TSMaster (2023:5:25.905; bull: @2023-05-25.19.04(2) (car413*) Servation Application Propert Tank Help	
art 300 Measurement Messages Re	🗏 🖉 🦂 🕨 🔳 😑 🗃 👬 12 💵 😫 🕐 🕨 🖽 🖽	Log Converter Log Diractory Video Repiny *
Image: Non-State Image: Non-State<	2	× n D
	Ne. Trabe /, Past Process Functions	
	0 %. Pentark Karge Selection	
	Log creeton time: 2023-03-28 13:52:213 (2879-3859776)	

a. Bus playback

b. Offline playback, add the need to be played packets, can drag and drop file add directly

c. Select the range of message playback. Since the number of message display window is limited, you can choose the time period required for the message

\$7	Analysis	Handware Pro	gram Sa	nubbon	Application	Project Tools	Help														TOSUMBLE
4 Start		E Parameter Setup	Comm		P R weet Disconnes Dis Echis t	start Maillermark	Stap	urt	Trace	Tianama	t Graphics	12 Numeric Display * Data Acab	Statistics sis	Database	Gauges	Scart Logging	Stap Logging	Bus Loggin =	Bus Rapby nd Replay	Log Converter Log Directory Video Replay	
			0		teplay P Online	Replay					Bus Pla	dack							4.8	č	1
				Row 1	can41.32023_05_	Name 13_15_50_51	•	9	ne III	0		ess (%) 0	Citydd	Ngcican4131	Logging\/Bv:	File Nam shoen4132023		5_50_51.b¥		×	
			Hessa Bus St																	0.0	

d. Bus playback-online playback-add recording files

e. Online playback can playback the message according to the acquisition time stamp, and set

the playback data

				-
C:\ydd\g	gc\can413\Logg	ing\Bus\can4132023_05_23_	15_50_51 🚘	A
		Do not auto start		
		Output only once		2
	Defa	ult: Timestamp as log fle		
	Immediatel	y: Direct send the first mess	age	
		Press a key		
		Press a key		
	Stop pla	/back even if an error occurs		-
		Send Tx messages		-
		Send Rx messages		
Set No F	Fiker Set As Pa	ss Filter Set As Block Filter F	iker D Edit Fike	e.,
Source	Channe Destina	tion Channel (ignore = 0, use	comma to se	٤.,
1	1			
	4			
	Set No	Defa Immediatel Stop plan Set No Fiter Set As Pa Source Channe Destinat 1 1 2 2 3 3	Do not auto start Output only once Default: Timestamp as log ffe Immediately: Direct send the first messa Press a kay Press a kay Stop playback even if an error occurs Send Tx messages Send Rx messages Set No Fiter Set As Pass Fiter Set As Block Fiter F Source Channel Desthiation Channel (ginore = 0, use 1 1 2 2 3 3 3	Output only once Default: Timestamp as log file Immediately: Direct send the first message Press a key Press a key Stop playback even if an error occurs Send Tx messages Send Tx messages Send Rx messages Server Channe Desthation Channel (ignore – 0, use comma to set 1 1 2 2 3 3

6. Appendix

6.1 CAN 2.0 Standard Frame:

The CAN standard frame information is 11 bytes, consisting of two parts: information and data parts. The first 3 bytes are for the information section.

	7	6	5	4	3	2	1	0		
						DLO	C (Da	ita		
Bytes 1	FF RTR x x Length)									
	(Message identification code)									
Bytes 2			ID	0.10	-ID.	3				
Bytes 3	ID.	ID.2-ID.0 x x x x x								
Bytes 4		Data 1								
Bytes 5	Data 2									
Bytes 6	Data 3									
Bytes 7	Data 4									
Bytes 8	Data 5									
Bytes 9		Data 6								
Bytes										
10	Data 7									
Bytes										
11	Data 8									

Byte 1 is the frame information. The 7th bit (FF) represents the frame format, in the standard frame, FF=0; the 6th bit (RTR) represents the type of frame, RTR = 0 is a data frame, RTR = 1 is a remote frame; the DLC represents the actual length of data at the data frame.

Bytes 2 and 3 are message identification codes, and 11 bits are valid.

Bytes 4~11 is actual data of data frame, remote frame is invalid.

6.2 CAN 2.0 Expansion Frame:

CAN extended frame information for 13 bytes, including two parts, information and data parts. The first 5 bytes are for the information section.

TOSい同星

	7	6	5	4	3	2	1	0			
					Ι	DLC (Data					
Bytes 1	FF	RTR	x	x	Length)						
	(Message identification code)										
Bytes 2			ID.	28-	ID.21	-					
Bytes 3		ID.20-ID.13									
Bytes 4		ID.12-ID.5									
Bytes 5	ID.4-ID.0 x x x										
Bytes 6	Data 1										
Bytes 7		Data 2									
Bytes 8		Data 3									
Bytes 9		Data 4									
Bytes 10		Data 5									
Bytes 11	Data 6										
Bytes 12	Data 7										
Bytes 13	Data 8										

Byte 1 is the frame information. The 7th (FF) indicates the frame format, FF = 1; the 6th (RTR)

It represents the type of frame, RTR = 0 as a data frame and RTR = 1 as a remote frame; DLC represents the actual data length at the data frame.

Byte 2~5 is the message identification code, and its high 29 bits is valid.

Bytes 6~13 is actual data of data frame, remote frame is invalid.

6.3 matters need attention

(1) Connect the lines to avoid short circuit.

⁽²⁾ Before using the equipment, please carefully check the pin information in the product manual.

③ During the operation of the equipment, be sure to connect the power cord correctly and avoid plugging and unplugging.

④ Attention! Damage caused by electrostatic discharge (ESD).

7. Disclaimer

Shanghai TOSUN Technology, LTD. based on the principle of providing better service for users, will present detailed and accurate product information for users as much as possible in this manual. However, since the content of this manual has a certain timeliness, TOSUN Technology cannot fully guarantee the timeliness and applicability of the document in any period of time. TOSUN Technology has the right to update the contents of this manual without notice. In order to get the latest version of the information, please visit the official website of TOSUN Technology regularly or contact the staff of TOSUN Technology regularly. Thank you for your tolerance and support!

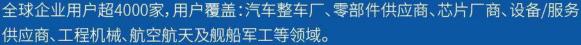


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同星智能成立于2017年,一直专注于研发国产自主可控的汽车电子基础工具链产品, 也是该领域国产领导品牌。

同星智能的核心软件TSMaster及配套硬件设备,具备嵌入式代码生成、汽车总线分析、 仿真、测试及诊断、标定等核心功能,覆盖了汽车整车及零部件研发、测试、生产、试验、 售后全流程。



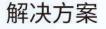
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- ECU刷写
- ・CCP/XCP标定
- ·嵌入式代码生成
- ·应用发布/加密发布
- ・记录与回放
- ·图形化编程
- ·剩余总线仿真
- C/Python脚本
- ·总线监控/发送
- SOMEIP和DoIP

硬件

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- ・1/2/6通道LIN转USB工具
- ·10通道CAN FD/CAN转以太网工具
- ·多通道Flexray/CAN FD转USB工具
- ・多通道车载以太网/CAN FD转USB工具
- ・车载以太网介质转换工具(T1转Tx)
- ・多通道CAN FD/Ethernet/LIN记录仪

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