PARK SIGNALLING
a Unipart Rail Company

Park Signalling

Specialists in innovative design and product development to enhance service life of train control systems and equipment, using cost effective digital technologies to deliver problem solving solutions to heavy and light rail networks.

PARK SIGNALLING
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Design • Develop • Integrate • Investigate

World class leaders in innovation

At Park Signalling innovation is at the core of everything we do. We listen to and understand our customers and work in a collaborative manner to effectively deliver the right solution which will improve efficiencies, reduce whole life costs and enhance safety. This is what makes Park Signalling the stand out solutions provider for our customers.

The founders of Park Signalling were instrumental in the development of SSI signalling and interlocking systems in the 1970's and 1980's. This foundation has enabled the team to continually develop innovative solutions to manage product obsolescence and performance improvements for legacy equipment. Building on these skills the team have been able to develop a range of innovative low cost signalling solutions for the digital railway.

At our UK facility in Stockport we have created an environment and culture that enables our people to explore new ideas, nurture and develop concepts and work with our industry and innovation partners in bringing new technologies into our customers' hands.

We are focused on creating value for our customers and stakeholders and for our people by continuing to develop and deliver cutting edge solutions to solve issues before they impact the operational railway.

Why collaborate with us?

Park Signalling have a well established track record of collaborating with industry partners in both heavy and light rail sectors. We have delivered a range of products and solutions that have been recognised as the benchmark standard in the industry. These have resulted in improved performance of signalling systems at locations across the UK and the rest of the world.

Our Expertise

The Park Signalling team has extensive experience within both heavy and light rail industries, we have developed a wide range of signalling products and solutions which have become the industry standard for monitoring and fault finding for signalling assets. All our solutions have been designed to meet the needs of our customers, every time. We are committed to offering world class innovation in consultancy, product design and delivery, complemented by outstanding levels of service.

Our diverse range of capabilities includes:

- Product Design and Innovation Excellence
- Innovative Technology
- Proven Reliability and Quality
- Outstanding Performance
- Agile and Flexible Service
- Environmental Commitment
- Global Solutions Provider

Accreditations and Associations

We hold a quality management system certificate to ISO 9001:2015 and we are a member of the British Standards Institute (BSi). We are proud to work in partnership with and carry endorsements from the following bodies:

- Railway Industry Association
- ISO9001:2015
- CIRAS
- IRSE
- BSi
- Investors in People
- RISQS

Railway Industry Association

Our accreditations and association partnerships provide our customers with the peace of mind and confidence required to ensure that Park Signalling is able to deliver the best solution to exceed our customers needs and expectations.

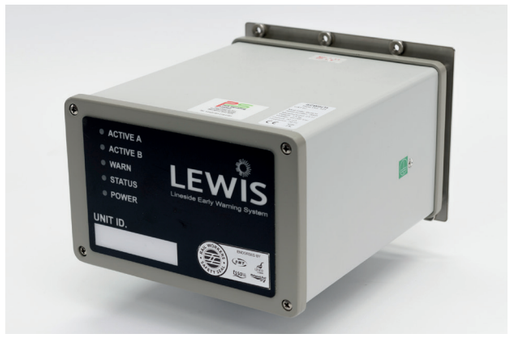
Product Innovation & Collaboration

Park Signalling works closely with Network Rail to deliver innovative solutions to Signalling issues.

Park Signalling has been involved in developing innovative products for SSI signalling systems for nearly 20 years. When Network Rail's Safer Trackside Working Programme was looking for a partner to help develop a warning system for trackside workers in SSI signalling areas, it was Park Signalling they turned to.

By combining our detailed knowledge of SSI signalling, with Network Rail's experience in safety warning systems, Park Signalling were able to produce a working product that fully met Network Rail's safety goals. Park Signalling and Network Rail engaged with the railway unions at an early stage in this project, leading to their buy in and approval of the product. This even included inviting the unions to name the product.

The success of this collaborative approach has resulted in the LEWiS (Lineside Early Warning System) product being made available to help improve trackside worker safety. Furthermore, the collaboration has continued, leading to the development of a Remote Disconnection Device (RDD), which enhances safety in those areas where relay based signalling is still in place.



REMIT *detect*

The Challenge

Solid State Interlocking (SSI) was the first computer based interlocking system, developed during the 1980s. It has proven to be a reliable and robust system, still controlling a significant proportion of the UK's Railways well into the 21st Century.

