



Hardware IFU—TC1011

Version: V1.10 | English

tosunai.com

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

Document Revision History:

Copyright information

Shanghai TOSUN Intelligent Technology Co., LTD

6 / 8,4801, Jiading District, Shanghai

In line with the principle of providing better service to users, Shanghai TOSUN Intelligent Technology Co., Ltd. (hereinafter referred to as "TOSUN Intelligence") 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 intelligence can not fully guarantee the timeliness and applicability of the document at any time period.

The information and data in this user manual are subject to change without notice. In order to get the latest version, please visit the official website of the company or contact the staff. Thank you for your tolerance and support! Any part of this manual shall not be reproduced in any form or in any manner without written permission of TOSUN Intelligence.

@ Copyright 2023, Shanghai TOSUN Intelligent Technology Co., LTD. All rights reserved.

catalogue

1
1
1
1
1
2
3
3
4
4
5
6
6
8
9
10
11
11
12
12
15
19
21
22
22
24
24

1. Product profile

1.1 Product Overview

TC1011 is a portable, easy to install 1 CANFD bus to USB interface device, the highest rate of 8 Mbps, the product uses high-speed USB2.0 interface and PC connection, Windows system drive design makes the device has excellent system compatibility.

With the powerful TSMaster software, support loading DBC and ARXML database files, can easily monitor, analyze, simulate CAN FD bus data, can also support UDS diagnosis, ECU brush, 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 multi-channel CAN FD / CAN bus data acquisition
- ✓ Domain Controller Test
- ✓ Various automated test systems

1.3 Functions and parameters

1.3.1 Functional characteristics

- ✓ US (microsecond) level hardware message timestamp to meet higher order requirements.
- Portable design, unique designed mounting holes for easy integration into various devices or instrument panels.
- ✓ High-speed USB2.0 interface, Windows, Linux system drive-free design, with excellent system compatibility.
- ✓ CAN channel DC2500V sequestration.
- ✓ Automotive grade design, support for dbc file, a2l file, blf file, asc file.
- ✓ CAN channel port rate 125 Kbps- -8Mbps tunable.
- ✓ Support for blf, asc format data recording and offline / online playback.
- ✓ The UDS diagnosis and CCP calibration can be supported.
- ✓ Support for the UDS-based Flash Bootloader.

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

1.3.2 Technical parameters

channel	1 * CAN FD
PC terminal interface	High-speed of USB2.0
CAN terminal interface	DB9
drive	Windows,Linux System 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 5 Kbps—1Mbps
CAN FD	Support for ISO and non-ISO standard CAN FD, port rate 125 Kbps- -8Mbps
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
Receiptofmessage messagesper second *	Maximum of 20,000 frames / s
insulate	CAN channel DC 2500V isolation, electrostatic grade contact discharge \pm 8KV
supply electricity	USB supply electricity
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

			least	represent	crest	
	parameter	test condition	value	ative value	value	unit
working	USB supply	Two CAN delivery				
voltage	electricity	channels	5.10	5.12	5.14	V
working	USB supply	Two CAN delivery				
current	electricity	channels	0.15	0.17	0.19	А
	USB supply	Two CAN delivery				
power	electricity	channels	0.77	0.87	0.98	W
	Bus pin pressure					
	resistance	CANH、CAHL	-42		42	V
CAN	terminal	Enable terminal				
joggle	resistance	resistance		120		Ω
	Isolation and					
	pressure	The leakage current is				
	resistance	less than 1 mA	2500			VDC

1.3.3 Electrical parameters

1.4 Shipping list

✓ TC1011 Host machine



2. Hardware interface description

2.1 Description of the hardware interface



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

DB9 pin definition:

Ι)B9 pi	n	pin	definition
	\bigcirc		PIN2	CANFD_Low
6 7	000	1 2 3	PIN3	CANFD_GND
89	000	4 5	PIN5	CANFD_Shield
	\bigcirc	i.	PIN7	CANFD_High

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
LINK	Hardware connection indicator light

Description of the color of the indicator light:

pigment	description
LINK green light	The device hardware is connected
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 incorrect 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.



