

# ZD Datalogger 2 Product Family Datasheet

Version 1.0

## **ZD Datalogger 2 Product Family**

ZD Datalogger 2 Product Family is an automotive bus data logging product tailored to the needs for mass data logging of vehicle, whose integrated bus interfaces, storage function of the integrated design and low power consumption with good heat dissipation of the electrical design, are completely able to meet the users' demands that projects will be rapidly deployed. ZD Datalogger 2 Product Family supports current standard automotive bus interfaces, including 100/1000 Base-T1 (2F), 1000 Base-T, FlexRay (A&B), CAN/CAN FD, LIN and Serial etc. In terms of storage, ZD Datalogger 2 Product Family is available with a variety of storage options, such as local SSD storage from 500GB to 4TB, wireless data transfer via WIFI and USB internet stick, and cloud storage.

ZD Datalogger 2 Product Family can be widely applied in R&D and testing of the automotive industry, whose application scenarios cover the development testing of single controller, the integration testing of functional system and the endurance testing of complete vehicle. The stable and real-time data logging characteristics provide developers with excellent technical support for bus data monitoring, analysis, and storage. ZD Datalogger 2 Product Family provides a RESTful API interface and a compatible Python SDK of Windows/Linux, which can easily integrate into existing systems. In addition, ZD Datalogger 2 Product Family can support batch real-time processing of signals through built-in software extensions and edge computing capabilities, thus improving the efficiency of data analysis. Marker support allows users to easily retrace the time point of any event.

ZD Datalogger 2 Product Family is designed and manufactured to the specifications of automotive controllers, supporting to be used in wide voltage, extreme temperature, and vibration environments. The nanosecond-level timestamp allows cold starts in a fraction of a second while ensuring the preservation of crucial data records and synchronizing with the automotive controller.

## Features

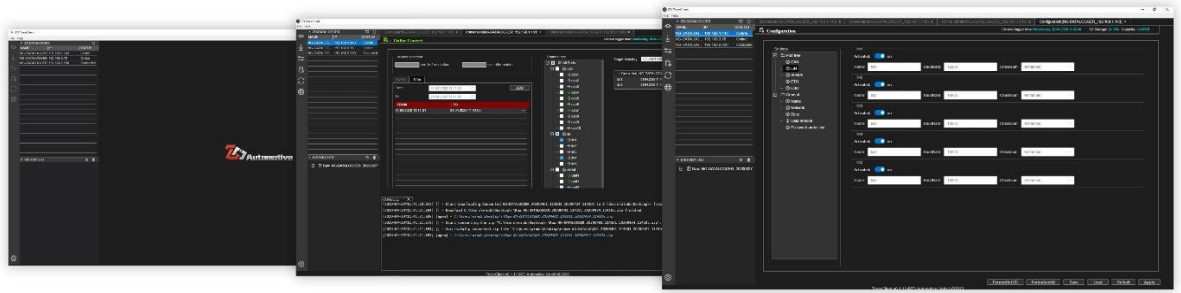
- High-density automotive bus protocol interfaces and other standard communication protocol interfaces, supporting 1000 Base-T1
- Vehicle compliance, lower power consumption and good heat dissipation, signal hibernation and wake-up
- High-performance data transmission, supporting Internet, USB 3.0, and wireless transmission
- Real-time network monitoring
- Supporting local mass storage and instant cloud storage
- Web page for remote management and monitoring device status
- Supporting expansion modules, such as USB flash drive, USB network adapter, GPS module and LTE/WIFI module
- Providing large-capacity cloud services for configuration, storage, maintenance, and online diagnostics
- Remote firmware update (OTA)

## Main Functions

- Rich interfaces
  - Automotive bus interfaces:  
100/1000Base-T1, FlexRay (A&B), CAN/CAN FD, LIN
  - Standardized communication interfaces:  
Serial, 1000Base-T, USB 2.0, USB 3.0
  - Expansion modules:

Supporting expansion of GNSS signal module, LTE internet adapter and webcam via USB

