ZD

# Vehicle Bus Tool

## Product Description

ZD VBT (Vehicle Bus Tool) is a comprehensive automotive bus tool platform software independently developed by ZD, specifically designed to meet the needs of modern automotive development. This software integrates various functions such as node simulation, bus recording, signal analysis, diagnosis, calibration, script writing, etc., and can efficiently support the use of ZD Box series and ZD USB CAN series hardware products.

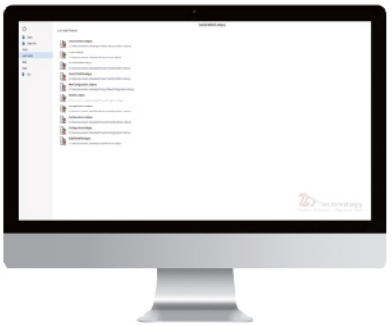
The ZD VBT software is designed to serve network design and R&D engineers as well as test engineers from OEMs and component suppliers, fulfilling their diverse requirements in the whole process of R&D scenarios, including early-stage bus data analysis, ECU development, and functional testing. Whether it is in data processing, function verification, or fault diagnosis, ZD VBT can provide powerful support, helping engineers improve development efficiency and testing quality.

### | Hardware Device Management Function

The ZD VBT software supports multiple high-performance bus interface hardware devices of ZD, such as the ZD Box series and the ZD USB CAN series hardware.

Hardware products: ZD Box 2i / ZD USB CAN

## | Project Management

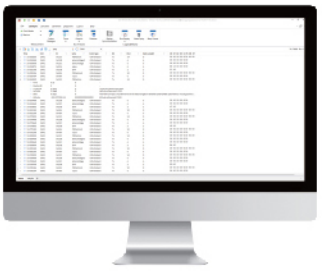


## | Bus Analysis Function

ZD VBT software is a professional automotive testing and development platform software that can be connected to the ZD Box 2i series of hardware devices. The analysis function of the ZD VBT software supports the sending, monitoring, playback, statistics, and recording of data from various mainstream in - vehicle bus types (CAN/FD, LIN, Ethernet, Flexray). It supports the Trace display and chart display of bus data, as well as the Graphic display of signals. Meanwhile, it also supports the synchronous playback and analysis of multi - format data such as GPS and video along with data in various bus formats.

### Bus Message Monitoring

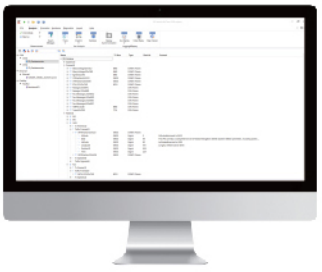
The bus message monitoring function (Trace) supports multiple display modes, database parsing, display of multiple bus/protocol types, and flexible filtering settings. It helps users to monitor and analyze bus messages in real-time, improving the efficiency of bus communication testing and fault troubleshooting.



- **Time display mode switching**
- **Display mode switching**
- **Database parsing and signal value viewing**
- **Display of multiple bus types**
- **Parsing of multiple application layer protocols**
- **Header template and customization**
- **Frame rate and message cycle display**
- **Header filtering and pre - filtering**

### Database Window

It supports loading DBC, ARXML, LDF, and XML databases, and can display the database structure, signal communication matrix, and message communication matrix.



## Signal Graphical Display

Graphic is a component specifically designed for multi - signal analysis and visualization. It supports functions such as synchronous display of multiple signals, cursor measurement, separate display on the Y - axis, and display of a large number of offline data points. It helps users efficiently and intuitively analyze and compare signal data, meeting the signal processing requirements in complex scenarios.

### Core functions

- **Synchronous display of multiple signals**
- **Cursor measurement function**
- **Separate display of multiple signals on the Y-axis**
- **Display of a large number of offline data points**
- **Adaptive adjustment and optimization**

## Playback Function

The ZD VBT software supports the online/offline playback function for multiple buses and multiple types of data formats.

- It supports industry-standard data file formats such as ASC, BLF, PCAP, etc.
- It supports a rich variety of data source types: CAN/FD, LIN, Ethernet, Flexray, GPS, Video.

## Bus Statistics

The CAN bus statistics function provides users with comprehensive bus monitoring and analysis tools. It aims to help engineers and developers gain in - depth insights into the performance and status of the CAN network. Through real - time data monitoring, users can better manage and optimize vehicle network communication.