	选择安装	装语詞	Ī						×	
		选	择安装期间	回要使用的]语言:					
		E	ıglish						~	
						确定		取消		
Step 2:										
Setup - TSMa	ster 2023.6.2	.25.90	6					_		\times
	nont									And in case
License Agreen Please read th	he following in	mport	ant informat	tion before	continuin	ıg.				-/
Please read the Please read th		lcense tion.	Agreemen	t. You mus	t accept t	he terms of			before	<i>~/</i>
Please read the Please read the Continuing with SHANGHAI TO CAREFULLY R SOFTWARE A PROCESS, OF TO BE BOUND TO THIS AGR THE SOFTWA AND THEIR C BE SUBJECT AGREEMENT TO BIND THE	he following in he following Li th the installati	License tion. OLOG DFTW/ KING T VISE E MS O D BE B TURN VISE E MS O D BE B TURN THEN DF AN THIS A	Agreemen LTD. & TS RE LICENSI HE APPLICA XECUTING T THIS AGR DUND BY ITS HE SOFTW IN THIRTY (CURRENT R ENTITY, YO GREEMENT,	t. You mus MASTER S E AGREEME BUE BUTTO THE APPLIC EEMENT. II S TERMS A VARE (WITH 30) DAYS RETURN PO U AGREE A , AND REFE	t accept t OFTWAR ENT ("AGF ON TO CC CABLE QU F YOU DO ND CONE H ALL ACC OF RECEI ULICY. IF Y ND REPRE ERENCES	The terms of E LICENSE , MPLETE TH OTE (DEFIN NOT WISH DITIONS, DO COMPANYIN IPT. ALL RE OOU ARE AG ESENT THA HEREIN TO	AGREEM BY DOV HE INST HED BELC TO BEC NOT IN G WRIT TURNS T CCEPTIN T YOU H "YOU" A	ENT VINLOADII ALLATION DW), YOU COME A P ISTALL O TEN MAT TEN MAT TO TOSU G THIS VAVE AUT	NG THE I AGREE ARTY R USE ERIALS N WILL HORITY R"	
Please read th Please read th continuing with SHANGHAI TO CAREFULLY R SOFTWARE A PROCESS, OF TO BE BOUND TO THIS AGR THE SOFTWA AND THEIR C BE SUBJECT AGREEMENT TO BIND THE SHALL MEAN	he following in he following Li- th the installati OSUN TECHNO READ THIS SOI AND/OR CLICK R BY OTHERW D BY THE TERM RE AND RETI ON TAINERS) N TO TOSUN'S T ON BEHALF OF ENTITY TO TI SUCH ENTITY	License tion. OFTW/ KING T VISE E CMS O D BE B TURN TURN THEN THEN Y. "QU	Agreemen LTD. & TS RE LICENSI HE APPLICA XECUTING T THIS AGR DUND BY ITS HE SOFTW IN THIRTY (CURRENT R ENTITY, YO GREEMENT,	t. You mus MASTER S E AGREEME BUE BUTTO THE APPLIC EEMENT. II S TERMS A VARE (WITH 30) DAYS RETURN PO U AGREE A , AND REFE	t accept t OFTWAR ENT ("AGF ON TO CC CABLE QU F YOU DO ND CONE H ALL ACC OF RECEI ULICY. IF Y ND REPRE ERENCES	The terms of E LICENSE , MPLETE TH OTE (DEFIN NOT WISH DITIONS, DO COMPANYIN IPT. ALL RE OOU ARE AG ESENT THA HEREIN TO	AGREEM BY DOV HE INST HED BELC TO BEC NOT IN G WRIT TURNS T CCEPTIN T YOU H "YOU" A	ENT VINLOADII ALLATION DW), YOU COME A P ISTALL O TEN MAT TEN MAT TO TOSU G THIS VAVE AUT	NG THE I AGREE ARTY R USE ERIALS N WILL HORITY R"	
Please read the continuing with SHANGHAI TO CAREFULLY R SOFTWARE A PROCESS, OF TO BE BOUND TO THIS AGR THE SOFTWA AND THEIR C BE SUBJECT AGREEMENT TO BIND THE SHALL MEAN	he following in he following Li- th the installati OSUN TECHNO READ THIS SOI AND/OR CLICK R BY OTHERW D BY THE TERM RE AND RETI ON TAINERS) N TO TOSUN'S T ON BEHALF OF ENTITY TO TI SUCH ENTITY	License tion. OLOG OFTW/ KING T VISE E MS O O BE B TURN WITH THEN OF AN THIS A Y. "QU	Agreemen CLTD. & TS ARE LICENSI HE APPLICA XECUTING T THIS AGRI THE SOFTW IN THIRTY (CURRENT F ENTITY, YO GREEMENT, ote" means	t. You mus MASTER S E AGREEME BUE BUTTO THE APPLIC EEMENT. II S TERMS A VARE (WITH 30) DAYS RETURN PO U AGREE A , AND REFE	t accept t OFTWAR ENT ("AGF ON TO CC CABLE QU F YOU DO ND CONE H ALL ACC OF RECEI ULICY. IF Y ND REPRE ERENCES	The terms of E LICENSE , MPLETE TH OTE (DEFIN NOT WISH DITIONS, DO COMPANYIN IPT. ALL RE OOU ARE AG ESENT THA HEREIN TO	AGREEM BY DOV HE INST HED BELC TO BEC NOT IN G WRIT TURNS T CCEPTIN T YOU H "YOU" A	ENT VINLOADII ALLATION DW), YOU COME A P ISTALL O TEN MAT TEN MAT TO TOSU G THIS VAVE AUT	NG THE I AGREE ARTY R USE ERIALS N WILL HORITY R"	
Please read the continuing with SHANGHAI TO CAREFULLY R SOFTWARE A PROCESS, OF TO BE BOUND TO THIS AGR THE SOFTWA AND THEIR C BE SUBJECT AGREEMENT TO BIND THE SHALL MEAN	he following in he following Li- th the installati OSUN TECHNO READ THIS SOI AND/OR CLICK: B BY OTHERW: D BY THE TERM REEMENT AND D BY THE TERM REEMENT AND ARE, AND RETU ONTAINERS) N TO TOSUN'S T ON BEHALF OF ENTITY TO TT SUCH ENTITY TO TOSUN'S T SUCH ENTITY TO TOSUN'S T SUCH ENTITY	License tion. OLOG OFTW/ KING T VISE E MS O O BE B TURN TURN THEN OF AN THEN OF AN THIS A Y. "Qu	Agreemen LTD. & TS RE LICENSI HE APPLICA THIS AGRI DUND BY ITS THIS AGRI DUND BY ITS THIS AGRI DUND BY ITS THIS AGRI UNT HIRTY (CURRENT F ENTITY, YOU GREEMENT, DOT THE AGRICULT THE AGRICULT CURRENT F	t. You mus MASTER S E AGREEME NBLE BUTTU FHE APPLIC EEMENT. II S TERMS A (ARE (WITI (30) DAYS ETURN PO U AGREE A , AND REFE the quotat	t accept t OFTWAR ENT ("AGF ON TO CC CABLE QU F YOU DO ND CONE H ALL ACC OF RECEI ULICY. IF Y ND REPRE ERENCES	The terms of E LICENSE , MPLETE TH OTE (DEFIN NOT WISH DITIONS, DO COMPANYIN IPT. ALL RE OOU ARE AG ESENT THA HEREIN TO	AGREEM BY DOV HE INST HED BELC TO BEC NOT IN G WRIT TURNS T CCEPTIN T YOU H "YOU" A	ENT VINLOADII ALLATION DW), YOU COME A P ISTALL O TEN MAT TEN MAT TO TOSU G THIS VAVE AUT	NG THE I AGREE ARTY R USE ERIALS N WILL HORITY R"	~/

