Wayside Signal

by Unipart Dorman

Modernize your Wayside Signal assets with an LED Signal, backed by an unrivaled industry track record.

Wayside User GUIDE

Way Ahead in Signaling

UNIPART DORMAN

UNIPART DORMAN

World Class leader in innovation

At Unipart Dorman we listen to and understand our customers needs, enabling us to deliver innovation with true value.

We have over 140 years experience in developing products and solutions that deliver real benefits without compromising safety and performance in a challenging environment of a safety critical nature.

At our UK facility in Southport we have created an engaging 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 to life.

We are driven to create value for our customers, for our stakeholders and for our people by spearheading LED signal solutions into the rail industry worldwide.

Pioneering the use of LED Signaling technology, with the first use anywhere on the railway across the entire world in the early 1980's

Since then Unipart Dorman have built a 95% market share of the LED signal market in the UK, where we have taken LED signal performance, safety and reliability to an unprecedented level, and delivered innovative industry firsts such as Self Cleaning, Zero Maintenance LED Signaling and (iLS) Integrated Lightweight Signaling.

Our North American journey commenced in 2010 with the installation of our 'Classic' Wayside LED Signals as part of a field test at Union Station Toronto, and their comprehensive safety case and flawless operation since, resulted in the 2017 contract award to supply all of the signals on the 1st phase of the project.

Union Station provided the foundation for the development of the wider Railroad Wayside LED Signal development, including the AREMA compliant SearchLITE and ColorLITE models.

This guide has been developed to allow you to simply and quickly identify the signal that best fits your requirements and each chapter is supported with technical specifications and visuals aids to help ensure your deployment is successful, safe and well informed.

Additional information can be found on our wesbite **www.unipartdorman.com** including data sheets, industry research and case studies, together with your local distributor contact details.

We trust you find this guide a useful tool and should you have any further questions, please do not hesitate to contact our team who will be pleased to speak with you.

Safety

Activities which may pose a hazard will have the following highlighters:

Activities identified as needing extra care are highlighted using the Caution symbol.

Activities which are or have the potential to be hazardous to personnel and/or equipment are highlighted with the Warning symbol.

The Unipart Dorman WSM has been subjected to extensive trials and testing (at Unipart Dorman and in nationally accredited test facilities) throughout its development, including ergonomic trials on the installation and replacement of modules.

Before commencing installation or maintenance, any local safety requirements affecting the continued safe working environment of the signaling installation site and/or the railroad, either directly or indirectly shall be carried out.

Before the commencement of any activity, arrangements shall be applied to protect the working railroad.

It is the user's responsibility to ensure all necessary risk assessments, permissions to work and preparatory safety activities are correctly completed, documented and adhered to throughout the installation and subsequent life of the module.

The content of this User Guide document is not to be used to substitute or justify the commission of good engineering practices.

Failure to adhere to the instructions and warnings contained in this publication could cause serious injury, endanger life and/or cause catastrophic damage to the equipment and surrounding infrastructure.

The WSM shall not be used for any purpose other than that described in the introduction above. If it is used for any other purpose, Unipart Dorman will not accept any responsibility for damage, injury or death caused by the activity.

All activity on the WSM both mechanical and electrical must only be carried out by staff deemed capable of undertaking the task by their employer. It is the user's sole responsibility to ensure that the apparatus is installed and/or maintained by competent staff. Where a specific qualification is subject to periodic retest and certification, it should be valid throughout the time of the works.

A copy of these instructions should be readily available. Anyone required to install or maintain the WSM is to be fully conversant with them, particularly the safety advice and warnings contained therein and deemed sufficiently competent (and where necessary properly certified) to undertake the task by their supervisory chain.

The latest version of this document is available from Unipart Dorman using the contact details on the back page.

If any doubt exists on the serviceability of the WSM or you are not sure about any of the instructions in this document, you should stop work and contact your supervisor immediately and if necessary contact Unipart Dorman for specialist advice using the details on the back page.

Wayside Signal Range -
An Introduction

The Unipart Dorman Wayside Signal Module is used as the light source on a railroad signal which, through a combination of light configurations and colors, gives train drivers appropriate movement authority as determined by the signal controller.

The Wayside SearchLITE and ColorLITE railroad signal modules have been developed to provide a reliable LED solution which utilizes the same physical footprint as existing light units. This means that they can be used as an easily installed retrofit unit in a wide range of signal head types and interlocking systems across North America.

The LED Wayside Signal Modules (WSM) are simple to install using basic hand tools and provide a long, predictable service life allied to revolutionary optics, which have been specifically designed to maximise the light output without significant power consumption.

There are Long Range (readable at 5000 ft/1520m) and Medium Range (readable at 2000 ft/610m) variants available as detailed below:

To ensure compliance with AREMA specifications, an extensive program of testing has been carried out using nationally accredited testing facilities. The results of these tests are available as part of a comprehensive Safety Case document available form Unipart Dorman upon completion of an NDA.

The table below shows the most common variants of the WSM although other models are available and can be ordered using a part code generated from various options as illustrated in the Order Guide shown on page 7 of this handbook.

Module	Description	Long Range (Standard Clear Outer Cover)	Medium Range (Standard Smoked Outer Cover)
ColorLITE	Single Color Red, 12v, Pulse Proved, Free Wired Connection	WSCL/R--/3PI/AF	WSCM/R--/3PI/BF
ColorLITE	Single Color Yellow, 12v, Pulse Proved, Free Wired Connection	WSCL/Y--/3PI/AF	WSCM/Y--/3PI/BF
ColorLITE	Single Color Green, 12v, Pulse Proved, Free Wired Connection	WSCL/G--/3PI/AF	WSCM/G--/3PI/BF
SearchLITE	Tri-Color RYG, 12v, Pulse Proved, Plug Coupled Connection	WSSL/RYG/3PI/AP	WSSM/RYG/3PI/BP
SearchLITE	Tri-Color RYG, 12v, Pulse Proved, Free Wired Connection	WSSL/RYG/3PI/AF	WSSM/RYG/3PI/BF

Labels

The WSM is fitted with three labels. An identification label which details the module part number, module type and colors, date of and place of manufacture and a unique serial number.

