REDTRONIC

VEHICLE WARNING AND SAFETY SOLUTIONS

MANUFACTURED IN THE UNITED KINGDOM

BULLITT

ADVANCED

USER MANUAL

Contents

1.0 Introduction

The Bullitt Advanced Lightbar is an intelligent, user-friendly programmable Lightbar system. The Lightbar utilises cutting-edge technology alongside revolutionary Patent approved design for aerodynamic form. It presents the ideal solution for users demanding more from their Lightbar than standard models.

2.0 Lightbar Specification

Lengths available:

- 55cm / 21.5”
- 71cm / 28”
- 88cm / 34.5”
- 105cm / 41”
- 121cm / 47.5”
- 138cm / 54”
- 154cm / 60.5”
- 171cm / 67”
- 187cm / 73.5”
- 204cm / 80”

Standard Features:

- Aerodynamic Drag 1.45mpg/0.62kpl
- 10-30v Operation
- 23 Optional Functions
- 9 Programmable Inputs
- 360-degree Output 1
- 16 Flash Patterns
- 10 Colour Options *(Multi-Colour only)*
- CAP168
- Dim Function *(50% & 25%)*
- Synchronisation
- Rotate Flash Patterns *(2 speeds)*
- ECE R65 Monitor Output
- Voltage Sense: 9.5v De-power

Programmable Features:

- 360-degree Output 2 *(Colour 2)*
- Colour Select
- In-built Traffic Director on Front
- In-built Traffic Director on Rear
- Optional in-built Traffic Director on Front & Rear at same time
- Front/Rear Split *(Independent or Simultaneous)*
- Alley Light *(Left & Right)*
- Front Floods
- Rear Worklamp
- Flexi-Flash – ability to set a specific or pair of lightheads on front or rear in a specific location (flash or permanent on lamp {rear red})
- Front Take-Downs

3.0 Power Specification

Bullitt Advanced Lightbars are manufactured to operate within the voltage range of 10-30v DC negative ground *(-ve earth)*. This will require setting upon installation to ensure correct functionality.

Supply Voltage

11-30v DC full brightness

10-11v DC *Possible* Reduced brightness *(begins to reduce below 11v for green, blue and white LED's)*

9.5v DC Lightbar shuts down

Supply Current

Up to 20A when operational, dependant on supply voltage, LED colour and number of LED modules.

Approximately 5mA when inactive *(refer to 14.0 Fuse Requirements)*

4.0 LBAR Main Controller

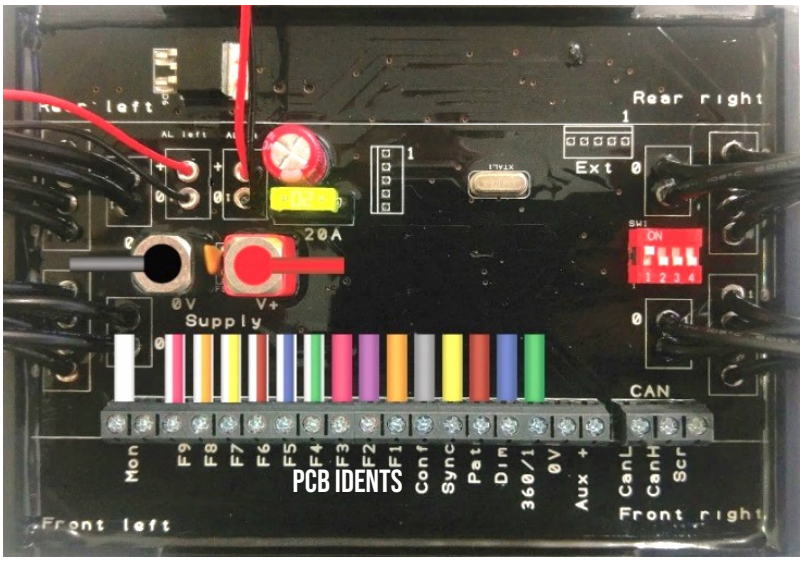
There are nine programmable inputs *(F1-F9)* available to programme a variety of 23 optional features.

