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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 28787-2023

**Data communication protocol between intelligent terminal and
dispatching center for urban bus and trolleybus**

城市公共汽车车载智能终端与调度中心间数据通信协议

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Foreword

This document was issued on 17 March 2023 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 October 2023.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies when assessing a submission.

1 Scope

GB/T 28787-2023 specifies how a bus talks to the control room. Every urban bus now carries a terminal reporting its position, its schedule adherence, its passenger counts and the state of the vehicle, and the dispatching centre uses that stream to hold headways, to intervene when a service bunches, and to drive the arrival predictions passengers read at the stop. The traffic is unusual: thousands of vehicles reporting continuously over mobile networks that drop out in tunnels and under bridges, so the protocol has to be economical with bytes and has to define what happens to messages generated while the vehicle was unreachable. Standardising it also breaks the dependence on a single supplier - a city that changes terminal vendor should not have to change its dispatching system. This document specifies the protocol basis, the communication connection, the message processing and the data formats for communication between the on-board intelligent terminal and the dispatching centre for urban buses and trolleybuses. Under CCS L79, it is written for terminal manufacturers, for the vendors of dispatching platforms, and for the municipal transport operators who buy both.

This document specifies the protocol basis, communication connection, message

processing and data format for data communication between intelligent terminal and dispatching center for urban bus and trolley bus.

This document is applicable to the data communication between intelligent terminal and dispatching center for urban bus and trolley bus through wireless transmission channels.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 32852.1-2016, Urban passenger transportation terminology - Part 1: General terminology

JT/T 808-2019, GNSS for operating vehicles - General specifications for vehicle terminal communication protocol and data format

JT/T 1076-2016, GNSS system for operating vehicles - Technical specification for onboard video terminals

JT/T 1078-2016, GNSS system for operating vehicles - Video communication protocol

3 Terms and definitions, abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 32852.1-2016 as well as the followings apply.

3.1.1 origin station; primary station

On a bus line, a start-end station that is equipped with a master scheduler.

The total mileage traveled by a delivery vehicle during the operation service process, including passenger mileage and empty mileage.

[Source: GB/T 32852.1-2016, 8.6]

3.1.11 dispatching center

A place for remote dispatching of operating vehicles on multiple lines.

[Source: GB/T 32852.2-2018, 3.3.2]

3.1.12 transit signal priority

According to the real-time monitored traffic conditions at intersections or historical traffic data, combined with the real-time passenger state of bus operating vehicles and the state of arriving earlier & later, priority signal timing is provided for bus operating vehicles, so that buses and trolley buses can pass in priority over other vehicles.

3.1.13 display plate for vehicle running position

The vehicle is marked with the name of the route and the names of the stops. There is an indicator light showing the current running position of the vehicle and the running direction of the vehicle.

[Source: GB/T 32852.2-2018, 3.5.24]

3.2 Abbreviations

The following abbreviations apply to this document.

CAN: Controller Area Network

FTP: File Transfer Protocol

GBK: Chinese Internal Code Specification

HTTP: Hyper Text Transfer Protocol

ID: Identity

IP: Internet Protocol

LCD: Liquid Crystal Display

LED: Light Emitting Diode

RSA: An asymmetric cryptographic algorithm (developed by Ron Rivest, Adi Shamir, Leonard Adleman, named after the names of the three)

TCP: Transmission Control Protocol

6.2 The classification, requirements and encryption mechanism of signaling data messages in the protocol shall comply with the requirements of Chapter 7 of JT/T 808-2019.

6.3 The real-time audio and video transmission channel agreement in the protocol shall

meet the requirements of 4.2 in JT/T 1078-2016.

6.4 The audio and video signaling data message communication shall use the established link between the vehicle intelligent terminal and the dispatching center for the transmission of positioning information. No new link shall be created. A new link shall be created for the communication of audio and video code stream data message, instead of the link for transmitting the positioning information.

6.5 The message definition in the protocol shall meet the requirements of Annex A.

7 Data format

7.1 Basic data

7.1.1 General response from terminal

The data format of the general response message body of the terminal shall comply with the provisions in 8.1 of JT/T 808-2019.

7.1.2 General response from dispatching center

The data format of the general response message body of the dispatching center shall comply with the provisions in 8.2 of JT/T 808-2019.

7.1.3 Terminal heartbeat

The data format of the terminal heartbeat message body shall comply with the provisions in 8.3 of JT/T 808-2019.

7.1.4 Query server time request

The data format of the query server time request message body shall comply with the provisions in 8.4 of JT/T 808-2019.

7.1.5 Query server time response

The data format of the query server time response message body shall comply with the provisions in 8.5 of JT/T 808-2019.

7.1.6 Server retransmission subpackage request

The data format of the message body of the server's retransmission subpackage request shall comply with the provisions of 8.6 of JT/T 808-2019.

7.1.7 Terminal retransmission subpackage request