The other labels are a warning the WSM may become hot during operation and the earth bonding safety label.

Examples of the labels are shown below:

WaysideSIGNAL ColorLITE Module

Unipart Dorman Part No. WSCL/Y--/3P1/AF
Long Range
Serial No.   426 -
Date of Manufacture
Manufactured for UNIPART RAIL by Unipart Dorman, Southport. PR9 7TN. Tel:+44 (0)1704 518000. Fax:+44 (0)1704 518001

Operating Voltage : 12V
Current Consumption at
Nominal Op. Voltage :

HOT SURFACE.
DO NOT TOUCH.
ALLOW TO COOL
BEFORE
SERVICIING.

SAFETY ELECTRICAL
CONNECTION
DO NOT REMOVE

⚠ A check that these labels are applied and legible should be carried out before installing the WSM and during any subsequent maintenance activity.

Ordering Information

The Unipart Dorman WSM signal range has been developed to attain both mechanical retrofit and electronic compatibility across a wide range of existing signal heads and interlocking using a minimal number of variants. However some applications will require different modules to be deployed e.g. Medium and Long Range and the below examples illustrate how the WSM part coding works to ensure the best unit is chosen for your application.

Example 1:

ColorLITE / Single Color / Long Range / Red / 12v / Pulse Proved / Clear Outer Cover / Free Wired Connection.

The Cells highlighted below show the characteristics selected:

Product Feature Selected	Product Code										
Character	1-3	4	5	6-8	9	10	11-12	13	14	15	
Wayside SIGNAL	ColorLITE WSC	Long Range L		Red R--		12V 3	Pulse Proved P1		Standard Clear A	Plug Coupler P	
Wayside SIGNAL	SearchLITE WSS	Medium Range M	/	Yellow Y--		110V 1	Low Voltage Pulse Proved P2		Standard Smoked B	Free Wired F	
Wayside SIGNAL	LEDMech WLM	Dwarf D		Green G--	/	24V 2	Low Voltage Constant Proving P3	/	Anti Snow C		
				Red, Yellow, Green RYG			No Proving N-		Anti Snow Smoked D		
				White W--							
ColorLITE	Single Color / Long Range / Red / 12v / Pulse Proved / Standard Clear Outer Cover / Free Wired Connection										
	WSC	L	/	R--	/	3	P1	/	A	F	
WSCL/R--/3P1/AF											

Example 2:

SearchLITE Tri-Color / Medium Range / RYG / 12v / Pulse Proved / Standard Smoked Outer Cover / Plug Coupled Connection.

The Cells highlighted below show the characteristics selected:

Product Feature Selected	Product Code										
Character	1-3	4	5	6-8	9	10	11-12	13	14	15	
Wayside SIGNAL	ColorLITE WSC	Long Range L		Red R--		12V 3	Pulse Proved P1		Standard Clear A	Plug Coupler P	
Wayside SIGNAL	SearchLITE WSS	Medium Range M	/	Yellow Y--		110V 1	Low Voltage Pulse Proved P2		Standard Smoked B	Free Wired F	
Wayside SIGNAL	LEDMech WLM	Dwarf D		Green G--	/	24V 2	Low Voltage Constant Proving P3	/	Anti Snow C		
				Red, Yellow, Green RYG			No Proving N-		Anti Snow Smoked D		
				White W--							
SearchLITE	Tri-Color / Medium Range / RYG 12v / Low Voltage Pulse Proved / Standard Smoked Outer Cover / Plug Coupled Connection.										
	WSS	M	/	RYG	/	3	P1	/	B	P	
WSSM/RYG/3P1/BP											

ColorLITE Specifications

The Unipart Dorman WSM is constructed of an enclosure housing, a display of Light Emitting Diodes and their control electronics which presents a disc of colored light depending on the product configuration as determined from the Part Number.

The ColorLITE is a module with a single color output (Red, Yellow or Green). The ColorLITE is available in long or medium range versions, which are easily distinguished as the medium range outer cover is manufactured from Polycarbonate with a grey tint in addition to the different part numbers. The ColorLITE module is supplied complete with 43''/1092mm flying leads terminated with ¼''/M6 ring terminals, to allow termination to AAR terminals in the signal head housing.

In addition to the carton making and the part number label, it is easy to identify what the module will show when lit as the supply cables have been color-coded to match. For example, red modules have red wires etc.

1	Polycarbonate Outer Cover
2	LED Display with Mask
3	Heatsink
4	Earth Strap and Attachment
5	43''/1092mm flying leads with ¼''/M6 ring terminals
6	Immersion Proof Breathing Vent

