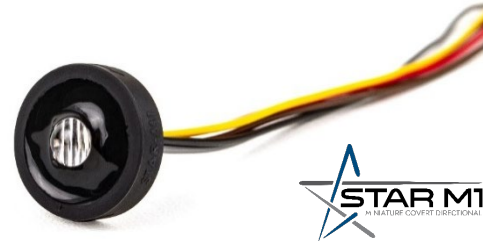


Installation and Operation Instructions

Star M1 Miniature Covert R65 Directional LED



Product Description

The Star M1 directional LED is an industry first from Redtronic and the ideal solution when a discrete covert light is required.

Part Number

Part Number	Colour	Voltage	Amps	Warranty
DSRX-001-BC	Blue	12-24VDC	630mA	2
DSRX-001-AC	Amber	12-24VDC	630mA	2
DSRX-001-RC	Red	12-24VDC	630mA	2
DSRX-001-WC	White	12-24VDC	630mA	2

Technical Information

Voltage Range	12-24 VDC (nominal) 11-32 VDC (extreme)
Number of LEDs	One ultra-bright LED
IP rating	IP69K protection against dust & water ingress
Approval	R65 Class I approved (4 units required per vehicle to meet R65)
Compliant	EMC / R10 compliant
Warranty	2 years
Design registered	Registered Community Design 008317283-0001
Synchronisation	Multiple head synchronisation
Weight	10g
Amps/current peak max	3 watts
Lens material	PMMA
Base material	Silicone casing
Built-in inhibit circuit	Accepts 12-24 VDC supply to inhibit flash pattern
Mounting	Fast curing silicone or medium viscosity adhesive (available from Redtronic SP_DSXXADHESIVE)
Accessories	Optional pod sold separately (SP_DSXXPOD)

Flash Patterns

1	Quad
2	Triple
3	Double
4	Single
5	Quad/single
6	Quad/triple/double/single
7	CAP168 - unlock with Brown to +Ve for 10 seconds

Cable Connections

Function	Cable Colour	Description
Power 1 +Ve	Red	Power 1 – powers primary colour
Ground -Ve	Black	0v ground / earth
Pattern +Ve	Brown	Changes the flash pattern by momentarily applying to a positive. Apply to +Ve for 1 second to revert to quad flash (pattern 1)
Synchronisation	Yellow	Link to other Redtronic products to synchronise / sync to -Ve will enter CRUISE / GATSO mode
Inhibit +Ve	Grey	Link to indicator +Ve (will inhibit the circuit when indicator is active)

Additional Functions

This product is supplied as standard to simultaneously flash with additional units. It is possible to alternate the lamps by following the following steps:

Alternate a pair of lamps (Change side/mode):

1. Power primary colour of one lamp
2. Yellow to -Ve (lamp will go to permanent on)
3. Brown to +Ve (lamp will depower and then re-illuminate after about 5 seconds)
4. Remove connections and when powered Lamp side will have changed modes and will now flash alternately

Warranty and Liability

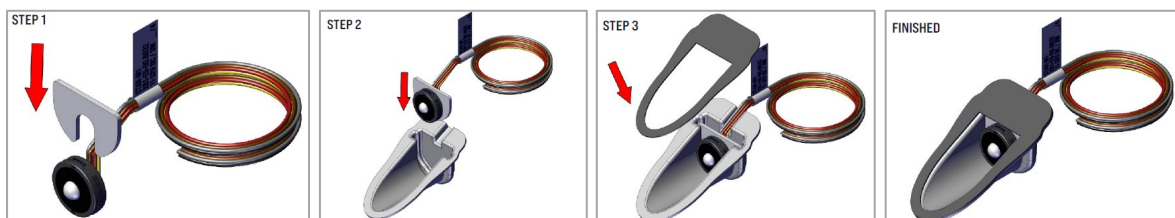
This product benefits from a 2-year warranty.

Maintenance

If the product protrudes the lens through a hole leaving it exposed to the elements, we advise that you do not wash with cleaning agents, only use water.

