PRODUCT INFORMATION

Services & Support for IP-based data transmission

IBIS-IP

IBIS-IP offers transport operators a new standard for an integrated on-board information system. Instead of using the serial vehicle bus for communication as before, communication now takes place using an IP network by means of individual services. IP-based data transmission permits larger data volumes, offers extended possibilities and, through standardisation, overcomes the borders between proprietary systems.

For some time now, IBIS-IP has been on everybody's lips – but what is it exactly? Basically, IBIS-IP is an interface specification that will gradually replace the previous VDV300 vehicle bus and train bus functionalities. The VDV has stipulated IBIS-IP as standard, on the one hand to facilitate new functions and, on the other, to enhance compatibility for optimum integration of components from various manufacturers in one and the same system.

General advantages of IBIS-IP

With IBIS-IP, the various devices and units run on a single infrastructure, insofar as they use the same protocol. The times when several parallel infrastructures, back offices and control units were necessary are thus a thing of the past.

Using IBIS-IP simplifies the following:
- Integrating new services and developing new components
- Reducing dependencies during on-board integration of new and existing devices and services
- Components in the vehicle network can be both data providers and data consumers
- Enhancing efficiency in the operation and maintenance of equipment and services on the vehicle
- Providing up-to-date, dynamic intermodal passenger transport services based on intermodal urban public transport information

IBIS-IP can be used in various different areas. ebblo offers services and corresponding support for the following:
- Passenger information
- Ticketing
- Passenger counting
- System

The following sections take a closer look at the IBIS-IP services offered by ebblo, including the tasks and benefits. All described services are typically based on standard protocols such as UDP, TCP and HTTP – with TimeService as the only exception.

Passenger information

Comprehensive passenger information is a crucial competitive factor in public transport. It is now common practice for transport operators to provide their passengers not only with information about scheduled trips, but also with real-time information, e.g. about delays, operational incidents or destination changes. This information is published on DPI signs and via announcements in vehicles and at stops, as well as on apps and websites.

IBIS-IP lets transport operators also provide their passengers with individual information about their current trip and bring them to their destination by the fastest route, even when there's a disruption.

In addition, systems from different providers can communicate with each other more easily if communication takes place via IBIS-IP. The transport operators therefore benefit from simpler integration.

In the area of passenger information ebblo can offer the following IBIS-IP Services:
- CustomerInformationService
- HTML-DisplayService

CustomerInformationService
The CustomerInformationService provides information that is required for passenger information on and in the vehicle. In this way, the passenger information components in the vehicle do not have to retrieve or collate any information from other services in the vehicle network. The CustomerInformationService bundles all information and thus ensures consistency, which would not be the case if different information sources from different service providers were used.

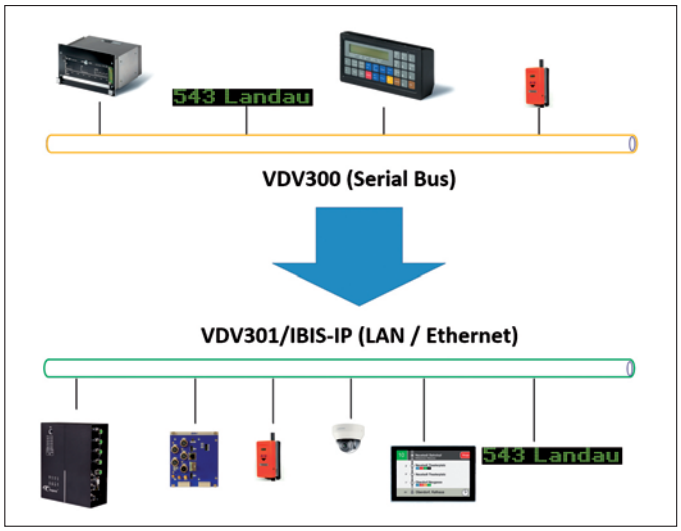
The CustomerInformationService does not provide any information about the display or representation!