The module body is manufactured from precision cast aluminum and has an integral finned heatsink. All modules have an immersion proof breathing vent fitted in the rear enclosure, an 8''/200mm earth bonding strap attached by a ¼''/M6 Allen socket headed screw and shakeproof washers and a free wire ring terminal connection.
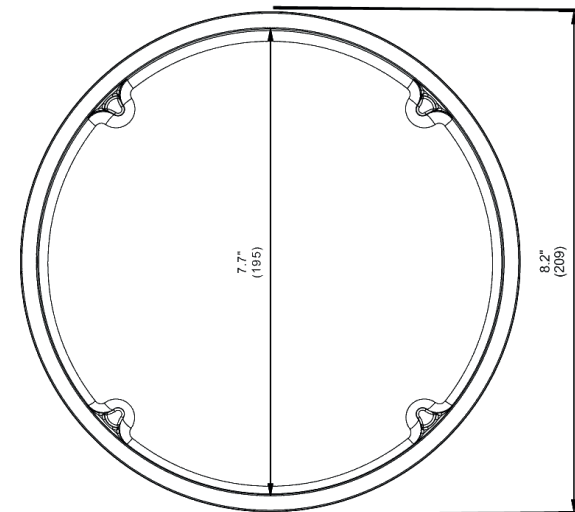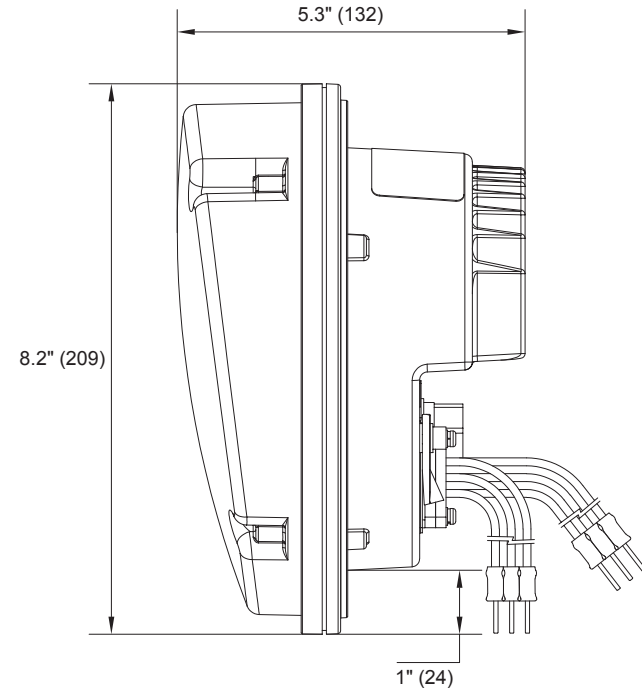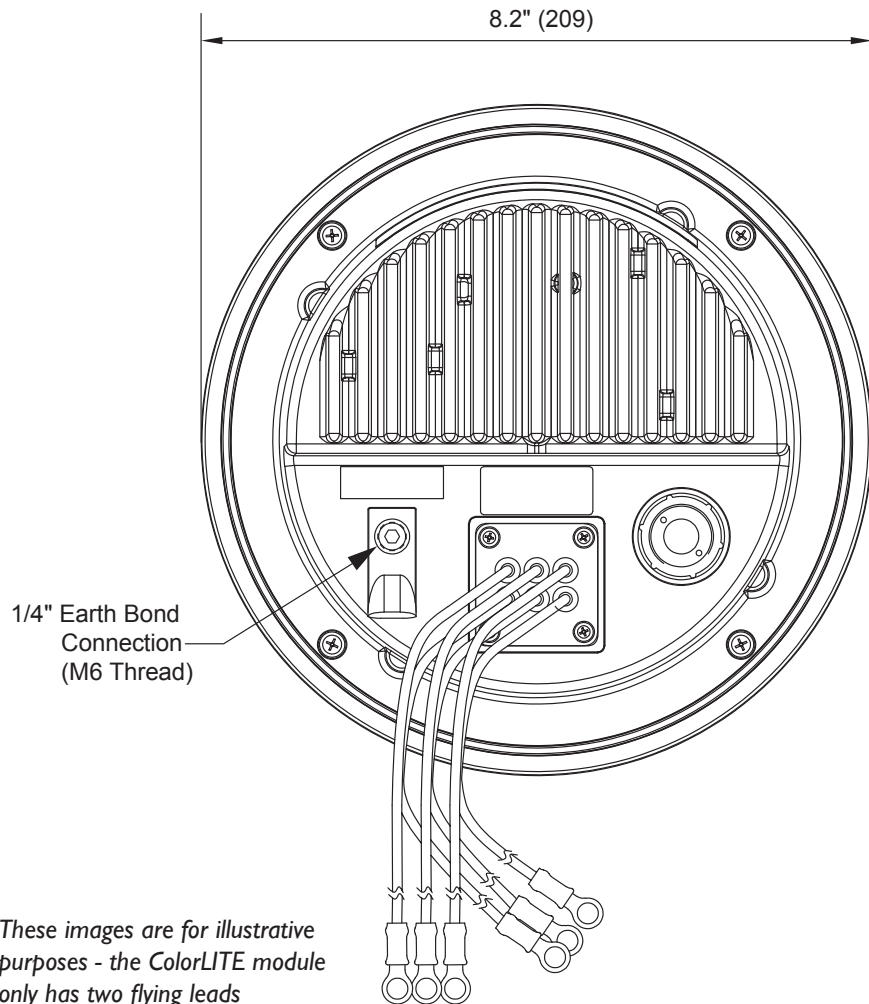
The display comprises a number of LEDs (depending on the variant selected) which sit behind an internal lens that focuses the light from of each LED. There is also a mask that reduces the effect of incoming light reflection.
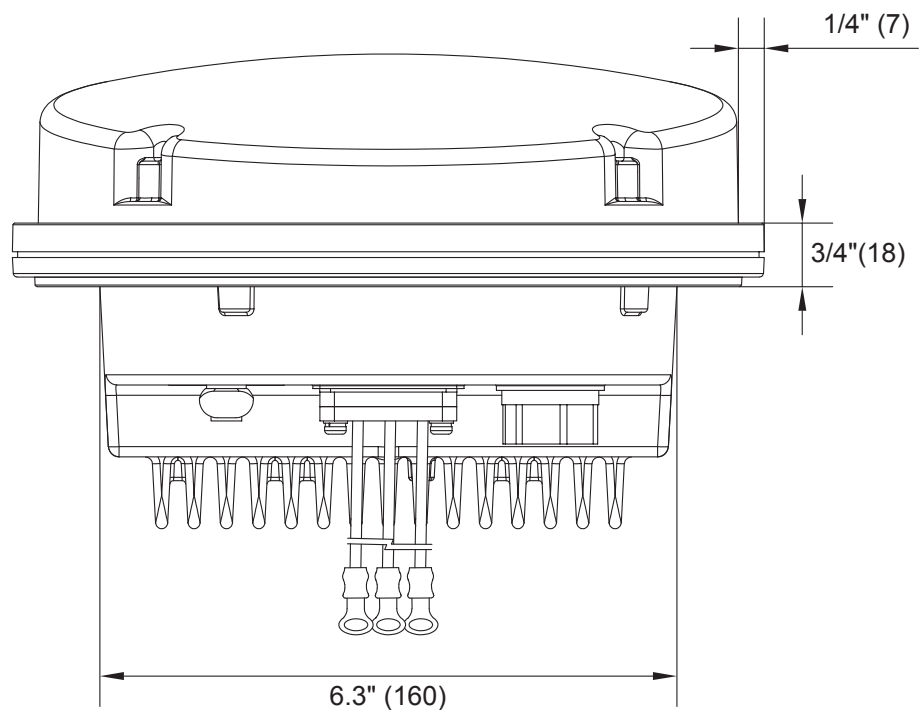
The signal module is protected by a Polycarbonate outer cover which has a hard UV protective coating on the outside front face. This reduces the effects from cleaning activities, wind blown debris and the damaging effect of UV from the sun.

