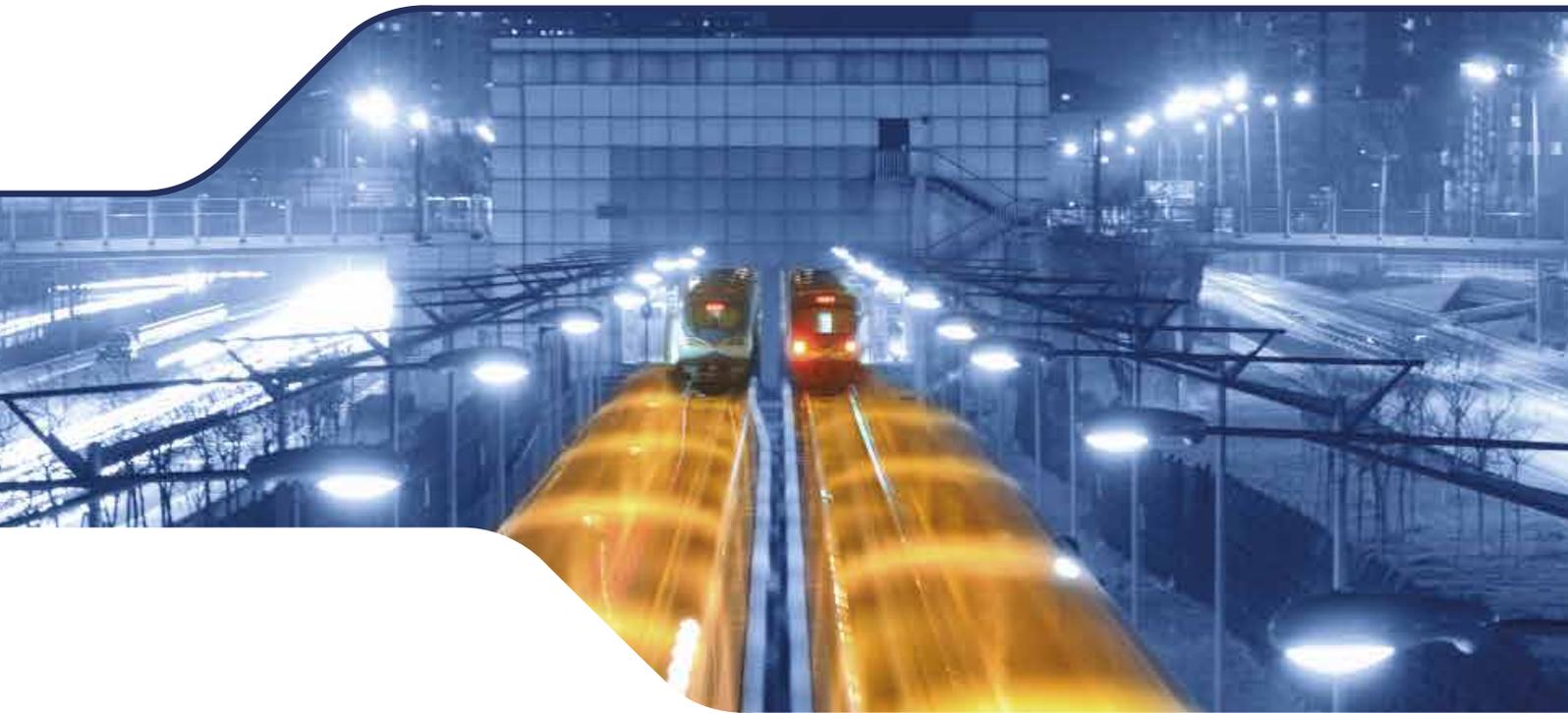




# Unipart Dorman - Rail

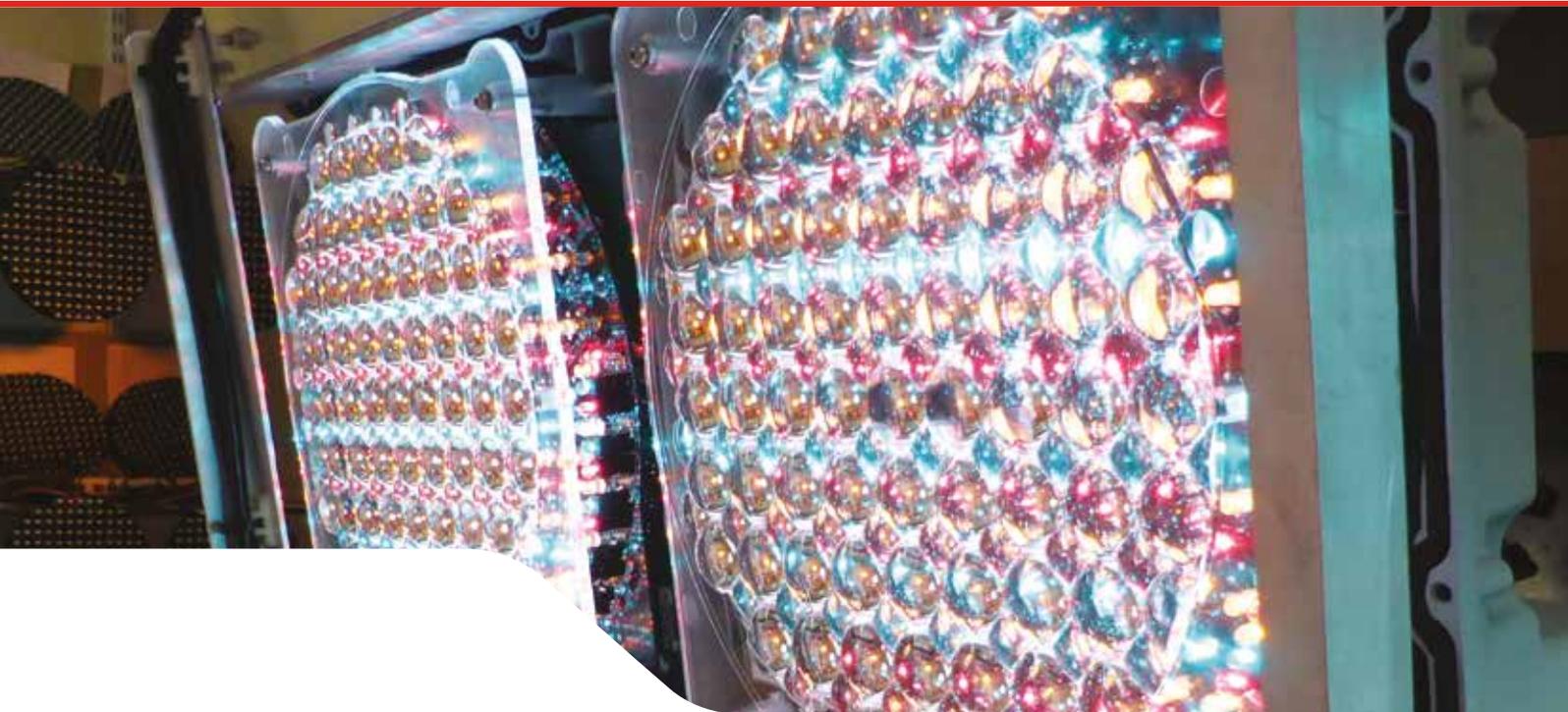
Transforming safety and performance with innovative, maintenance free LED signalling solutions



**UNIPART**  
**DORMAN**

## Way Ahead in Signalling

INTELLIGENT ENGINEERING, UNIQUE PEOPLE, WORKING TOGETHER



## World class leaders in innovation

At Unipart Dorman we listen to and understand our customers, enabling us to recognise the drive to improve efficiencies, reduce whole life costs and increase safety. This is what really makes the difference for our customers.

We have over 140 years experience in developing products and solutions that deliver these benefits without compromising safety and performance.

Our team of electronic, mechanical and optical design engineers deliver innovative world class patented products to operate in challenging environments of a safety critical nature. We excel in the continuation of developing innovative solutions for challenging problems.

At our UK facility in Southport 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 want to create value for our customers, for our stakeholders and for our people by spearheading LED signal solutions into the rail industry.**

## Why collaborate with us?

Unipart Dorman pioneered the use of LED technology on the UK Railway and since we introduced them, have supplied in excess of 100,000 modules in a wide variety of signals and indicators.

Our commitment to collaborating with customers by listening to their needs and aspirations has brought truly innovative solutions to rail networks across the world and nearly 140 years of designing and manufacturing safety critical products, provides a solid platform of expertise to deliver cost effective and efficient, reliable LED signals.

# Our Expertise

As a result of our extensive experience within the rail industry, we have built up an unrivalled range of unique products designed to meet the needs of our customers, every time. We are committed to offering world class innovation in design and manufacture, complemented by outstanding levels of service.

Our diverse range of capabilities can deliver the following:

- Design and Innovation Excellence
- Innovative Technology
