China Commercial Vehicle T-Box Report, 2022

July 2022

TOP10 commercial vehicle T-Box suppliers: using terminal data to build telematics platforms will become a megatrend

1. From the perspective of market size, the pace of popularizing T-Box accelerates in the era of Chinese Phase VI Emission Standards.

Since July 1, 2021, the Chinese Phase VI Emission Standards for heavy-duty diesel vehicles have been implemented in an all-round way. Before leaving factories, the vehicles subject to the standards should be equipped with compliant remote emission management terminals (T-Box). Driven by policies, China's commercial vehicle T-Box market has made a rapid expansion.

In 2021, China's commercial vehicle T-Box installation rate hit 45.9%, an increase of 20.3 percentage points over the previous year; the market was valued at RMB1.26 billion.

With the full implementation of the Chinese Phase VI Emission Standards and the growing demand for commercial vehicle telematics, the market demand for T-Box will sustain growth from 2022 to 2025. It is expected that in 2025, the installation rate of commercial vehicle T-Box in China will reach 90%, and the market will be worth over RMB2.2 billion, with an AAGR of around 24%.

China's Commercial Vehicle T-Box Market Size and Installation Rate, 2020-2025E
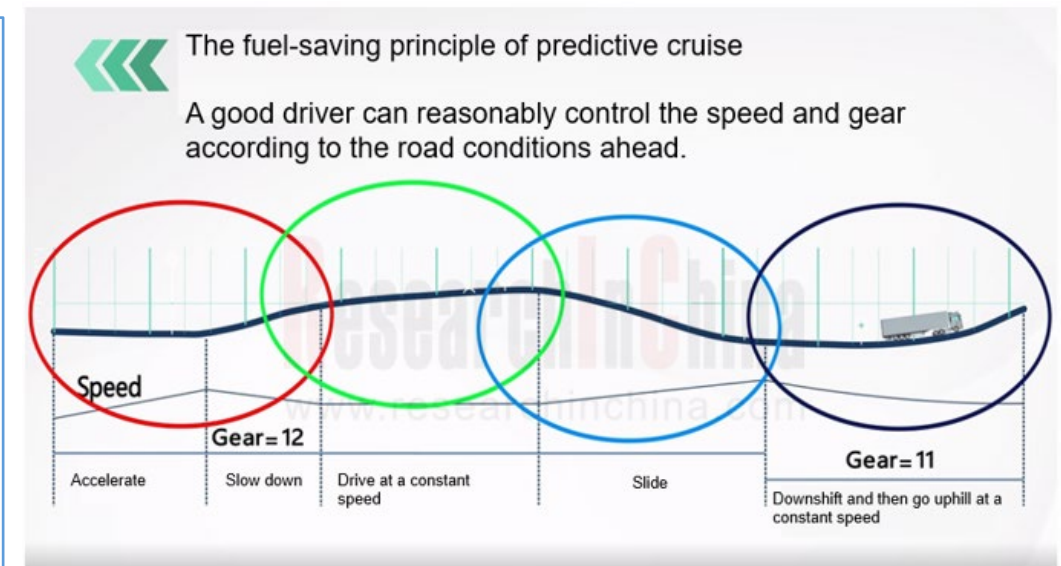
Source: ResearchInChina
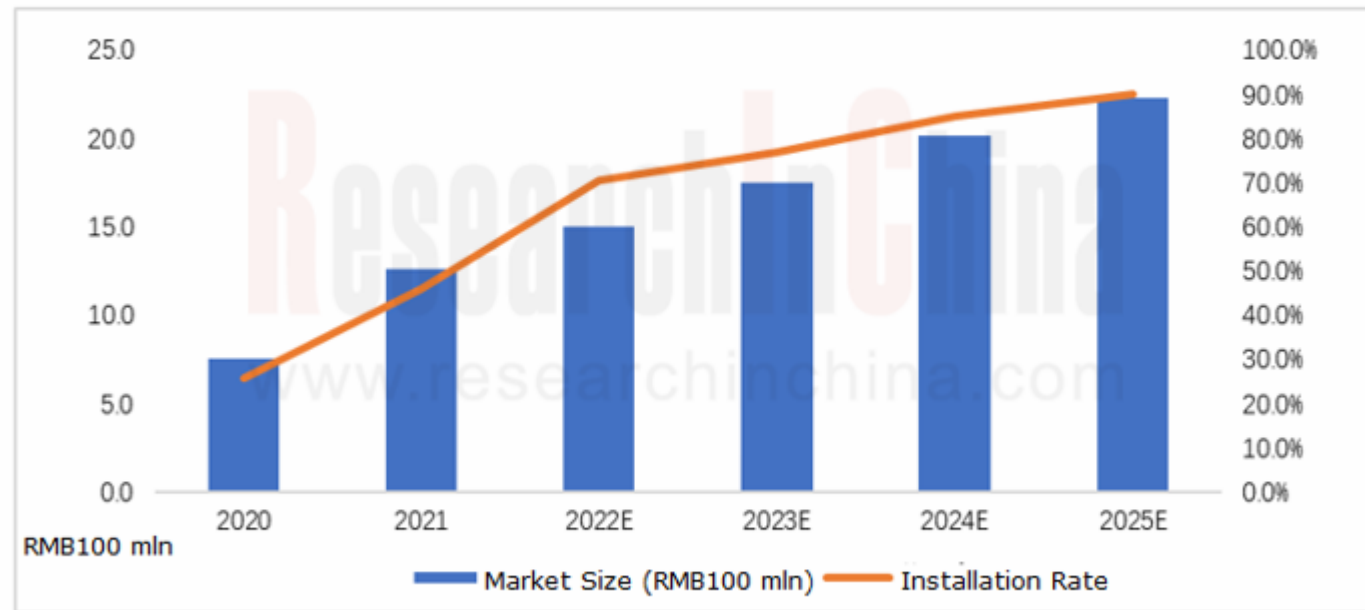
2. Through the lens of products, data application centering on AD/ADAS and telematics will be a trend.

