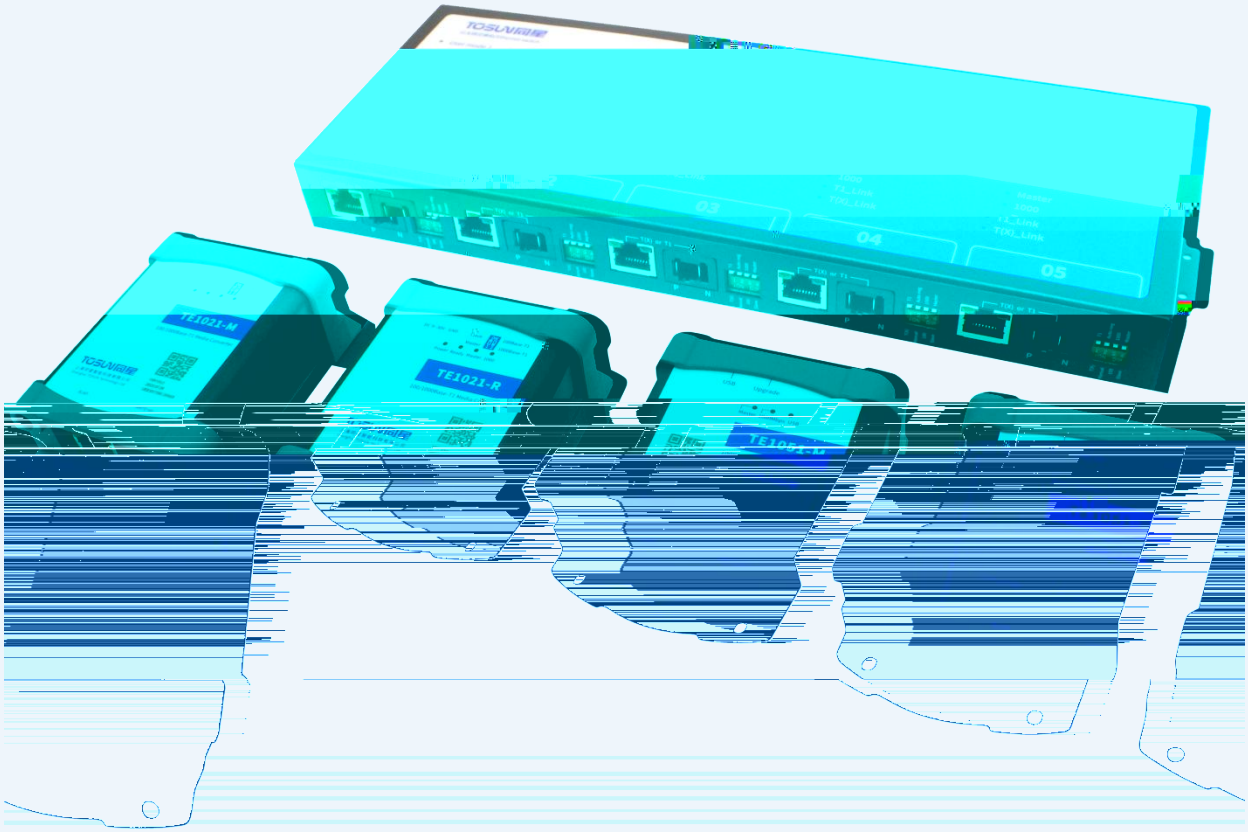
TOSUN



Version: V1.0 | English

Copyright Information

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If there are any changes to the information and data in this manual, no separate notice will be given. To obtain the latest version of the information, please visit the official website of TOSUN Technology or contact the staff of TOSUN Technology. Thank you for your understanding and support!

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TE1021

TE1051

TE1105

Product Type	Ethernet media conversion tool	Ethernet-to-USB interface tool	Ethernet switch
Number of channels	1	1	5
Ethernet Speed	Gigabit/100 Megabit	Gigabit/100 Megabit	Gigabit/100 Megabit
Ethernet Interface	RJ45+TE MATEnet or Rosenberger H-MTD	RJ45+TE MATEnet or Rosenberger H-MTD	RJ45+TE MATEnet
Galvanic Isolation	Network transformer/capacitor isolation	Network transformer/capacitor isolation	Network transformer/capacitor isolation
Power Supply	9V-30V (phoenix terminal power supply)	5V (USB power supply)	9V-28V (phoenix terminal power supply)
Case Material	Metal	Metal	Metal
Dimension	Approx. 110*70*36mm	Approx. 110*70*36mm	Approx. 332*112*30mm
Weight	Approx. 140g	Approx. 140g	Approx. 934g

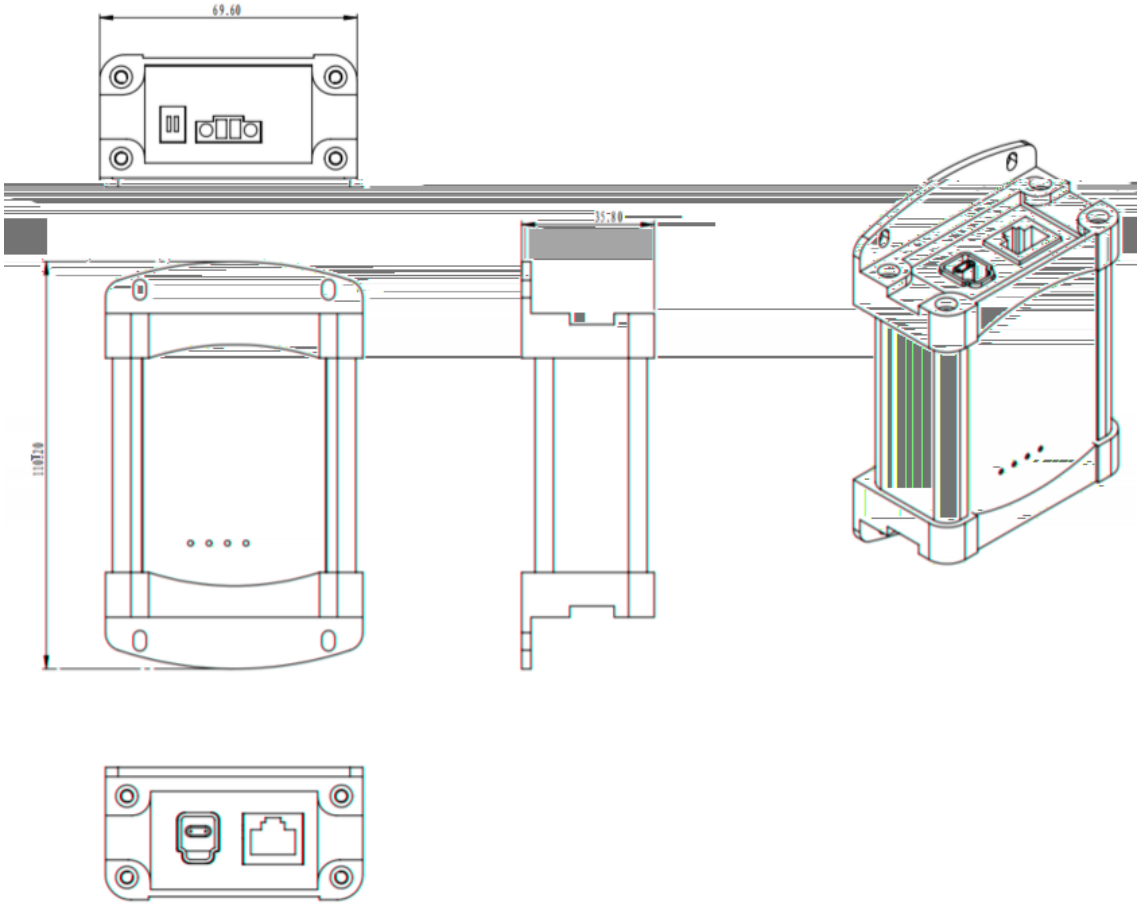
The TE1021, developed by TOSUN, is a media conversion tool that translates 100/1000Base-T1 automotive Ethernet to 100/1000Base-TX standard Ethernet. It allows mode selection between master and slave through a button, enabling lossless data conversion between automotive Ethernet and 100/1000Base-TX Ethernet. Data transfer is full-duplex in both directions, and mode configuration is easily handled through DIP switch.

The TE1021 is an ideal, cost-effective conversion tool for interfacing 100/1000Base-T1 automotive Ethernet with PC systems.