4.1 Input / Output functions

	Function	Ident	Colour	Description
Standby Mode	Gnd	0V	Black	Ground/0V (High current stud connector)
	V+	V+	Red	Power In, positive (High current stud connector)
INPUTS	360 0/P1	360/1	Green	Flash entire bar, pattern & colour set 1
	Dim	Dim	Blue	Dim Input
	Pattern	Pat	Brown	Programme flash pattern. Also used for configuration
	Sync	Sync	Yellow	Sync In/Out
	Configure	Conf	Grey	Enables set-up of system configuration
	Function 1	F1	Orange	Programmable Input, Function 1
	Function 2	F2	Violet	Programmable Input, Function 2
	Function 3	F3	Pink	Programmable Input, Function 3
	Function 4	F4	Wh/Grn	Programmable Input, Function 4
	Function 5	F5	Wh/Blu	Programmable Input, Function 5
	Function 6	F6	Wh/Brn	Programmable Input, Function 6
	Function 7	F7	Wh/Yel	Programmable Input, Function 7
	Function 8	F8	Wh/Or	Programmable Input, Function 8
	Function 9	F9	Wh/Pink	Programmable Input, Function 9

OUTPUTS	R65 Monitor		White	A positive output to indicate that R65 flashing is working. Will drive up to 500mA at nominal supply voltage
	4 x LED Interface		4-core Black	Sends power to Front Left, Front Right, Rear Left & Rear Right
	4 x LED Supply		2-core Black	Return power line for bars with more than 4 slaves on each string
	Alley LEFT O/P		Tyco Connect	Alley Light power, positive & negative
	Alley Right O/P		Tyco Connect	Alley Light power, positive & negative
	CANBUS		N/A	Connection for external switch panel via CANBUS *(not currently available)*
	LED Data		N/A	Serial Output for remote display *(not currently available)*
	Serial		N/A	Serial Interface *(not currently available)*

4.2 Wiring & Connectivity



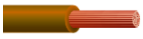
5.0 Setting the Flash Pattern

5.1 360 Output 1 & 2 *(Standard Flash Patterns)*

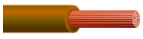
The Bullitt Advanced Lightbar has 16 x ECE R65 approved flash patterns available that can be programmed to the outputs

	FLASH PATTERN	LED FUNCTION		FLASH PATTERN	LED FUNCTION
1	Quad	Left-Right	9	Quad	Mix Mode
2	Triple	Left-Right	10	Triple	Mix Mode
3	Double	Left-Right	11	Double	Mix Mode
4	Single	Left-Right	12	Single	Mix Mode
5	Quad	All On	13	Quad	In-Out
6	Triple	All On	14	Triple	In-Out
7	Double	All On	15	Double	In-Out
8	Single	All On	16	Single	In-Out

a) When in 360/1 (Green Wire) or 360/2 (F1-F9 set function: See section 8.0):