SSI data links are remarkably tolerant of problems. Performance issues are masked by the SSI diagnostic processor, meaning that only complete failures are reported. Monitoring individual data links is a very time consuming, manual process which is costly in both resource and time. It requires a technician to be present to read and asses the outputs.

The Solution

Park Signalling have developed REMIT *detect* (Remote Missing Telegram Detector). This is a system which monitors multiple SSI data links (up to 64), recording the occurrence of missing reply telegrams and glitches. Using proven technology from Park Signalling's SSI Link Analyser, the system connects to the data link test points provided by the interlockings.

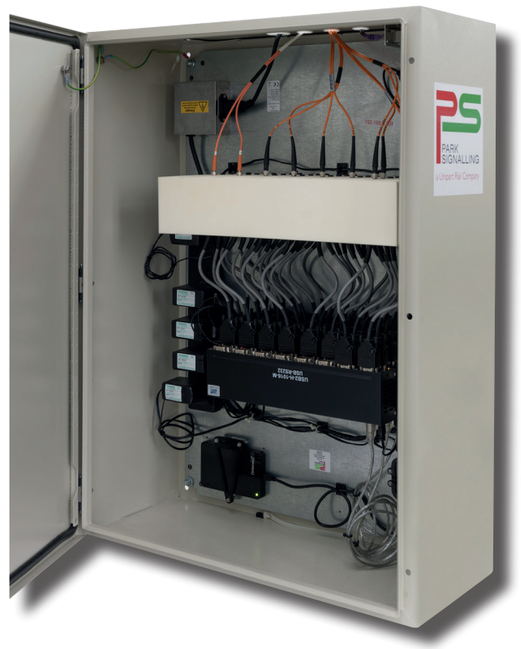
An Ethernet connection is provided for the user to connect a PC (either directly or over a network), from where all missed telegram and glitch information is available on a simple web interface.

The Result

By installing Park Signalling's REMIT *detect*, users are able to monitor a continuous count of missed telegrams. Additionally, the system also provides a count for individual telegram addresses. This is very helpful when trying to pinpoint the exact location of data link faults.

The Benefits

- Easy to install. Connections made via Optical Fibre
- Network Rail Product Accepted PA05/06017
- Continuous, remote monitoring in real time
- Very cost-effective. Multiple data links can be monitored by one person.



ISPU-E

The Challenge

The introduction of Rolling Stock driven by AC Traction Motors, has resulted in new Electro Magnetic Capability (EMC) issues with conventional signalling in the United Kingdom and worldwide. For Solid State Interlocking (SSI) systems, the alternating current from AC Traction Motors can result in stray currents being induced into the data link. This can result in Trackside Modules indicating faults or even failing.

The Result

By installing Park Signalling ISPU units, infrastructure owners are able to protect sensitive signalling equipment against interference. This enables the introduction of new, technically advanced Rolling Stock on to conventionally signalled infrastructure, quickly, cost-effectively and with the minimum of disruption.

The Solution

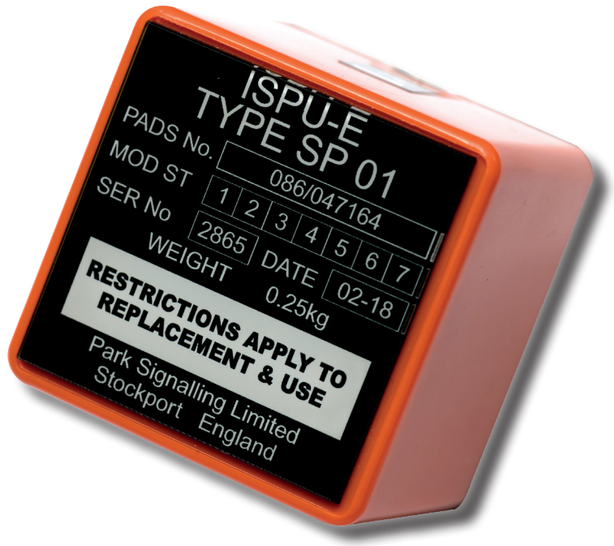
Park Signalling have developed an Isolating Surge Protection Unit (ISPU) for SSI Data Links. It is an improved surge protection unit that incorporates a transformer to greatly enhance immunity to common mode surges and voltages.