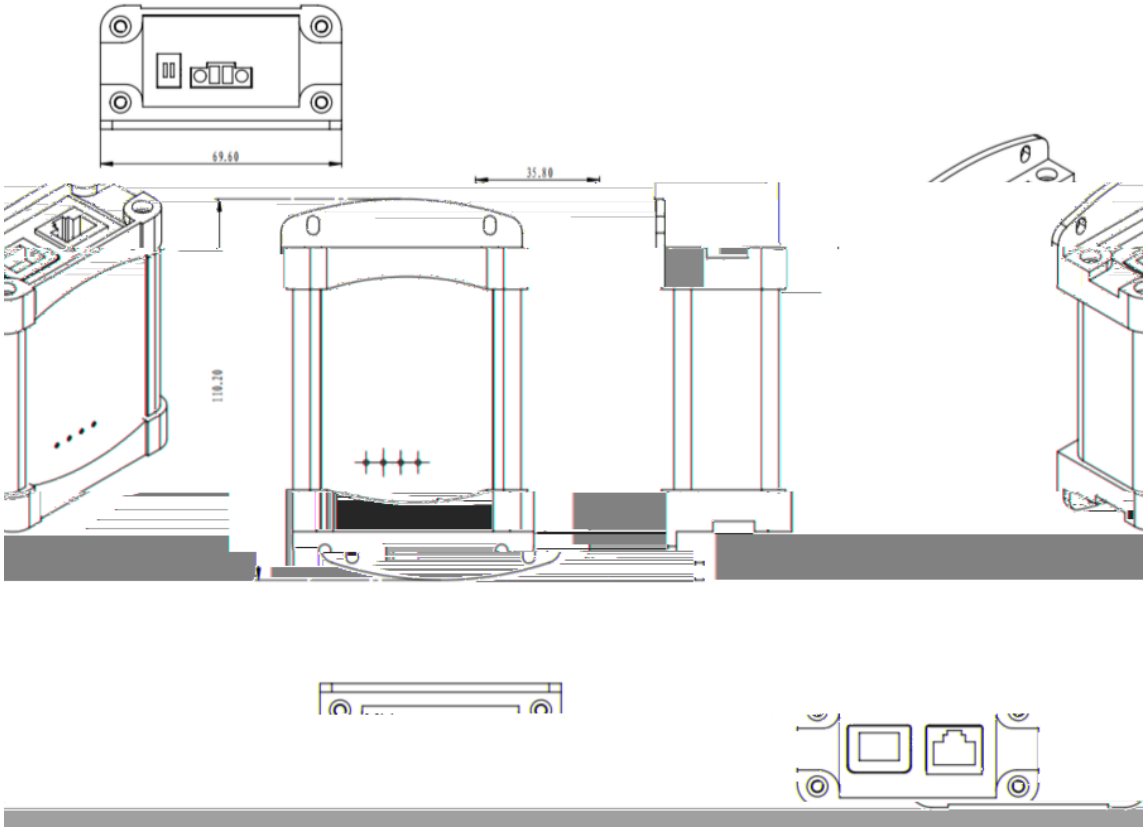
It is suitable for R&D professionals, ECU production lines, test engineers, and after-sales engineers.

- ✓ 100/1000Base-T1 100/1000Mbit/s full-duplex over 2 pairs of UTP (unshielded twisted pair)
- ✓ Lossless data conversion between automotive Ethernet and standard Ethernet
- ✓ Two automotive Ethernet interface options: TE MATEnet or Rosenberger H-MTD
- ✓ RJ45 interface with LED indicators for standard Ethernet
- ✓ LED indicators for Ethernet data communication status
- ✓ Master/slave mode,

Parameter		Test Condition	Minimum Value	Typical Value	Maximum Value	Unit
Operating Voltage	DC power supply	Ethernet conversion	9	12	30	V
Operating Current	DC power supply	Ethernet conversion	--	0.12	--	A
Power Consumption	DC power supply	Ethernet conversion	--	1.5	--	W
EMC Compatibility	EFT	IEC61000-4-4 standard	±4			



TE1021-M:

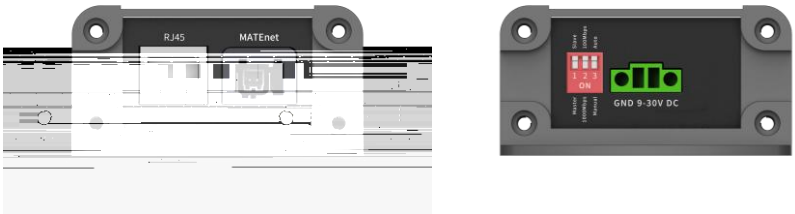


✓ Main device: TE1021

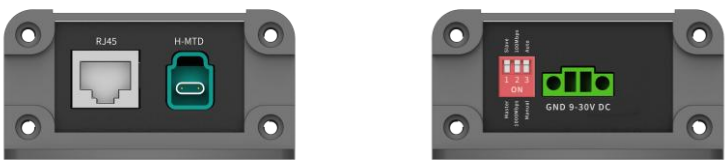
✓ Rosenberger Ethernet cable (1 male, 1 female) (optional)

✓ Rosenberger Ethernet cable (dual female) (optional)

✓ TE MATENET Ethernet cable (dual female) (optional)

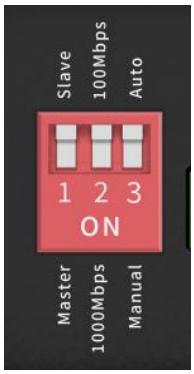


TE1021-M



TE1021-R

- RJ45 interface
- In-vehicle Ethernet Interface (MATENET or Rosenberger)
- DIP Switch



DIP	Status	Description
1	Up	Slave mode
	Down	Master mode
2	Up	100 Mbps mode
	Down	1 Gbps mode
3	Up	Enable auto-negotiation
	Down	Disable auto-negotiation

- 2-Pin phoenix terminal power supply port

* Note: The TE1021 also has a version with a two-key DIP switch (early version, which has now been replaced by the three-key version). If you receive the two-key version, the DIP switch settings are as follows：

- DIP Switch:

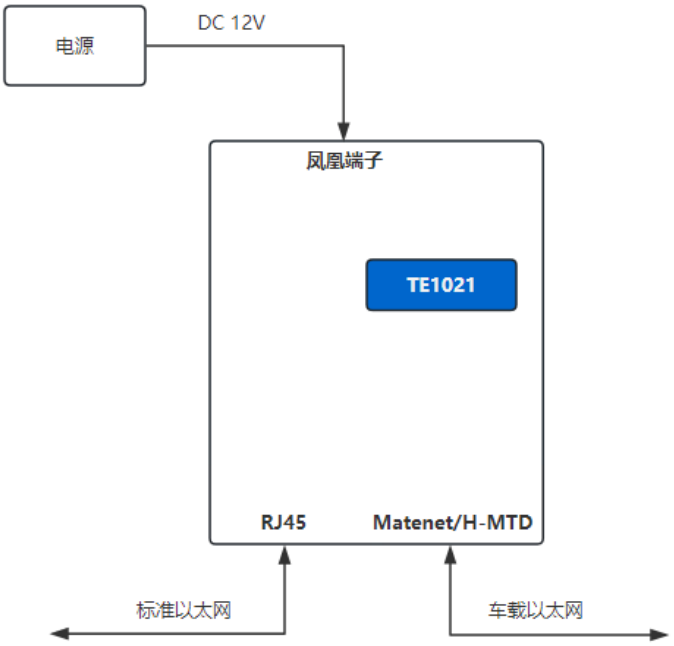
DIP	Status	Description
1	Up	Slave mode
	Down	Master mode
2	Up	100 Mbps mode
	Down	1 Gbps mode

Diagram of LED indicator:

Description of indicator:

Power	Indicator for power.	Always on when powered.
T1_Link	Indicator for T1	Blinks during T1 port communication
Master	Indicator for master/slave mode	Always on in master mode/off in slave mode

1000Mbps	Indicator for 100M/1000M	Always on in 1000M mode/off in 100M mode



The TE1021 device is powered with 12V DC via the phoenix terminal interface, and the Power LED lights up green.

By connecting the RJ45 interface to a standard Ethernet network and the Matenet/H-MTD interface to an in-vehicle Ethernet network, the device enables conversion between standard Ethernet and in-vehicle Ethernet. Configuration for master/slave mode, 1000 Mbps/100 Mbps mode, and auto-negotiation can be adjusted using the DIP switches on the TE1021 device.

The TE1051 is a tool launched by TOSUN that provides one Ethernet to USB interface.