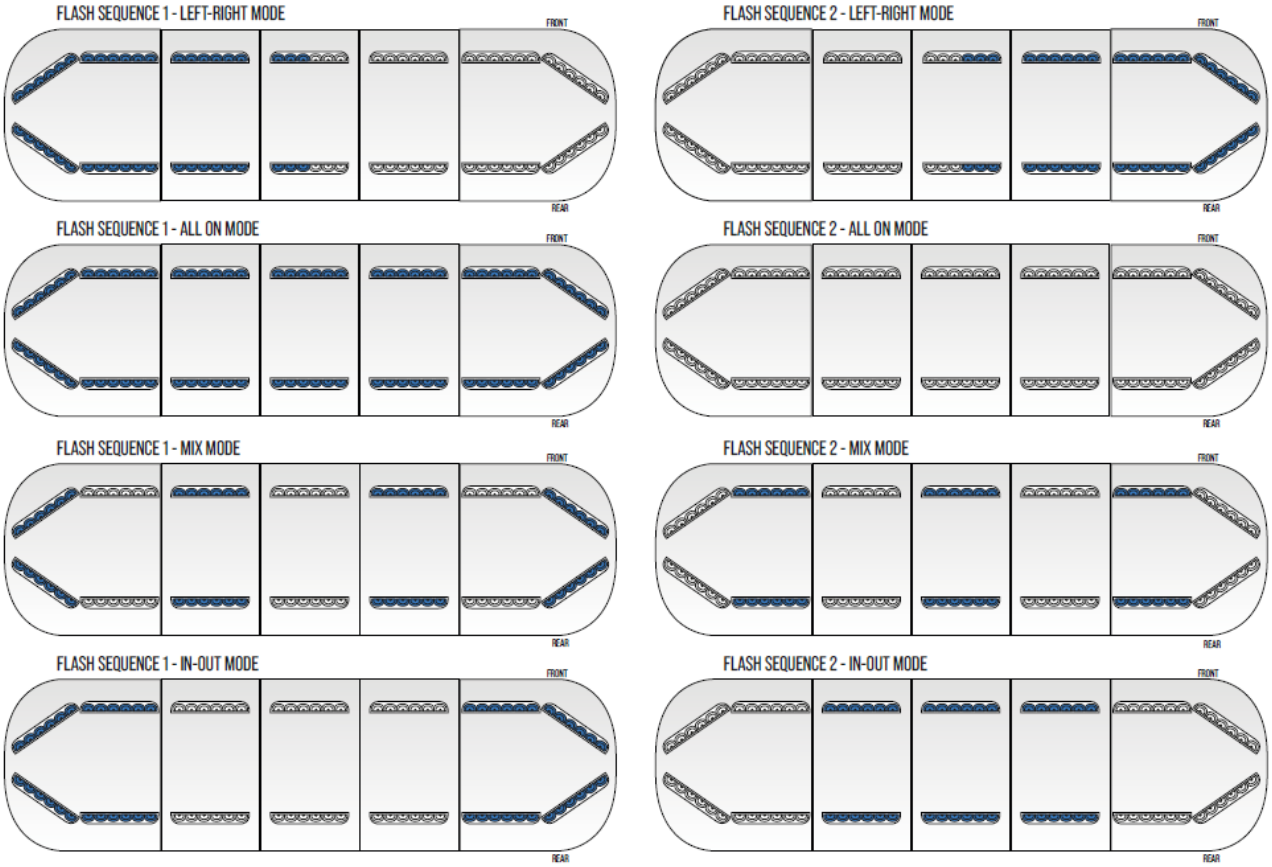


b) Apply the brown *(Pattern Select)* wire to +ve momentarily. Repeat until the desired flash pattern has been programmed



c) To return to the first pattern *(Quad Left-Right),* apply brown permanently to +ve for a two (2) seconds

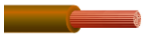
d) Release the brown wire



5.2 Alley Lights – 'Permanent on' or 'Flash'

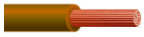
a) Ensure the Lightbar is in 'Standby' mode by connecting Red +ve Black -ve

b) Apply the Alley Left & Alley Right input wires to +ve permanently



c) Apply the brown *(Pattern Select)* wire to +ve momentarily

d) The Alley Lights will now flash in an alternating pattern



e) To Revert to 'Permanent on' apply the brown *(Pattern Select)* wire to +ve momentarily

f) If wanting to use more than 'alley light' for illumination, simply Apply the grey *(Config)* wire to +ve permanently

g) Apply the brown *(Pattern Select)* wire to +ve momentarily

h) Release the grey wire

Note: Changing Alley Lights to 'Flash' will not affect the pattern of the lightbar when it is not selected