The SSI system requires that the data link and Data Link Modules (DLMs) be protected from lightning, traction and other electrical surges. This is conventionally achieved by the use of Surge Protection Units (SPU) placed at DLMs, along with Data Link Isolating Transformers (DLITs).

There have been several successive generations of surge protection for SSI, each giving enhanced protection compared with the earlier generation. The most recent standard, Engineering Specification: SSI Trackside Data Link Surge Protection Module GS/ES 1937, defines a plug-in unit to a prescribed 11-pin base design. Park Signalling's ISPU is the only ISPU device with Network Rail approval (PADS no. 086/047164).

The Benefits

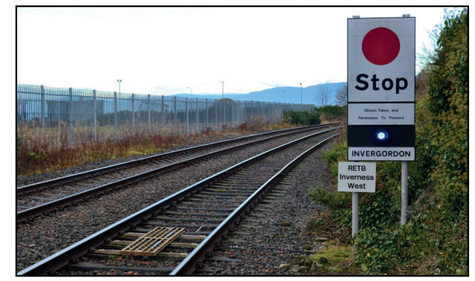
- Plug-compatibility with units designed to GS/ES 1937.
- Network Rail PADS approved
- Designed to meet the requirements of BS EN 50125-3:2003
- All connections made via the 11 pin (B11A) plug base in accordance with GS/ES1937



RETB Signalling

Radio Electronic Token Block Signalling (RETB)

Radio electronic token block (RETB) is a method of controlling movements on railways with simplified infrastructure, enabling reductions in the overall cost of operation. The essence of the system is the secure transmission of uncorrupted data by the means of a radio network. This system can also be configured to include Train Protection Warning System (TPWS).



The Challenge

Park Signalling habitually 'goes the extra mile' with its customers by using a deep understanding of the railways and signalling technologies to meet and exceed their requirements. This was recently illustrated in the development of the RETB.

Park Signalling were awarded a contract from Network Rail to design, develop and manufacture a suitable system which involved a technique to "eavesdrop" on RETB token transactions to temporarily suppress the appropriate TPWS equipment on the infrastructure.

The project involved the design and development of the Trackside Radio Control Module (TRCM), Location Identity Device (LID), Maintainer's Terminal (MT) and a Site Configuration Tool used to configure the TRCM to respond to specific RETB Token.

The Solution

The project required close collaboration with the incumbent Train Operating Company, Network Rail operation staff, maintainers, the radio system supplier Comms Design Limited and Telent. A number of challenges were overcome such as space restrictions, human factors associated with the operations and project timescales. The project programme was complex due to the many interactions and dependencies with the other work-streams.

Technically there was little risk other than the possible non-availability of the tools on which the original system was developed. This risk was mitigated and controlled by means of creating a backup of the original system including tools before work commenced. A rigorous and complete Factory Acceptance Test of all equipment, witnessed by Telent and Network Rail was conducted before the equipment was shipped and installed on site. This proved to be extremely successful and meant that any design issues could be quickly rectified in a controlled environment. Installation and testing times were reduced and as the system worked first time, site health and safety risks were reduced due to the short time working on site.

The Benefits

Park Signalling's successful delivery of the RETB project has resulted in a number of benefits being realised by Network Rail, these include:

- Provides upgraded train protection functionality on RETB lines in the UK
- Park Signalling's existing Trackside Radio Control Unit (TRCU) 'eavesdrops' on RETB electronic tokens via the upgraded radio systems
- TRCUs are fitted at passing loops and interface to the Thales TPWS equipment
- TRCUs are configured to only respond to specific electronic tokens
- When required the TRCU suppresses the TPWS equipment to allow trains to depart and pass the stop board at the passing loop without a TPWS activation
- The RETB Interlocking split at Invergordon has allowed capacity increase on the Far North RETB Signalling System
- The provision of a second RETB Interlocking has allowed two signaller operation on the Far North RETB Signalling System
- The replacement of the obsolete first-generation control centre equipment

Technician's Terminal

The Challenge

The components and hardware used in the original Solid-State Interlocking (SSI) Technician's Terminal, manufactured by GEC and Westinghouse, are difficult to obtain; a situation that will continue to deteriorate with the existing equipment located around the world.