### Core functions

- **Bus load rate monitoring**
- **Peak load rate analysis**
- **Data frame rate statistics**
- **Data frame counting**
- **Error frame rate monitoring**
- **Error frame counting**
- **Controller status detection**

## | UDS

Unified Diagnostic Services (UDS) is an important function of automotive ECUs and plays a crucial role in every stage of automotive R & D, production, and after - sales service. ZD's toolchain helps users conveniently conduct R & D and verification of functions related to fault diagnosis, as well as programming based on the UDS protocol. VBT implements UDS functions based on CAN and Ethernet, and supports functions such as diagnostic parameter configuration, diagnostic file import, diagnostic service execution, and automated diagnosis.

### Diagnostic Parameter Configuration

Users can import standard diagnostic database files, such as.ODX/.PDX files, into the software. VBT can parse the corresponding diagnostic communication configuration parameters from the diagnostic database files. For the diagnostic services defined in the diagnostic database, users can achieve diagnostic interaction with the controller based on the parsed diagnostic services.

### Diagnostic Console

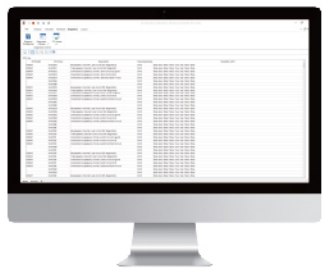
The diagnostic function of ZD VBT implements all diagnostic services of UDS diagnosis. By parsing the diagnostic database, users can easily establish communication between the diagnostic tool and the controller, and perform operations such as session mode switching, data reading and writing, fault code management, and controller programming. It provides an efficient and reliable solution for vehicle diagnosis and controller management.

#### Core functions

- **Full support for UDS diagnostic services**
- **Session mode management**
- **Data reading and writing**
- **Fault code management**
- **Controller programming**
- **Diagnostic database parsing**

### UDS Fault Code Viewer

The UDS Fault Code Viewer in the ZD VBT software is specifically designed for vehicle controller fault management. It supports comprehensive monitoring and management of the controller's historical faults, current faults, and pending faults. With the functions of timed reading and event - triggered updating, users can keep track of the controller's fault status in real - time and generate detailed diagnostic reports, which helps with efficient fault troubleshooting and analysis.



DTC Reading

#### Core functions

- **Timed reading and event-triggered update**
- **Export of diagnostic reports**
- **Intuitive viewing of fault information**

## | Simulation

The simulation function of the ZD VBT software can simulate multiple types of buses such as CAN/FD, LIN, and Ethernet. It enables the node simulation of ECUs to establish the communication logic between the ECU and the controller under test, and also allows for the monitoring of the content and status of bus communication.

### CAN/FD Simulation

The CAN/CANFD message simulation design aims to assist users in efficiently simulating and testing CAN network communication. Through this module, users can easily configure and send CAN messages. It supports multiple sending types and data filling methods to meet various simulation requirements.

#### Core functions

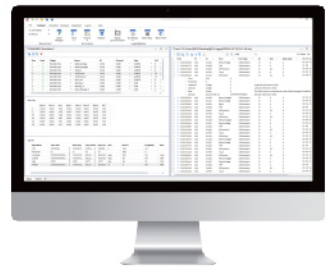
- Node simulation function
- Script binding & CRC
- Support for database files
- Create new CAN/CANFD frame
- Configuration of message sending type
- Setting of message sending cycle
- Modification of data field length
- Data filling method

### Application Scenarios

- **Automotive Electronics Testing:** Simulate various communication scenarios in the CAN/FD network to verify the communication performance and stability of ECUs.
- **Industrial Automation:** Test the reliability and real-time performance of the CAN network in industrial control systems.
- **Embedded System Development:** Simulate CAN communication during the development stage to accelerate the system debugging and verification process.

### Advantages

- **Efficient and Convenient:** Quickly load and configure the simulation environment through database files, reducing the workload of manual configuration.
- **Flexible Customization:** Support multiple sending types and data filling methods to meet different testing requirements.
- **Precise Control:** It is possible to customize the message sending cycle and the length of the data field, enabling precise simulation control.



## Ethernet Simulation

The Simulation module offers a comprehensive Ethernet communication simulation solution. It supports generating customized Ethernet frames through database files or manual configuration and enables flexible simulation of network communication scenarios.

### Core Functions

- Parsing of database files
- Creation of new Ethernet frames
- Filling of data content

## Application Scenarios and Advantages

- **Automotive Electronics Testing:** Simulate SOME/IP communication between ECUs to verify the functional consistency of ADAS (Advanced Driver Assistance Systems) and in-vehicle entertainment systems.
- **Industrial Network Verification:** Simulate real-time data interaction with sensors through periodic messages to test network load and stability.

# Features

- Easy and convenient to operate
- High performance and precision
- Support for multiple bus database files
- Support for multiple in-vehicle bus types
- Visual analysis
- Support for online and offline parsing of Flexray