Users can transmit data from standard Ethernet 100Base-TX/1000Base-T or in-vehicle Ethernet 100/1000Base-T1 to a PC via the USB interface. With the TSMaster software, it allows for monitoring, simulation, analysis, and testing of Ethernet data, as well as supporting functions like DoIP and SOME/IP. The TE1051 connects to the PC using a USB interface and does not require additional power, making it convenient to use.

- ✓ 100 us (microsecond) level hardware message timestamp
- ✓ Driverless design for Windows 10/11 system, and driver installation is required for Windows 7
- ✓ 1 channel 100Base-Tx 1000Base-T 100/1000Base-T1
- ✓ Selection can be switched at any time through software
- ✓ In-vehicle Ethernet interface types: TEMATEnet or Rosenberger H-MTD
- ✓ LED indicator for the operating status of in-vehicle/standard Ethernet
- ✓ LED indicator for the system operating status, including rate and master/slave mode
- ✓ In-vehicle Ethernet messages parsing;
- ✓ Supports DoIP and SOME/IP;
- ✓ Secondary development API interface for Windows system, supporting timestamped Ethernet

for easier secondary development;

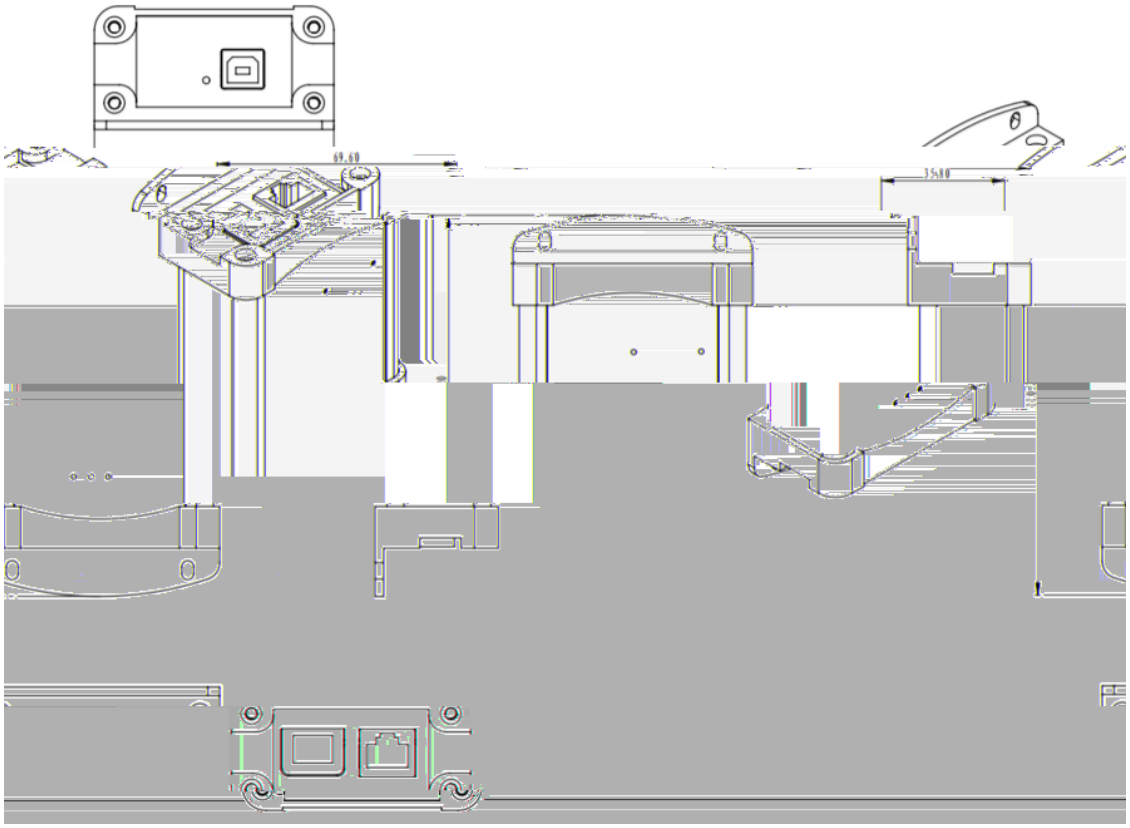
- ✓ Supports receiving/sending RAW message format, modifying message CRC and events of send completion
- ✓ Offers example projects based on API interfaces and lwIP protocol stack for TCP/IP
- ✓ Loopback maximum rate is approximately 7 Mbytes (full-duplex transmission and reception)

Channel	Standard Ethernet 100Base-TX/1000Base-T or in-vehicle Ethernet 100/1000Base-T1
PC Interface	USB 2.0 interface
Ethernet Interface	RJ45+TE MATEnet or Rosenberger H-MTD
Driver	Driverless design to offer excellent system compatibility
Timestamp Accuracy	100 us (microsecond) level hardware message timestamp
Galvanic Isolation	Network transformer/capacitor isolation
Power Supply	USB power supply
Power Consumption	1.5W
Case Material	Metal
Dimension	Approx. 110*70*36mm
Weight	Approx. 140g (without packaging)/Approx. 438g (with packaging)
Operating Temperature	-40 ～80
Operating Humidity	10% ～ 90% (non-condensing)
Operating Environment	Keep away from corrosive gases

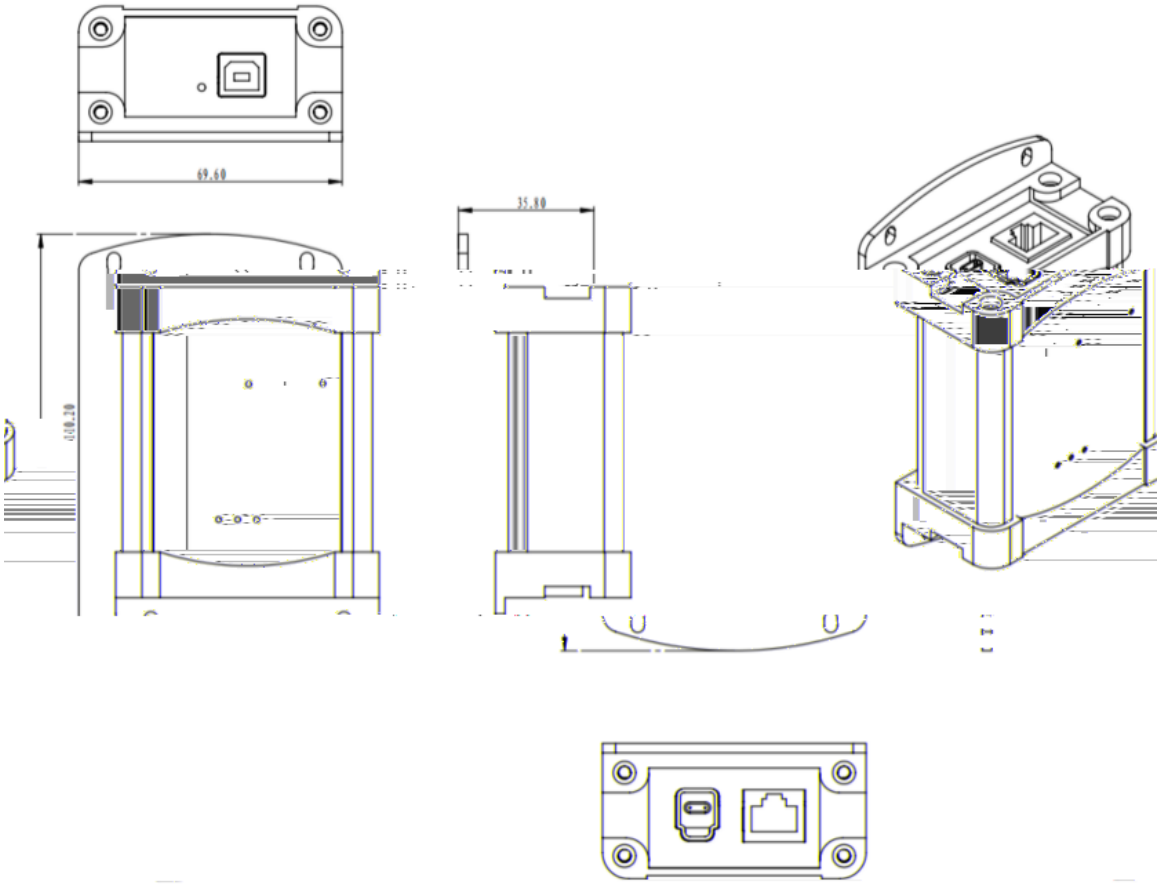
Parameter		Test Condition	Minimum Value	Typical Value	Maximum Value	Unit
Operating Voltage	USB power supply	Ethernet message transmission	4.8	5.0	5.2	V
Operating	USB power	Ethernet message	--	0.23	--	A