- Proven Reliability and Quality
- Outstanding Performance
- Exceptional Service
- Environmental Commitment
- Manufacturing Excellence

Clients and strategic partners who place their trust in Unipart Dorman to deliver:



## We do it right..

The rail industry has many standards and safety controls and we understand that everything needs to conform to ensure safety and interoperability of systems.

That is why we are members of all relevant industry organisations, and have certifications and accreditations for the standards which underpin safety, security and quality - in our products, services and people.

- Railway Industry Association
- IRSE
- BSI
- Investors in People
- RISQS
- RSSI
- TÜV SÜD BABT
- AREMA





# Innovation and Design

We all talk about innovation but genuine innovation is much more than words.

True creativity is cultivated, it's curated - a product of creative confidence.

The kind of creative confidence that encourages the sharing of ideas, invites partner input and builds strong relationships with leading academic institutions and international research centres.

That's what makes Unipart Dorman innovation so... innovative.

Pre-emptive and industry accredited innovation specifically designed for safety critical and harsh environments - for example, our unique Integrated Lightweight Signal (iLS), the latest generation in railway signalling was designed in collaboration with Network Rail to meet the changing needs of the industry.

Innovation that keeps your operations working efficiently and profitably now and into the future.

## Innovating for you

Utilising its long standing close relationship with the UK rail industry, Unipart Dorman accepted the challenge to deliver a revolutionary range of railway signals which within the first five years of use realised over £90m of performance improvements.

The main benefit of the new and radical approach to signalling, has been the ability for the operating authority to reduce the amount of scheduled maintenance to zero based upon a wealth of reliability data and new self-cleaning lens technology. This increases signal availability and reduces the risk of death and injury to workers associated with trackside maintenance.