The CustomerInformationService obtains information from plan data and real-time data on vehicle statuses. Possible content includes route numbers, published route names, special route symbols, destinations with formatting instructions for the front and side of the vehicle and for the driver, pattern sequences with stop names and arrival/departure times, current and next stops, connection advice per stop, door status or stop requests.

This service can be used to operate interior displays (next stop, route sequence) and exterior displays, similarly to the previous VDV vehicle bus.

The interface can be used as soon as a network is present, regardless of vehicle type, model or year of construction.

HTMLDisplayService
When using the HTMLDisplayService, the screen content for multifunctional displays is supplied by the web server of the on-board computer and displayed using a web browser. The HTMLDisplayService provides an URL to the web server. If the display calls up the web server via the URL, it receives the content to be displayed via HTML. As a rule, the web server is located inside the vehicle for buses and inside the traction for trams.



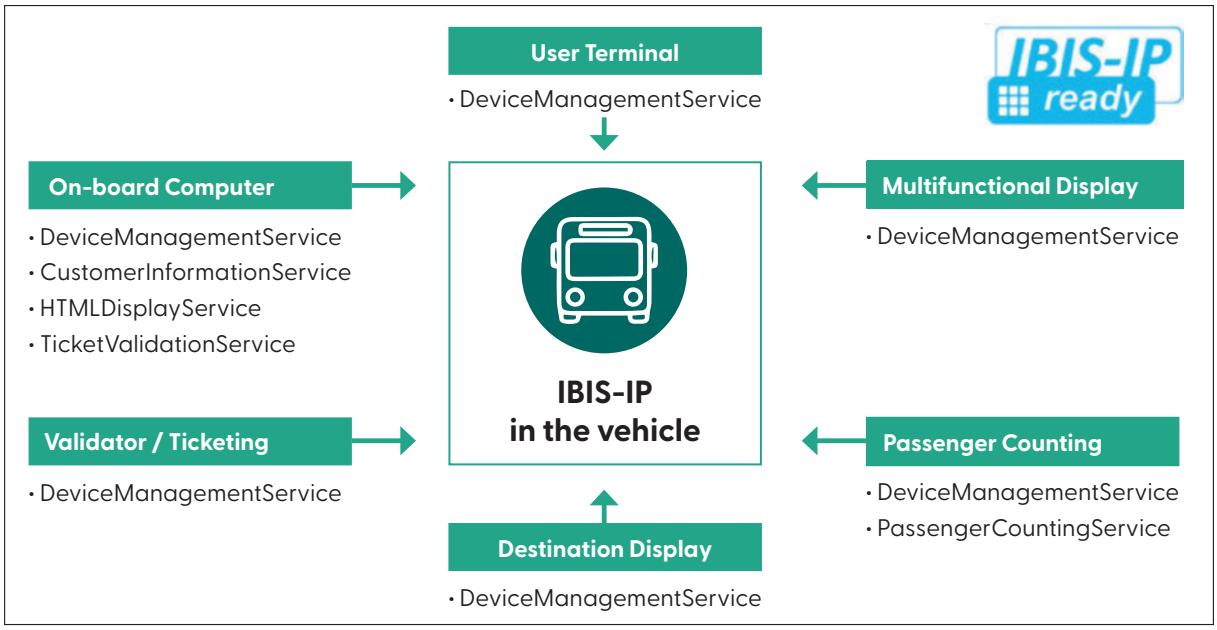
Devices and components in the vehicle network

To integrate a multifunctional display using the HTML-Display service, DNS-SD is used to search for a suitable URL in the service entry of the HTMLDisplay service. The web browser in the display then contacts the web server via the URL. The content can now be displayed from the browser.

The HTML content supplied by the web server must be understood by the display browser. The requirements made in terms of HTTP content must be regulated between the display supplier and the service provider.