Current	supply	transmission				
Power Consumption	USB power supply	Ethernet message transmission	--	1.2	--	W
EMC Compatibility	EFT	IEC61000-4-4 standard	±4	--	--	kV
	ESD	IEC61000-4-2 standard	Contact discharge :±15 Air discharge :±15	--	--	kV

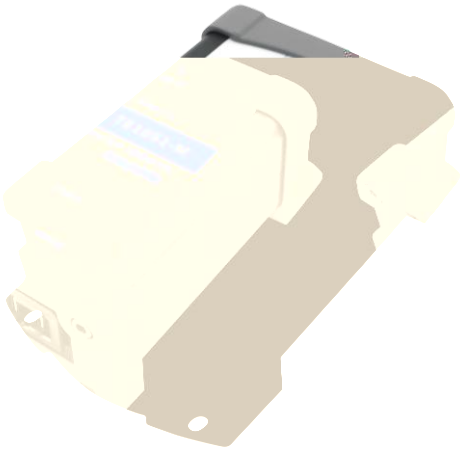
TE1051-M:



TE1051-R:



✓ Main device: TE1051



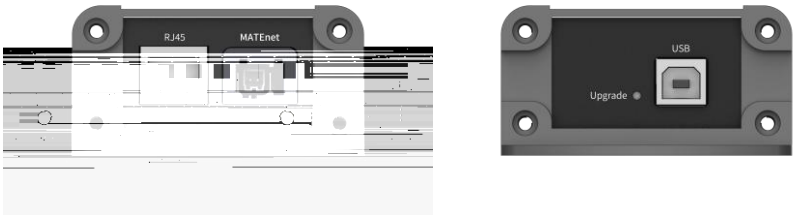
✓ USB cable*1

✓ Cat 6 Gigabit Ethernet cable*1

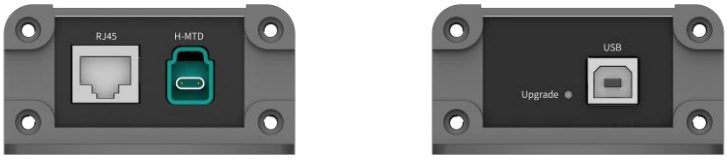
✓ Rosenberger Ethernet cable (1 male, 1 female) (optional)

✓ Rosenberger Ethernet cable (dual female) (optional)

✓ TE MATENET Ethernet cable（dual female）(optional)



TE1051-M



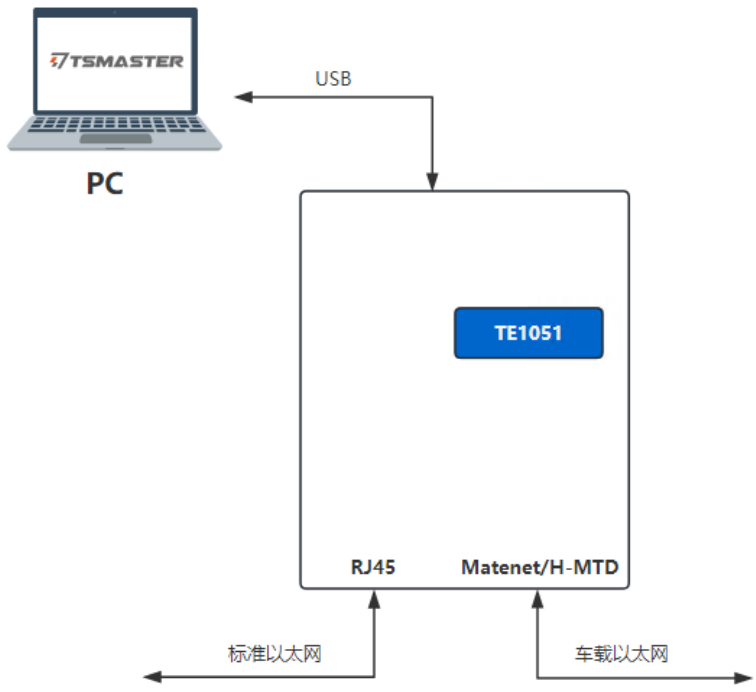
TE1051-R

- RJ45 interface;
- in-vehicle Ethernet interface (MATENET or Rosenberger);
- USB 2.0 interface;

Diagram of LED indicator:

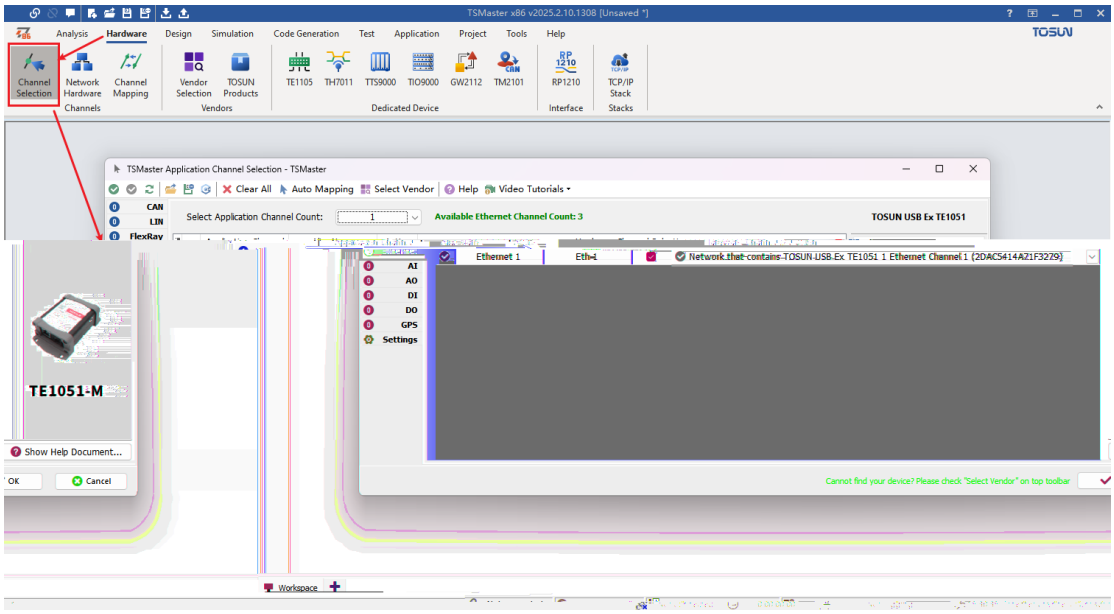
Description of indicator:

Master	Indicator for master/slave mode	Always on in master mode/off in slave mode
1000Mbps	Indicator for 100M/1000M	Always on in 1000M mode/off in 100M mode
USB	Indicator for USB	Always on when USB is connected
T/TX-Active	Indicator for T/TX	Blinks during standard Ethernet communication
T1-Active	Indicator for T1	Blinks during in-vehicle Ethernet communication

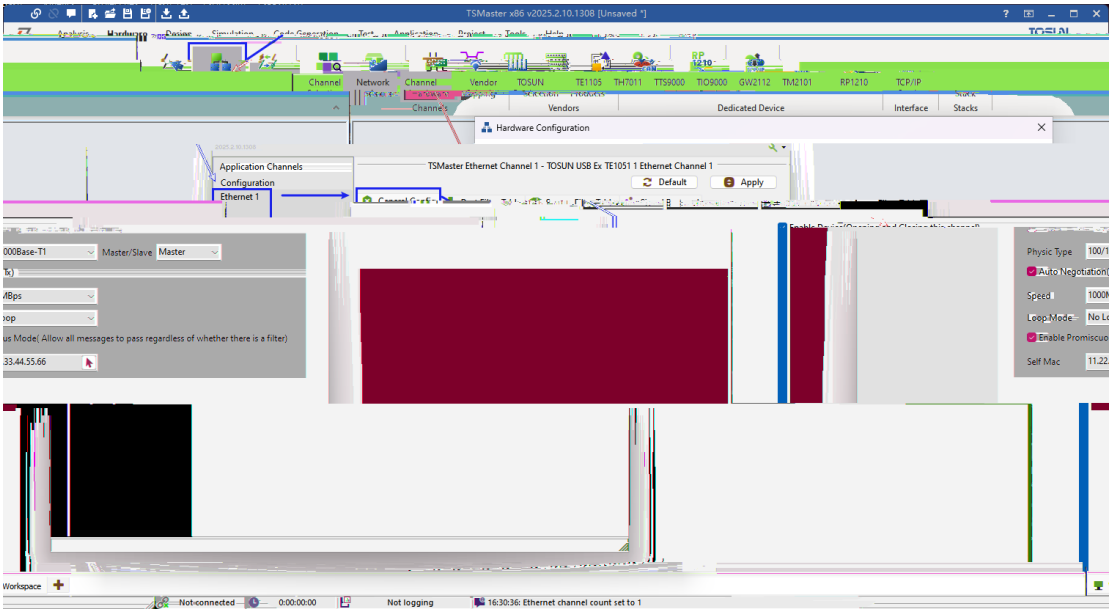


Connect the TE1051 device's USB port to the PC, and connect the standard Ethernet interface or in-vehicle Ethernet interface to the ECU. This allows users to monitor, simulate, analyze, and test Ethernet data on the PC using the TSMaster software. After purchasing the TOSUN licensed license, users can also use DoIP and SOME/IP functionalities.