- High precision, high speed
  - Design of interfaces to meet maximum theoretical transmission speed of requirements; data acquisition based on FPGA (Field Programmable Gate Array)
  - Timestamp: 10 ns
  - Multi-devices based on synchronization extension
- Vehicle compliance
  - Supportable temperature range: -40°C to +70°C
  - 12V / 24V DC vehicle power, and a wide voltage operating range of 8V to 28V
- Multi-functional multiplex of ports, built-in Automotive Ethernet gateway
  - Standard Ethernet interface as a data logging expansion port, supporting 100/1000Base-T1 via a media converter
  - Automotive Ethernet gateway function, capable of monitoring and recording tracing data between ECUs without affecting all communication links
- Matching desktop software - ZD TraceClient
  - All bus data and ECU logs recorded by Datalogger 2 Product Family can be saved in various data conversions such as ASC, BLF, PCAP, TXT and other mainstream formats by the accompanying application software - ZD TraceClient. The file formats are compatible with CANoe, CANape and other mainstream software. In addition, for the convenience, ZD TraceClient also enables data monitoring, allowing users to know the system's operational status in real time.
  - With the application ZD TraceClient, users can
    - Easily and flexibly configurate ports.
    - Download the raw data recorded by the ZD Datalogger 2 Product Family.
    - Convert raw data from ZD Datalogger 2 Product Family to a specified format.
    - Monitor data on various buses in real time and add time stamps.



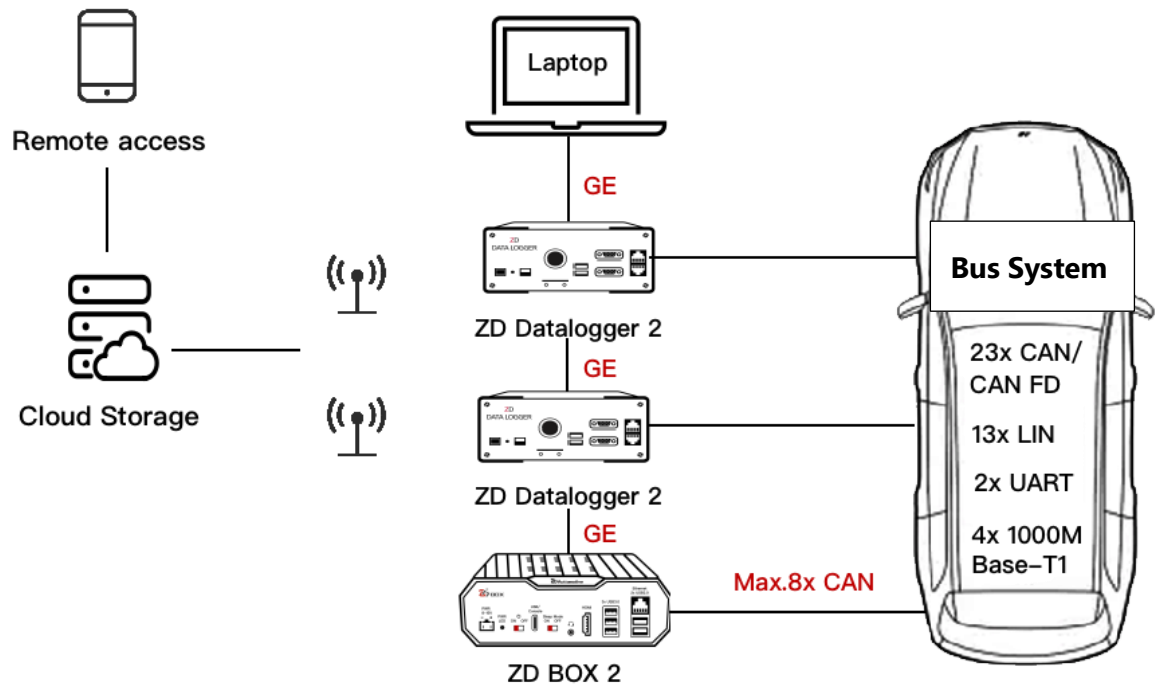
## Application Scenarios

- Automotive bus data acquisition

In the middle and late stages of the vehicle development process, after each system is tested independently, the vehicle will move on to the stage of integration testing. At this stage, the interacting functions of bus signal need to be integrated testing. The acquisition and analysis of bus signals is the focus of this phase. Whether it is the timing analysis of the signals, the determination of specific error values, or the entire driving cycle of the bus signals, including the acquisition of wake-up and sleep with no loss, which are the basic prerequisites for the vehicle development.

With the existing electrical architecture of domain controller-driven, the variety and number of buses may exceed the number of ports that can be provided by standard products on the market. The ZD Datalogger 2 Product Family can simultaneously provide 12 CAN/CAN FD, 10 LIN and 10 Ethernet ports. The whole automotive data acquisition and timestamp synchronization can be achieved through the network synchronization of 2 Dataloggers. The simulation platform --- ZD BOX 2 and its accompanying software TSP (Trace-Simulation-Platform) enable to monitor up to 8 CAN bus signals in real time.

