

RETB-Digital In-Cab Signalling

by Park Signalling & Comms Design



SPEAN BRIDGE

Radio Electronic Token Block (RETB) is a radio based digital solution to the problem of signalling trains on lightly used lines where there is a requirement for low capital and operational expenditure.

RETB, which was originally conceived by British Rail Research, has been extensively improved since its first iteration back in the mid-1980s and now has many additional features through a collaborative partnership between Comms Design and Park Signalling both of Unipart Technologies Group.

General Operation

All communications (voice and data) are controlled by the signalling centre and are carried out via VHF radios, which negates the need for expensive lineside equipment and a single signal person is able to control up to 20 stations depending on the levels of traffic.

The movement of trains along a section of line is governed by an Electronic Token, and this effectively becomes the authority for travel and releases the Solid State Interlocking.

A token is issued by the single signaller, first by establishing voice communications with the train and then coordinating the send/receive of the data payload (token) between both operators.

Using voice protocols the driver will confirm that there is a token on the display of the Cab Display Radio (CDR see image below) for that section of the line.



The fail-safe RETB interlocking checks the validity of the signaller's actions. Furthermore, the RETB interlocking ensures that no more than one token for a section of line is issued. This process is repeated at stop boards, stations and token exchange points (TEPs)

Equipment

The RETB system predominantly consists of

- a proven SSI interlocking system specially designed and configured for use with RETB
- Cab Display Radios, with handset and loudspeaker
- Fixed site radio installations that provide full radio coverage over the RETB rail network
- A RETB system control rack that contains a full system database
- Special to type signallers workstations

For safety and investigation in the event of an accident the RETB database system logs all token transfers that are undertaken and also records all voice transactions.

The RETB radio network is a full-duplex network which means that everyone hears everything.

Another important safety feature is the inclusion of a Kaba key which can be removed from the CDR thus rendering it inoperable.

Current and Future Enhancements to RETB Train Protection and Warning System - TPWS

TPWS for RETB was a challenge that was swiftly overcome by Park Signalling. By listening to the RETB token transfer via a Trackside Radio Control Module (TRCM), via a Trackside Radio Control Unit (TRCU) it was possible to determine which token was relevant to which TPWS site.



TRCU Lineside Status Indicator

Resilient Positioning - Know where your train is at any given time. This is currently in development at Comms Design and has had a concept of operations completed.

Resilient Positioning - using different orbiting positioning satellites, the on train CDR GPS receiver and small trackside beacons it is possible to accurately position a train along the sections of track.

A passenger Request to Stop product which removes the need for a passenger to "wave" down a train.



Interested in learning more?

Scan the QR to watch a digital animation of RETB in action

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