To support more abundant commercial vehicle telematics functions, T-Box technology keeps advancing. Boosted by 5G, big data and cloud computing among others, commercial vehicle T-Box that meet the basic national regulations will head in the following directions:

◆ 5G T-Box, C-V2X and high-precision positioning. For example, Jingwei Hirain Technologies and Shenzhen Yuwei Information 2nd Technology Development have launched T-BOX products that support 5G and C-V2X technologies and are applicable to more fields such as vehicle data collection, audio and video surveillance, high-precision positioning, and intelligent driving warning.

◆ Full vehicle OTA updates require that T-Box features powerful computing power, and fast and stable network speed. Compared with passenger cars that underline OTA updates on entertainment and intelligent driving, trucks focus more on practicality and engine modules. Some models launched by leading OEMs, like FAW Jiefang J6P/J7, pack such functions as multi-sensor fusion, perception & positioning, precise horizontal and vertical control, intelligent path decision & planning, backstage monitoring and scheduling, V2X & CVIS, remote OTA updates, and remote driving.

◆ High integration (central gateways, Ethernet interfaces, antennas, six-axis gyroscopes, ETC, etc.). One example is the ETC OEM technology jointly unveiled by Foton Motor and Zhilian Network. In the production process, the OBU module is embedded into the built-in system of T-Box and shares the chip with the original device. They are integrated as an intelligent OEM T-Box.

◆ Integrated with AD/ADAS. T-Box, AD/ADAS and connectivity function can achieve synergy, which allows addition of capabilities such as fatigue warning, video surveillance, intelligent cockpit, fleet control and V2X. In L0 systems, the use of vehicle data enables front-end monitoring and warning, and back-end operation and maintenance management; in L2, driving safety and energy-efficient driving; in L4, platooning, intelligent altitude, and energy supply, etc.

For example, the predictive cruise P-BOX developed by Zhonghuan Satellite reserves a HD map interface on its T-BOX. With a built-in ADAS map and the predictive cruise control (PCC), the optimal control over the vehicle can save fuel and relieve much driver's fatigue without changing driving behaviors or vehicle powertrain matching.