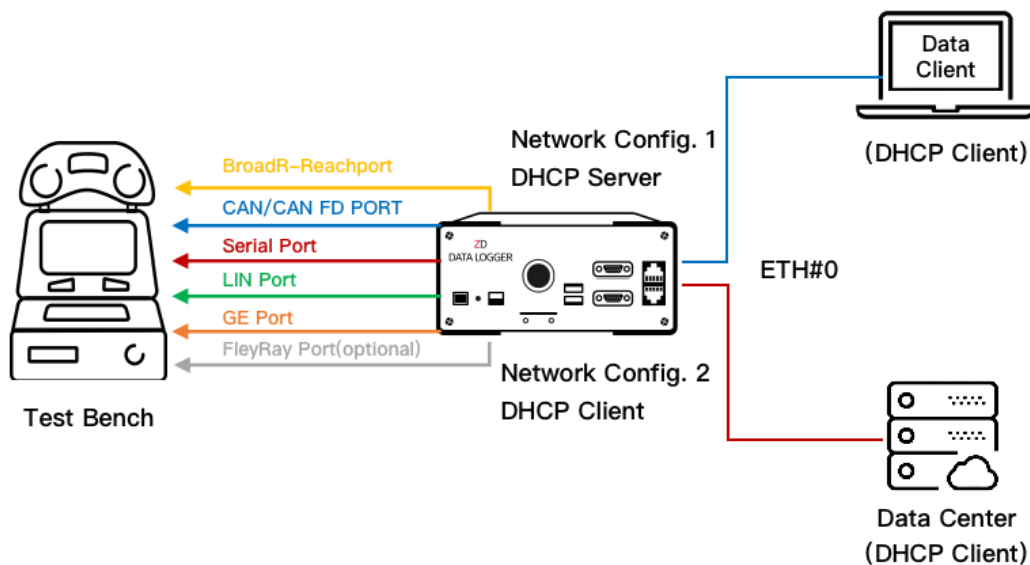
By configuring cloud network of ZD Datalogger 2, users can not only access and configure the device through cell phones or mobile terminals, but also allow data to be uploaded to the cloud in real time for remote access.



- Data acquisition solutions of Bench in labor

In the laboratory scenario, the data acquisition remains i.e., the acquisition and storage of log information, bus data and debugging information of ECUs, should be consistent with the requirements of automotive data acquisition. The difference lies in the higher requirements of bench data collection for multi-device management in the LAN.

Datalogger 2 Product Family supports both client and server modes of DHCP. When Datalogger 2 is in standalone operating system and multiple users want to access its data, Datalogger 2 can be set to DHCP server mode, then the users' computers will be automatically assigned with IP access rights by this DHCP client mode. When there are several Datalogger 2 in the lab, whose data need to be accessed and configured through a single Server, users can configure Datalogger 2 as DHCP client mode to obtain IP from the server uniformly, which is convenient for accessing the devices belonging to the whole LAN.