In TSMaster, click Hardware->Channel Selection->Ethernet, and select the TE1051 hardware.



In Network Hardware, select the Ethernet channel, and users can configure the Ethernet-related parameters.



After the configuration, click Analysis->Start and connect the TE1051 device to efficiently carry out works such as bus development, testing, ECU production line, etc. with the powerful

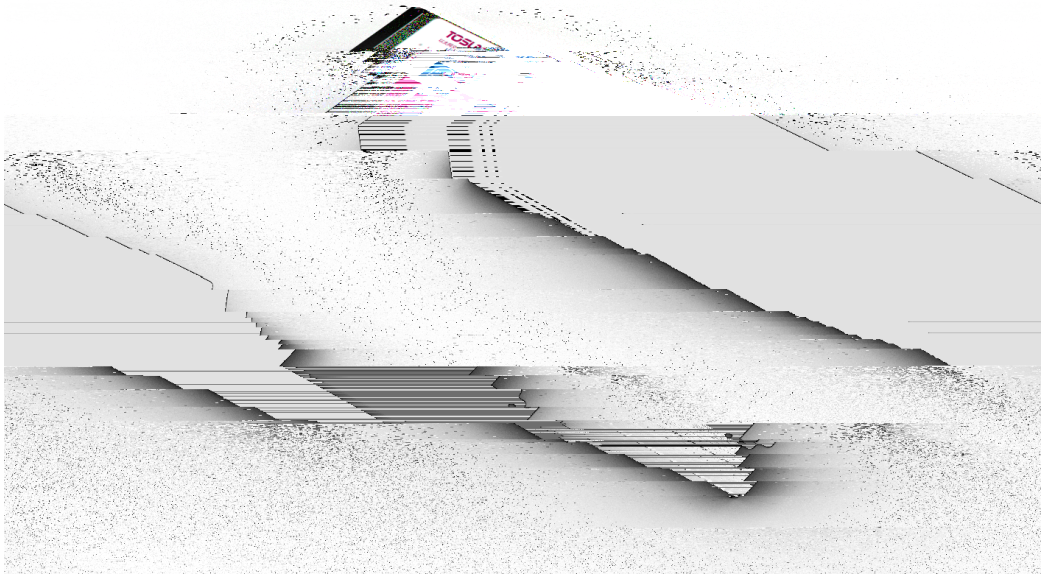
TSMaster software. For more detailed instructions on using the TSMaster software, please refer to the TSMaster software manual and the quick start guide.

The TE1105 is a 5-port Ethernet switch launched by TOSUN. It enables data exchange and message monitoring between any port of standard Ethernet (100Base-TX/1000Base-T) or in-vehicle Ethernet (100/1000Base-T1) and the terminal network.

It supports IEEE 802.1Q (VLAN) mode, MAC filtering during mirroring, IEEE 802.1Qav AVB traffic shaping, and IEEE 802.1Qat time-sensitive scheduling.

The device allows users to select between normal mode and custom mode via button. A DIP switch can toggle between master mode and slave mode, enabling lossless conversion of Ethernet data between automotive Ethernet and 100/1000Base-TX Ethernet. The TE1105 is an ideal, cost-effective converter tool between 100/1000Base-T1 automotive Ethernet and PC systems.

It is suitable for R&D professionals, ECU production lines, test engineers, and after-sales engineers.

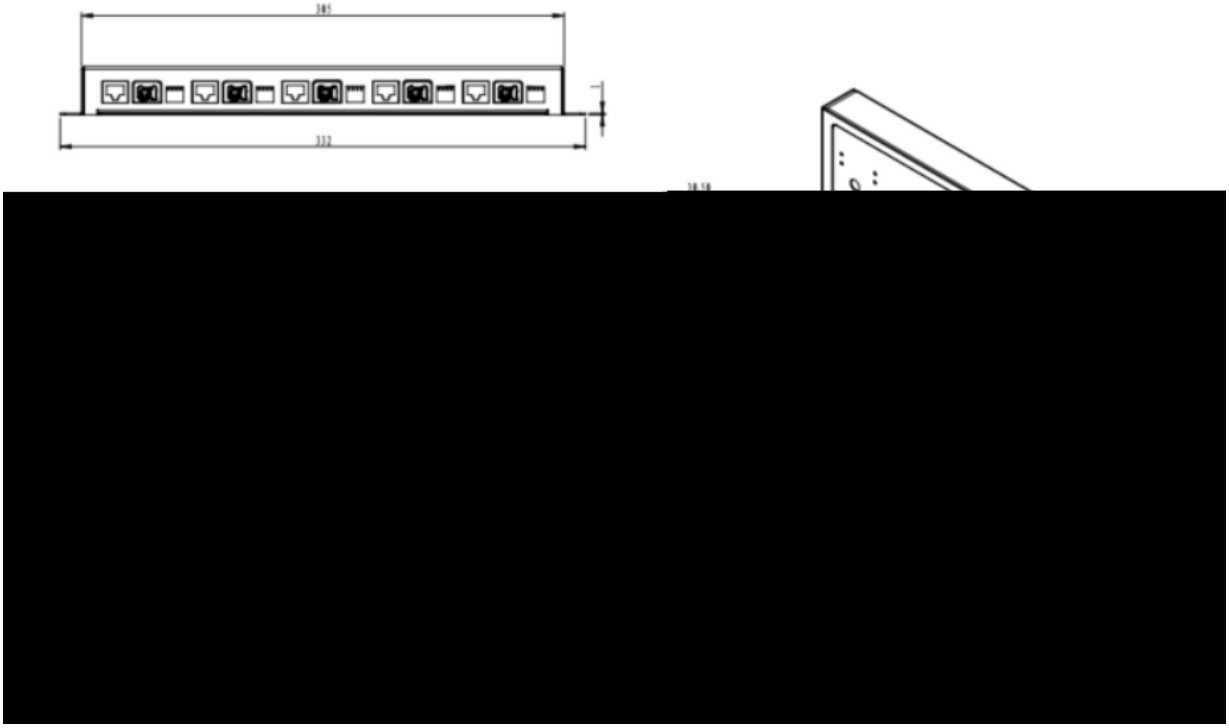


- ✓ 5 ports for 100Base-Tx/1000Base-T and 100/1000Base-T1, which can be switched at any time via DIP switches
- ✓ In-vehicle Ethernet interface type: TEMATEnet
- ✓ Supports Ethernet packet forwarding and monitoring
- ✓ Supports 2 custom configurations for defining VLAN, TSN time scheduling, AVB traffic shaping, and port filtering rules, etc.
- ✓ Mirror function: Allows for message mirroring using a pair of in-vehicle Ethernet channels
- ✓ Transparent function: Enables direct message transmission to the PC via RJ45
- ✓ LED indicator for the operating status of in-vehicle/standard Ethernet
- ✓ Master/slave mode, 100/1000Mbps configurable via DIP switches, with LED status display
- ✓ High-quality cables

Channel	5 ports for 100Base-Tx 1000Base-T, or in-vehicle Ethernet 100/1000Base-T1
PC Interface	USB 2.0 interface
Ethernet Interface	RJ45+TE MATEnet

Galvanic Isolation	Network transformer/capacitor isolation
Power Supply	DC9-28V (phoenix terminal power supply)
Power Consumption	6W
Case Material	Metal
Dimension	Approx. 332*112*30mm
Weight	Approx. 934g (without packaging)/ Approx. 1569g (with packaging)
Operating Temperature	-40 ～80
Operating Humidity	10% ～ 90% (non-condensing)
Operating Environment	Keep away from corrosive gases