Window Pod Installation

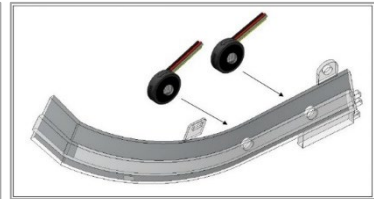
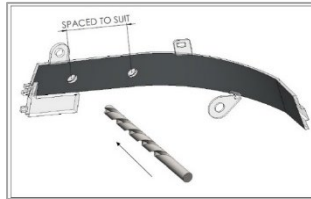
This installation guide demonstrates how to insert the Star-M1 in to the (SP_DSXPOD) window pod in 4 simple steps.



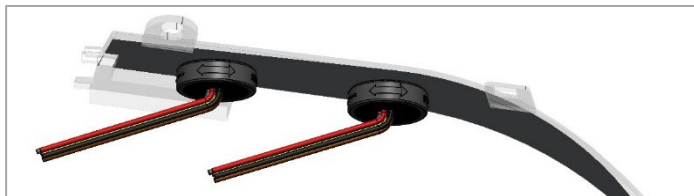
Installation

This installation guide demonstrates a Wing-Mirror fitment instruction, not all wing-mirrors are taken apart the same, please refer to the vehicle manufacturer instructions and ensure a trained specialist carry's out the work. Modification to the vehicle in any way to fit a Redtronic product is done so at the risk of the owner, Redtronic do not accept liability if the vehicle is damaged, Instruction's provided by Redtronic are a guidance and all work should be carried out legally by a trained professional.

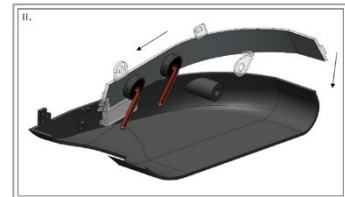
- Disassemble the wing mirror
- Stabilise vehicle temperature to 20 degrees Celsius.
- Drill 2 off 8.0mm holes, 5.0mm deep.
- Affix Star-m1 module to indicator lens using silicone adhesive, aligning star-m1 optics with 8.0mm holes.



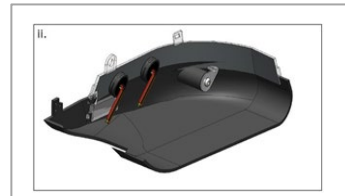
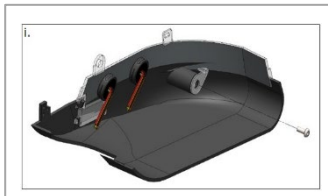
- Ensure that horizontal indicator arrows on star-m1 modules are aligned as shown in top-down view below:



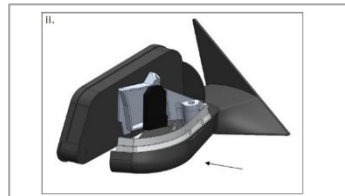
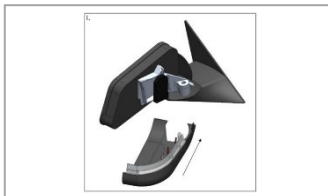
- Affix indicator lens to wing mirror lower case.



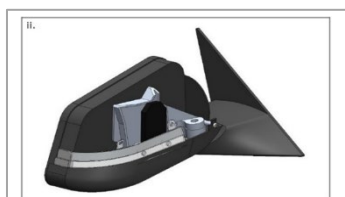
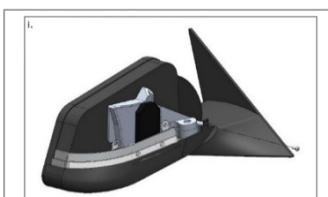
- Secure indicator lens to wing mirror lower case using screws/clips.