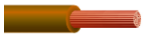
6.0 CAP168 / ICAO / CAA / ACAA (whilst in 360/1, 360/2, Cruise Mode, Rotate patterns) - *(61fpm)*

This function is built-in to the Cruise and Rotate flash patterns as standard. If you require it on another wire, setting Dil Switch 2 to **'ON'** gives the addition of CAP168 pattern *(Airport Mode)* to the 360/1, 360/2 flash pattern options – in all 4 different flash modes (*left-right, all-on, mix, in-out*). In addition, the colour can be individually set to each output *(refer to 9.0 Setting the Colour)*

6.1 360/1 & 360/2 Outputs

a) Ensure the Lightbar is in 'Standby' mode, set Dil Switch 2 to **'ON'**

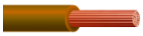
b) Apply the input wire programmed as **'360/2'** to +ve permanently



c) Apply the brown *(Pattern Select)* wire to +ve momentarily until CAP168 is enabled

6.2 Cruise Mode

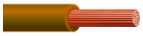
a) Apply the input wire programmed as **'Cruise Mode'** to +ve permanently



b) Apply the brown *(Pattern Select)* wire to +ve momentarily until CAP168 is enabled

6.3 Rotate

a) Apply the input wire programmed as **'Rotate'** to +ve permanently



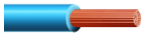
b) Apply the brown *(Pattern Select)* wire to +ve momentarily until CAP168 is enabled

7.0 Setting Dim Mode

There are two modes available with the Lightbar; 25% brightness and 50% of full brightness *(default)*. Dim does not apply to Stop/Tail/Indicator, Alley Lights, Worklamps or Front Floods.

a) Ensure the Lightbar is in 'Standby' mode

b) Apply the green *(360/1)* wire to +ve permanently



c) Apply the blue *(Dim)* wire to +ve permanently

d) Dim is now enabled at 50% of full brightness on all inputs

To decrease to 25% of full brightness: -

a) Apply the green *(360/1)* wire to +ve permanently

b) Apply the blue *(Dim)* wire to +ve permanently

c) Apply the grey *(Config)* wire to +ve permanently

d) Apply the brown *(Pattern Select)* wire to +ve momentarily

e) Lamps will reduce in brightness

f) Release the grey wire

g) To revert back to default setting simply repeat the process

Note 25% Dim mode does not meet the requirements of the R65 candela (brightness) specification

8.0 ECE R65 Monitor Output

The monitor output activates when the Lightbar is flashing with R65 compliance. Detected faults, such as loss of communication to the board, will prevent the signal from activating. Any detected fault will cause the LED to flash.

The minimum requirement for R65 compliance is activation of the end 'angled' modules in the Lightbar, on full brightness. The monitoring output will therefore activate when these lamps are performing correctly. If other lamps fail for any reason, the monitor output will still activate. *This is not a 'full Lightbar monitor'.*

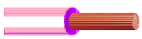
The monitor output wire *(white)* can be connected to an external LED signal, buzzer or computer to monitor ECE R65 compliance. This is a positive output that will drive up to 500mA at nominal voltage supply. Please do not put a heavy load to this wire connection. When there is non-compliance to the standard, the signal will deactivate.

9.0 Setting the Colour

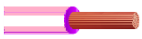
This is not applicable to any lightbars built as 'single colour' only.
Setting Dil Switch 1 (located on the main internal motherboard) to **'ON'** restricts the colour selection to 3 full output colours only (i.e. whichever LED is mounted within lighthead). This will normally be set at the factory on all Single and Dual colour models.
On Dual and Multi-Colour Lightbars, a colour can be set to each function as required by the user:

a) Ensure the Lightbar is in 'Standby' mode

b) Apply the required input wire (*360/1 or F1-F9*) to +ve permanently



c) Apply the white/pink (Colour select) wire to +ve momentarily until desired colour is set



d) To return to the first colour, apply the white/pink to +ve permanently for three (3) seconds