Parameter		Test Condition	Minimum Value	Typical Value	Maximum Value	Unit
Operating Voltage	DC power supply	Ethernet data exchange	9	12	30	V
Operating Current	DC power supply	Ethernet data exchange	--	0.47	--	A
Power Consumption	DC power supply	Ethernet data exchange	--	5.7	--	W
EMC Compatibility	EFT	IEC61000-4-4 standard	±4	--	--	kV
	ESD	IEC61000-4-2 standard	Contact discharge :±15 Air discharge :±15	--	--	kV



- ✓ Main device: TE1105

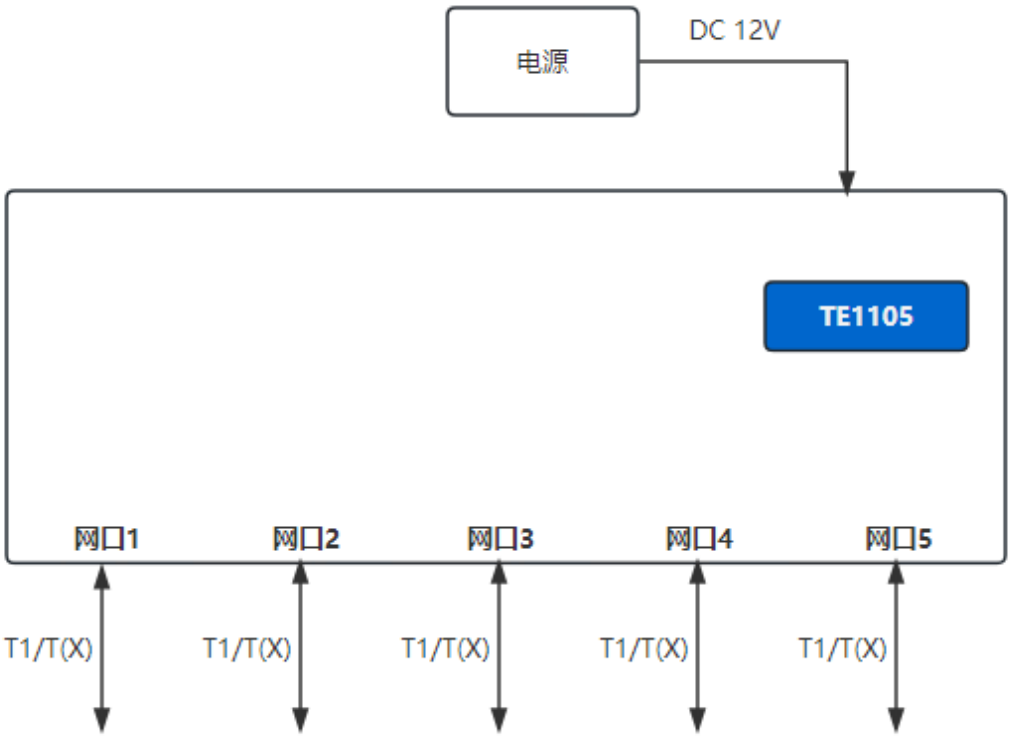
- ✓ USB cable*1

- ✓ 12V 2A power adapter *1

✓ MATENET Ethernet cable *5

- 2-Pin phoenix terminal power supply port
- DC power supply port
- USB 2.0 interface
- Ethernet interface (MATENET)
- DIP switch:

	Indicator for USB	Always on when USB is connected
User mode1	Indicator for user custom mode 1	Always on when this mode is turned on
User mode2	Indicator for user custom mode 2	Always on when this mode is turned on
Normal	Indicator for normal mode (switch mode)	Always on when this mode is turned on
Port mirroring	Indicator for port mirroring mode	Always on when this mode is turned on
Master	Indicator for master/slave mode	Always on in master mode/off in slave mode
1000Mbps	Indicator for 100M/1000M	Always on in 1000M mode/off in 100M mode
T1_Link	Indicator for T1 port link.	Blinks during T1 port communication
T(X)_Link	Indicator for T(X) port link.	Blinks during T(X) port communication



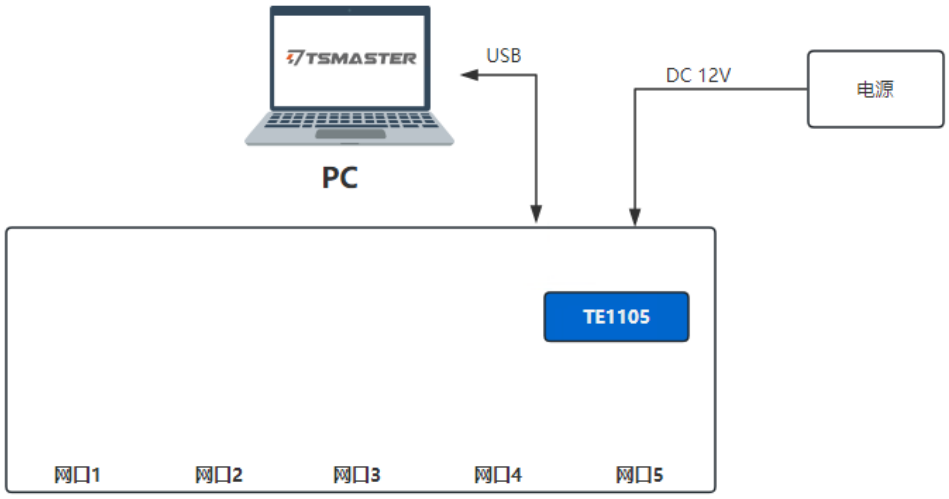
1. Switch mode (normal mode)

In normal mode, the switch determines which port to forward a data packet to base on the destination MAC address of the received packet. In this mode, the switch learns the MAC addresses of each port and builds a MAC address table to optimize the packet forwarding path, ensuring effective communication between devices in the network.

2. Port mirroring Mode

Port mirroring mode allows for copying packets from one or more source ports to another port (mirror port), while the packets from the source ports continue to be forwarded normally. This mode is typically used for network monitoring and analysis, including both inbound and outbound packets. The mirror port mode is very useful for network fault diagnosis, performance evaluation, and security auditing.