TOSiV同星

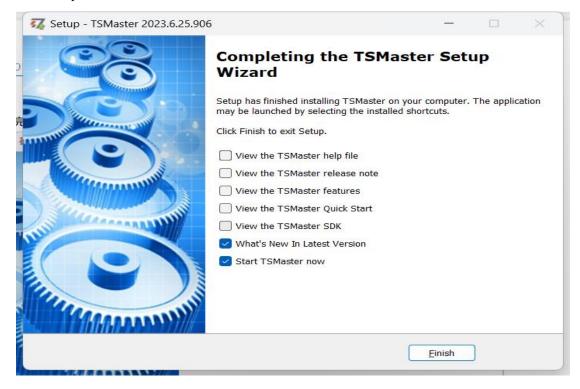
Step 3:

🐼 Setup - TSMaster 2023.6.25.906				\times
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	
At least 347.3 MB of free disk space is required.				
Copyright (c) 2017-2023 TOSUN. All rights reserved.				
	Back N	lext	Ca	ncel

Step 4:

Setup - TSMaster 2023.6.25.906	-		>
Ready to Install			-
Setup is now ready to begin installing TSMaster on your computer.			
Click Install to continue with the installation, or click Back if you want to revi	ew or change any	/ settings.	
Destination location: C:\ydd\TSMaster		4	h.
		,	
4		₽	
right (c) 2017-2023 TOSUN. All rights reserved. ——————————————————————————————————			
Back	Install	Ca	ncel

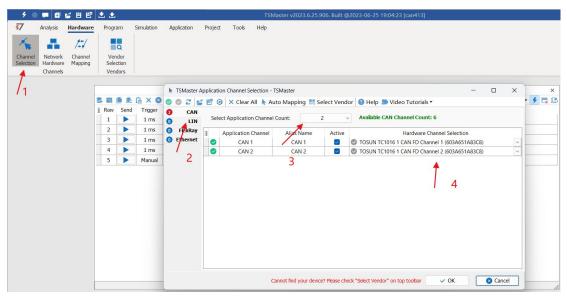
Complete installation:



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



TOSい同星

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.

7 🔍		\$ 8 B	ٹ 🖈				TSMaster v2023.6.25.906. Built @2023	3-06-25 19:04:23 [can413]		
\$7	Analysis I	Hardware	Progr	am	Simulation	Application Project Tools	Нер			
*	- 1	1-1		Q						
Channel Selection	Network Hardware Channels	Channel Mapping	Ver Sele Ven	ction			硬件配置	×		
	Channels	[Ven	aors		Application Channels	TSMaster CAN FD Cha	Innel 1 - TOSUN TC1016 1 CAN FD Channel 1	-	
			S. 🛤		🔓 × 😆	CAN 1	Parameter	Value	2 -	4 5
			E Row		Trigger	CAN 2	CAN Controler Type	ISO CAN FD		-
			1		1 ms		Arbitration Phase Baud-rate [Kbps]	500	-	
			2	-	1 ms		Data Phase Baud-rate [Kbps]	2000	-	
					3		Arbitration Phase Bit Timing	TSEG1=63,TSEG2=16	-	
			3		1 ms		Data Phase Bit Timing	TSEG1=15,TSEG2=4		
			4		1 ms		Arbitration Phase SJW	15		
			5		Manual		Data Phase SJW	3		
					Thurlou		Controller Mode	Normal		
							Filter Type	Allow All		
							Filter ID	X000000000X		
							Termination Resistor			

