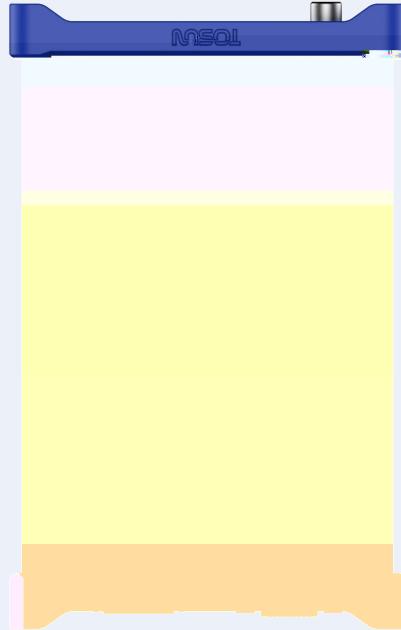




1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

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1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

Copyright Information

Shanghai TOSUN Technology Ltd.

No. 9 Building, 1288 Jiasong North Road, Jiading District, Shanghai (Headquarters)

Buildings 14-17, Lane 4849 Cao'an Highway (Shanghai Research Institute)

In an effort to provide users with the best possible service, Shanghai TOSUN Technology Ltd. (hereinafter referred to as “TOSUN Technology”) has made every attempt to present accurate and detailed product information as possible in this manual. However, due to the time-sensitive nature of the content, TOSUN Technology cannot guarantee the timeliness and applicability of the content at all times.

| | |
|---|---|
| Product Features & Interface Overview | 2 |
| 1. Introduction | 4 |
| 1.1. Technical Specifications | 4 |
| 1.2. Electrical Specifications | 5 |
| 1.3. Ö | |

The TX1000 is a high-speed calibration device that connects to a PC via an RJ45 Ethernet interface. Featuring a driverless design for Windows systems, it offers excellent system compatibility. When used with the powerful TSMaster software, TX1000 supports connections to ARM and AURIX series MCUs. The supported debugging protocol is DAP (JTAG/SWD are not currently supported and will be added in future releases).

TX1000 supports operations such as modifying the ECU program counter (PC) for jump control, program halt, and resume. Through the debug interface, it enables high-speed memory access to ARM/AURIX-based ECUs without affecting the normal execution of ECU code. In addition, TX1000 can also be used for ECU calibration based on the XCP protocol.

Included resources:

- CAN FD monitoring software TSMaster
- Cross-platform secondary development library (with a dedicated programming manual)



| | |
|---------------------|---|
| PC Interface | USB 2.0, RJ45 Ethernet |
| Timestamp Precision | Microsecond-level high-precision timestamps |
| Driver | Cross-platform, driver-free design |
| Connector | Standard D-Sub, 9-pin |
| License | Supports all TSMaster paid licenses |
| Relay Type | Magnetic latching relay |
| Power Supply | USB-powered, external DC power (9-36 V) |
| Power Consumption | 4 W |
| ESD Protection | ± 4 kV contact |

| | |
|-----------------------|--|
| Dimensions | Approx. 178 * 113* 38 mm |
| Weight | Approx. 420 g (without package)/775 g (with package) |
| Operating Temperature | -40 to +80 |
| Operating Humidity | 10% ~ 90% RH (no condensing) |



| | |
|--------------------------|---|
| | |
| Connection Standard | High-speed CAN (ISO 11898-2 compliant) |
| Supported Protocols | Full support for CAN and CAN FD (ISO 11898-1 compliant) |
| CAN Baud Rate | 125 kbps ~ 1 Mbps |
| CAN Frame Data Length | Up to 8 bytes |
| CAN FD Baud Rate | 125 kbps ~ 8 Mbps |
| CAN FD Frame Data Length | Up to 64 bytes; supports BRS frames |
| Max Frame Rate | Transmit: 20,000 frames/s; Receive: 20,000 frames/s (single channel, 1Mbps, remote frame, 0 data bytes) |



| | | | | | |
|-------------------|------------------|-----|-----|----|---|
| | | | | | |
| Operating Voltage | USB power supply | 4.8 | 5.0 | -- | V |
| Operating Current | USB power supply | -- | 0.6 | -- | A |
| Power Consumption | USB power supply | -- | 3 | -- | W |



| Bus Pin Tolerance
Voltage | CAN_H, CAN_L to GND | -58 | -- | 58 | V |
|------------------------------|---------------------|------|----|----|-----|
| Isolation Voltage | Leakage 1mA | 2500 | -- | -- | VDC |



| ESD | IEC 61000-4-2 | Contact discharge | ± 4 | kV |
|-----------|---------------|---------------------------|---------|----|
| | | Air discharge | ± 8 | kV |
| EFT/Burst | IEC 61000-4-4 | Electrical fast transient | ± 2 | kV |



