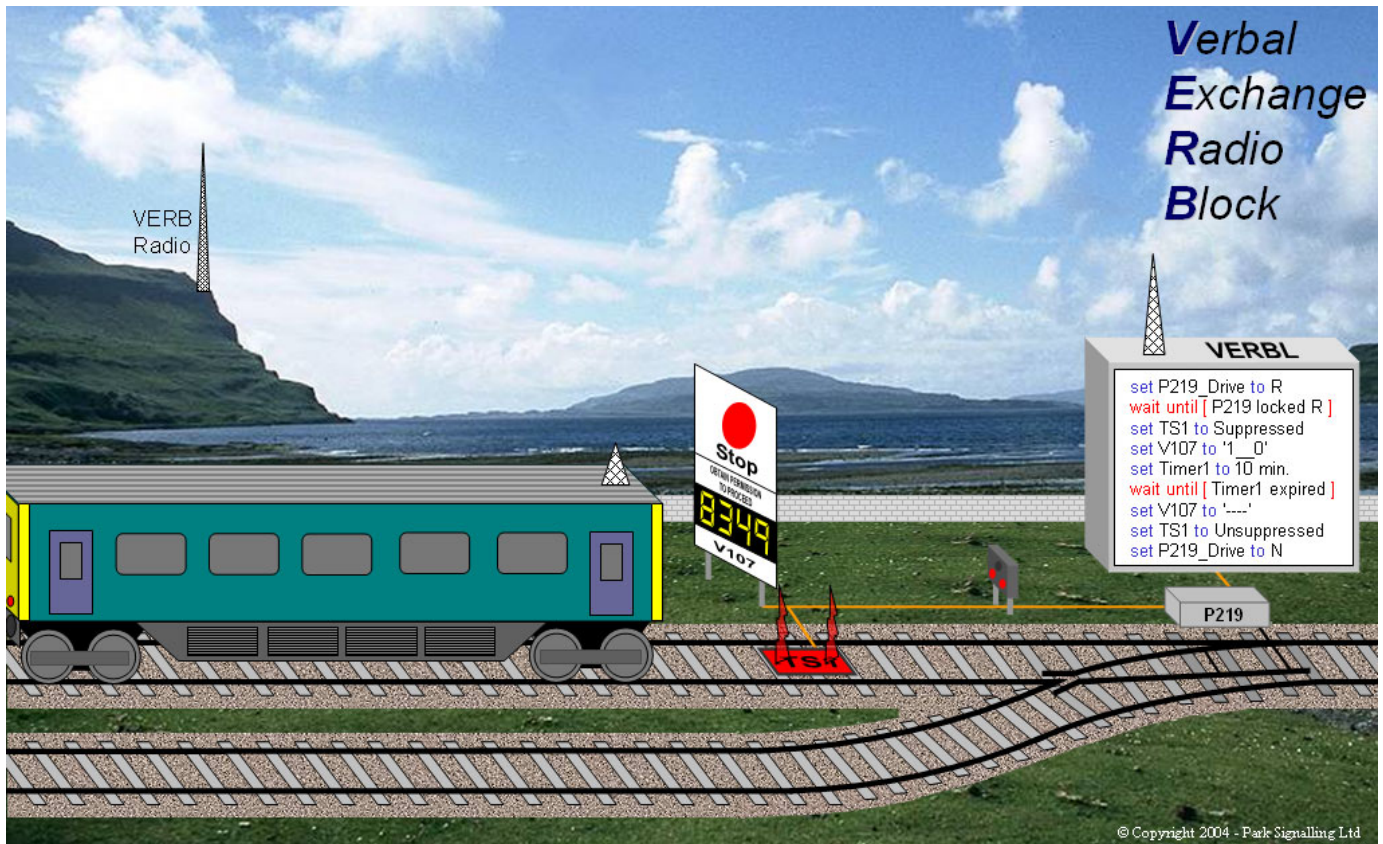


Park Signalling presents **VERB**

– A new concept in low-cost signalling



Signalling Evolution

Signalling systems are a compromise between centralisation – to optimise operational control; and de-centralisation – vital sensors and actuators must exist trackside and system robustness implies graceful degradation via distributed redundancy. While past technologies and organisational structures have tended to favour centralisation, affordable local processing and wireless data now facilitate de-centralisation. Building on the success of its TRCU system (an interface between radio-based RETB signalling and TPWS trainstops developed for Network Rail) Park Signalling is developing a range of low-cost de-centralised signalling products.

