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Application Note

AN 114HE

Maximise Passenger Information System Revenue by Adding Wi-Fi that Integrates Perfectly with Existing On-board Ethernet Technology

Add a highly reliable and innovative wireless product to your existing on-train Passenger Information System and create a new revenue stream.



Passenger train operators can now add increased functionality thanks to Belden wireless OpenBAT. The range comprises two series, BAT-R (IP20) and BAT-F (IP67). Both support the IEEE 802.11n transmission standard, which allows data speeds of up to 450 Mbps in both the 5 GHz and the 2.4 GHz bands. Both series also feature Clear Space® wireless interfaces. Developed and patented by Hirschmann™, these are specifically designed to meet the requirements of an industrial environment. They also have a powerful HiLCOS operating system with extensive management, security and quality of service functions plus layer 3 IP routing.

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**Be certain.
Belden.**

- **Cost efficiency:** small capital outlay delivers added functionality
- **Flexibility:** system becomes accessible remotely
- **Reliability:** a high quality product (designed for industrial environments) perfectly matching the existing system
- **Time saving:** new configurations can be downloaded automatically
- **Increased profit:** a new revenue stream can be created from an existing installation

Increasingly complicated timetabling, coupled with passenger expectations of real time and accurate travel information, means that Passenger Information Systems on board rail vehicles are becoming commonplace.

The deployment of Passenger Information Systems is, therefore, usually not driven by any future direct revenue forecasts (excepting increased passenger numbers). Instead, it is driven by passenger expectations of the required service level.

Typically, a Passenger Information System will include some form of display system; all the way from larger LCD based displays capable of

showing multiple lines of text or graphics to smaller dot matrix type displays only capable of showing one or two lines of text.

However, Passenger Information Systems are not in use all of the time; they are predominantly used to make announcements or display information as a vehicle nears the next station or stop.

System Requirements

- EN 51055: Electronic Equipment Used on Rolling Stock
- Long predictive lifetime >20 years
- Fulfilment of all safety regulations
- Gigabit Ethernet interface
- Bulkhead mounting
- Fast and stable wireless point-to-point connection
- Extended temperature range
- Long lasting devices, high MTBF guarantee
- Low failure rate
- Superior radio technology enabling reliable connections
- Guaranteed safe and reliable networking
- Easy set-up



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Belden® Solution



For a European Metro train builder – who is also responsible for vehicle operational maintenance – Belden designed and supplied a solution for an in-service fleet of trains based on the wireless BAT product series. An IP67 Wireless BAT access point was added to each train's Passenger Information System. Using an ethernet patch cable, the access point was connected to the ethernet switch (also a Belden product; the proven OCTOPUS managed ethernet switch) within the Passenger Information System. The maintenance depots were already fitted with an ethernet infrastructure, so adding a wireless capability was straightforward, this time with a Belden BAT IP20 Wireless product.

The customer updated the train maintenance procedure so that the Passenger Information System was left powered to allow the wireless transfer of advertisement data from the depot infrastructure to each train.

Through the use of the existing Passenger Information System, the customer was able to create a new source of revenue for the operator.

Product Details

The OpenBAT range, comprising the BAT-R (IP20) and BAT-F (IP67) series

- Newest technology designed for harsh and demanding industrial environments
- Long-lasting devices, high MTBF guarantee; low failure rate
- Best radio technology enabling new applications and reliable connections
- Redundant design enables high availability and network stability

Rail Approved ethernet cable

- Halogen-free, oil resistant and flame retardant performance
- Approved to international railway standards, flame resistance, low toxicity, low smoke emissions
- High operating temperature, according to Class TX EN 50155:2007 Railway applications standard
- 100 mbps, 1,000 mbps and 10,000 mbps