Unit: mm

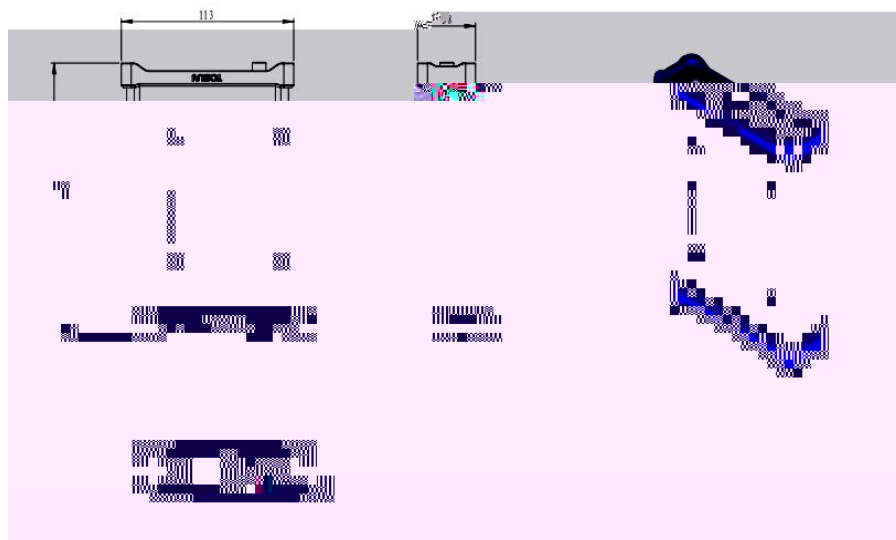


Figure 1-1 Mechanical Dimensions



Figure 1-2 Hardware Interface

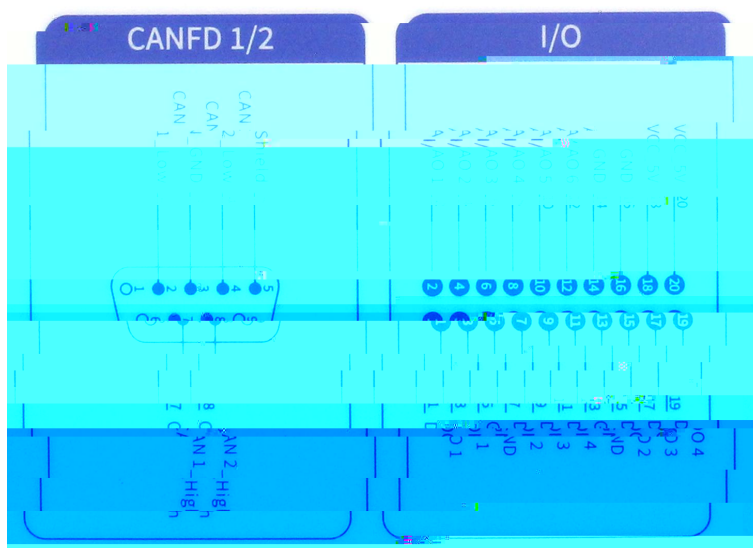


Figure 1-3 Pin Assignment



Figure 1-4 Front Panel Layout



| Power | Status of power indicator |
|----------|--|
| MCD | Status of high-speed calibration indicator |
| Link | Hardware connection indicator |
| CAN FD 1 | Status of CAN FD channel 1 |
| CAN FD 2 | Status of CAN FD channel 2 |



| CAN FD | Green | Normal frame transmission/reception |
|--------|-------|-------------------------------------|

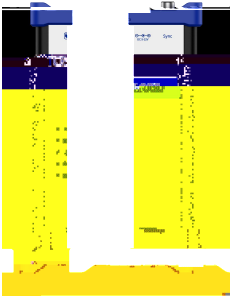
| | | |
|------|-------|---|
| | Red | Frame transmission/reception error — configuration, protocol, or wiring fault |
| Link | Green | Device connected successfully |



- Operating System: Windows or Linux
- One available USB port (USB 2.0 or higher), or a powered USB hub





| | | | |
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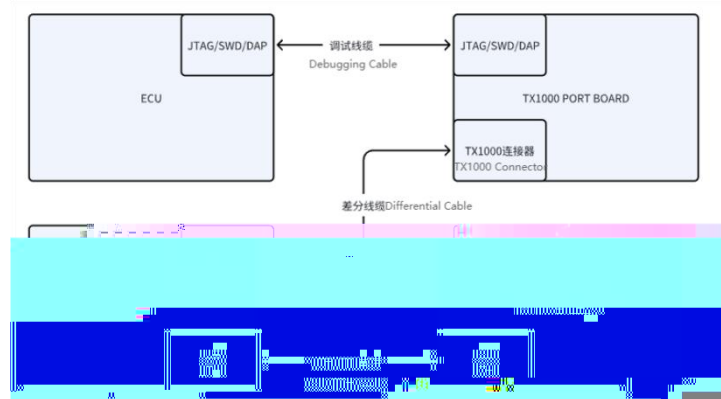


For details on the paid accessory “CAN Surge Protector”, please refer to the appendix.



The TX1000 device is connected to the PC via Ethernet (RJ45). The TX1000 is connected to the POD board through a differential cable, while the ECU is connected to the POD board using JTAG / SWD / DAP debugging cables.

On the PC side, when used together with the powerful TSMaster software, the TX1000 device can be controlled to perform XCP measurement, memory read operations, and more.