VERB - Design

Verbal Exchange Radio Block (VERB) integrates a number of technologies to form a novel signalling solution. With reference to the above diagram, the key design features of VERB are as follows:

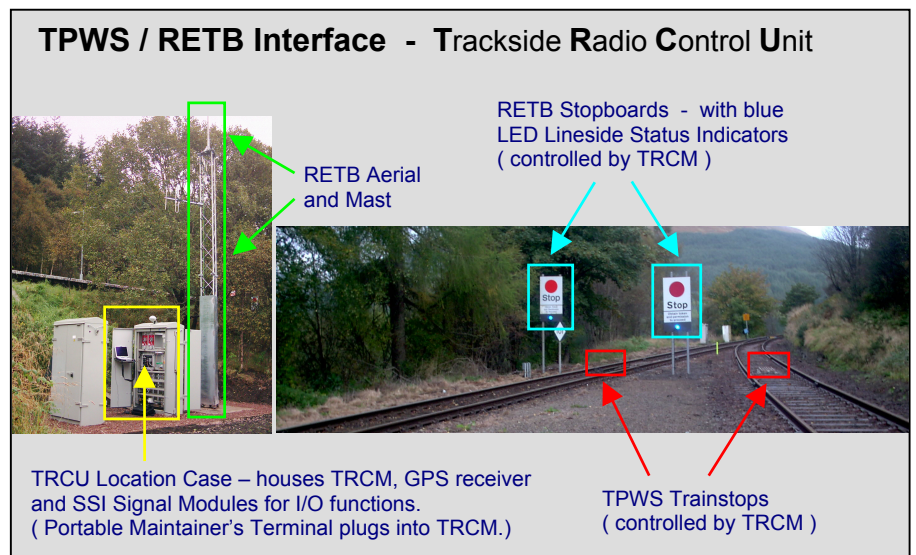
1 The train is localised by means of the driver verbally reporting a system generated pseudo-random number (shown on a 4-digit, seven segment display) back to the signaller over voice radio or GSM;

2 If the number is the one expected the signaller is allowed to send a train movement authority to the local VERB controller (VERBL) via data radio, GSM or GPRS;

3 The supplied movement authority can trigger a series of processing actions within the VERBL unit, such as calling points and,

conditional upon correct detection of their new state, suppressing a train stop and displaying a proceed indication to the driver via the trackside display;

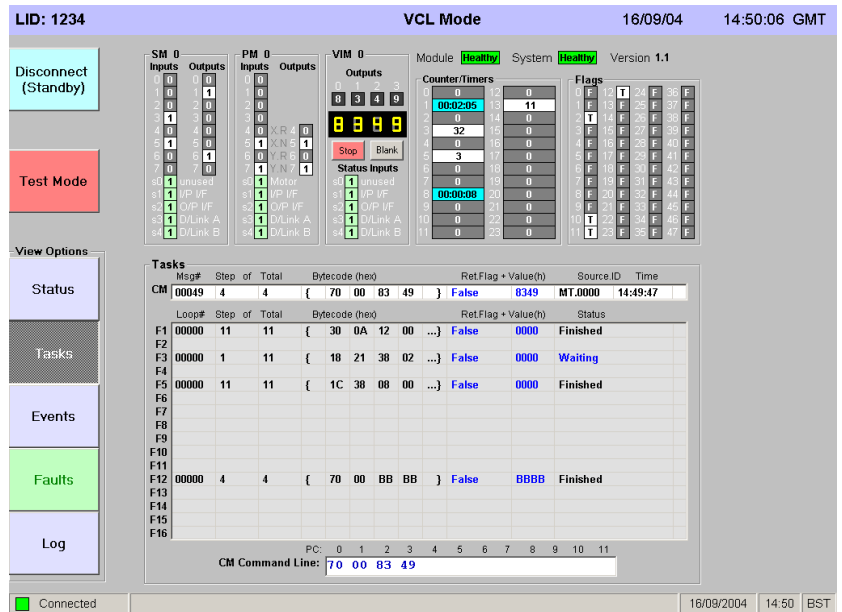
4 A series of restorative actions can be performed after the train has departed.