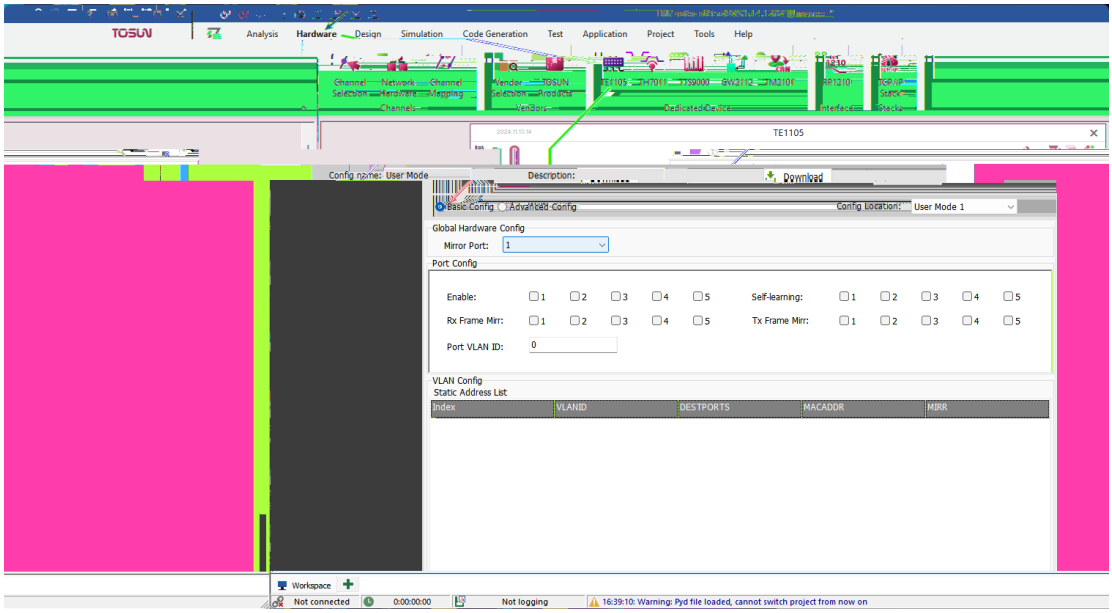
3. User Mode



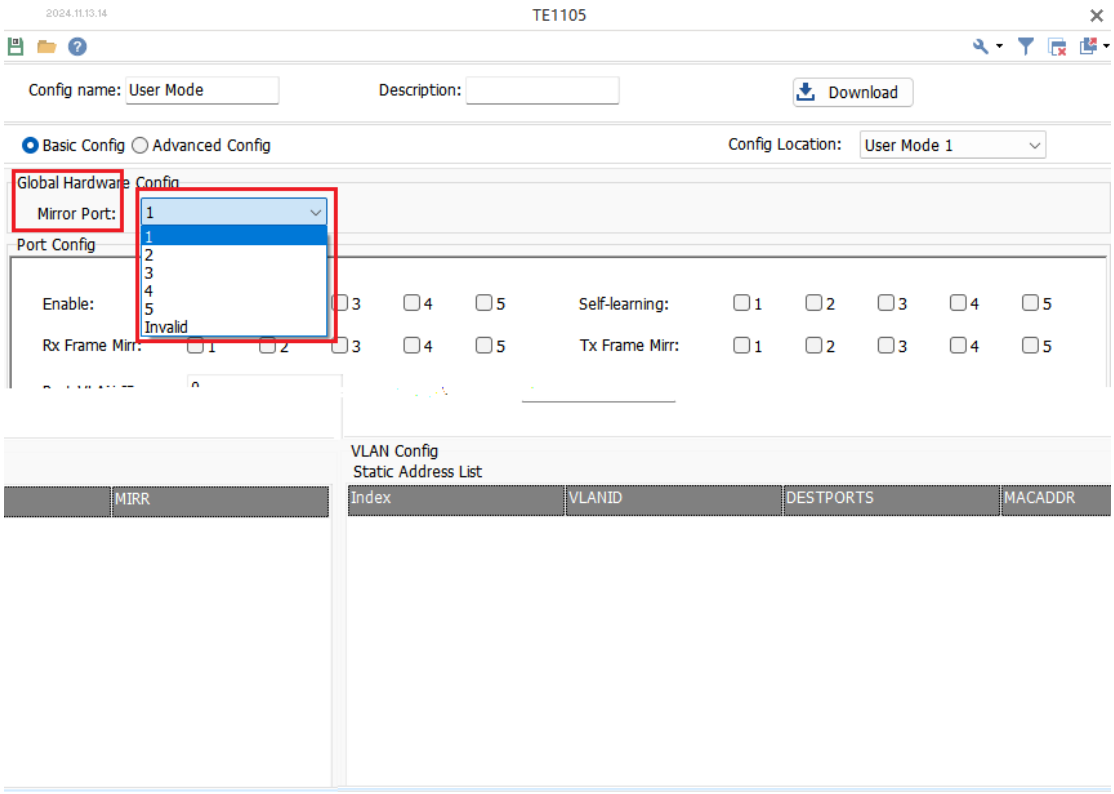
User custom mode requires connecting the TE1105 device to a PC via USB, and using TSMaster on the PC for custom configuration.

Basic Configuration:

(1) Open the TSMaster software, click Hardware, and select TE1105, then select “Basic Config” to open the configuration panel.



Global Hardware Config: Mirror Port --- 1~5 indicates that the port is a mirror port, while "Invalid" means there is no mirror port.



Port Config:

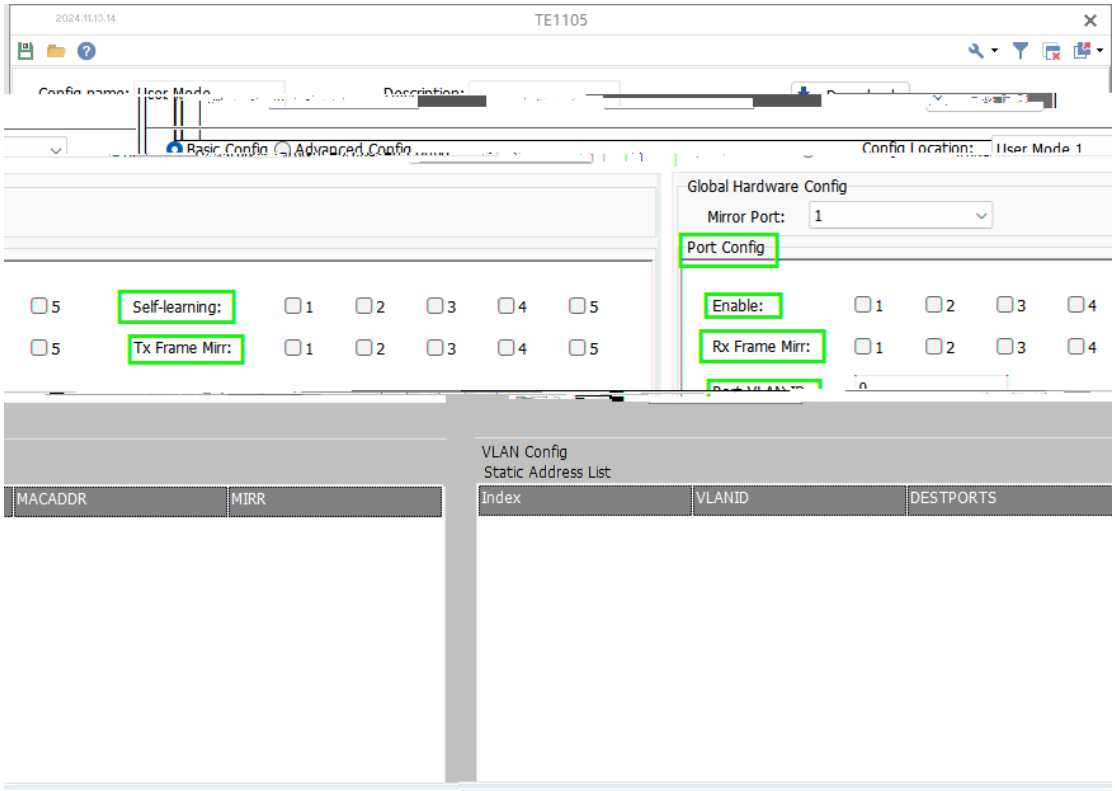
Enable: Indicates whether the receive and transmit functions of the corresponding port are enabled.

Self-learning: Activates the self-learning feature for the corresponding port.

Rx Frame Mirr: Mirrors the frames received on the corresponding port to the mirror port.

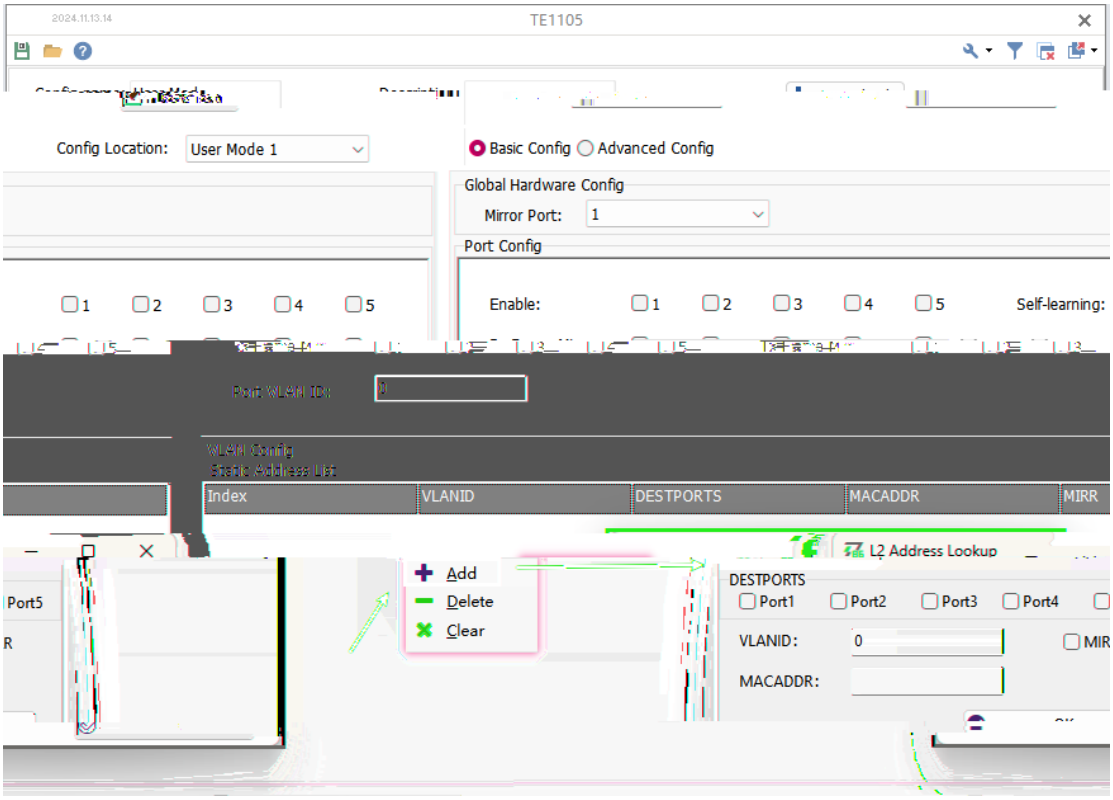
Tx Frame Mirr: Mirrors the frames sent from the corresponding port to the mirror port.