Dimensions

The ColorLITE modules all have the same footprint and have been designed to allow fitment into all known signal housings illustrations below show the module dimensions.

All variants of the WSM weigh 4.5lbs/2 Kg

8.2" (209)

1/4" Earth Bond Connection (M6 Thread)

These images are for illustrative purposes - the ColorLITE module only has two flying leads

5.3" (132)

8.2" (209)

1" (24)

7.7" (195)

8.2" (209)

1/4" (7)

3/4"(18)

6.3" (160)

Item	Technical Description
Weight	4.5 lbs./2 Kg
Electrical Interface	43''/1092mm freewire leads terminated with ¼''/M6 ring terminals and 8''/200mm Earth strap
Operating Voltage	8Vdc to 16Vdc
Nominal Current at 12Vdc	2000mA
Min Current at 12Vdc Nominal	>1100mA
LED Colors	Standard units available in Red, Yellow and Green as shown in AREMA 7.1.10
Lit Aspect Intensity Long Range (5000 ft/1520m) and Medium Range (2000ft/610m)	LED Signal Module Purchase Specification
Storage Temperature Range	-67°F to 185°F / -55°C to +85°C
Operating Temperature Range	-40°F to 158°F /-40°C to +70°C
Ingress Protection	NEMA 250-1991 Enclosure 4 (IP65 Equivalent)
Outer Cover Construction	High Impact Polycarbonate front cover with external UV resistant hard coating to reduce scratching during cleaning operations
Rear Housing Construction	Aluminum casting incorporating heatsink, pressure vent and sealed connections, allowing for greater internal environmental control, which in turn prolongs the operational life of signal
Interlocking	Refer to page 23 for detail on interlocking compatibility, Hot and Cold Filament tests and the unique (patent pending) 5/16 Light Out protection
Performance Characteristics	Refer to page 24 of this guide for detail on AREMA and AREMA+ compliance testing

SearchLITE Specifications

The Unipart Dorman WSM is constructed of an enclosure housing a display formed of Light Emitting Diodes and their control electronics which presents a disc of colored light depending on the product configuration as determined from the Part Number.

The SearchLITE is a module with a tricolor output (Red, Yellow or Green). The SearchLITE is available in long or medium range versions, which are easily distinguished as the medium range outer cover is manufactured from Polycarbonate with a grey tint in addition to the different part numbers. The SearchLITE module has a Mil Spec 5015 plug coupled receptacle for electrical connection and a separate Plug coupled harness accessory (purchased separately), to allow termination to AAR terminals in the signal head housing.

1	Polycarbonate Outer Cover
2	LED Display with Mask
3	Heatsink
4	Earth Strap and Attachment
5	43''/1092mm flying leads with ¼''/M6 ring terminals
6	Immersion Proof Breathing Vent

The module body is manufactured from precision cast aluminum and has an integral finned heatsink. All modules have an immersion proof breathing vent fitted in the rear enclosure, an 8''/200mm earth bonding strap attached by a ¼''/M6 Allen socket headed screw and shakeproof washers and either a plug coupler or free wire connections.
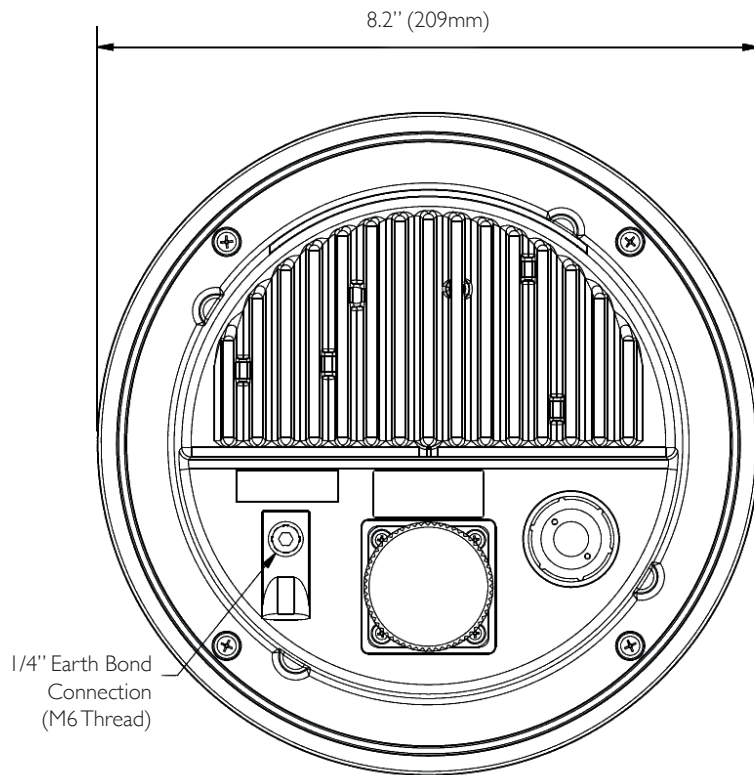
The display comprises a number of LEDs (depending on the variant selected) which sit behind an internal lens that focuses the light from each LED. There is also a mask that reduces the effect of incoming light reflection.