For more information read the [Zero Maintenance Case Study](#).



# Inspiration unrealised? Product potential unfulfilled? **We can help bring your ideas to life.**

Unipart Dorman provide a complete product development service that offers support through the whole life cycle of products, from concept to installation. We will work in collaboration with your team to deliver a unique solution for your business with our forward thinking approach and continued focus on innovation.

This makes us your perfect partner for design and innovation.

## **Our Capabilities**

- Design Engineering
- Electrical and Electronic Engineering
- Mechanical Engineering
- Optical Engineering
- Product Approval Management
- 3D CAD Modelling
- Project Management
- Prototyping
- Lean and Continuous Improvement Philosophy
- Specification Conformance and Testing

## **Your Operational Benefits**

- Bring ideas to life
- Reduction of customers' business operation expenses
- Cost reduction opportunities through design techniques
- Access to state of the art technologies, materials and processes
- Full management and understanding of the complete product life cycle
- Experience in designing products for safety critical and harsh environments
- Reduction of customer resources in R&D





## Product Innovation

### Bringing ideas to life

Unipart Dorman is working closely with Thales to develop four new signal indicators for the multi million pound modernisation of four London Underground lines (Hammersmith and City, Metropolitan, District and Circle Lines - 4LM).

- Fixed Red Light (FRL)
- Route Secure Indicator (RSI)
- Rail Gap Indicator (RGI)
- Short Range Colour Light Signal

The improvements to these vital transport arteries in London will boost capacity by an average of a 33% across the four lines and the main benefit will be to deliver the ambitious target of a train every two minutes at peak times.

Pivotal to meeting this target is eliminating the delays caused by signal failure and the experience and reliability data Unipart Dorman has amassed over many years, gives Thales confidence in the product and whilst the signal displays are unique to London Underground they are based on established mainline signal technology.

Unipart Dorman has established a dedicated design team for 4LM to enable close collaboration with the Thales design team and this process has allowed rapid evolution of the new signals from basic concept through to working prototypes ready for trial installation in line with Thales' requirements.



# Assisted Lift Trunnion

by Unipart Dorman

As part of our continual drive to deliver world beating solutions to our rail customers, Unipart Dorman identified that the majority of signals being ordered were simple 3 and 4 aspect heads and strong customer feedback indicated a need to reduce the amount of support equipment required to install and maintain the signals.

To increase worker safety and reduce installation time, Unipart Dorman has developed a new Assisted Lift Trunnion which uses progressive rate spring technology to reduce the lifting force required in moving the horizontal post to the vertical plane.



## Features & Benefits

- Can be used for a wide range of signals including the Unipart Dorman Classic signal range, CLS LITE, Banner Repeaters, Route Indicators and Level Crossing Wig Wags
- Simplified installation using basic handtools
- Permanent lifting eye provided allows the use of a variety of readily available mechanical handling devices - no plant or large equipment required
- Complies with PAN/E/CE 0017 (Project Advice Note - Signal Structures - 'Form A-Guidance for Loading and Performance') and is subject to its own generic F001, F002, and F003 submission
- Signal sighting is done from ground level, allowing the trunnion to be installed and sighted in advance of signal post and head delivery to site
- After sighting, the trunnion can be secured in the horizontal position for extended periods using the hold down pin secured with a standard padlock

# Wayside Signal

by Unipart Dorman

## 'Re-inventing a bright Idea'

For the past several years since the award of our first significant signalling contract in North America at Union Station Toronto, Unipart Dorman have been listening and working hard to understand the signalling challenges of both Class I and Transit railroads in North America.

For a number of reasons LED signalling has not demonstrated the same performance, system reliability and safety improvements as demonstrated in our home market and we wanted to know why and see if there was a possibility to use our experience in this field to allow Railroad operators to share some of the same operational benefits of our own home network operators.

We have now successfully launched, the AREMA compliant SearchLITE, ColorLITE and LEDMech Series of retrofittable LED wayside modules.

## The Vision

Modernise your rail Wayside Signal assets with enhanced performance, reliability and safety, subsidised through reduced system operational costs.

The Unipart Dorman SearchLITE, ColorLITE and LEDMech signals offer a unique opportunity for operators to have the choice of upgrading to a complete new signal head, or a plug and play family of single and tri-color 12V modules that will fit in any existing signal housing, linking to any existing interlocking for all types of existing incandescent signals, including mech GRS and US&S searchlights.



The units are available in both medium and long range variants and suit all railroad wayside signal applications:

ColorLITE series:

- Single Colour - Red, Yellow and Green single colours with single wire and ring terminal connection

SearchLITE series:

- Tri-colour - Red, Yellow and Green colours from a single aperture, with MIL 5015 plug coupled connection to AAR terminals

LEDMech series:

- Mechanical Searchlight - Red, Yellow and Green colours from a single aperture, with US&S H2 type or GRS SA-I type plug coupled connection to an LEDMech interface module made specifically for the application



*Note: A photo-effect has been applied to this image to demonstrate 3 signal colors from a single aperture*

LED light sources provide a long and predictable life, giving huge benefits to railway operators. Unipart Dorman's Wayside Signal Module is the latest development for the company to offer a solution for global railway signalling systems.

## Safety

The reliability of Unipart Dorman LED Wayside Signal module range is based upon design excellence developed over 30 years of supplying LED products into the UK railway sector. The signals are fully compliant with AREMA C&S requirements.