TO

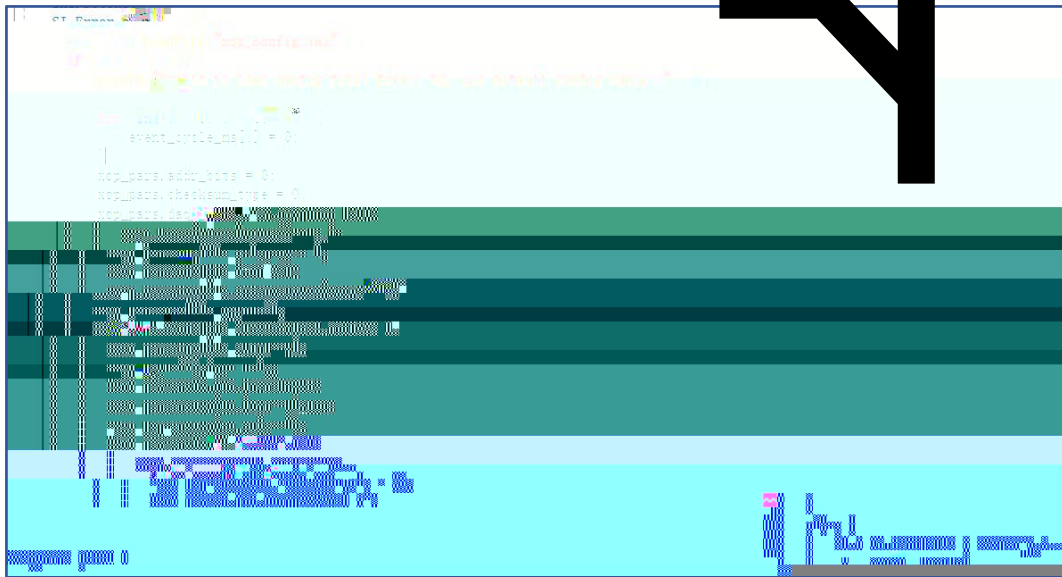


Figure 2-5 XCP ON TX1000 Configuration Parameter Demo

First, the initialization stage requires loading

WGHYBDS SP LI QWBRV F
to configure the internal IP protocols

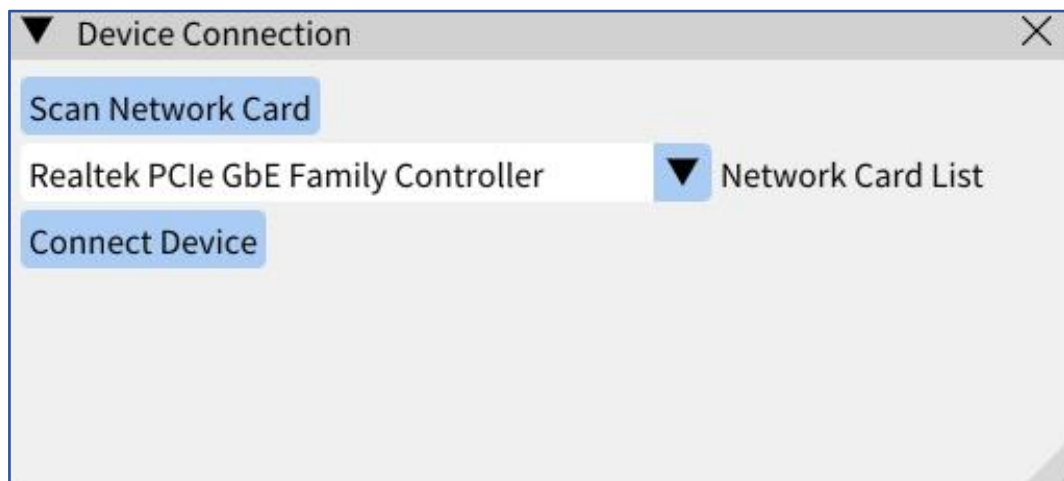


Figure 2-9 TX1000 Device Connection Interface

On the main interface, the device connection status can be viewed. Click “Disconnect Device” to disconnect from the device.

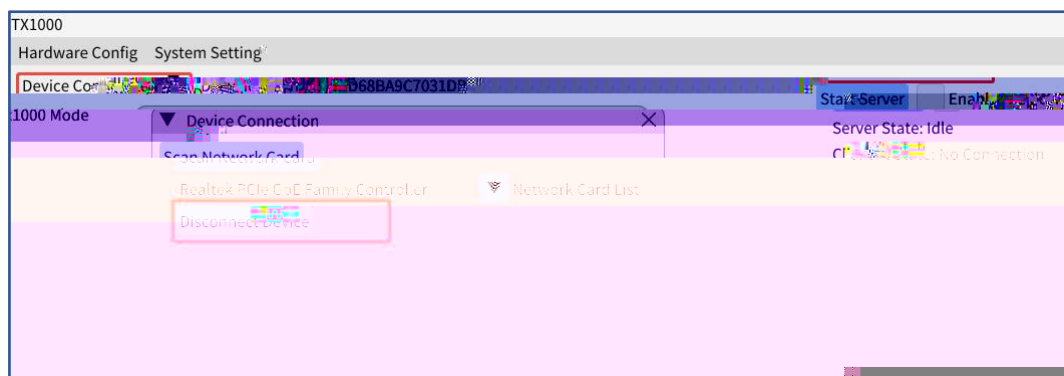


Figure 2-10 TX1000 Device Connected

Enter the parameter configuration interface to set various parameters. After the server is started, these parameters will be sent to the TX1000