The signal module is protected by a Polycarbonate outer cover which has a hard UV protective coating on the outside front face. This reduces the effects from cleaning activities, wind blown debris and the damaging effect of UV from the sun.
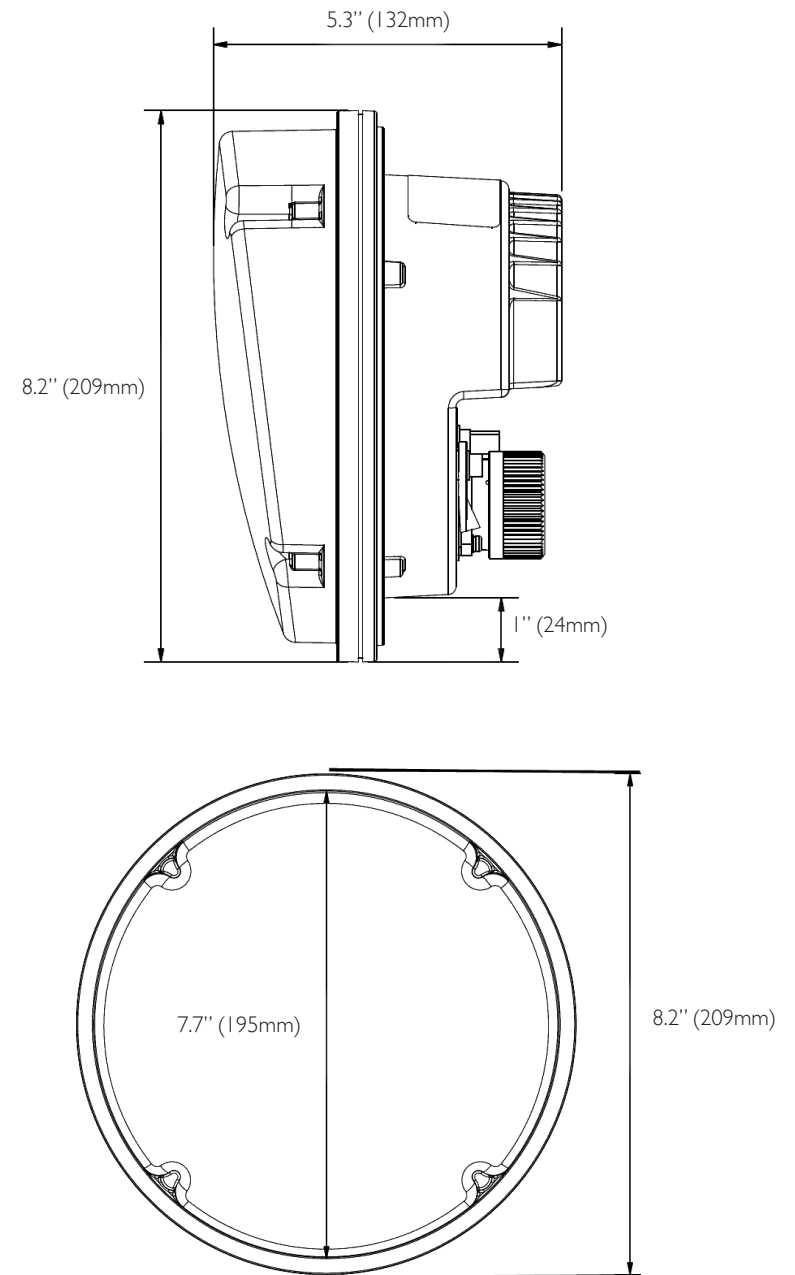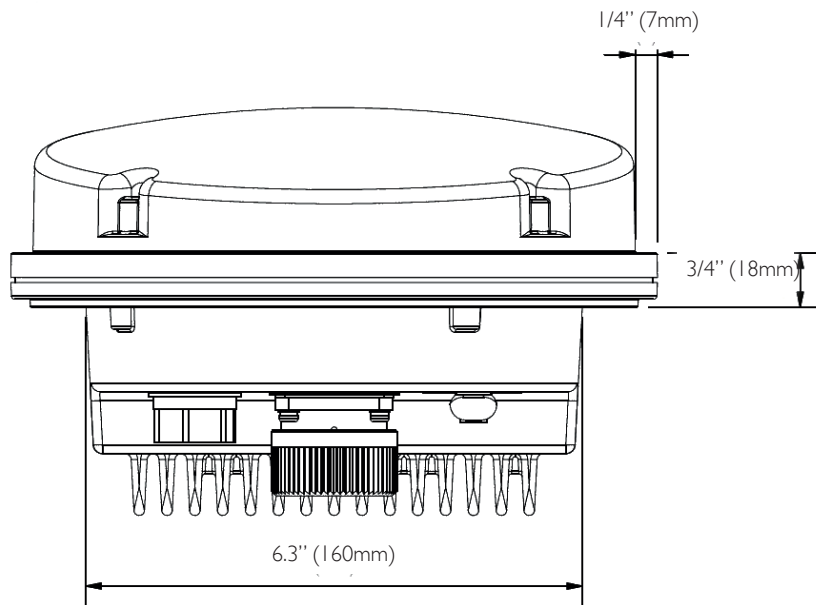
Dimensions

The SearchLITE modules all have the same footprint and have been designed to allow fitment into all known signal housings illustrations below show the module dimensions.