## Cost Effectiveness

LED technology will instantly reduce costs associated with maintenance, servicing and spares holding driven by virtually removing both pre-planned and reactive maintenance activity (filament lamps). There is a further opportunity to reduce maintenance activity to zero by using the self-cleaning outer cover; this reduces debris and snow from building up on the signal front cover.

## Construction

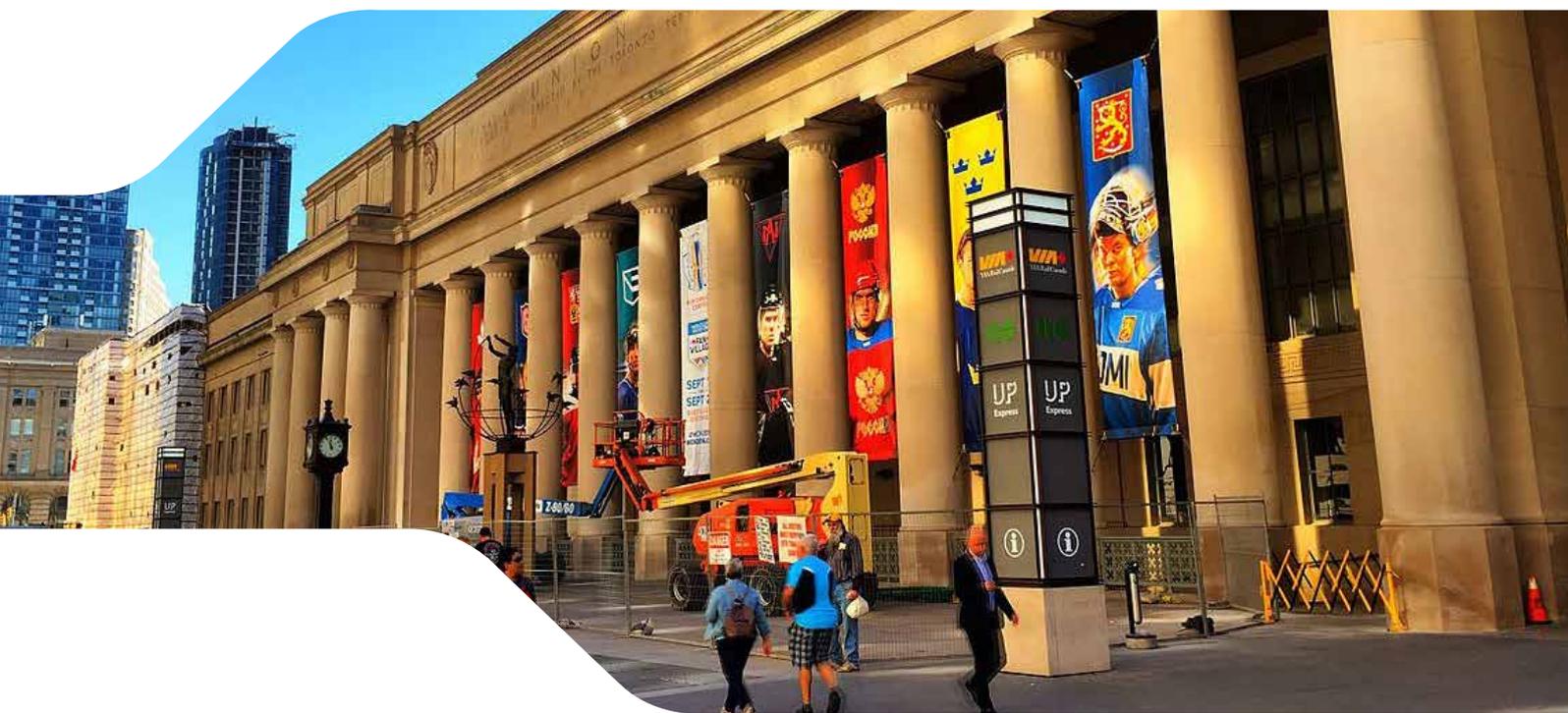
The front outer cover is manufactured from high impact polycarbonate that has a UV resistant hard coating to reduce scratching due to cleaning operations. Also available is a self-cleaning outer cover that reduces debris and snow build up. The rear of the housing is manufactured from an aluminium casting that incorporates a heatsink, pressure vent and sealed plug coupled connection. This design gives greater control of the environment within the signal module, that prolongs the operational life of the signal.



## Benefits

- Unipart Dorman track record incorporated into design
- Slim profile retrofits into all existing signal housings, no specials for tri-colour, exact same foot print
- LED technology gives a long and predictable service life allowing for extended life of current assets
- AREMA+ thermal shock tested to replicate and exceed real field temperature extreme variations
- Performance improvements for existing assets including enhanced safety and reliability
- Multiple Interlocking compatible, cold and hot proving with patented technology
- Plug and Play connection for all types including mech signal retrofits, no change of existing wiring
- Cost reduction in asset operation and maintenance
- Modernisation of infrastructure subsidised through operational cost savings
- Phantom signal reduction
- Competitively priced with realistic up cost for tri-colour over single colour





# Exporting Signaling Expertise

## The Union Station Project

Unipart Dorman have been contracted by Alstom Signalling to supply LED tri-colour signal heads as part of the largest single station re-signalling project to have been undertaken in North America in recent history.