VERB - Advantages

VERB provides a number of distinct advantages over both conventional and proposed alternative signalling systems:

- No special equipment is required on the train beyond mandatory voice comms. and train-stop sensors – i.e. it does not require captive train stock;
- Only local cabling is required - all data communications back to the centre is wireless (GSM, GSM-R, GPRS, VHF, etc.);
- The required data communications bandwidth is very low – only short, simple, infrequent message traffic;
- Use of SSI Trackside Functional Modules for I/O;
- Autonomous local behaviour using local sensors and actuators can be remotely monitored or overridden.

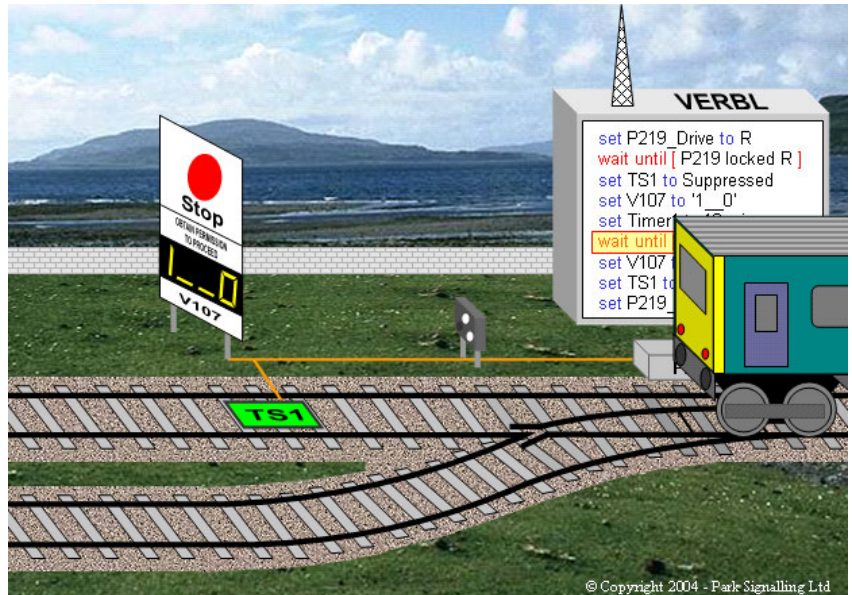


Maintainer's Terminal (plug-in laptop PC) screen-shot showing I/O and Task status

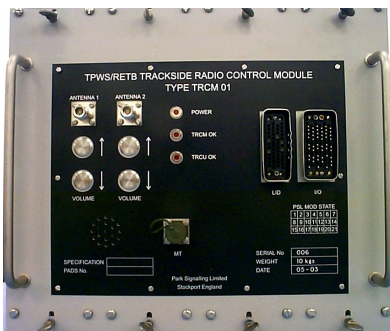
VERB – Future Development

The current VERB system requires a central interlocking to provide movement authority. However, if local controller modules are allowed to communicate directly with geographically adjacent modules, e.g. the one controlling the next passing loop, then it is, in principle, possible to replace the centrally provided movement authority with a request for one. This request would be accepted or rejected based on a co-operative determination of interlocking state between the source controller and the destination controller - in effect, a modern version of classic Token Block working.

Interestingly, local processing and digital wireless data return us, in a sense, to a century old signalling architecture. This should come as no surprise, since the application domain is essentially unchanged. It serves to remind us that good system architecture transcends its implementation technology.



Train departing after points switched, trainstop suppressed and 'GO' indication displayed



Prototype VERBL Controller Module

Related Products

Using similar technologies and principles to those already described a number of other de-centralised, controller-based signalling products are also being actively developed at Park Signalling:

- Train Operated Points;
- Level Crossing control;
- Possession Management;
- Temporary Signalling.



If you would like a demonstration of VERB or any further information on Park Signalling Limited then please contact us on tel: **0161 975 6161** or email: info@park-signalling.co.uk Website: www.park-signalling.co.uk