3.3 Message sending

57	Analysis	Hardware	Pro	gram	Simulation	Application	Project	Tools	Help												
1		1-1		Q																	
hannel election	Network Hardware	Channel Mapping		endor																	
	Channels		V	endors																	
		[CAN	CAN ED	Frankr	nit								
			CAN / CAN FD Transmit														2- 4 🗖				
			≣ Rov				Message Na		Id	Chn	Туре	DLC	BRS	D0	D1	D2	D3 [04 D	5 D6	D7	Comment
			1		1 ms		NewMsg		001	1	Std. Data	8		00	00	00	00 (0 0	00	00	
			2		1 ms		NewMsg		002	1	Std. Data	8		00	00	00	00 (0 0	00 0	00	
			3		1 ms		NewMsg		003	2	Std. Data	8		00	00	00	00 0	0 0	00 0	00	
			4		1 ms		NewMsg		004	2	Std. Data	8		00	00	00	00 0	0 0	00	00	
			5		Manual		NewMsg		123	1	Std. Data	8		00	00	00	00 (0 0	00 0	00	
				P											- Constanting						

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

operating steps:

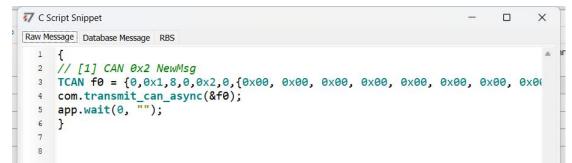
a. Message sending-Add a CAN / CAN FD message for sending

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

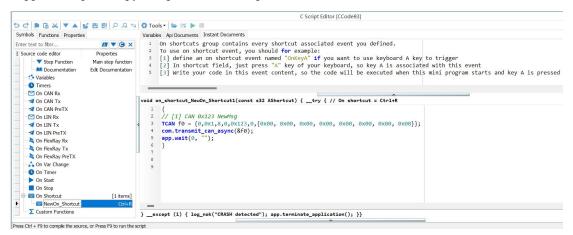
c. Message am trigger setting, manual trigger / cycle trigger, cycle trigger can set the sending cycle

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 Program Simulation Applica		nject Tools	Help		_												
	API	S	💽 🤤)		-		1		C							
ioftware Features Application Quick Video Software Manual Notes * Start Tutorials * SDK *	API Examples	Automation Examples	Check Whate Update is Ne			TOSU Produ		Credit	ts /	About							
Help contents S Graphics	*	📕 How to add	real-time comme	nt in bl	f				лп								
🕙 Encrypt Publish	÷.	TSMaster F	eature: Real-time	comm	ent in Graphic	CS											
S 11939	+	📑 TSMaster F	eature: How to pl	ot Bus	load in Graph	ics											
😂 🖼 🔇 Simulation	•	TSMaster F	eature: How to m	onitor	message cyc	le in G	Fraphic	s								2-	+ 🗔
Row S Matlab Automation	•	ge Name	Id	Chn	Type	DLC	BRS	DO	D1	D2	D3 D	4 D5	D6	D7	Co	mment	
1 🔇 App Publish		wMsg	001	1	Std. Data	8		00	00	00	00 0	0 00	00	00			
2 S Vendor Interface Conne	ctivity +	wMsg	002	1	Std. Data	8		00	00	00	00 0	0 00	00	00			
3 S Diagnostics	+	wMsg	003	2	Std. Data	8		00	00	00	00 0	0 00	00	00			
4 🔇 Panel	+	wMsg	004	2	Std. Data	8		00	00	00	00 00	0 00	00	00			
5 🔇 Mini Program (C Code E	ditor) 🕨	wMsg	123	1	Std. Data	8		00	00	00	00 0	0 00	00	00			
Calibration	+																
(*) Siar 🕙 Toolbox Development	۲				*				-	_							
System Variables Manag	jer →	Byte 1	Byte 2		Byte 3			D.	/te 4			D.	te 5		Byte 6	D	vte 7
Graphic Program	•	00	00		00				00				00		00		00
S Replay	•		00	-	00				00		~		00	-	00		00
S 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.