The signals are a combination of 3 aperture signal heads for mounting on gantries and signal masts and 3 aperture ground mounted dwarf signals.

The Signals are a variation on the Unipart Dorman 'Classic Signal' range, which are the established premium LED signal of choice on the UK Rail Infrastructure, based on their unparalleled reliability, field performance and ability to maintain true signalling colours throughout the wide temperature range.

Union Station is the largest and busiest rail passenger facility in Canada, functioning as a transportation hub for passenger, commuter and freight trains.

- Union Station currently handles almost 40 million passengers a year
- This number is expected to double over the next 20 years
- Daily ridership is approaching 160,000 and peak period arrivals at Union Station are close to 45,000
- VIA Rail and Amtrak are also expecting increased usage of the station
- Freight traffic continues to pass through Union Station from both Canadian National (CN) and Canadian Pacific (CP) railroads

Union Station and the adjacent Rail Corridor is known as the Union Station Rail Corridor (USRC). The USRC is some 6.4 km long and consists of a complex network of approach tracks, passenger platforms and four Interlocking's at Cherry Street, Scott Street, John Street and Bathurst Street.

- It has 14 station tracks with platform access
- More than 180 signals
- 250 switch machines
- 40 km of circuited track and all associated infrastructure

Within the USRC, TTR directs USRC rail operations using Train Movement Directors (TMDs) located at the three control offices, in the John, Scott and Cherry Street towers, and maintains the facility with a force of maintainers located throughout the territory. The TTR staffs the towers 24 hours/day-365 days/year. The TMDs coordinate all train movement by voice communication and for movements through John, Scott and Cherry, operate a vintage electro mechanical signal system (built in

the 1930's) by manually manipulating levers to line switches, set signals and clear routes. Track protection is achieved by physically placing "cans" over the levers to prevent their use during maintenance activities.

In recent years, the Union Station Railway Corridor has been undergoing major construction phases to renew the signalling, electrical and communications equipment to modern standards and improve capacity and throughput of the USRC resulting in a better customer experience for Go Transit passengers.

Works are expected to be fully finished and ready to receive the next generation of passengers in 2019/2020, with upgraded signals and track, a new roof and glass atrium over the passenger platforms, new staircases and access points as well as a completely new underground shopping concourse within the main building below the tracks.

## Exceeding Global Client Expectations

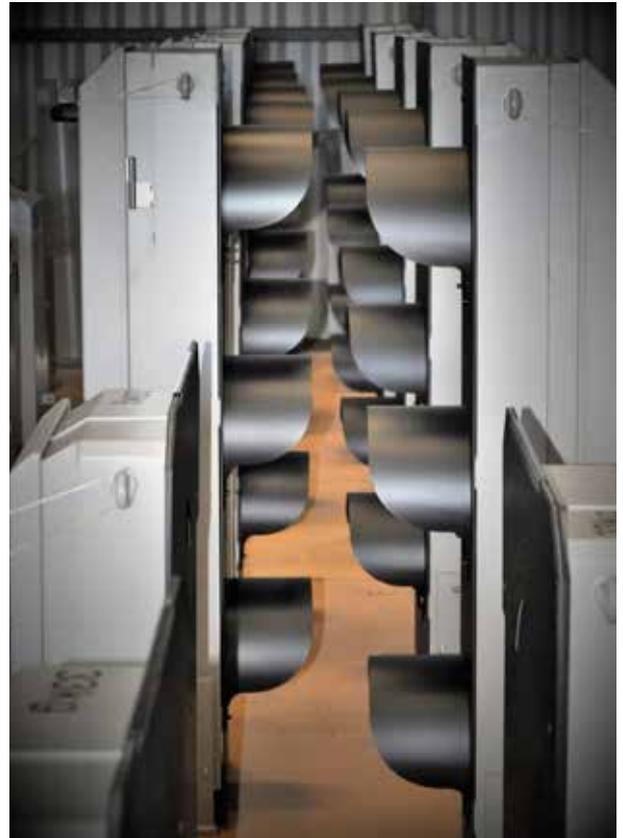
The Unipart Dorman team have been working for several years to export our 'Best in Class UK performance' onto the world stage and Union Station is just one example of how we are making an impact with the way we do business overseas.

The signalling upgrade followed the successful trial of approx 40 signals which were installed in the Union Station train shed and surrounding area back in 2010.

The signals have been monitored closely over the past 7 years and have worked flawlessly in terms of reliability and optical performance. As part of the signal trials in order to secure Transport Canada approval, Unipart Dorman submitted a Safety Case on the project and were informed during this process that it was the most comprehensive Safety Case on signals ever received.

Some examples of the specific differentiation to exceed client needs on the project were as follows:

- Plug and play, MIL standard coupled connections, making installation and testing quicker, safer and easier
- True current and optical based light out detection is provided as an integral element of the product design
- All signal heads have sighting scopes and are adjustable to ensure optimal signal sighting and alignment
- Patented design ensures LED signalling colour maintained at temperature extremes
- Patented design ensures access can be performed from a position of safety at the rear of the signal
- Unique mountings to allow for the ground mounted, 9 aspect signals to be reclined when required for exceptional freight traffic



Unipart Dorman's innovation team worked closely with Hatch, Go Transit, Transport Canada and Toronto Terminal Railways.

