

# 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 signaling 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.

After 5 years of attending RSSI as part of our learning experience, this fall in Indianapolis we will be launching, the AREMA compliant SearchLITE, ColorLITE and LEDMech Series of retrofittable LED wayside modules.

## The Vision

Modernize your Rail Wayside Signal assets with enhanced performance, reliability and safety, subsidized through reduced system operational costs.

The Unipart Dorman SearchLITE, ColorLITE and LEDMech signals offer a unique opportunity, for the first time operators will 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 Color - Red, Yellow and Green single colors with single wire and ring terminal connection

SearchLITE series:

- Tri-color - 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 colors 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*

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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 signaling 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-color, 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
- Modernization of infrastructure subsidized through operational cost savings
- Phantom signal reduction
- Competitively priced with realistic up cost for tri-color over single colour

## Collaboration - the story so far

The key to implementing the vision was to secure the collaborative intent of a visionary Railroad operator and the collaborative support of a strategic partner. It took time as all good things do, but we were fortunate.



John Leonardo GM Wayside Train Control & Communication for CP had worked with us previously in Toronto on Union Station and had witnessed how we had taken up the challenge to prove to Metrolinx that

we could resolve an issue with the tri-color LED searchlight signals they were initially pursuing and attain an AREMA and TAC compliant 110V AC LED Searchlight signal.

After numerous field trials, readability tests and what proved to be the most comprehensive safety case ever received for an LED signal by the incumbent consultants HATCH, the TAC and AREMA approvals were achieved.

We went on to install 30 signal heads in Union Station in 2010 and 7 years later not one single failure or issue has been reported, this performance helped us to secure the supply of the remaining 326 heads that were delivered on the main USRC contract to Alstom earlier this year.

CP chose to work with Unipart Dorman to come up with a complete suite of signal solutions that would allow them to modernize their existing assets and deliver additional operational benefits.

The support from CP has been instrumental in ensuring our innovation delivered true value in a market which is still very new to us in comparison to our UK market. The collaboration with CP has been a very rewarding experience, we have learnt a lot during the process and have gained the trust of new colleagues and made new friends along the way.

A recent example was the successful completion of readability assessment testing this summer which took place just south of Calgary, the tests conducted took into account 1,276 observations (896 day time, 380 night time), of which the scoring mechanism indicated very distinctly the intensities that we should be achieving in the final design to ensure considerations of LED current and therefore LED life and glaring were taken into account.

The equipment under test was capable of being illuminated above and below the ideal intensity setting for all the colours and color combinations for the aspects. Following the tests there were no concerns expressed by the observers as the signal's presence could be seen at 5,000ft and sometimes called and the signal aspects could be easily read at 2,000ft. This was the case for both the daytime and night time tests.

In addition to readability assessments to develop medium and long range signals, we also undertook an extensive series of interlocking compatibility tests at the CP Calgary training school on a variety of interlockings including:

*AC Relay, AC Relay with DC base, EC4, iLOK, MicroLOK2, VHLC and ElectrologIXS*

We do also plan to conduct further testing with interlocking providers directly to secure their independent verification of compatibility. We are also happy to visit with any interested operators who use other interlockings not previously mentioned and have facilities to conduct non-operational compatibility tests. AREMA testing is underway as this article was being published and we plan to submit test reports to TUV Rhineland for assessment and approval later this fall.

In understanding the challenges of the existing solutions it led us to understand that failures in the field were on AREMA compliant devices and it was felt that temperature extremes and fluctuations outside of the AREMA range may have played a part. To address this issue we are also conducting a series of AREMA + tests including thermal shock testing to replicate and exceed true field conditions such as Chinook temperature fluctuations.

Live Beta field trial tests are due to commence towards the end of this year with CP and a number of other Class 1s have also expressed an interest.

Our knowledge and footprint in the North American market (although growing), needed to be expanded quickly to ensure the same levels of unparalleled service that we deliver on a day to day basis in our home market was also available locally to our new North American clients.

To do this we researched the sector for a strategic partner who could understand our vision and were able to demonstrate the same core values of the Unipart Dorman business, with an in depth understanding of the customer base.



Modern Railway Systems exceeded our criteria and have also played an instrumental part in supporting the success of our development efforts to date.

**to be continued...**

We hope you enjoyed reading this article, if you have an interest in beta testing the signals on your railroad or would like more information, contact us at: [dorman.enquiries@unipartdorman.com](mailto:dorman.enquiries@unipartdorman.com) and join us on the remainder of this journey.