Park Signalling has an excellent reputation regarding managing obsolescence and extending the useful life of older signalling, telecommunications and control system equipment which are no longer supported by Original Equipment Manufacturers (OEMs).

The Solution

Park Signalling has the ability to reverse engineer equipment, replacing obsolete components with current operational equivalents to the correct Safety Integrity Level (SIL). They investigate, repair, rebuild and provide spare equipment, providing ongoing technical support where requested.

Park Signalling has developed a replacement Technician's Terminal (type reference MT04) using standard Commercial Off-The-Shelf (COTS) components. The technologies used have been carefully chosen with consideration for operational performance and longevity of availability.

Product trials have taken place on Network Rail Infrastructure at Woodburn Junction in Yorkshire, UK and Ashford Integrated Electronic Control Centre in Kent, UK.

The Result

A major consideration in the development was to provide a replacement for the original Technician's Terminal which is directly compatible at all the electrical interfaces. Park Signalling has also replicated the feel and functionality of the original Technician's Terminal to minimise the need for the re-training of staff.

The Benefits

- Standard (COTS) components
- Directly compatible at all of the electrical interfaces
- Replicated feel and functionality of original Technician's Terminal
- To log interlocking system activity
- Control serial interfaces connect up to six SSI systems
- Provide means of applying and removing technician controls including:
    - Start/Stop Interlocking
    - Track Circuit Occupy
    - Route Bar
    - Aspect Disconnect
    - Points Disable
    - Temporary Approach Control
    - Disable Interlocking MPMs
- Display data link telegram contents
- Display panel requests
- Provision of a trackside display

Innovation and Design

Park Signalling identified the requirement for a Train Protection System based on Global Navigation Satellite System / Inertial Navigation System (GNSS / INS) as part of its low cost signalling development initiatives, including Verbal Exchange Radio Block (VERB) and Virtual Lineside Signalling (VLS) projects.

Innovating for you

Following a high-profile incident on a UK Tram system, Park Signalling realised that our innovative low-cost signalling concept, could be developed into a tram vigilance system, which would have stopped this accident and others occurring. This system is TRAMSAFE.

Our TRAMSAFE idea is very simple in concept. The system comprises a GPS receiver that continuously monitors trams' speed and position which is compared to a bespoke digitised map of the transport system speed transitions that is stored on the Tramsafe Unit The map data is relevant to the line over which the vehicle operates and contains the permissible speed profile information relevant to the line.

As the tram travels through the network its speed is continuously compared against the required speed profile. If the tram exceeds the permitted line speed then an alert tone is sounded. Should the driver fail to respond (i.e. apply the brakes) a more urgent intervention tone sounds and the tram brakes will be applied automatically.

All speed and position events are recorded and logged for a minimum of 24 hours. It is possible to remotely download and update new mapping software to the device by means of wifi.

The device will provide an alarm to the control centre if an intervention occurs. A mechanism to reset the brakes is provided following an intervention.

The data for the line is programmed into the device by an office-based support computer. This computer allows the creation of the necessary map and permissible speed data for the line to be defined and programmed into TRAMSAFE device. All trams are fitted with devices which have identical programs and data. It will be possible to download new map and speed data to the tram by means of Wifi and/or GSM/GPRS. This allows the possibility of introducing and managing temporary speed restrictions on an hour by hour basis if required.

Park Signalling continues to engage with the UK's Tram Operators and hopes to commence trials of TRAMSAFE in the near future.

The Benefits

- Use of COTS materials wherever possible to reduce cost and to future proof TRAMSAFE
- Designed from the ground up to meet Tramway Operators' needs
- Enables Operators to minimise disruption to their timetables after an intervention
- Only intervenes if Tram Driver over speeds or drives outside of the route speed profile

GateLock

The Challenge

Every year in the United Kingdom, there are numerous incidents and near misses at User Worked Crossings (UWCs'). In the majority of cases, these incidents are caused through users not contacting the signaller at the controlling signalling centre and following verbal instructions. This can be due to unfamiliarity with the crossing, laziness or poor discipline.

In terms of the classic six step risk model (ERIC PD: Eliminate, Reduce, Isolate, Control, PPE, Discipline) under ALARP (as low as reasonably practicable), the UK railway industry cannot currently afford to eliminate many of the UWC's that exist.

The Solution

Park Signalling Ltd in collaboration with Haywood and Jackson Fabrications Ltd, have developed and produced the GateLock product.