Clive Porter - Signal Team Lead on the project for Unipart Dorman was quoted "work undertaken in Toronto has been very rewarding to date in particular the positive reaction from drivers to the new signals – we look forward to hopefully working on the USRC in the coming years and building on these foundations as we further expand our global presence and expertise". Feedback from all parties to date in Toronto has been very positive.

"Unipart Dorman were extremely responsive during the Safety Case approval process and we found their product to be highly functional and effective in its application".

**Adrian Peach - Hatch**

"The plug coupler cable harness design for the signal allowed straightforward installation whilst minimizing test requirements. The signals have been installed for over 3 years with no failures or light output degradation recorded. LED is definitely the way forward".

**Lou Internicola - TTR**



# Product Enhancement

Is 'good' good enough?

**Not really when you're striving for excellence.**

With ever increasing pressures for improving efficiencies in transport networks, reducing product life costs and increasing safety, businesses are looking at new ways to get the most out of their assets and to meet business objectives without compromising performance or safety.

Our Product Enhancement service elevates performance and improves equipment reliability.

The Unipart Dorman Innovation Centre of Excellence empowers us to meet the growing demand for innovative solutions for signalling environments - for example, our Ground Position Light Signal, which was specifically designed to meet the needs of Network Rail and was so successful that they instigated a national fitment campaign of over 15,000 units.

**Productivity improved. Life cycles extended.**

**Bottom line boosted.**

## Our Service Features

- Full analysis of existing products to highlight areas for improvement
- Redesign to improve reliability and reduce manufacturing costs
- Performance and maintenance procedures detailed and documented
- Extensive knowledge of safety critical systems and operations
- Supplier approval and assurance process
- Development of manufacturing drawings and supporting documentation
- Project management of component introduction
- Full compliance management service

## Your Operational Benefits

- Extended life for current assets and systems
- Performance improvements for existing assets
- Cost reduction in maintenance of assets
- Cost reduction in asset operation

# FL360

by Unipart Dorman

## 'Enhancing your safety with 360 degrees of visibility'



For the past two decades New York City Transit have been using a custom Unipart Dorman LED flagging lantern for maintenance of way warning light applications.

The LED lanterns were available in Red, Amber and Green with a White lantern also available in a tungsten filament lamp. The Amber and Green Lanterns were used to demarcate areas of the work zone and the Red was used by the flagger.

The lanterns operated from a 6V battery, incorporated a hinged carrying handle and a wide stability base to allow mounting on uneven surfaces, the units were able to switch from flash to steady modes and also had interchangeable heads to allow colours to be easily changed.

The lanterns met very strict optical performance requirements in both colour and 360° visibility in both the horizontal plane and 5° above horizontal and were independently UL performance tested to ensure compliance.

The lanterns were also put through rigorous independent robustness testing, including environmental, drop and shock testing and as a result the body and lens of the unit were made from a high impact thermoplastic lexan, all of which led to an exceptional field performance in one of the harshest environments on the rail network.

The lanterns are still used today by NYCT Maintenance of Way personnel, some 20 years after it was first introduced which is testament to the products effectiveness and respect it has gained.

## Over to the innovation team

As in all walks of life, requirements and practices eventually change over time and NYCT came up with the challenge of repackaging all of the functionality and performance of the existing lantern into a smaller, lighter compact version for better ease of handling.

Unipart Dorman's product innovation team answered the call and have developed the FL360.

The FL360 not only maintains all of the functionality and performance of the original lantern, with true 360° optics, signalling colours in Red, Green and Amber it has also been enhanced with new additional features including:

- Flexible mounting options - a removable combination rubber magnetic base to allow both uneven ground mounting stability and magnetic mounting at all angles
- Best in class run times - 150hrs flash mode and 60hrs steady mode covering the longest of weekend shifts
- Molded side eyelets for clip on mounting or rope attachment to emergency braking system

This product is currently undergoing field testing with NYCT and Unipart Dorman have already received expressions of interest from numerous other transit agencies in the FL360.

For further information please contact us at:  
[dorman.enquiries@unipartdorman.com](mailto:dorman.enquiries@unipartdorman.com)



# Product Replacement

It's often the little things that can cause the biggest headaches, such as the need for a 'like for like' replacement of obsolete products.

In fact, we already help some of the world's best known rail networks handle exactly those types of issues - for example, providing LED replacement units for existing semaphore signals and barrier boom lamps & all of the classic signals!

By carrying out a detailed analysis of existing product's fit, form and function, our Product Replacement service is able to supply a full suite of supporting documentation. Documentation that enables the manufacture and supply of products and components for as long as you need them.