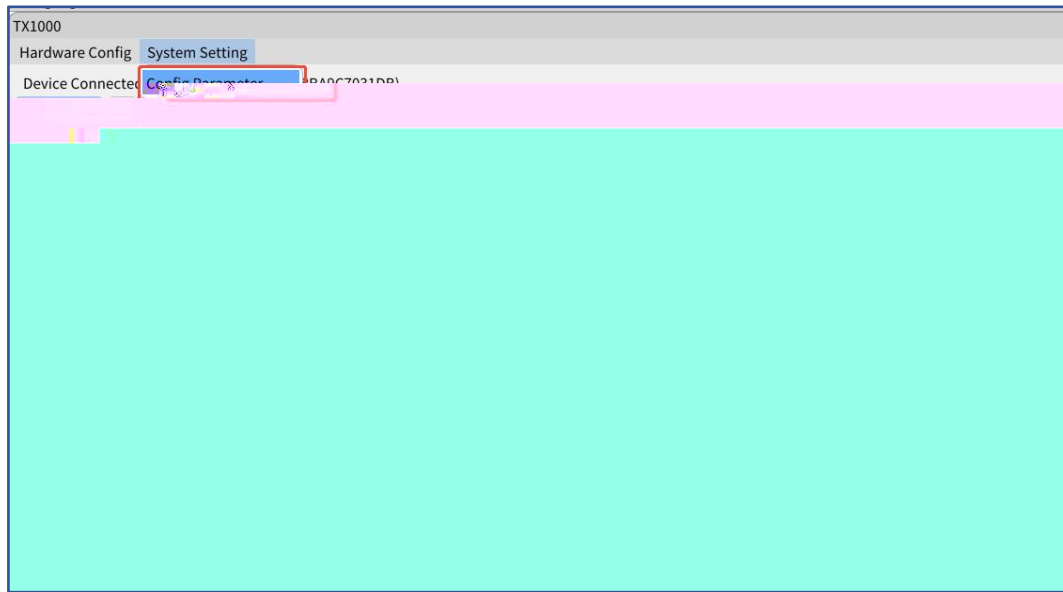


Figure 2-11 Parameter Configuration Interface

This interface provides three buttons with the following functions:

- Load configuration file parameters: loads parameters from the file into the interface.
- Save configuration parameters to file: saves the parameters currently shown in the interface to the xcp_config.ini file.
- Reset to default parameters: resets all parameters in the interface to system default values, without automatically saving them to the file.