GateLock is a GRP (Glass Reinforced Plastic) manufactured gate and post solution, fitted with an electronic gate locking system.

The GateLock product contributes to greater control and increased discipline at UWCs'. GateLock has the potential to provide affordable risk mitigation against the stated instances and issues.

The Benefits

Gatelock is a low cost solution which allows Network Rail to significantly reduce the risk of missuse of many UWCs'.

It is much lower in cost than competing products, meaning that many more crossings can be fitted. The gate and post are made of 100% recycled materials and can be colour matched to the individual requirement for each site.

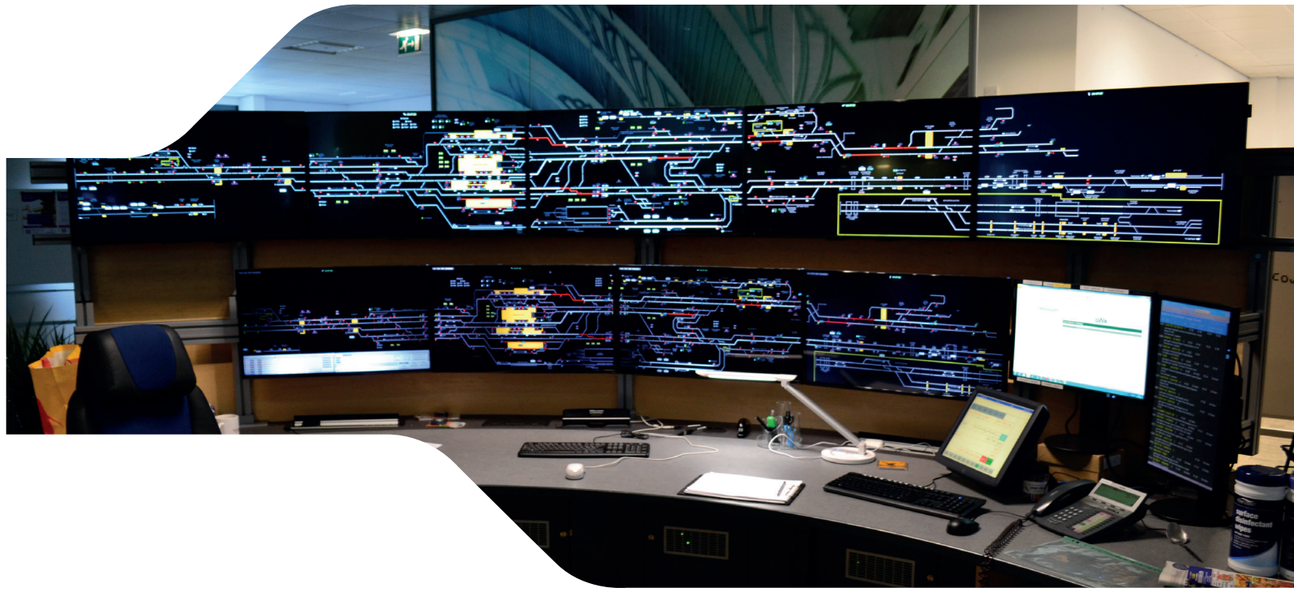
- Compatible with the Network Rail Transforming Level Crossings Strategy (NR17)
- Significantly reduces risk at User Worked Crossings
- Encourages correct and compliant user behaviour at crossings
- Provides basic maintenance diagnostic information
- Use of recycled materials means solution is environmentally friendly and sustainable

Consultancy

Park Signalling Ltd has a long and successful record of providing high quality, high value consultancy services to the Railway Industry in the UK and overseas. Whether you are new to the sector, or have years of experience, Park Signalling can help with your signalling or control systems.

We can provide consultancy in the following areas:-

- Heavy rail signalling and train control
- Light rail and metro train control
- Obselesence management
- New and innovative signalling systems
- Complex problem solving
- Reverse engineering
- Product approval



Our customers include:-

- Network Rail
- TfGM
- Crossrail
- MTR

About Unipart

The Unipart Group is a leading UK manufacturer, full service logistics provider and consultant in operational excellence. Operating across a range of market sectors, including automotive, manufacturing, mobile telecoms, rail, retail and technology, Unipart offers a breadth of services to a wide range of blue chip clients internationally.

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