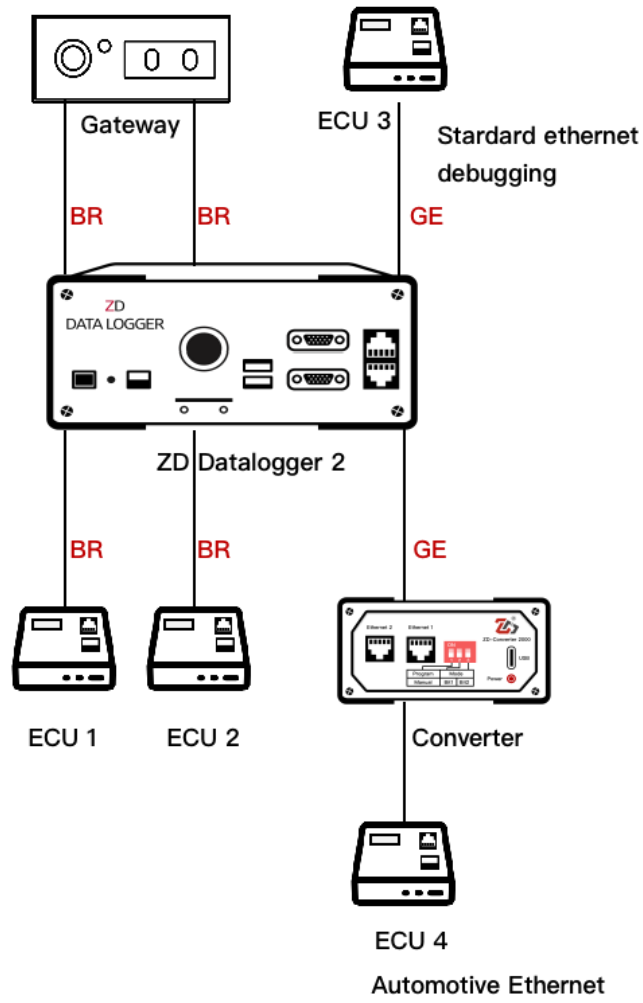


- Data acquisition case of Automotive Ethernet

Automotive Ethernet differs from the traditional automotive bus system topology by adopting a star-network, point-to-point connection topology in the entire vehicle. In order not to interfere with this point-to-point Automotive Ethernet communication, ZD Datalogger 2 Product Family integrates the switching function of Automotive Ethernet, which accesses the existing Ethernet connection in the vehicle through two Automotive Ethernet ports and uses FPGA for high-speed and reliable data acquisition.

In order to match application scenarios of users more flexibly, ZD Datalogger 2 Product Family provides two 1000Base-T as data logging ports.

Not only can the two ports be directly connected to the Standard Ethernet debugging port of the ECU, but also can be connected to the Automotive Ethernet interface through ZD-Converter series.





## Specification

Multiple Ethernet Protocol Supporting	<ul style="list-style-type: none"><li>• Ethernet, protocol based on:<ul style="list-style-type: none"><li>➤ DLT</li><li>➤ Eso Trace</li><li>➤ TCP/DU</li><li>➤ ADB LOG</li></ul></li></ul>
Additional Interfaces	<ul style="list-style-type: none"><li>• 2 * 1000Base-T</li><li>• 2 * USB 2.0</li><li>• 1 * USB 3.0 for high-speed data download</li><li>• 1 * SD card</li><li>• 1 * USB Type C console port</li></ul>
Logging Performance	<ul style="list-style-type: none"><li>• Time-stamp resolution: 10ns</li><li>• Start-up timing for recording:<ul style="list-style-type: none"><li>➤ 100/1000Base-T1: &lt; 1s</li><li>➤ CAN/CAN FD, LIN, FlexRay(A&amp;B), UART/Serial: &lt; 200ms</li></ul></li><li>• Automotive Ethernet Forwarding Delay: &lt; 10µs</li></ul>
User Interfaces	<ul style="list-style-type: none"><li>• Sleep mode selection</li><li>• Factory reset</li><li>• On/off control</li><li>• Ext. triggers</li><li>• 3 * LED status display</li><li>• 4 * 1000Base- T1 indicator</li></ul>
Storage	<ul style="list-style-type: none"><li>• ZD Datalogger 2F: 1TB to 4 TB</li><li>• ZD Datalogger 2C: 500 GB</li></ul>

Storage Performance	<ul style="list-style-type: none"> <li>• Continually logging up to 200 Mbps</li> <li>• Short-term rush logging up to 1Gbps</li> <li>• Downloading through Ethernet interface 200Mbps</li> <li>• 1 * USB3.0 for high-speed data downloading, whose data download up to 2Gbps</li> </ul>
Software Supporting	<ul style="list-style-type: none"> <li>• TraceClient PC Software for Windows 7 and 10(64-Bit)</li> <li>• Python SDK for easy integration in customer environment</li> <li>• Output formats: *.asc, *.blf, *.esotrace, *.dlt, *.raw, *.pcap, *.txt, *.txt (ASCII HEX)</li> <li>• Cooperation mode: automatically detecting other dataloggers in a network and synchronizing their time</li> </ul>
Operation Conditions	<ul style="list-style-type: none"> <li>• Temperature range: -40°C to +70°C</li> <li>• Input voltage: 6V – 36V</li> </ul>
Dimensions & Weight	<ul style="list-style-type: none"> <li>• Dimensions: 188 * 70 * 169 mm (W * H * D)</li> <li>• Weight: 830g</li> </ul>

## Product Comparison

	Datalogger 2F	Datalogger 2C
CAN/CAN FD	12	12
LIN	10	10
Serial	8	8
FlexRay(A&B)	2	2(optional)
10/100/1000Base-T (Management)	2	2
10/100/1000Base-T (data logging)	2	2
100Base-T1	4	0
1000Base-T1	4	0
USB3.0	1	1
Storage	1TB to 4 TB	500 GB

## Contact

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