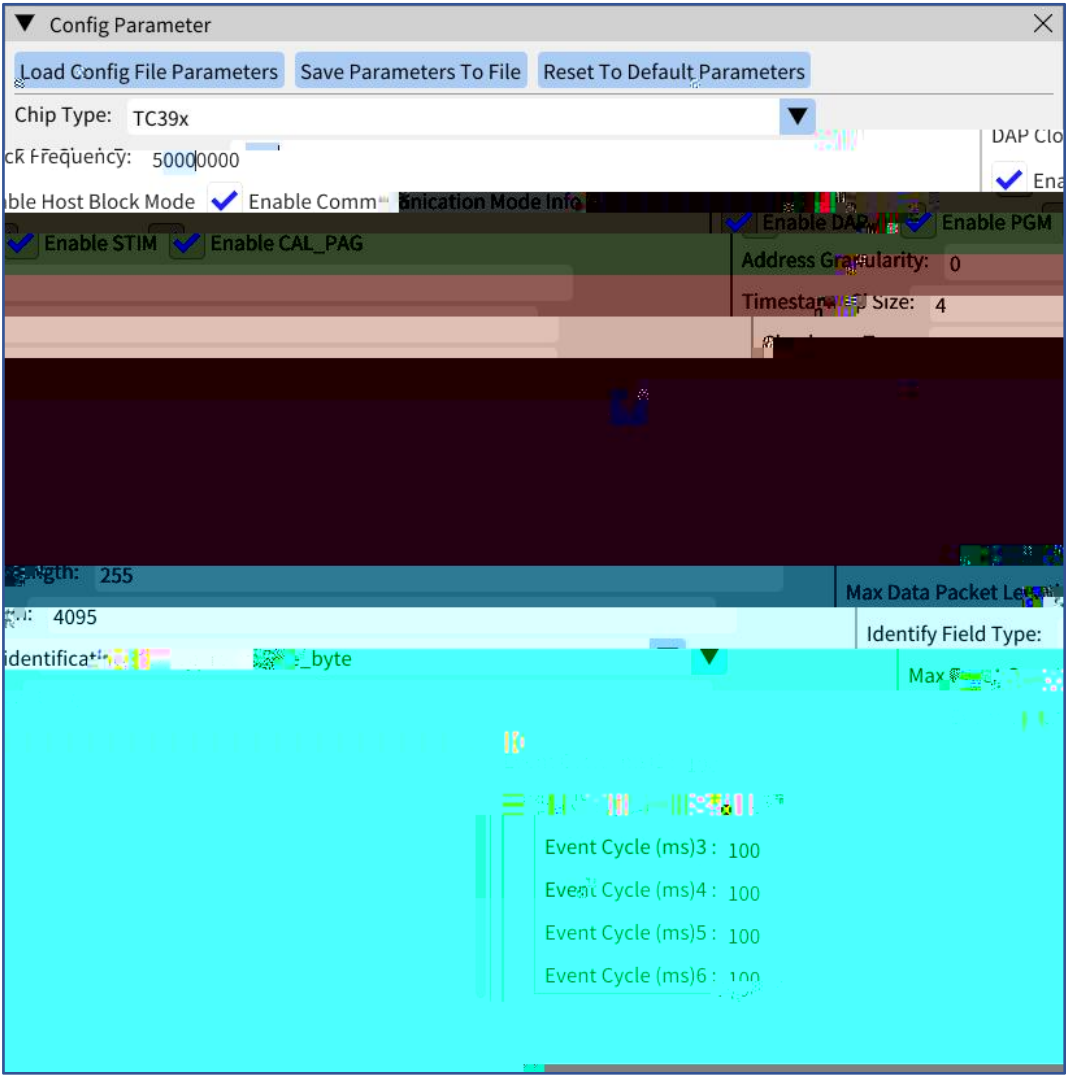


Figure 2- 3

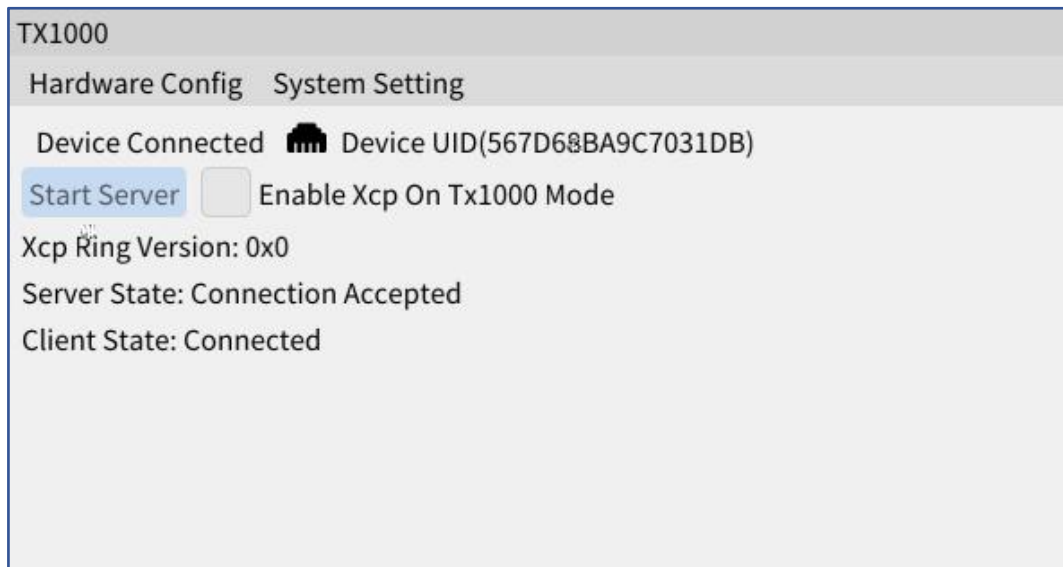


Figure 2-13 Start XCP Server

1. Before using TSMaster, the STATION APP or STATION GUI APP must be started first. After startup, open the TX1000 Demo project in TSMaster.
2. To test XCP in TSMaster:
 - Click “Applications” in TSMaster, then open the Calibration Manager.