All variants of the WSM weigh 4.5lbs/2 Kg

8.2'' (209mm)

1/4'' Earth Bond
Connection
(M6 Thread)

This illustration shows the plug coupled version

5.3'' (132mm)

8.2'' (209mm)

1'' (24mm)

7.7'' (195mm)

8.2'' (209mm)

Dimensions

1/4'' (7mm)

3/4'' (18mm)

6.3'' (160mm)

Item	Technical Description
Weight	4.5 lbs./2 Kg
Electrical Interface	43''/1092mm freewire leads terminated with 1/4''/M6 ring terminals or Mil Spec 5015 plug coupled receptacle with plug coupled harness accessory (purchased separately), and 8''/200mm Earth strap
Operating Voltage	8Vdc to 16Vdc
Nominal Current at 12Vdc	2000mA
Min Current at 12Vdc Nominal	>1100mA
LED Colors	Tricolour available in Red, Yellow and Green as shown in AREMA 7.1.10
Lit Aspect Intensity Long Range (5000 ft/1520m) and Medium Range (2000ft/610m)	LED Signal Module Purchase Specification
Storage Temperature Range	-67°F to 185°F / -55°C to +85°C
Operating Temperature Range	-40°F to 158°F /-40°C to +70°C
Ingress Protection	NEMA 250-1991 Enclosure 4 (IP65 Equivalent)
Outer Cover Construction	High Impact Polycarbonate front cover with external UV resistant hard coating to reduce scratching during cleaning operations
Rear Housing Construction	Aluminum casting incorporating heatsink, pressure vent and sealed connections, allowing for greater internal environmental control, which in turn prolongs the operational life of signal
Interlocking	Refer to page 23 for detail on interlocking compatibility, Hot and Cold Filament tests and the unique (patent pending) 5/16 Light Out protection
Performance Characteristics	Refer to page 24 of this guide for detail on AREMA and AREMA+ compliance testing

SearchLITE

Installation - Mechanical

The Wayside Signal Series are fully compliant with AREMA C&S requirements and have been mechanically fit tested to a wide variety of incumbent Colorlight and Searchlight signal housings.

Unlike some other modules available on the market the ColorLITE and SearchLITE modules have the exact same physical footprint allowing the same clamping brackets to be used on all models and also enabling cross transfer of modules between housing types where and when necessary.

⚠ A final check should be made using the order information tables on page 7 and the part number label attached to the module to ensure that the module being installed is of the correct color, voltage and proving type.

Pre Installation Checks

It is strongly recommended that the installation is carried out on the bench in a workshop and not at the signal post location.

Each module is supplied in a cardboard carton which is widely recyclable and must be disposed of in accordance with all relevant local and national legislation.

Prior to mounting the WSM check that the mounting and securing hardware in the head/housing is clean, free of damage and lubricated as required. The module should also be checked for damage and any transit/packing materials should be removed and correctly disposed of.

🛑 Before the commencement of any activity, arrangements shall be applied to protect the working railroad.

⚠ Before any installation or maintenance, the contents of this manual and all other relevant publications etc associated with the activity to be undertaken should be reviewed and understood.

Mounting Hardware

Mounting hardware is not provided with the modules as it is supplied by the signal housing manufacturer.

Examples of typical mounting clamps are depicted below.

Orient the module correctly and secure the module in the housing/head using the hardware and method specified in the equipment manufacturer's instructions. The only tools required to install the module are a selection of standard wrenches/sockets (½" AF nut runner) for mounting as detailed in the head/housing manufacturer's instructions.

An appropriate range torque wrench is required for final tightening of the fasteners which secure the WSM in the head/housing. (The correct torque value for the fasteners are as detailed in the head/housing manufacturer's instructions).

Earth Bonding Strap

The WSM comes pre-fitted with an 8"/200mm tinned copper, earth bonding strap which is fixed to the WSM casing using a ¼"/M6 Allen socket headed screw and shakeproof washers, ½" (12mm) long. The other end of the strap is terminated with a 5/16"/M8 ring connector. The correct torque value being 3.31lbf/ft (4.5Nm).

🛑 If the socket headed screw is replaced, the length of the screw shall not exceed 0.47"/12mm to prevent the screw bottoming out in the hole before adequate bonding is achieved.

Installation - Electrical

The Wayside Signal Module Series are compliant with AREMA C&S requirements, the SearchLITE module is equipped with a Mil 5015 plug coupler receptacle to allow plug and play connection through a plug coupled harness (separate accessory) with local AAR terminals in the head and the ColorLITE module is equipped with freewire ring terminal leads for termination to the same AAR terminals.

⚠ A check should be made on the existing signal whether an in-line rheostat/variable resistor is fitted. Where such a device is installed, it should be removed before connecting the new module or if this is impractical, it should be set and fixed to zero Ohms.

Pre Installation Checks

Each module is supplied in a cardboard carton which is widely recyclable and must be disposed of in accordance with all relevant local and national legislation.

🛑 Before the commencement of any activity, arrangements shall be applied to protect the working railroad.

⚠ It is recommended that the unit is mechanically installed and correctly earthed prior to electrical connection. A competent person should ensure that the supply is isolated before connecting the plug coupler/free wired terminals.

⚠ As part of the installation procedure and following any disturbance of the AAR terminal connections it is the user's responsibility to ensure that all required electrical testing is completed.

Electrical Connection ColorLITE - Free Wired

The ColorLITE WSM are electrically connected using the standard 43"/1092mm fly leads terminated with ¼"/M6 ring terminals, onto the signal head/housing AAR terminal block connectors.

