ebblo

CASE STUDY

(Image: © Rhein-Neckar-Verkehr)

Rhein-Neckar-Verkehr GmbH rnv

Implementation of the VDV standard IBIS-IP

rnv GmbH

Since 2022, the rnv in the Rhein-Neckar Metropolitan Region has been using IBIS-IP as the new standard for data transmission. IBIS-IP was rolled out in the context of commissioning the new vehicles for the Rhein-Neckar-Tram – the RNT2020 trams. Since then, all devices on this vehicle type use the same infrastructure for communication. This eliminates the need for parallel infrastructures, back offices and control units.

What is IBIS-IP?

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

The VDV has stipulated the interface specification IBIS-IP (VDV301) as standard, which is gradually replacing the previous VDV300 vehicle bus and train bus functionalities. On the one hand, IBIS-IP facilitates new functions; on the other, it enhances compatibility for optimum integration of components from various manufacturers in one and the same system.

What are the advantages of IBIS-IP?

Using IBIS-IP simplifies procedures for transport operators as follows:

- 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

ebblo solutions for IBIS-IP

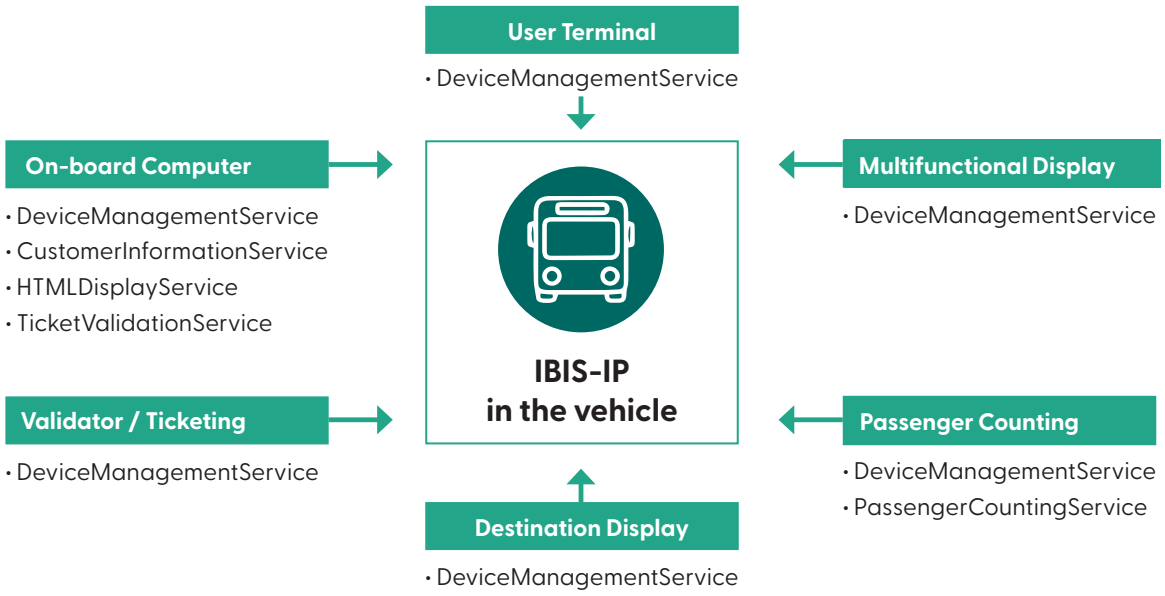
The IBIS-IP services offered by ebblo are typically based on standard protocols such as UDP, TCP and http – with TimeService as the only exception. ebblo offers IBIS-IP services and support for the following areas:

- **Passenger information**
  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.
- **Ticketing**
  ebblo uses an IBIS-IP service to provide the on-board computer with known data about fares and zones as well as the current position on the pattern. The service provides all the necessary information in the IBIS-IP network, for example to control validators.
- **Passenger counting**
  The IBIS-IP service offered by ebblo is implemented as a client version and only provides the data consumer function. The service on the passenger counting system side provides data from the passenger counting sensors.
- **System**
  ebblo offers six IBIS-IP system services that form the basis of an IBIS-IP system. The DeviceManagementService can be used to publish static information about the devices, the status of the devices and error messages. Trams must have reliable network communication between the vehicles in order to provide consistent passenger information. Standardised usage of IBIS-IP in trams is implemented with two IBIS-IP services.