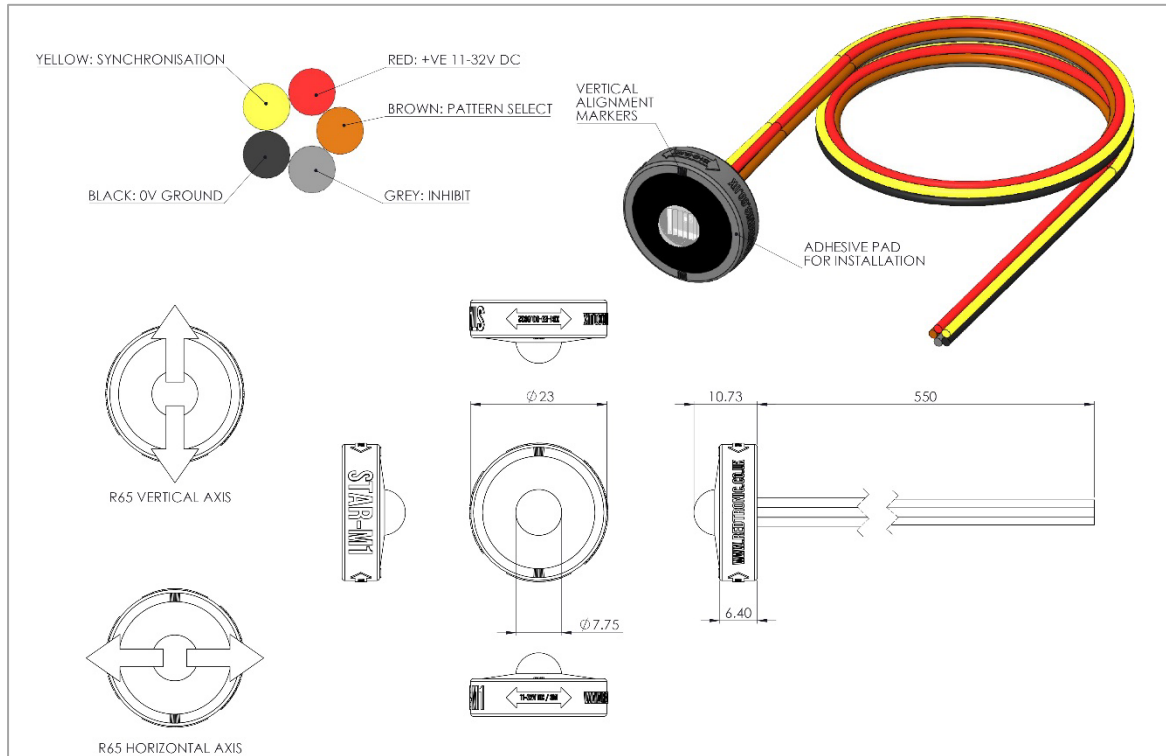
- Re-attach lower half of wing mirror case to main body.



- Secure lower half of wing mirror case to main body using screws/clips & feed cables through to vehicle interior, ensure all other cables are connected & correctly positioned to avoid trapping.

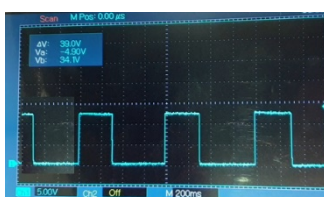


Wiring Diagram

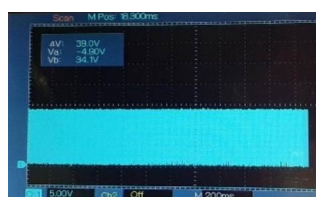


Inhibit feature

The Inhibit line is designed to be connected to a vehicle lamp supply line, typically to an indicator lamp supply wire. The voltage from a 12V vehicle battery varies according to the state of charge of the battery and the rate at which it is being charged or discharged - due to this, the supply to indicator and stop/tail lamps is usually regulated to around 12V. In some cases, this is often done by pulse width modulation (PWM), that is applying the full battery voltage but with short off pulses so that the overall effective (RMS) voltage seen is 12V. Normally, most modern vehicles and those using LED lighting have smooth regulation instead so that the lamps are fed with a constant 12V although we are aware of some use of PWM for some stop/tail activities primarily for dimming control. Where a vehicle has PWM regulation, this can cause problems with microcontroller-based detection circuits because these usually detect by sampling the signals at regular intervals rather than looking at the average voltage. If the sampling frequency is similar to the vehicle's PWM frequency, then it is possible for sampling to sometimes occur several times in succession in the gaps between the active pulses, thus momentarily registering the voltage as absent and causing a false response. The Star-M1 avoids this problem by sampling the lamp voltage at a much higher frequency than typical PWM frequencies. Upon activation of the inhibit feature the lamp deactivates and stops the lamp flashing after 50mSec from receiving the signal - so it cannot clash with the amber light from the indicator. Upon verifying that the inhibit input is no longer active, the STAR-M1 resumes flashing after 800mSec.



DC VOLTAGE on an indicator - clean on/off voltages



PWM sign (fast pulses)



PWM zoomed in at 5ms sampling rate