A major advantage is that displays from different manufacturers can also be controlled with the same layout via HTMLDisplayService. The layout or layouts for the different screen resolutions are coordinated between the transport operator and ebblo. The layout control is stored in the data supply and the connection advice is calculated on the basis of the timetable when the data is released.

The HTMLDisplayService also offers the great advantage of extending the representation with the transfer screen. When the AVLC has a VDV453/454 connection to a data distributor, this also includes journey continuation options offered by the German Federal Railways, suburban railways and other transport service providers.



Data providers and data consumers in an IBIS-IP system

Ticketing

With regard to ticketing, ebblo offers the following IBIS-IP service:
- TicketValidationService

TicketValidationService
ebblo uses the TicketValidationService to provide the data known to the on-board computer about the fare and zones as well as the current position on the pattern.

The TicketValidationService provides all the necessary information in the IBIS-IP network, for example to control the validators. The corresponding values are transferred each time the bus stops and during checks (deactivate validator).

Passenger counting

With regard to passenger information, ebblo offers the following IBIS-IP service:
- PassengerCountingService

PassengerCountingService
ebblo implements this service as a client version and only offers the data consumer function. The service provided by the passenger counting system makes data available from the passenger counting sensors.

There can be several instances of this service, giving due consideration to the following configurations:
- One single service provides the data for all doors in the vehicle.
- There is a separate service for every door in the vehicle.

System

With regard to system, ebblo offers the following IBIS-IP services:
- DeviceManagementService
- TimeService
- TrainSetServices
- SystemMonitoringService
- VideoDisplayService
- GNSSLocationService

The system services are the basic services acting as the foundation for an IBIS-IP system.

DeviceManagementService
The DeviceManagementService implements the device management tasks within IBIS-IP. The service is present on each device participating in IBIS-IP and is started automatically when the application is executed on the device. For full integration, the DeviceManagementService is required in addition to the other data services.

The service can be used to publish static information about the device, the device status and error messages.

TimeService
This service has a special status, as a procedure for synchronising time at IT level is already specified and standardised with the SNTP protocol.

This protocol allows IBIS-IP devices to synchronise their time (and date) with the time of the on-board computer.

The TimeService only provides the IP address of the time server. The actual time is synchronised via SNTP.

TrainSetServices
The ebblo implementation comprises the following TrainSetServices:
- TrainSetInformationService
- TrainSetManagementService

Transport operators with tram, lightrail and subway routes operate coupled cars in a train set. There must be reliable network communication between the cars to provide consistent passenger information. Standardised usage of IBIS-IP in trams and trains is implemented with two IBIS-IP services named above.

SystemMonitoringService
The main goal of the SystemMonitoringService is as follows:
- Monitoring the status of all devices and services
- Publishing the status of all devices and services

There is always only one SystemMonitoringService in an IBIS-IP system.

VideoDisplayService
The VideoDisplayService provides functionalities for IBIS-IP-based video data communication via Ethernet:
- provision of real-time information on data and video streams, together with components of the on-board video system
- control of the video recording (ring recordings, event or alarm recordings)
- requesting image and video material from all or individual cameras in the vehicle
- displaying an empty screen for certain events (e.g. stopping at stops)
- providing video data from individual cameras and pre-processed image data on monitors

The requirements made of the VideoDisplayService can be covered by one central service or various specific services and related operations. The specification of the VideoDisplayService considers both existing vehicle infrastructures as well as all types of data sources and data sinks.

Analysing and evaluating the recorded video data is not part of the VideoDisplayService. As a rule, evaluation takes place in the back office and a backend system or backend application. Furthermore, central storage of image and video data should take place in the car in the video control.

GNSSLocationService
With regard to location, ebblo offers the following IBIS-IP service:
- GNSSLocationService

The GNSSLocationService provides the current position of the vehicle with the help of the GPS coordinates.

ebblo recommends use of the IBIS-IP interfaces from version 2.4 (if available).

Do you need further information?
On request, ebblo can provide detailed implementation descriptions with technical details about the individual services.

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