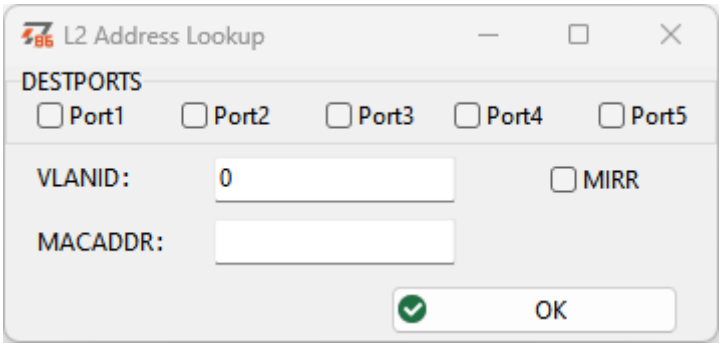
Port VLAN ID: Configurable VLAN ID range is 0-4095. If the switch receives a frame without a VLAN tag, it will automatically tag the frame with this VLAN ID and priority.



(2) Static Address List (supports a maximum of 1024 entries)

Right-click to open the selection window, the MACADDDR format is in the standard MAC address format.

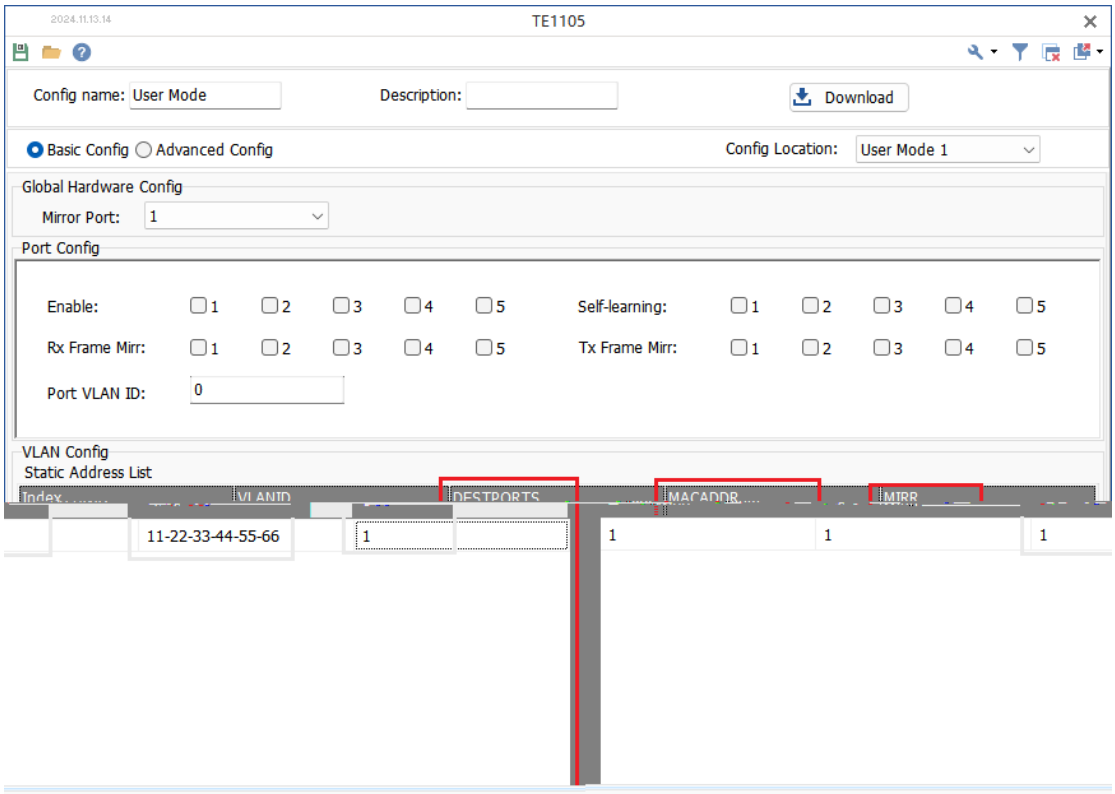




DESTPORTS: If the MAC address and VLAN ID of the received packet match this entry, the packet will be forwarded to the corresponding selected port.

MACADDRE: MAC address (FF-FF-FF-FF-FF-FF format)

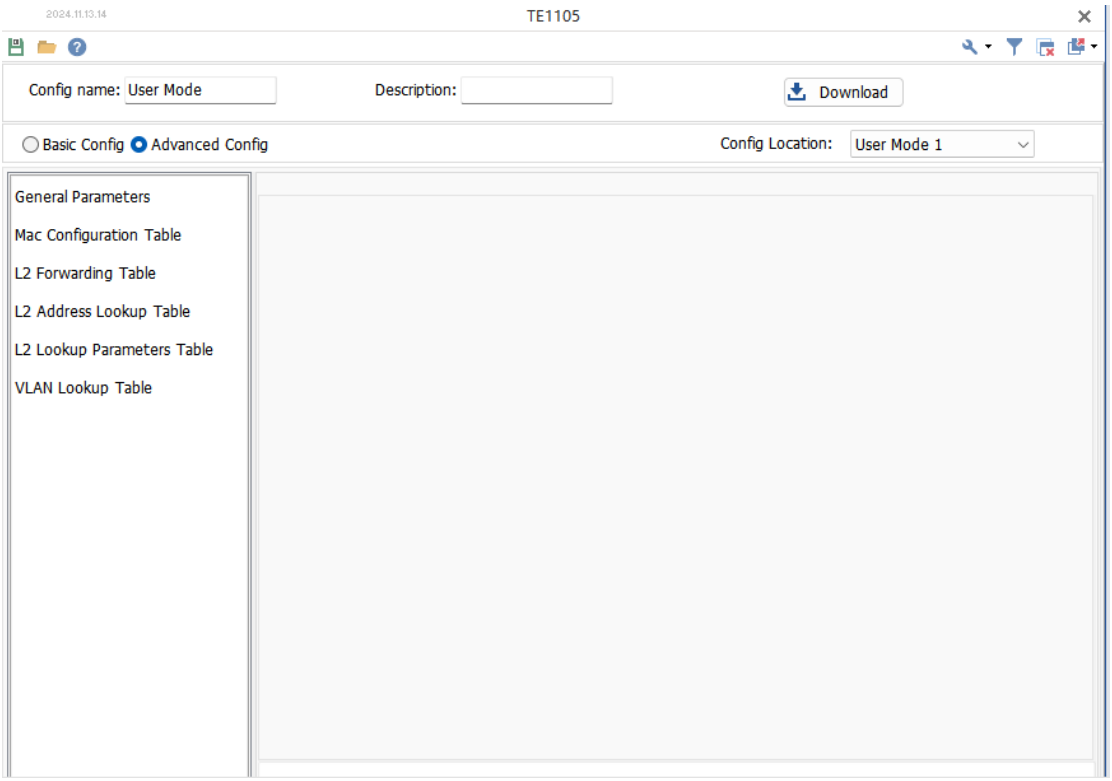
MIRR: When set to 1, if the destination or source MAC address of the frame matches, the switch will mirror that frame to the mirror port (as specified in the Global Hardware Config above).



Advanced Configuration:

The left-side navigation bar includes six submodules: General Parameters、Mac Configuration Table、 L2 Forwarding Table、L2 Address Lookup Table、L2 Lookup Parameters

Table and VLAN Lookup Table. By clicking on the corresponding submodule, the specific configuration interface will be displayed on the right side, allowing users to configure as needed.



After completing the basic or advanced configuration, click "Download" to download the parameters settings to the TE1105. During the download process, the USB indicator will blink slowly, and once the download is completed, the USB indicator will change from slow blinking to fast blinking.

The main electrical components of TE series products 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 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	No accumulation	Clean and protect the equipment.

	metal shavings		
	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.

TOSUN

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Multi channel automotive Ethernet/CAN FD to USB/PCIe device

TTS test systems

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