The fuel-saving principle of predictive cruise

A good driver can reasonably control the speed and gear according to the road conditions ahead.

Speed

Gear=12

| Accelerate | Slow down | Drive at a constant speed | Slide | Downshift and then go uphill at a constant speed |

Gear=11

Source: Zhonghuan Satellite

There are a large number of commercial vehicle T-Box suppliers in China, including bellwethers like Yaxon Network, Hopechart, Zhonghuan Satellite and Jingwei Hirain. Yaxon Network boasts a wide customer base, covering Foton, BYD, King Long and Yutong. Hopechart supports Dongfeng Motor and Shaanxi Automobile. Zhonghuan Satellite is a supplier to FAW Jiefang, Dongfeng Motor, SAIC Hongyan, Sinotruk and the like. Jingwei Hirain's major customers are FAW Jiefang, Sinotruk and JMC.

Top 10 Commercial Vehicle T-Box Suppliers in China by Market Share, Jan.-Apr.2022

No.	Supplier	Share
1	Yaxon Network	21.40%
2	Jingwei Hirain	12.70%
3	Zhonghuan Satellite	12.40%
4	Hopechart	11.80%
5	DIAS	6.60%
6	Intest	5.70%
7	Goyu	4.20%
8	Yuwei	3.60%
9	CVNAVI	3.50%
10	Anhui Domain Compute	3.30%

* The data are estimated by ResearchInChina according to its database, and the number of insured commercial vehicles (only in the Chinese market) and the supply of T-Box.

Source: ResearchInChina

Yaxon Network

In their efforts to improve the integration of T-Box hardware with 4G/5G, C-V2X, high-precision positioning and other modules, Chinese mainstream T-Box vendors are also striving to build telematics platforms for an expansion from hardware to data services, with the ultimate purpose of commercial vehicle telematics solutions that integrate software and hardware.

Yaxon Network

Yaxon Network's Yunxiang Telematics Service PaaS Cloud Platform supports concurrent services for tens of millions of vehicle terminals, and allows intelligent storage, mining and application of massive data.

Yunxiang Telematics Service PaaS Cloud Platform of Yaxon Network
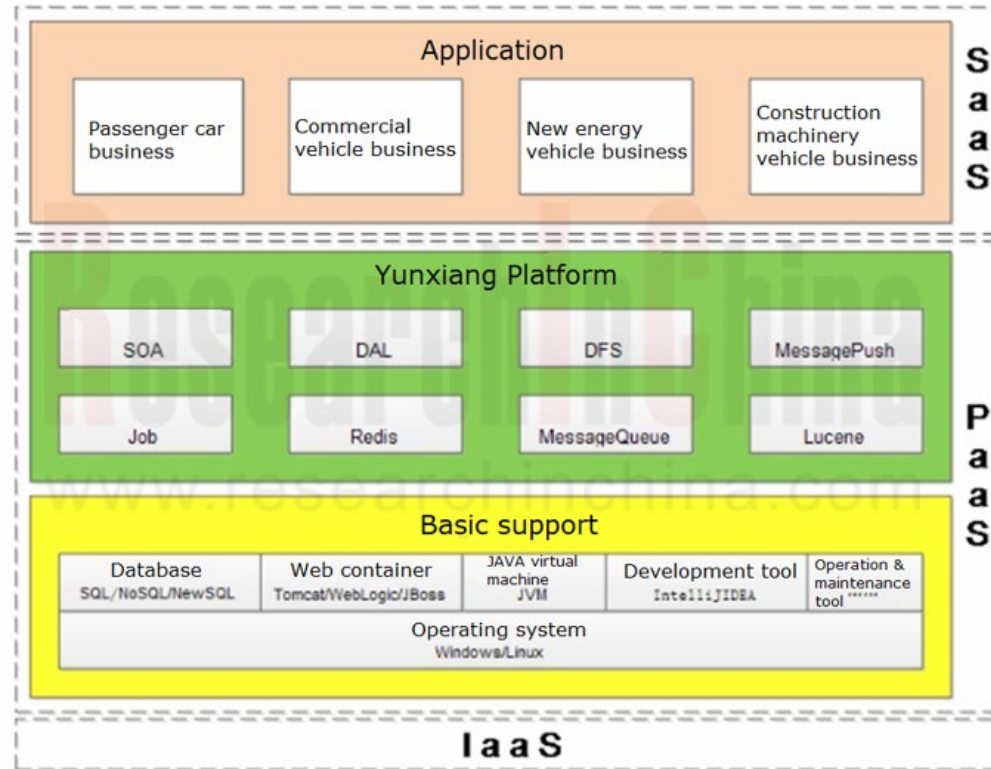
Source: Yaxon Network

