

The model of a modern modular railway

When infrastructure is developed piece-by-piece over a long period, it is necessary for each new development to accommodate the technology that preceded it. The development of the UK railway over the last 150 years has been characterised by such accommodation, resulting in an infrastructure that looks very different than if it were designed from scratch today.

Network Rail's initiative to develop a 'modular railway' has presented the opportunity to review existing signalling systems and reimagine how the railway might look without historical constraints. At the heart of the modular idea are four concepts:

- Standardising components for cost-effective projects.
- Standardising design of infrastructure elements within the whole project.
- Faster delivery of upgrades and enhancements.
- Reduced track possession time.

Signalling systems based on these principles save a lot of time and money, but also enable the acceleration of project implementation.

Based on its experience of developing over 500 LED signal variants to meet infrastructure requirements and having supplied over 60,000 LED signals to the rail infrastructure, Dorman introduced its lightweight modular signal concept to Network Rail senior signalling engineers in 2007. Such was the enthusiasm for the initiative, Dorman was invited to work alongside Network Rail's modular team and develop the solution in tandem with its chosen contractors.

During Dorman's development process, a modular signalling installation demonstration was performed for Network Rail and Signalling Solutions Limited (SSL) and was so successful in significantly reducing the installation time it was described as a revolutionary step forward in railway signalling history.

Current signalling systems

With low maintenance and environmentally improved LED technology now fast becoming the norm in the UK, and with general technological advances, many of the old existing systems which supported filament technology are no longer required.

For example, the need for gantry and cantilever structures along with equipment cases is now reduced. The elimination of these alone would reduce costs across the network by millions of pounds. The existing Dorman LED technology has already reduced maintenance costs significantly and the second generation of the Dorman colour light signal will deliver further significant benefits.

Dorman, responsible for the majority of UK LED signals that have been innovated and manufactured, is now trialling new lightweight modular LED signal structures. Following extensive ergonomic studies Dorman has reinvented the colour light signal and junction route indicators, delivering:

- Significantly reduced the weight of the complete structure.
- Eliminated the need for gantry mountings.
- Incorporated equipment traditionally housed in a location case.
- Introduced plug-and-play installation processes.
- Reduced the needs for cranes and on-site vehicular transport.



Ergonomic design - easy to lift, manoeuvre and install.

As the new lightweight signal has a very low weight and is designed to fit directly onto existing concrete bases, the installation and commissioning time is reduced from hours to minutes, leading to a dramatic reduction in blockades, possession times and costs.

This has led to positive discussions with contractors. Mark James, Project Director, Atkins, commented: 'Since Dorman has introduced LED technology into UK rail signalling, I have been impressed with the quality of product and design. During a recent visit to Dorman's new facility, I was really excited by the prospect of introducing its next generation of lightweight LED signals into our future signalling projects.'

Emerging signalling systems

The concept of modular systems - a single range of materials which fit together in the same way at every location - cannot be fully realised as there will always be areas where the standard cannot be applied. In recognition, Dorman has developed variants for different applications - with and without integrated control cabinets/cubicles.

These new systems differ radically from those that have gone before and will require new ways of working and specifications and a fresh approach to projects and renewals, but the benefits for the infrastructure are immense and within reach.

Dorman is exhibiting at InfraRail from 13th-15th April, NEC, Birmingham, and more information on the new technology will be available on Stand 615.

LED universal semaphore lamp

A further new product development from Dorman to achieve Network Rail Product Acceptance is the LED universal semaphore lamp. The LED replacement lamp is designed to be fitted into any existing semaphore signal and removes the risks associated with the regular maintenance requirements of traditional semaphore lamps.

The replacement lamps work in conjunction with the LED semaphore signal battery box, which has also recently gained Network Rail Product Acceptance, the battery box is designed to be accessible from the ground thus reducing working from height risks.

The benefits of the new system are:

- Cost saving.
- Lower carbon footprint (when compared to the paraffin lamp).
- Increased safety.
- No storage/transportation requirements of flammable liquids.
- High and low intensity variants.



Three and four aspect handlamps

The new LED handlamp (pictured above), which replaces the old 'NRS' (formerly 'Bardic') handlamp, is now available in both 3 and 4 aspect versions. The combination of an incredibly robust polycarbonate body to easily endure the knocks of everyday use, and impact resistant LEDs which deliver a longer battery life, means that the new handlamp will outperform the old version, and at a lower running cost. The handlamp is now available from the Unipart Rail Crews office.