	Left Side	Right Side		Left Side	Right Side
Colour 1	Blue		Colour 7	Dark Amber	
Colour 2	Amber		Colour 8	Light Blue (Green tint)	
Colour 3	Red		Colour 9	Purple	
Colour 4	Green		Colour 10	American Amber (Green tint)	
Colour 5	White		Colour 11	Blue	Red
Colour 6	Magenta (Pink)		Colour 12	Red	Blue

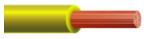
10.0 Programming the Lightbar

10.1 Setting an Input Function

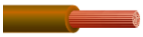
Nine inputs *(F1-F9)* can each be programmed to perform 23 optional functions

a) Connect all the input wires to the LBAR Main Controller (*refer to section 4.0*)

b) Ensure that the Lightbar is in 'Standby' mode by connecting Red +ve Black -ve



c) Apply the yellow *(sync)* wire to -ve permanently



d) Apply the brown *(Pattern Select)* wire to +ve permanently for **5 seconds,** diagnostic LED will display 4 short flashes – do not proceed to next stage without this 'pause'

e) Apply the required input wire individually (*F1-F9*) to +ve permanently

f) Apply the grey wire *(Config)* momentarily to +ve to cycle through to the required function. Diagnostic LED will flash to confirm the function has been selected *(refer to Appendix 2)*

g) Release the brown and yellow wire

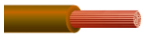
h) The F1-F9 input is now programmed to the desired function

i) Simply repeat the process until all the F1-F9 inputs have been programmed

Input Function	Feature Code	Default	Selectable Function
360 O/P 2	1	F4	Flash Entire Bar (Rear off as standard)
Colour	2	F9	Programme Colour
Left	3	F1	Main Traffic Director Left
Right	4	F2	Main Traffic Director Right
Centre	5	F3	Main Traffic Director Centre
Rotate	6	F6	Rotate Ends
Front Only	7		Flash Front Only
Rear Only	8	F5	Flash Rear Only
Cruise Mode	9		Glow Ends (Cruise Mode)
FF1 Front Flood Flash	10		Selected LED's Flash starting in front position (can also be made to steady burn)
FF2 Front Floods	11		Selected LED's Permanent On starting in front position (can also be made to flash)
FF3 Flexi-Flash	12		Selected LED's Flash starting in rear position (can also be made to steady burn)
Alley Left	13	F7	Alley Left
Alley Right	14	F8	Alley Right
Stop Light	15		Stop Light, Full Then 50% Brightness
Tail Light	16		Stop Light 25% Brightness
Indicator Left	17		Indicator Left
Indicator Right	18		Indicator Right
Left Front	19		Front Traffic Director Left
Right Front	20		Front Traffic Director Right
Centre Front	21		Front Traffic Director Centre
Rear Worklamp	22		Steady Work Light Rear
360° Worklamp	23		Steady Work Light All-Round

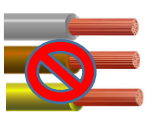
10.2 To reset an input to the first function in the list *(360 O/P 2 - Flash entire bar)*

a) Apply the yellow *(sync)* wire to -ve permanently



b) Apply the brown wire to +ve permanently

c) Apply the required input wire to +ve permanently



d) Apply the grey wire to +ve for two (2) seconds

e) Release the brown and yellow wire

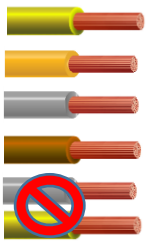
f) Input is now set to the first function

11.0 Traffic Director

By default, the three main Traffic Director *(TDIR)*inputs are setup to operate on the Rear Only. However, the inputs can also be programmed to operate as Front Only, Front & Rear or Front & Rear opposite. Additionally, the colour can be set individually to each input *(refer to 9.0 Setting the Colour)*You can also setup the length of the TDIR and select optional 'chase' mode (whereby lightheads stay lit when they have been activated).