Features of the Platform
- High concurrent access: easy to expand, concurrent access for tens of millions of vehicles
- Big data storage: easy to store, PB-level data storage and processing capabilities
- Big data analysis: driving behavior analysis, active security and other big data mining functions
- On-demand customization: flexible enough secondary development capabilities, quick response to customization needs
- Flexible expansion: elastic expansion, soft load or hard load for smooth system expansion

Performance indicators
- Concurrency: the system enables concurrent access for tens of millions of vehicles, and a single server allows concurrency of 30,000 vehicle terminals.
- Storage: the system can support PB-level data storage and a data increment of 10TB per day.
- Throughput: the system processes up to 500,000 transactions per second.
- Availability: not less than 99.9%.

Jingwei Hirain

Based on 4G/5G/V2X communication, Jingwei Hirain's commercial vehicle telematics system connects intelligent vehicles with data backstage and establishes fleet scheduling & monitoring system, fleet remote driving system, CVIS, and on-site operation and maintenance management information system, in a bid to realize automated operation management in the whole process from fleet departure and operation to final run and return to garage.

Jingwei Hirain's Commercial Vehicle Fleet Management System (FMS)
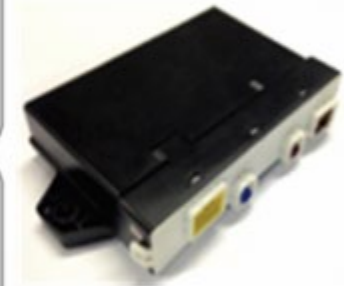
Source: Jingwei Hirain

Zhonghuan Satellite

The commercial vehicle telematics platform developed by Zhonghuan Satellite based on intelligent terminal hardware boasts 1,000+ items of telematics data, including 200+ items of vehicle raw data, 500+ items of label data preprocessed by terminals, and 300+ items of scenario data deeply processed by model algorithms. The advanced big data algorithms help to output a range of functions such as vehicle fuel consumption analysis, dedicated operating line analysis, regional driving behavior statistics, service station heat location selection, vehicle failure statistics, truck driver profiling, and comprehensive vehicle operation efficiency, so as to build all-round commercial vehicle intelligent connected big data output capabilities.

By virtue of the four core capabilities, independent development and production of intelligent connected sensors, full life cycle telematics construction, human-vehicle-road-goods cooperation big data analysis and processing, and AI algorithms based on logistics scenarios, Zhonghuan Satellite is committed to providing intelligent truck solutions to empower the logistics industry. It has helped 10 mainstream commercial vehicle manufacturers, more than 10 provincial traffic and transportation authorities, and hundreds of logistics and ecological enterprises to launch commercial vehicle intelligent connected service solutions, and has served more than 2.6 million commercial vehicles.

Commercial Vehicle Telematics Products of Zhonghuan Satellite

Source: Zhonghuan Satellite

The intelligent terminals with T-Box as the core favor wide adoption of big data, cloud computing and AI in commercial vehicles. The continuous efforts to excavate and improve value of information will not only bring lower cost and higher efficiency to companies in real terms, but also assist automakers achieving management transition from a decentralized to intensive way and building platforms that offer transparent information instead of data silos.
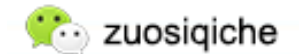
Table of Content　(1)

Table of Content (2)

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