"Parallel operation of VDV300 and VDV301 means we can continue operating existing devices that we have in stock, and also integrate new devices. That is very important in terms of economic efficiency."

Jürgen Grünwald,
Project Lead Control Systems at rnv

Data providers and data consumers in one IBIS-IP system



Which IBIS-IP services does rnv use?

Besides the basic services, rnv also uses, among others, the CustomerInformationService for passenger information, the PassengerCountingService for counting passenger numbers, and the TrainSetInformationService for system functions.

IBIS-IP for controlling displays in the vehicle

ebblo recommends using IBIS-IP for Multifunctional Displays in the vehicle. The displays provide passengers with comprehensive information about the route path, journey times and feasible transfers. The display is controlled by the on-board computer; the dynamic data are processed by the control system and sent to the vehicle by radio.

The IBIS-IP CustomerInformationService (CIS) provides raw data for interior and exterior displays. These include details about the route, vehicle destination text, route path or exit side. The data can differ for interior and exterior displays, e.g. in the vehicle destination text. When using this service, the layouts have to be defined separately for every display type.

ebblo therefore prefers to control Multifunctional Displays with the IBIS-IP HTMLDisplayService. This service offers the following advantages:

- Vendor-neutral procurement of the displays is possible, as long as they support the HTMLDisplayService.
- Central preparation of the display contents means it is no longer necessary to compile different layouts for each display manufacturer. The displays present HTML pages in a browser.
- All terminal devices show consistent data, thanks to responsive design.
- The two-senses principle for barrier-free design of information systems is supported. Parallel to displaying information, at the same time the on-board computer triggers audio information, generated by a Text-to-Speech engine.

Data supply: IBIS-IP exports from the LIO-Data SmartClient

When IBIS-IP is being rolled out for a transport operator, it is possible that the various interface partners do not know exactly where to get information about the IBIS-IP attributes being used. In the context of data supply, this leads to the following question: Which numbers, abbreviations or names are needed for the devices connected via IBIS-IP in the vehicle at which point?

IBIS-IP exports from the LIO-Data SmartClient are very helpful here, because this function can be used to export the data present in LIO-Data as XML files. Data can also be exported as Excel spreadsheets that are easy for every user to read. IBIS-IP exports simplify interface coordination between the transport operator, the vehicle manufacturer and the vendor of the connected devices.

CASE STUDY

rnv the company

Rhein-Neckar-Verkehr GmbH (rnv) has more than 2,600 employees. On working days, the company conveys around 500,000 passengers in the cities of Mannheim, Heidelberg and Ludwigshafen as well as the adjacent surroundings. rnv offers its passengers a safe, sustainable journey into the future, whether by tram, bus or the fips shuttle. With altogether more than 80 routes, rnv operates Germany's longest cohesive metre-gauge network.

IBIS-IP roll-out at RNV: challenges and experience

During the RNT2020 project, the functionality of the peripheral devices was changed from the partly customised vehicle bus control (VDV300) to the IBIS-IP environment (VDV301) as the new standard.

It was necessary to use the **TrainSetManagementService** and the **TrainSetInformationService** to warrant traction trips. This entailed intensive cooperation between ebblo and Skoda as the vehicle manufacturer with regard to the IBIS-IP network in the vehicle.

ebblo worked closely with Bustec and Skoda to ensure successful use of the **CustomerInformationService.** It was then necessary for ebblo to make some adjustments to the vehicle software and to the data supply.

The passenger counting sensors were integrated in the **PassengerCountingService** by Skoda. However, ebblo also receives the passenger counting data in order to produce statistics files.

ebblo's recommendation to other transport operators

When transport operators want to use IBIS-IP, they should think beforehand about what the displays should show (e.g. real-time information). This information then provides the basis for deciding between **CustomerInformationService** and HTML.

IBIS-IP ready

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ebblo

info@ebblo.com
Switzerland +41 58 911 11 11
Germany +49 30 34 06 02 70
UK +44 808 281 1039
Poland +48 71 715 83 00

ebblo.com