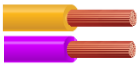
11.1 Traffic Director Rear Only *(Default input wires)*

11.2 Changing Traffic Director Operation *(Rear, Front, Front & Rear,Front & Rear Opposite)*



a) Ensure the Lightbar is in 'Standby' mode
b) Apply the yellow *(sync)*wire to -ve permanently
c) Apply the orange *(TDIR Left)*wire to +ve permanently
d) Apply the grey *(Config)*wire to +ve permanently
e) Apply the brown *(Pattern Select)*wire to +ve momentarily until the required operation is set
f) Release the grey and yellow wires

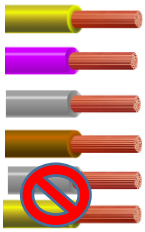
11.3 Warning Lamp Mode



a) Ensure the Lightbar is in 'Standby' mode
b) Apply the orange & purple wires to +ve permanently

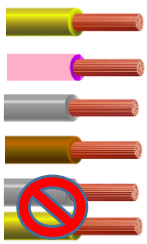
If more than one TDIR function is selected the Lightbar will resort to a programmable 'Warning' flash as a safety measure. Pattern setting is shared with the Flexi-Flash function *(see 12.12 Flexi-Flash),* therefore changing one will affect the other. Colour can be set to either function as required *(See 9.0 Setting the Colour)*

11.4 Setting Traffic Director Length



a) Ensure the Lightbar is in 'Standby' mode
b) Apply the yellow *(sync)*wire to -ve permanently
c) Apply the purple *(TDIR Right)*wire to +ve permanently
d) Apply the grey *(Config)*wire to +ve permanently
e) Apply the brown *(Pattern Select)*wire to +ve momentarily until the required length is set
f) Release the grey and yellow wires

11.5 Enable 'Chase' Mode



a) Ensure the Lightbar is in 'Standby' mode
b) Apply the yellow *(sync)*wire to -ve permanently
c) Apply the pink *(TDIR Centre Out)*wire to +ve permanently
d) Apply the grey *(Config)*wire to +ve permanently
e) Apply the brown *(Pattern Select)*wire to +ve momentarily
f) Release the grey and yellow wires
g) 'Chase' mode is now enabled on ***ALL*** Traffic Director operations
h) Repeat the process to revert back

12.0 Additional Programmable Inputs

These are functions that may be set to any of the inputs *(F1-F9).* The user can assign the function if it has not been set in the factory, however this will mean replacing an already programmed input if there are no spare function wires available. Pattern and Colour *(Dual and Multi-Colour only)* are selectable.

12.1 Front/Rear Split - Setting mode – *allows separate control of the front OR rear of the lightbar individually on 2 separate feature wires*

a) Follow section 10.1, selecting feature code 7 for Front mode

b) Follow section 10.1, selecting feature code 8 for Rear mode

12.2 'Cruise' Mode - *Both ends of Lightbar glow on 'steady burn low power'*

a) Follow section 10.1, selecting feature code 9

Note: CAP168 (Airport Mode) is incorporated into Cruise & Roto flash patterns. Applying the brown (Pattern Select) wire to +ve will enable CAP168 (see 6.0)

12.3 Front Flood Flash (Takedown lamps) – *Selected Front Modules flash (normally white lamps)*

a) Follow section 10.1, selecting feature code 10

b) To 'alternate' the flash mode against 360/1, 360/2, flexi-flash or other mode (if not restricted) – simple apply the brown *(Pattern Select)* wire to +ve for five (5) seconds – this will alternate the flash pattern against the main function. To revert – repeat operation.