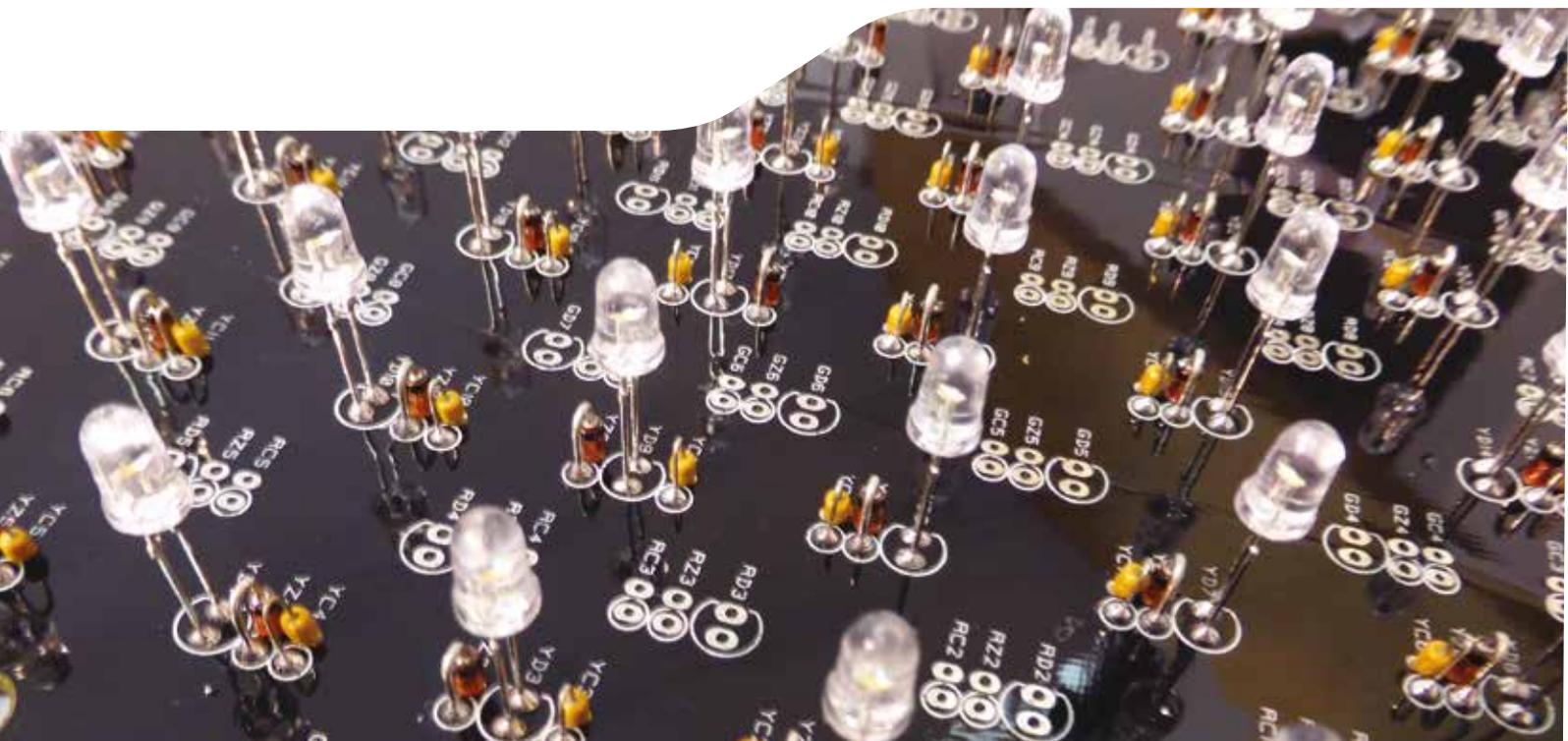
**Forward thinking engineering. Problems solved.**

## Our Service Features

- Extensive knowledge of systems and operations
- Supplier approval and assurance process
- Development of manufacturing drawings and supporting documentation
- Value engineering to reduce component costs
- Full analysis of "as is" state of components
- Examination and identification of potential IP infringements
- Analysis of manufacturing and material processes
- Validation of pre-production samples
- Full certification management process

## Your Operational Benefits

- Extended life for current assets and systems
- Improved product performance
- Reduced whole life costs of products
- Reduced cost of asset operation
- Continuation of supply for remainder of asset life
- Reduced maintenance costs



# LED Handlamp

The metal case Bardic handlamp had been the mainstay hand held signalling device on the UK Rail Network for many years and when the lamps and batteries became obsolete, Unipart Dorman were asked to produce a new and improved version.

This design process began with a full technical evaluation of the current product and an in-depth consultation process with the people who used the lamps which delivered a series of challenges. From a safety perspective the most important factor was sudden unexpected failure caused by the filament blowing and the use of a high performance LED which was inherently robust and with a Mean Time Between Failure of nearly 30 years constant use completely removed this problem.

An additional benefit was the LED used, has very low power consumption which can be accurately predicted, enables the introduction of a battery condition indicator which gives the operator confidence that the lamp will deliver signalling standard compliant light for a minimum of eight hours.

The metal body, which was prone to corrosion and damage from its hostile operating environment was replaced with near indestructible polycarbonate which also delivered a significantly lighter unit.

The Unipart Dorman LED Handlamp has full Network Rail Approval and it is mandatory Crew Equipment with a number of Train Operating Companies in the UK.



## Features and Benefits

- Unipart Dorman LED Handlamps have a 250% energy saving over filament lamps with battery life of 20 hours continuous use
- Red, Yellow and Green aspects are true signal colours
- LED light sources designed to give a long and predictable service life of over 10 years continuous use
- Stable light output across battery lifetime
- "Battery OK" indicator displays health of battery
- Available in 3 and 4 Aspect variants
- The weight is concentrated at the bottom of the lamp making it much more stable when laid on track ballast
- Optional Reloadable Battery Pack available for applications which are not reliant on Network Rail product approval
- Customer logos etc can be embossed on the lamp if required



# Manufacturing Excellence

Safety is built into our products during design and testing and is carried through our manufacturing processes where the most important link in the chain is the skilled operators who build our signals from component level to full assembly. Manufacturing excellence driven by safety culture is deeply embedded within the business and is regularly tested by customers and Notified Bodies as part of an ongoing compliance audit regime.