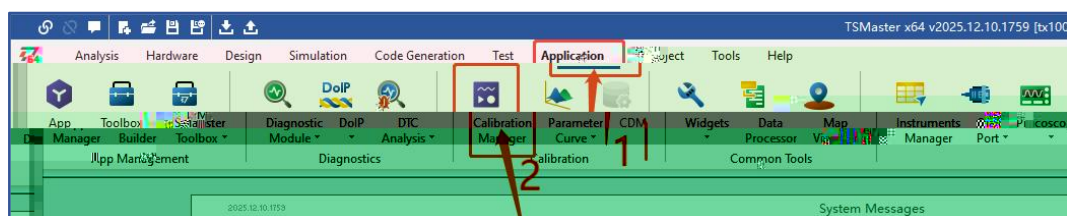


Figure 2-14 TSMaster Calibration Manager

- Import the A2L file and configure the transport layer as

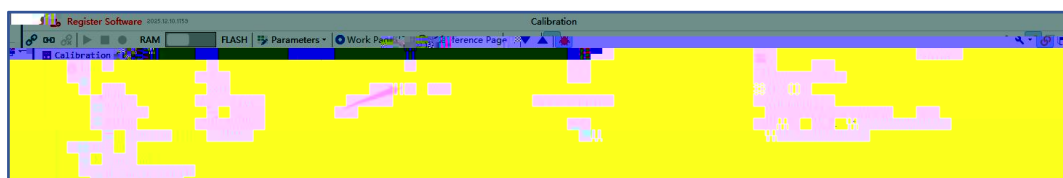
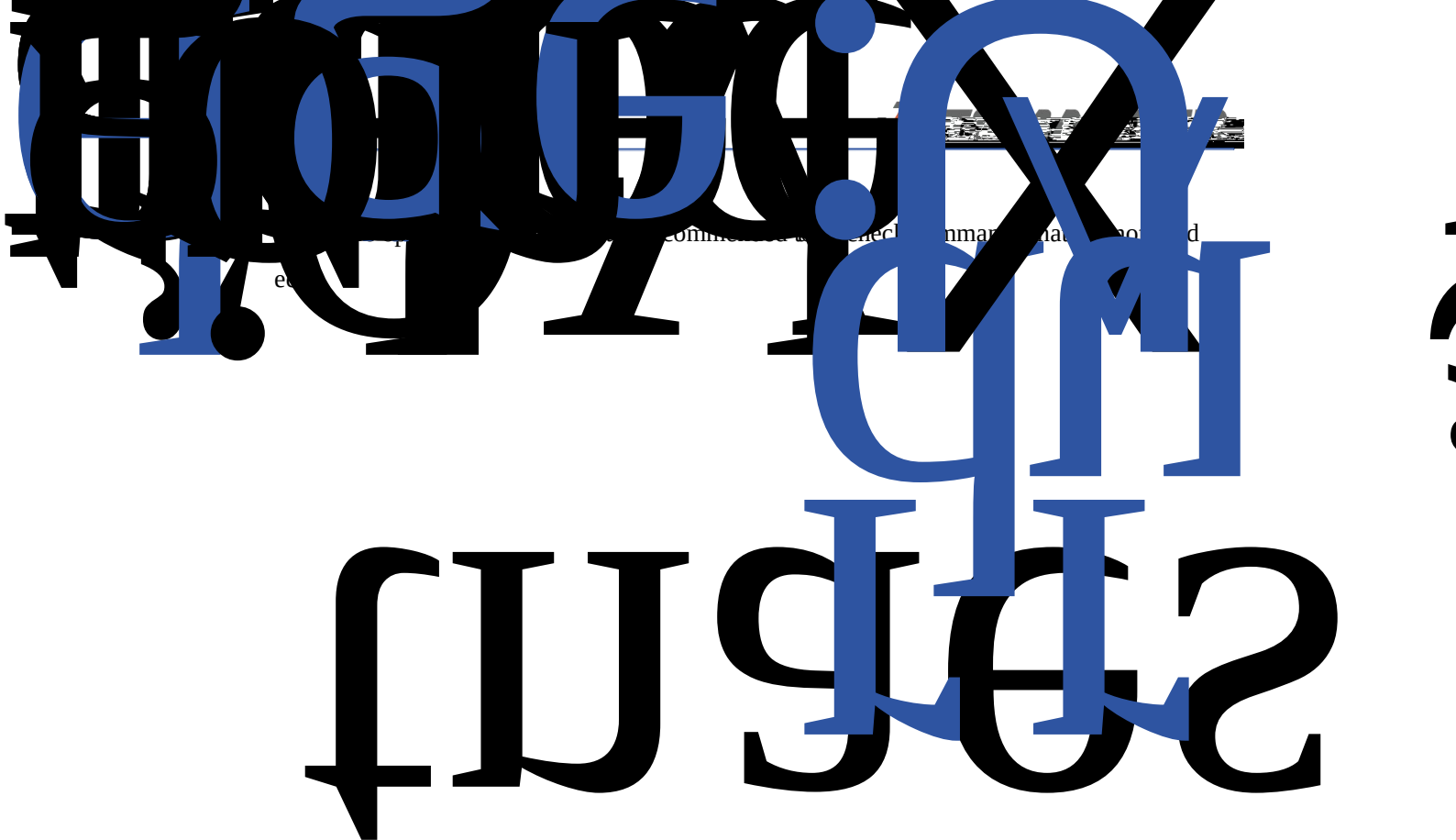


Figure 2-15 Configure XCP ON ETH



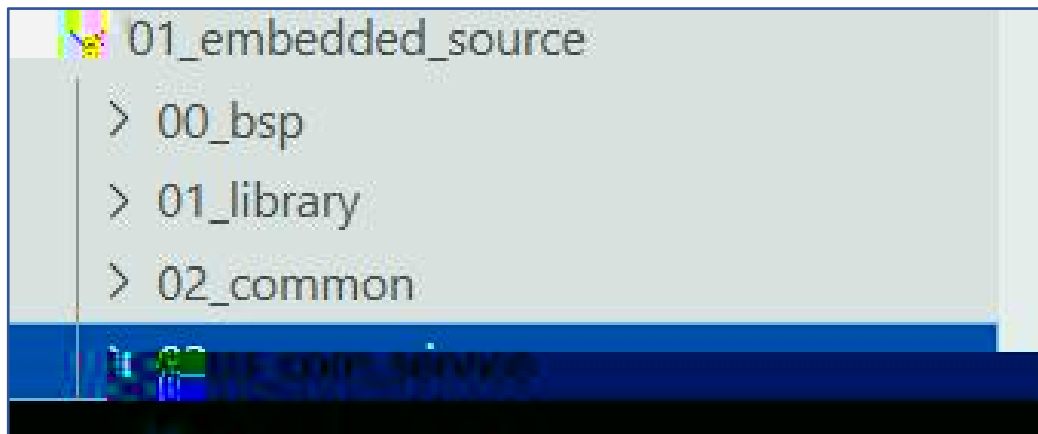


Figure 2-20 XCP Code Directory

- Then, refer to the code in [XCP Code Directory](#) and modify the initialization configuration:
- Modify the parameters of the [XCP_CONFIGURATION](#) structure, including the XCP version and XCP Tx/Rx buffer parameters.
- Configure parameters used by the XCP protocol stack, mainly including memory usage (allocate two contiguous memory regions: one for the protocol stack and one for DAQ), memory configuration, Seed and Key algorithm parameters.
- The [XCP_GetData](#) function is provided for viewing data during upload (optional).