The ring terminals should be connected and secured to the correct terminal posts in accordance with local procedures and the head/housing manufacturer's instructions.

⚠ The cable from the terminals shall be not allowed to hang unsupported.

Electrical Connection SearchLITE - Plug Coupled

The SearchLITE WSM are electrically connected using the separately supplied (pictured below) 12"/304mm pre wired plug coupled harness, terminated with ¼"/M6 ring terminals, onto the signal head/housing AAR terminal block connectors.

The ring terminals should be connected and secured to the correct terminal posts in accordance with local procedures and the head/housing manufacturer's instructions.

Please note that the cover on the plug coupler should only be removed immediately before a connection is required to prevent any moisture ingress. When installed and connected the WSM has protection to NEMA Level 250-1991 enclosure 4 (IP65 equivalent).

The Plug Coupler contact allocations are as shown below:
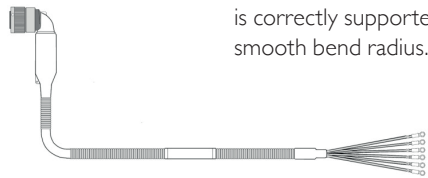

Contact Allocation
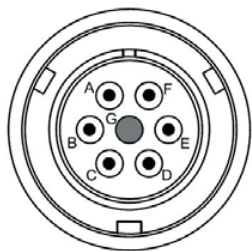
A	Red
B	Red
C	Yellow
D	Yellow
E	Green
F	Green
G*	Blank

*Contact G is unused and will be fitted with a blanking plug

⚠️ **The Plug Coupler should connect easily and the use of handtools is forbidden. If the coupler cannot be fully engaged by hand, there may be a fault or mismatch in connection detail. This should be investigated as any attempt to force the connection may result in bent or broken pins/sockets which may require complete replacement of either the infrastructure cable or the module.**

Align the keyway and lug inside the connector shells and turn the locking collar by hand until an audible 'click' is detected and the two indicator spots are aligned.

(The spots may be of different colors; this is simply the preference of the connector's manufacturer and does not affect the plug coupler's physical attributes).
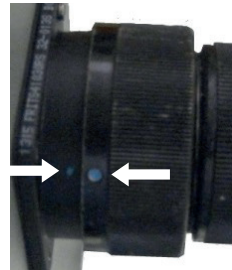
Once the connection is made, the indicator cable shall be secured such that its weight is correctly supported and maintains a smooth bend radius.

Interlocking Operation

The Wayside Signal Module Series are fully compliant with AREMA C&S requirements and have been designed an tested to be compatible with the majoirty of interlocking controllers and does not require any software or circuit design modification to install.

The units are capable of interfacing to systems that have both Hot and Cold Filament Tests and also Light Out detection.

The units have been tested already on the following 12v interlocking systems detailed in the table below:

5/16 Light Out Mechanism

The Wayside Signal Module Series is equipped with a unique (patent pending) lightout mechanism. Each module colour consits of 16 chains of LEDs, which are constantly being monitored, should 5 of these 16 chains extinguish for any individual colour, the lightout mechanism will be engaged causing lightout to be detected and reported by the interlocking.

If the interlocking controller you deploy is not listed above, please contact us and we will either confirm compatibility or arrange for testing to be undertaken to prove compatibility.

⚠️ **As part of the installation procedure and following any disturbance of the lead it is the user's responsibility to ensure that all required electrical testing is completed.**

VLC	Wayside Signal Version	Code	Status	Comments
AC Relay	Low voltage constant proving	P3	Tested	Not compatible at this time
AC Relay with DC bias	Low voltage constant proving	P3	Tested	Not compatible at this time
EC4	Pulse proved	P1	Tested	Compatible
iLOK	Low voltage pulse proved	P2	Tested	Not compatible at this time
MicroLOK 2	Pulse proved	P1	Tested	Compatible
VHLC	Pulse proved	P1	Tested	Compatible
ElectroLogIXS	Pulse proved	P1	Tested	Compatible
GEO	Pulse proved	P1	Tested	Compatible
VPI	Pulse proved	P1	Tested	Compatible
iVPI	Pulse proved	P1	Tested	Compatible

Performance Characteristics

The Wayside Signal Module Series are compliant with AREMA C&S requirements and have been independently tested and verified. The series has also undergone a series of product type testing, AREMA + testing to ensure ultra reliability in real field conditions and a highly comprehensive readability field evaluation.

All test results are available in separate safety case documentation.

AREMA Compliance

| Performance Criteria	Issue No
LED Colors	Available in Red, Green and Yellow As shown in AREMA 7.1.10
Storage Temperature Range	-67°F to 185°F / -55°C to +85°C AREMA 11.5.1 D1
Operating Temperature Range	-40°F to 158°F /-40°C to +70°C AREMA 11.5.1 D2
Ingress Protection	NEMA 250-1991 Enclosure 4 (IP65 Equivalent)
Vibration & Shock Tests	AREMA 11.5.1 D4 Class B
EMI	AREMA 11.5.1 D6
FCC Tests	CFR A7 Pt 15.107 CFR A7 Pt 15.109
Dielectric strength	AREMA 11.5.1 D7 Class B
Hot Filament Test	AREMA 7.1.5 B1
Cold Filament Test	AREMA 7.1.5 B2
Light Out Detection	AREMA 7.1.5 B3

Readability Performance

The WSM Series have successfully completed two rounds of readability assessment field testing which took place just south of Calgary, the tests conducted took into account 2,815 observations (1751 day time, 1064 night time), of which the scoring mechanism indicated very distinctly the intensities required for medium and long range model variants 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.