ج 🔍 🕈	🕀 💅 🗄 🖻	° 🕹 🕭		TSMaster v2023.6.25.906	i. Built @2023-06	-25 19:04:23 [can413]
Analy	rsis Hardware	Program Simulat	ion Application Project Too	ols Help		
				💽 🍦 📮		4 0
Software Fea Manual	tures Application Notes * Help content	Start Tutorials *	Software API Automation SDK * Examples Examples	n Check What Release	Products	edits About TOSUN
	Help concern	LS	Master SDK	Software Opdate	ADOUL	TOSON
		SDK	× 1 +			
	(🕂 新建 🗸 🔥		① ↓ 排序 ✓ 三 査看 ✓		
	÷		- > 此电脑 > 本地磁盘 (C:) > ydd	> TSMaster > bin > Data > SDM	< >	~ C 在 SDK
		📐 视频 🔹 🖈	名称 ^	修改日期	类型	大小
		■ 截图	늘 Calibration	2023/6/19 10:54	文件夹	
		🚞 wendang	📁 examples	2023/6/19 10:54	文件夹	
		🚞 产品手册	📁 lib 🔺	2023/6/19 10:54	文件夹	
		2023-06	🚞 Mini Program SDK	2023/6/19 10:54	文件夹	
	>	● WPS云盘	2			
	~	🖵 此电脑				
	4					

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.

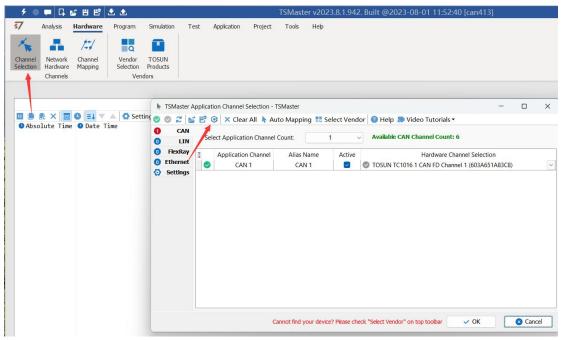
Such as: # include " TSMaster.h"

(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:



TOSい同星

C Script Fragments:

```
77 C脚本片段
      initialize lib_tsmaster("TSMaster");
  1
   2
     tsapp_set_can_channel_count(1);
     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 TC1011 1 CAN FD 通道 1
  9
     m.init();
  10
     sprintf_s(m.FAppName, "%s", "TSMaster");
  11
      sprintf_s(m.FHWDeviceName, "%s", "TOSUN TC1011");
  12
      m.FAppChannelIndex = 0;
  13
      m.FAppChannelType = (TLIBApplicationChannelType)0;
  14
      m.FHWDeviceType = (TLIBBusToolDeviceType)3;
  15
      m.FHWDeviceSubType = 5;
  16
  17
      m.FHWIndex = 0;
      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
  26
      finalize_lib_tsmaster();
```

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 TC1011 1 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 TC1011"); / / 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 = 5; / / 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

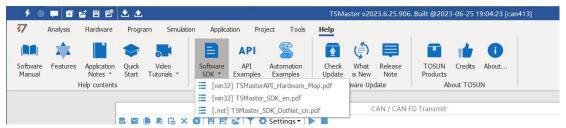
to the 0 mapping failure

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 :

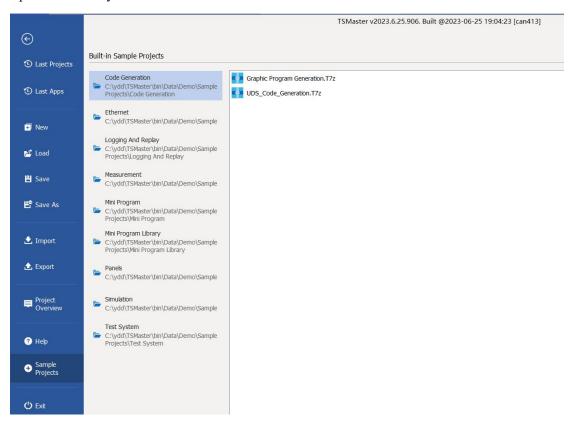
TSMasterAPI_Hardware_Map.pdf



TOSい同星

3. 6 Sample Works

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



Sample project panel:

ء 🗧 🗲	1 🖬 🖻 🖻	۰ 🛃					TSMast	er v2023.6.25	.906. Built @2023	8-06-25 19:	04:23 [Pane	l Basics]
77 Analysis	Hardware	Program	Simulatio	n Applicatio	on Projec	t Tools	Help					
		٢	5		API	2		(†) E		1	1	
Software Featur Manual	es Application Notes * Help contents		Video Tutorials ▼			Automation Examples	Check Update	What Rele is New No ftware Update			About	
	Help concents	5	1	1	Smaster SDK	Panel Basic		itware Optiate	1	ADOUL TOSU		×
1							-					۹ - 🕞 🛙
Text	Containe	rs	Buttons	Grap	phics	Data Manipulat	on UI	Trigger Events	Signal Relation		Page 8	Page 9
Check to set	Gear to 1, uncheck 1 Gear to 2, uncheck 1 Gear to 3, uncheck 1	to set Gear to	0	Check to set Check to set Check to set	Gear to 2			Data Select	GearGear			~
Trackbar to set Scrollbar to set Progressba	EngSpeed <						>		Switch left to se switch right to s If EngTemp is 12 become RED	et EngTemp to	120 deg.	
0												- EngSpeed - Gear
						0						