Only using high quality suppliers and a digital tracking system within the factory delivers complete traceability. These impeccable manufacturing and supply standards are underpinned with a robust quality assurance regime which has slashed complex post installation testing to virtually zero. This has given the UK rail operator enough confidence to certify the latest generation of Unipart Dorman products as the first ever to be classified as truly maintenance free throughout the life of the signal.

## Continual Improvement

Manufacturing Excellence has been key to achieving our leading position in LED solutions. Our customers look to us to provide valuable resources and insight necessary to help them grow.

We are committed to continual improvement. We implement lean manufacturing and deploy six sigma business management strategies to improve manufacturing processes whilst eliminating defects.

## Our people make the difference.

Our workforce fully embraces our continuous improvement culture and are totally engaged in providing the best possible service and products to our customers.

## Our Capabilities

- Assembly
- Electrical and Electronic Engineering
- Design Engineering
- Optical Engineering
- Mechanical Engineering
- Procurement and Logistics
- OEM and Contract Manufacture Management
- Quality Management
- Lean and Continuous Improvement Philosophy

## We do much more than just signals.

In this continuously changing industry, adopting a flexible and responsive approach is essential. We support you by offering tailored solutions and innovations. Our unique service meets the demanding needs of our customers. Every time. With on-site linkages to the Unipart Dorman Innovation Centre of Excellence, our manufacturing service includes whole life cycle asset support.

# System Integration and Legacy Manufacturing

## Complex integration. Made easy.

Some of the products we manufacture are single items. Others are key components in larger systems and others are part of complex equipment where we manufacture and supply the entire system.

If you have a design for a system and need a manufacturer to source, build, package and distribute, speak to us and we will find a solution for you - for example, our new Inline shunt which has been designed in collaboration with two major signalling providers.

## We'll make it better.

### Legacy Manufacturing

Sometimes suppliers go out of business or decide to stop manufacturing products because for them it's not economically effective.

#### That's where we can help.

There are items that we manufacture that previously were made by other businesses. Not only do we manufacture them, we also make them better - our LED handlamp replaced the older type and is now used extensively on the rail network.

If you suddenly find you can't source a part - talk to us.

### Your Operational Benefits

- Strong divisional innovation forum designed to support customers
- Reduced costs through tailored product packages
- Reduced supply chain by working with one dedicated partner
- Enhanced performance of products
- Reliable, intelligent and innovative design and manufacturing
- Enhance existing systems and components





# Zero Maintenance Signalling from Unipart Dorman

## The Challenge

**During the last fifteen years we have introduced a variety of LED signals that provide a long and reliable operational service. The very low failure rates (over 40 million fault free operational hours for GPLs) and predictable degradation of the LED intensity, allowed our engineers to consider how to design the next generation of signals.**

**The next challenge was to enable the industry to benefit from the increase in LED signal performance and reduce the whole life costs and operational risks even further.**

## The Solution

We set out to design a range of signals that would be maintenance free - never needing a scheduled maintenance visit thus reducing the time that staff were on the operational railway. We also aimed to remove the risks associated with working at height and realised that this would also significantly reduce the need for heavy structures with load bearing capabilities for personnel, and massively reduce the network maintenance costs and the safety costs incurred in going trackside.

Our experience told us that we could develop highly efficient and reliable circuits and we knew that the existing annual maintenance was mainly limited to cleaning the lenses, therefore we concentrated on the light output parameters and cleaning requirements. Our solution was to develop a 'self cleaning' signal.

The project as a whole has been running for over fifteen years, starting with the development of ranges of LED Colour Light Signals (CLS) that were designed to retro-fit on to existing infrastructure in the same 'format', through to lightweight versions to the current iLS (integrated Lightweight Signal), which is a radical development featuring the signal head and post integrated into a single composite housing and post, with a trunnion/enclosure base.

# The Result

Network Rail has amended its maintenance requirements of these signals as follows:

- Unipart Dorman iLS and CLS LITE signals are designated 'self-cleaning' and require no visits for signals in locations where they are exposed to free falling rain.



## The Benefits

Since the introduction of the Unipart Dorman LED signals, over 100,000 LED modules are now installed on the UK rail infrastructure, and the September 2015 Network Rail ROSE NR/SIG/10665/Mod 001 document now means that a significant number of them no longer require annual maintenance visits, driving increased savings and increased safety through fewer workers being required at the trackside.

Previously these signals would have required an annual check, involving a minimum of two track workers. With the new maintenance standard, we are removing the need for these visits, reducing the cost of ownership of the signal to the purchase and installation cost.

It is estimated that the first 1000 filament Colour Light Signals which have been replaced by Unipart Dorman signals will **deliver reduced maintenance costs of over £4,061,000\*** over the fifteen years of their projected life, and with a further circa 1000 to be installed in CP5, these benefits will double.

Additionally, there has been very few Unipart Dorman signal failures in operation. **Filament signals previously accounted for 72,000 delay minutes, equating to a cost of £2,775,000\*** annually which will be eliminated once all filament lamps are replaced.

These significant cost savings are being delivered now as a direct result of Unipart Dorman's LED signalling innovations.

*\*Calculated on 2005 values using RPI to estimate current costs.*



## 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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