AREMA + Performance

To ensure ultra reliable performance and to take into account extreme conditions not fully captured in AREMA, the Wayside Signal Module Series have been temperature cycle tested to replicate and exceed real field temperature variations caused by adiabatic cooling and warming.

Performance	Criteria
Temperature Cycling	-4°F to +68°F / -20°C to +20°C with a 3 hour transition, 3 hour hold, 3 hour transition, 3 hour hold for 20 cycles
Thermal Shock	-40°F / -40°C for 1.5hr, 2 min transition time to +158°F / +70°C for 1.5hr, 2 min transition time down to -40°F / -40°C for 1.5hr repeated several times
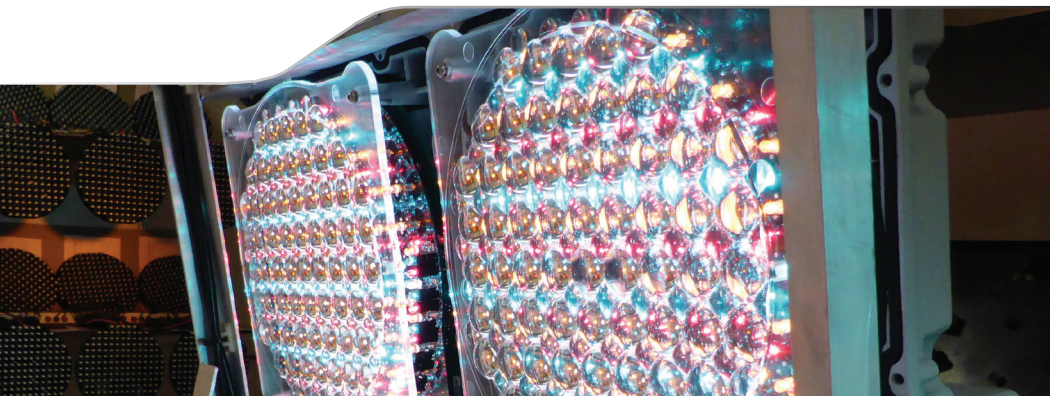
Warranty & Maintenance Activity

All Unipart Dorman WSM modules are supported with a 2 year limited warranty. The WSM is designed to be maintenance free other than simple cleaning which would be delivered either 'on-condition' or as part of a calendar based maintenance schedule.

In the unlikely event of the WSM requiring anything other than simple husbandry, the entire unit shall be replaced with a serviceable signal module.

⚠ There are no user maintainable parts in the WSM. Any attempt to access the internal components may result in injury or damage to the module and will result in any warranty being declared void.

Maintenance Replacement

🔴 Before the commencement of any activity, arrangements shall be applied to protect the working railroad.

⚠ A final check should be made using the order information tables on page 7 and the part number label attached to the module to ensure that the module being installed is of the correct color, voltage and proving type.

To replace the unit, first ensure that all safety measures have been implemented and recorded.

🔴 The heatsink at the rear of the module may become hot during operation. Do not allow it to come into contact with bare skin or heat sensitive surfaces until it has cooled.

Disconnect the plug coupler/ring terminals and in the case of a plug coupled connection either fit a blanking cap or utilize some other method of preventing any ingress of water and/or other contaminants into the end connector of the supply cable.

Locate, remove and retain the screw and earth bonding strap from the connection at the rear of the unit.

The module should then be removed from the head/housing as detailed in that equipment's manufacturer's instructions.

Fitment of the new unit is a reversal of the removal method. Care should be taken to ensure the replacement module is of the correct type and is orientated correctly.

⚠ If the socket headed screw is replaced, the length of screw shall not exceed 0.47"/12mm to prevent the screw bottoming out in the hole before adequate bonding is achieved.

It is essential that all earthing/bonding arrangements are restored correctly and any necessary testing is carried out.

The electrical hookup should be made using the instructions and warnings shown in the relevant Electrical Connection section.

When the signal module is secured in position and correctly connected, the instructions in the section on Post Installation should be followed.

Fit any blanking caps etc removed from the new unit to the old indicator for return of the old signal module and remove any waste for disposal in accordance with local and national procedures.

Post Installation Checks

The Module has been designed for 'Plug and Play' installation. Unipart Dorman recommends that the only test required is to have the signaler call on the aspects and ensure that the correct indications are displayed.

This advice does not supersede any instructions issued by the operating authority.

If the WSM requires any cleaning, the only medium approved is clean water with the addition of proprietary soap based detergents if required.

Glossary of terms

Abbreviation	Definition
''	Inch
A	Ampere
AC	Alternating Current
AAR	Association of American Railroads
AREMA	American Railway Engineering and Maintenance-of-Way Association
°C	Degrees Centigrade
CFR	Code of Federal Regulations
°F	Degrees Fahrenheit
ft	Foot
Hz	Hertz
IP	Ingress Protection Rating
kg	Kilogram
LED	Light Emitting Diode
lb	Pound
lbf/ft	Pounds force/Foot
mA	Milliamperes
Mil 5015	Military Standard for round quick release electrical connectors
mm	Millimeters
MML	Modern Manufacturing Limited
M5/M6/M8	Metric Fastener Sizes
NEMA	National Electrical Manufacturers Association
Pt	Part
PCB	Printed Circuit Board
Vdc	Volt direct current
VHLC	Vital Harmon Logic Controller
WSM	Wayside Signal Module

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.

Contact us:

Wennington Road
Southport
Merseyside
PR9 7TN
UK
T: +44 (0) 1704 518000
E: dorman.enquiries@
unipartdorman.co.uk

173 Main Street
Bath
Ontario
K0H 1G0
Canada
T: +1 613 352 3458
E: dorman.enquiries@
unipartdorman.com

Westcode Inc
223 Wilmington -
West Chester Pike
Suite 105, Chadds Ford
PA 19317
T: +1 (0) 610 738 1200
E: sales@westcodeus.com

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