4. Inspection and maintenance

TC1011 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 still cannot be 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 the thermometer to
	temperature		check the temperature and
	(Including the internal		ensure that the ambient
	temperature of the enclosed	-40°C~+80°C	temperature remains within
	environment)		the allowable 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 equipment	required
	Check for corrosive or	No easily	Check by smelling or using

Domestic leading brand of automotive electronic tool chain

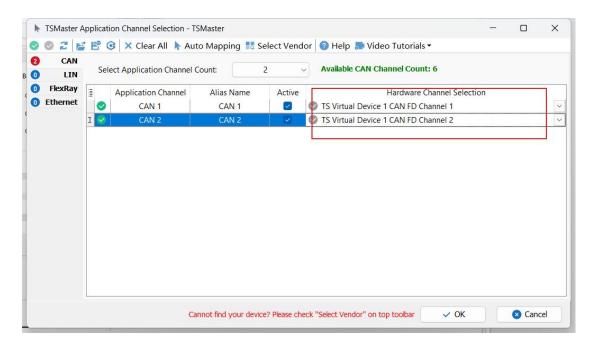


	flammable gases in the	corrosive or	a sensor
	equipment area	flammable gases	
		The vibration and	
		shock are within	
	Check the vibration and	the specified	Install the liner or other
	shock levels	limits	shock absorber, if required
		There are no	Isolation equipment and
	Check the noise sources	significant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

-	TSMaster A	pplicat	ion Channel Selection - T	SMaster			_		×
0	026	; E° (🧿 🗙 Clear All 🖒 Aut	to Mapping 📲 Se	elect Vend	or 🕜 Help 🄝 Video Tutorials 🕶			
0		Sel	ect Application Changel	- Automatic Map	ping of ur	mapped channels channel Count: 6			
в 🛈					the second				
		Ξ	Application Channel	Alias Name	Active	Hardware Channel Selection			
,	Luichict		CAN 1	CAN 1		TOSUN TC1016 1 CAN FD Channel 1 (603A651A8			~
,		I	CAN 2	CAN 2	~	TOSUN TC1016 1 CAN FD Channel 2 (603A651A8	3C8)		~
1									
-									
			Ca	nnot find your device	? Please che	ck "Select Vendor" on top toolbar		🛛 Cano	el
		-					_		

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

9 🔍 🗭 🖬	🞽 🗄 🗳 .	± 🕹					TSMaster v2023.6.25.906. Built @2023	3-06-25 19:04:23 [Panel Basics]	
77 Analysis	Hardware	Program	Simulation	Application	Project	Tools	Help		
* .	1-1	Q							
Channel Network Selection Hardware	e Mapping	Vendor Selection					Hardware Config	guration	
Channes	5	Vendors							
				📥 Apple	cation Chann	nels	TSMaster CAN FD C	Channel 1 - TOSUN TC1016 1 CAN FD Channel 1	
				🗘 Confi	guration			🛃 Default	Apply
				CAN CAN	1				<u> </u>
Text	Containers		Buttons	CAN CAN	2		Parameter	Value	
							CAN Controller Type	ISO CAN FD 500	
Check to set Ge	arta 1. unchack to	cot Coor to 0	GroupBox	fc			Arbitration Phase Baud-rate [Kbps]	2000	
	ar to 1, uncheck to	i set dear to o					Data Phase Baud-rate [Kbps] Arbitration Phase Bit Timing	TSEG1=63 TSEG2=16	
100			⊖ Ch	ec			Data Phase Bit Timing	TSEG1=15,TSEG2=4	
Check to set Ge	ear to 2, uncheck to	set Gear to 0	⊖ Ch	ec			Arbitration Phase S1W	15	
			0.7				Data Phase SJW	3	
Check to set Ge	ear to 3, uncheck to	set Gear to 0	⊖ Ch	ec			Controler Mode	Normal	
							Fiter Type	Alow Al	
							Fiter ID	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	
Trackbar to set En	aSpeed						Termination Resistor		
	5-F								
Scrollbar to set En	gSpeed <								

5.2 Inconvenient message observation and signal filtering:

	Settings	Filter String:			× To												2, -	4	
Absolute Time Counter	Chn	Identifier	FPS	Message Name	Type	Dir	DLC	Data	BRS	ESI	00	01 0	2 03	04	05	06	07 0	8 0	9 1
0.016474 18	CAN 2	51A	0	NM_Gateway_P		Rx	4	4	1	0	00	00 0	0 00						
40.651222 318587	CAN 1	064	10	EngineData	FD	Tx	15	64	1	0	00	00 0	0 00	00	00	00	00 0	0 0	0 0
- (•) IdleRunning		Running		0															
(•) EngTemp		-50 degC		0															
···(•) PetrolLevel		0 1		00															
(••) EcoMode		0		0															
(•) Gear		Idle		0															
-(•) EngPower		0 kW		0000															
() EngForce		0 N		00000000															
(••) EngSpeed		0 rpm		0000															
() EngTorque		0		000000000	000000														
() ShiftRequest		Shift_Request_Off		0															
() SleepInd		0		0															
() EngTubePressure		0		000000000	000000														
(••) EngValvePos		0		000000000	000000														
(••) EngStates		0		000000000	000000														
• (••) EngIgnitionAngle		0		000000000	000000														
() EngKnocking		0		000000000	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:

	No. 10	1	<u></u>		CAN / CAN FD	Trace															×
🗈 🗈 🗙 👿 🕻) ≡↓ ▼ ▲	Setting:	Filter String:			× Ta												9.	. 4	5	
Absolute Time	Counter	Chn	Identifier	FPS	Message Name	Туре	Dir	DLC	Data	BRS	ESI	00	01	02 (03 04	1 05	06	07	08	09	10
91.841186	719904	CAN 2	003			Data	Tx	8	8		54	00	00	00 (30 00	00	00	00			
91.843474	719921	CAN 1	004			Data	Rx	8	8	-	\sim	00	00	00 0	0 00	00 6	00	00			
91.844999	719934	CAN 2	004			Data	Tx	8	8			00	00	00 (0 00	00 6	00	00			
91.846778	719951	CAN 1	003			Data	Rx	8	8	-	-	00	00	00 0	0 06	00 6	00	00			
91.751739	719201	CAN 1	064	9	EngineData	FD	Tx	15	64	1	0	00	00	00 6	0 06	00 6	00	00	00	00	90
91.851486	719984	CAN 2	064	9	EngineData	FD	Rx	15	64	1	0	00	00	00 (0 06	00	00	00	00	00	00
91.855829	720021	CAN 1	001	957		Data	Tx	8	8	-		00	00	00 (30 00	00	00	00			
91.857871	720034	CAN 2	001	957		Data	Rx	8	8	-	-	00	00	00 (0 00	00 6	00	00			
91.860169	720051	CAN 1	002	950		Data	Tx	8	8	-	-	00	00	00 (0 00	00	00	00			
91.861701	720064	CAN 2	002	950		Data	Rx	8	8	-	-	00	00	00 (90 00	9 00	00	00			
ist	Al Messa	ages						0 %	b												

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.

チ ● ■ ■ 🖉 目 🖻 土 土	TSMaster v202	23.6.25.906. Built @2023-06-25 19:04:23	can413*]	? @ _ O ×
Analysis Hardware Program Simulation Application	Project Tools Help			TOSUNAR
		Trace Transmit Graphics Numeric Display Data Analysis	Latatstics Database Gauges Start Start Loggin Show CAN Database	
			Show LIN Database	
	CAN Databas	se	Show FlexRay Database	
\$ \$ ≥ \$ 0 + - ⊠ ▼ ▲		× Channel: All		
Channel Assgrment Connel (CANP) Channel Assgrment Cannel (CANP) CAL /D Overtrain 0:13:20 0:33:21 0:33:22 0:33:24 0:33:25 0:33:32 0:33:32 0:33:32 0:33:32 0:33:32 0:33:32 0:33:33 0:33:33 0:33:33 0:33:33	■ ■ CALP D Powertism ⊕ Signals (46) ⊕ Signals (47) ⊕ Messages (14) ⊕ Messages (14) ⊕ Modes (2)		Communication Matrix	* * + # = @

5.4 How to automatically record the message messages:

● ♥ @ ♥ 8 8 2 2 2	TSMaster v2023.6.25.906. Built @2023-06-25 19:04:23 [can413*]	
Analysis Hardware Program Simulation	Application Project Tools Help	TOSUNA
Stop Measurement Messages Real-time (Image: Disconnect Start Stop COS EUS Messurement Messurement Trace Transmit Graphiss Numeric Statistics Database Gata Analysis Data Analysis	
	Bus Logging ×	
	Enable Module and a settings - Log File: can4132023_06_27_17_51_41.blf	
	Data File Folder C:\ydd\gc\can413\Logging\Bus\ Defaut	
	Data Fie Name [Configuration Name][System Time] Name Rule	×
	名称 大小 项目类型 修改日期 1	
O Time Message	□ can4132023 04 20 544 KB BLF 文件 2023/4/20 13:23	
09:31:26.173 CAN 2 bit rate	「can4132023_04_20 7.69 MB BLF 文件 2023/4/20 17:57	
09:31:26.182 Bus Statistics	「can4132023_05_04 330 KB BLF 文件 2023/5/4 15:27	
09:31:26.185 Application con	Can4132023_05_05 592 KB BLF 文件 2023/5/5 9:34	
09:31:26.185 TC1016 1 31939	Can4132023_05_23 194 KB BLF 文件 2023/5/23 15:52	
09:31:26.185 TC1016 1 J1939	「can4132023 05 23 275 KB BLF 文件 2023/5/23 15:55	
09:32:40.936 Trace is in ch		
09:32:47.430 Trace is in fin	Chan4132023 05 26 2.82 MB BLF 文件 2023/5/26 11:26	
09:32:51.605 Trace is in re	门can4132023 05 30 25.9 MB BLF文件 2023/5/30 12:49	
09:32:53.786 Trace is in ch		1
09:32:54.674 Trace is in fin 09:32:55.143 Trace is in rea		
09:33:31.635 Application di		
09:33:31.635 Bus Statistics	□ can4132023_06_06 112 KB BLF文件 2023/6/6 11:05	
09:33:59.004 CAN Database po		
	Can4132023 06 07 284 KB BLF 文件 2023/6/7 17:04	
	□ can4132023 06 12 29.7 KB BLF 文件 2023/6/12 9:46	