12.4 Front Floods - *Set selected modules to permanent on*

a) Follow section 10.1, selecting feature code 11

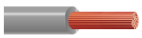
12.5 Stop lamp – *Factory fitted but can be installed as an upgrade [see 13.0 Lightbar Upgrades] – only available to set up on the 'rear' of the lightbar [feature unavailable at front]*

You must utilise 2 x BL.ADSTI for this function to work – setting this feature on a standard lightbar lamp will void warranty

c) Follow section 10.1, selecting feature code 15 for Stop lamp

d) The lamps at the rear should light up REAR CENTRE module

e) Apply the yellow *(sync)* wire to -ve permanently



f) Apply the grey *(Config)* wire to +ve permanently

g) Apply the brown wire to +ve momentarily until the required module sections are lit – you can cycle through various lamp positions at this stage – with a maximum length of 1 full module – the modules split into half to allow for STI setup using BL.ADSTI, each time it will return to the centre to allow you to select the correct position

h) Once setup in the correct position: Release the grey and yellow wires

12.6 Tail - *Factory fitted but can be installed as an upgrade (see 13.0 Lightbar Upgrades)*

You must utilise 2 x BL.ADSTI for this function to work – setting this feature on a standard lightbar lamp will void warranty

a) Follow section 10.1, selecting feature code 15 for Stop

b) Follow section 10.1, selecting feature code 16 for Tail for the wire connection to run this feature

c) Once set, the tail lamps should appear in the same position you have set up for STOP.

12.7 Left Indicator – *sets the REAR INDICATOR positions*

You must utilise 2 x BL.ADSTI or 2 x BL.ADIND for this function to work as expected – setting this feature on a standard lightbar lamp does not meet UNECER6 & UNECER7 homologation requirements unless the specified lamps are utilised.

This setup procedure sets up the REAR POSITION of the Indicators in the lightbar. If you want to set up FRONT POSITION indicators only, please see 12.8

a) Follow section 10.1, selecting feature code 17 for Indicator Left

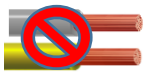
b) The lamps at the rear should light up REAR CENTRE INDICATOR positions (Front indicators will light up if active)

c) Apply the yellow *(sync)* wire to -ve permanently

d) Apply the grey *(Config)* wire to +ve permanently

e) Apply the brown wire to +ve momentarily until the required module sections are lit – you can cycle through various lamp positions at this stage – with a maximum length of 1 full module – the modules split into half to allow for STI setup using BL.ADSTI, each time it will return to the centre to allow you to select the correct position - the 'off' position is a part of this setup procedure, so if you do not want 'REAR INDICATORS' leave the lamps in the 'off' position in order to ensure no lamps light up upon activating an indicator line

f) This is setting the REAR position – so depending on how the lightbar is already set up, some front lamps may be lit – in order to turn these off, you need to set up **Right Indicator** – see 12.8



g) Once setup in the correct position: Release the grey and yellow wires

12.8 Right Indicator - *sets the FRONT INDICATOR positions*

You must utilise 2 x BL.ADSTI or 2 x BL.ADIND for this function to work as expected – setting this feature on a standard lightbar lamp does not meet UNECER6 & UNECER7 homologation requirements unless the specified lamps are utilised

a) Follow section 10.1, selecting feature code 18 for Indicator Right

b) If you already set up the LEFT INDICATOR then the position will already be set – if not, please follow section 12.7

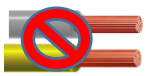
c) You may find that the FRONT INDICATOR positions are lit – these can now be turned off using the following procedure:

d) Apply the yellow *(sync)* wire to -ve permanently

e) Apply the grey *(Config)* wire to +ve permanently

f) Apply the brown wire to +ve momentarily until the required module sections are lit on the FRONT of the lightbar – you can cycle through various lamp positions at this stage – with a maximum length of 1 full module – the modules split into half to allow for STI setup using BL.ADSTI, each time it will return to the centre to allow you to select the correct position – the 'off' position is a part of this setup procedure, so if you do not want 'FRONT INDICATORS' leave the lamps in the 'off' position in order to ensure no lamps light up upon activating an indicator line