- Pass the initialized parameters to the `init_handler` function in `main.c`. If the function returns a non-null value, initialization is considered complete. The returned pointer is used as the handler for `sigint`.



```

void* tosun_xcp_setup(struct tosun_xcp_init_pars_t* init_pars_p)
void tosun_xcp_handle();
void tosun_xcp_event_handle(void* xcp_p, uint16_t event_idx);
#endif // __cplusplus

```

Figure 2-22 XCP API

- After initialization, calibration and measurement can begin. According to application requirements, place the `tosun_xcp_handle()` function in a periodic task. The scheduling period can be adjusted based on the calibration and measurement signals. For XCP events, insert the `tosun_xcp_event_handle(xcp_p, event_idx)` at the corresponding measurement points to implement DAQ functionality. A simplified pseudo-code example is shown below:

```

void* xcp_p = NULL;
struct tosun_xcp_init_pars_t init_pars;

void task_10ms(){
    uint16_t event_idx = 0;
    uint16_t daq_val = 0;
    xcp_p = tosun_xcp_setup(&init_pars);
    while(1){
        delay_ms(10);
        tosun_xcp_handle();
        daq_val = 0;
        tosun_xcp_event_handle(xcp_p, event_idx);
    }
}

```

Figure 2-23 Simplified Pseudo-code Example



You may also scan the QR code below to follow the official WeChat account and obtain download links.