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):

operating s

🗲 💿 🗰 🛃 🔡 📩 📩 TSMaster v2023.6.25.906. Built @2023-06-25 19.04.23 [can413*]	? 🗉 – 🗆 X
37 Analysis Hardware Program Simulation Application Project Tools Help	TOSUV间星
Start Stop Measurement Messages Real-time Connect Disconnect Start Stop Measurement Measur	g Converter g Directory deo Replay *
Bus Playback	
car4132023_05_23_15_50_51.blf 0.199	
In No. Enable / Post Process Functions	
0 % Playback Range Selection:	
Log creation time: 2023-05-23 1552:15 [3970.3859776]	

- 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

		1 Siviaster v2025.0.25.900. Bull	(@2025-06-25 13:04:25 [call415-]		· · · · ·
Analysis Hardware Program Sir	mulation Application Project Tools	Нер			TOSUNIA
🗲 🕘 🗄 💻 🛤	8 8x 🕨		iii 12 🔟 🛢 ଉ) 🕨 🛄 🔛 🚟 Log Col	
Start Stop Measurement Messages Real-tir Setup Commo		Stop Trace Transmit Measurement * *	Graphics Numeric Statistics Database Gaug	es Start Stop Bus Bus Logging Logging Logger - Replay OVideo R	Replay *
Me	easurement		Data Analysis	Logging and Replay	^
			Bus Playback	× • • 🛱 🕑	1
ë	Offine Replay 2 Online Replay				
	Row Name 1 can4132023_05_23_15_50_51	Start	Progress (%) 0 C:\ydd\gc\can413\Logging	File Name \Bus\can4132023_05_23_15_50_51.blf ×	
					3
© Time Messa 09:31:26.182 Bus St					

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

Display Name	can4132023_	05_23_15_50_51				
Source File	C:\ydd\gc\can413\Logging\Bus\can4132023_05_23_15_50_51					
Replay Settings						
Auto start on measurement start		Do no	ot auto start			
Output times		Outpu	at only once			
Output mode		Default: Tim	nestamp as log file			
Start timing conditions	1	mmediately: Direc	t send the first message	,		
Start / Stop shortcut		Pre	ess a key			
Pause / Resume shortcut		Press a key				
Force Replay	Stop playback even if an error occurs					
CAN Options						
Tx messages in log file	Send Tx messages					
Rx messages in log file	Send Rx messages					
Replay Filter	Set No Filter	Set As Pass Filter	Set As Block Filter Filter D Edit	Filter.		
	Source Chan	ne Destination Cha	annel (ignore = 0, use comma to	ser		
	1	1				
CAN Channel Mapping	2	2				
	3	3				
	4	4				
			🗸 ОК — Сап			

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		
					DLC (Data					
Bytes 1	FF	RTR	x	x	Length)					
	((Message identification code)								
Bytes 2	ID.10-ID.3									
Bytes 3	ID.2-ID.0 x x x x					х				
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	
					DLC (Data				
Bytes 1	FF	RTR	x	x	Length)				
		(Messag	e id	lent	ificat	ion co	ode)		
Bytes 2	ID.28-ID.21								
Bytes 3		ID.20-ID.13							
Bytes 4		ID.12-ID.5							
Bytes 5	ID.4-ID.0					х	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 Intelligent Technology Co., 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, Shanghai TOSUN cannot fully guarantee the timeliness and applicability of the document in any period of time. Shanghai TOSUN 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 Shanghai TOSUN regularly or contact the staff of Shanghai TOSUN regularly. Thank you for your tolerance and support!





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。

全球企业用户超4000家,用户覆盖:汽车整车厂、零部件供应商、芯片厂商、设备/服务 供应商、工程机械、航空航天及舰船军工等领域。

扫码关注 获取软件下载链接

软件

- ・UDS诊断
- ・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

- ・1/2/4/8/12通道CAN FD/CAN转USB工具
- ・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

CAN CAN lin Ch

- 解决方案
- ・EOL测试设备
- ・FCT测试设备
- ·汽车"四门两盖"试验解决方案
- ·线控底盘测试解决方案
- ·电机性能/耐久试验解决方案
- ·新能源产线设备解决方案
- ·总线一致性测试解决方案
- ·信息安全解决方案

www.tosunai.com