Figure 3-2 TOSUN Official WeChat Account



1. Double-click the TSMaster installer and select the installation language.

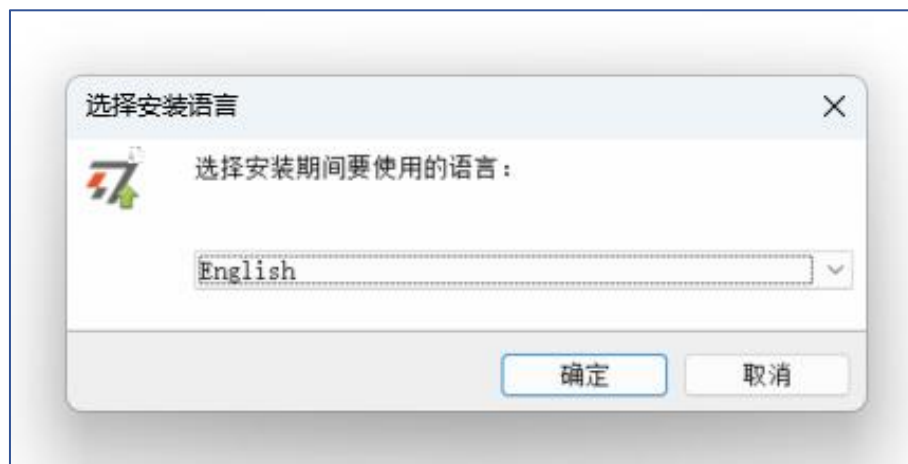


Figure 3-3 TSMaster Installation

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



Figure 3-5 TSMaster Installation

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

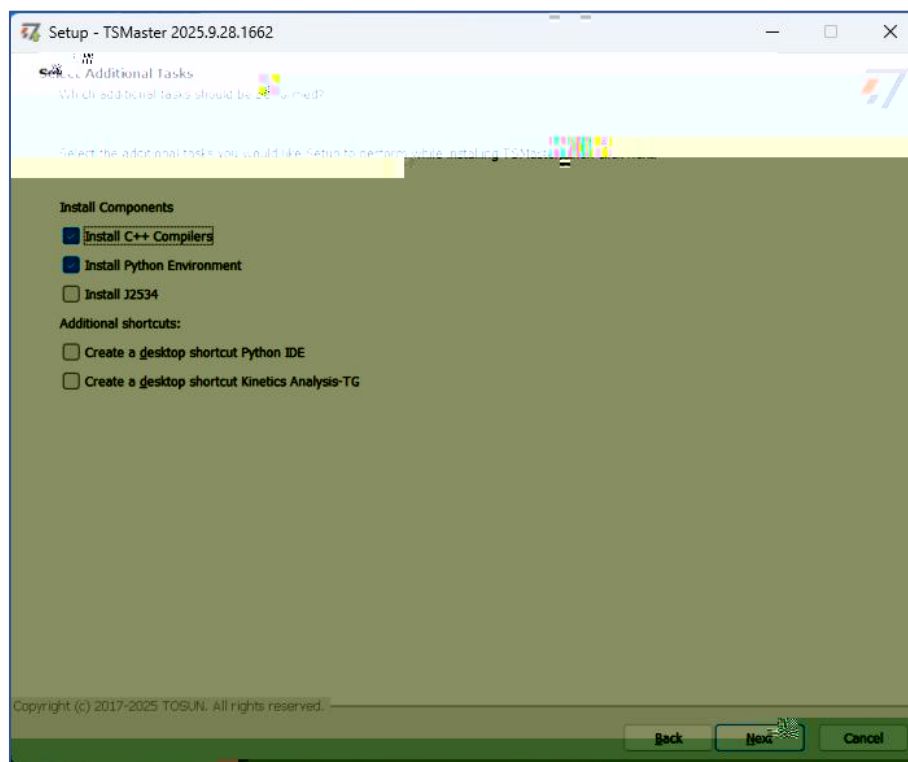


Figure 3-6 TSMaster Installation

5. Click “Install” and wait for completion.

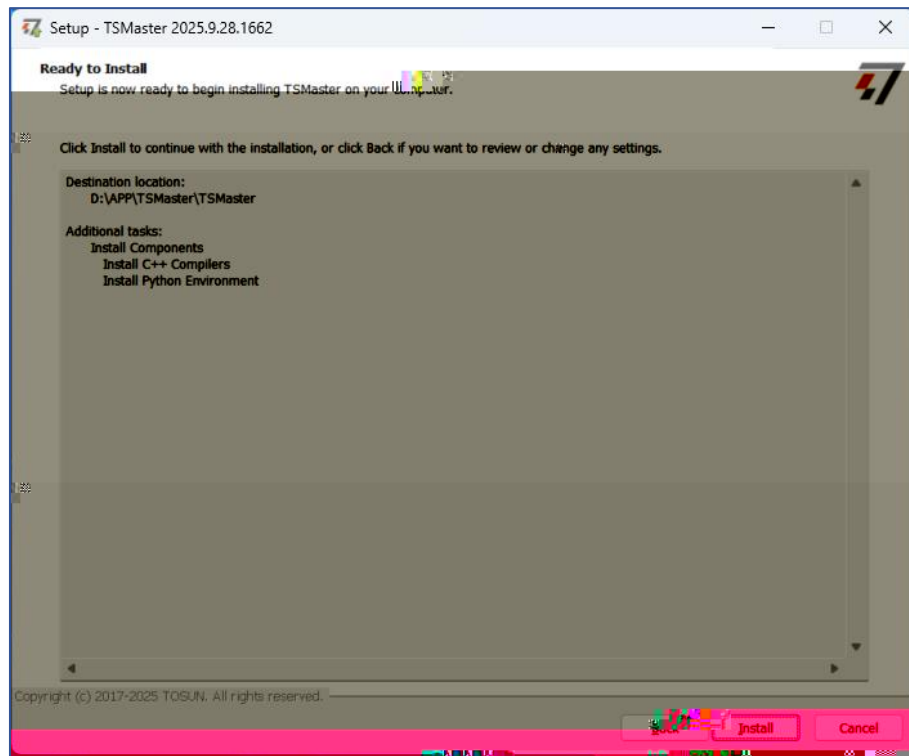


Figure 3-7 TSMaster Installation

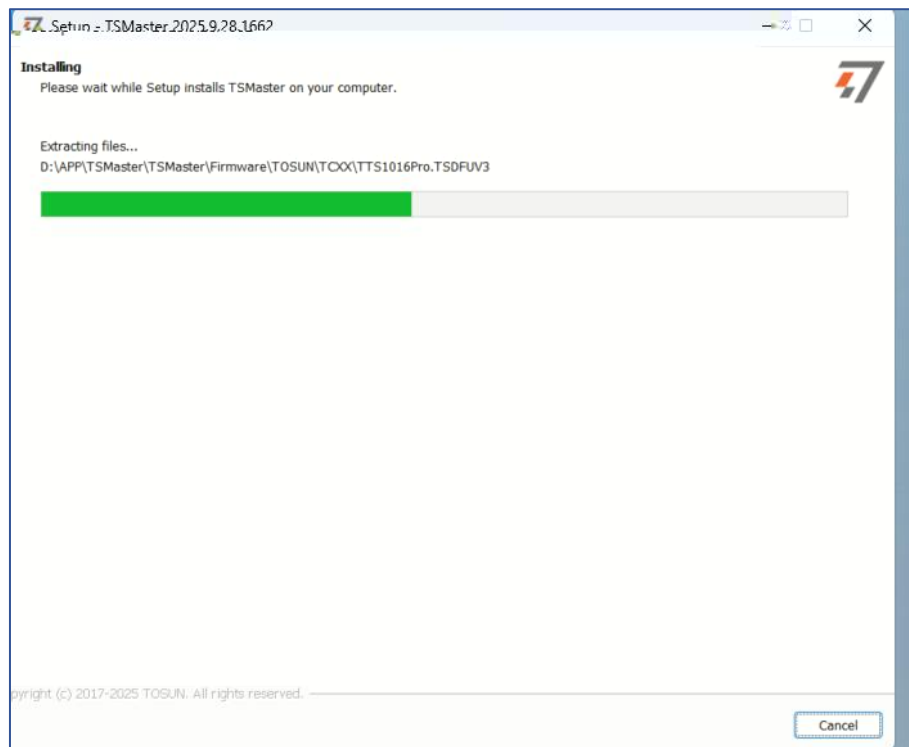


Figure 3-8 TSMaster Installation

The TX1000 primarily contains semiconductor components, which typically have a long service life. However, adverse environmental conditions may accelerate aging and degrade performance. To ensure proper operation, regular inspections are recommended to maintain the required environmental conditions.

It is recommended to inspect the device at least once every 6 to 12 months. In harsher environments, inspections should be performed more frequently. Refer to the table below for inspection criteria and recommended actions. If issues persist, please contact Shanghai TOSUN Technology Ltd.



| Power Supply | Check voltage fluctuation at power input | USB port:+5V DC
Power port:
+12V DC | Use a power meter or voltmeter at the input; ensure voltage fluctuation is within range |
|--------------------|--|---|---|
| Ambient Conditions | Check ambient temperature (including internal temperature within enclosures) | -40 ~ +80 | Use a thermometer to ensure temperature is within specified range |
| | Check the ambient humidity (including internal humidity within enclosures) | 10% ~ 90% RH | Use a hygrometer to ensure humidity is within specified range |