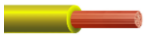
g) This is setting the FRONT position – so depending on how the lightbar is already set up, some front lamps may be lit – in order to turn these off, you need to set up **Left Indicator** – see 12.7



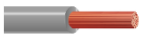
h) Once setup in the correct position: Release the grey and yellow wires

12.9 Rear Worklamp - *Set selected modules to permanent on*

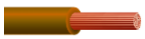
a) Follow section 10.1, selecting feature code 22 for Rear Worklamp



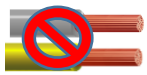
b) Apply the yellow *(sync)* wire to -ve permanently



c) Apply the grey *(Config)* wire to +ve permanently



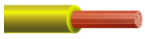
d) Apply the brown wire to +ve momentarily until the required modules are lit – you can cycle through various lamp positions at this stage, with each cycle it will 'add' a lamp position into the chain, you can end up lighting the whole rear bar with this feature.



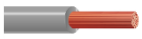
e) Release the grey and yellow wires

12.10 Rear Worklamp - *Set front / rear operation*

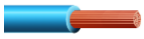
a) Follow section 10.1, selecting feature code 22 for Rear Worklamp



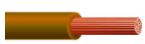
b) Apply the yellow *(sync)* wire to -ve permanently



c) Apply the grey *(Config)* wire to +ve permanently



d) Apply blue *(Dim)* wire to +ve permanently



e) Apply the brown *(Pattern Select)* wire to +ve momentarily This will cycle the lamps through Rear only – Front only - Front/Rear – Rear only

f) Release the grey and yellow wires

12.11 360 Worklamp - *Steady work light all round*

a) Follow section 10.1, selecting feature code 23 for 360° Worklamp

12.12 Flexi-Flash (FF) - *Flash selected modules, in a variety of positions*

Flexi-Flash allows the user to set a single LED module (or multiple modules) programmed to this input function, in any desired format, giving the user total flexibility. This function can be used to set up individual lightheads to flash or steady burn as required on the rear or front of the lightbar, on either side or both sides. It also has independent flash pattern and colour select on each setting.

In this version of software (v2.1) we have made it so there are 2 x more flexi-flash functions, so on 3 separate wires, you can set up 3 different features rather than the original 1 wire option. This is helpful to be able to set up a variety of new features in the lightbar.

a) Follow Section 10.1, selecting feature code 10-12 **(FF1, FF2, FF3)**

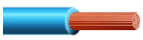
12.13 Changing Flexi-Flash Operation – *this selects the 'position' of the lamp within the Lightbar such as rear, front, front & rear and/or side (see Fig. 1)*

a) Ensure the Lightbar is in 'Standby' mode

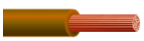
b) Apply the programmed Flexi-Flash input wire to +ve permanently

c) Apply the yellow *(sync)* wire to -ve permanently

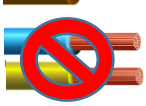
d) Apply the grey *(Config)* wire to +ve permanently



e) Apply the blue *(Dim)* wire to +ve permanently

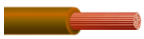


f) Apply the brown *(Pattern Select)* wire to +ve momentarily until the required operation is set



g) Release the grey , blue and yellow wires

Flexi-Flash Sequence			
1	Rear Only	**6**	Front Right only
2	Front Only	**7**	Front Left only
3	Front & Rear	**8**	Front & Rear Right only
4	Rear Right only	**9**	Front & Rear Left only
5	Rear Left only	**Sync -ve**	Permanent On

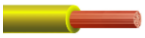


h) To 'alternate' the flash mode against 360/1, 360/2, another flexi-flash or other mode (if not restricted) – simple apply the brown *(Pattern Select)* wire to +ve for five (5) seconds – this will alternate the flash pattern against the main function. To revert – repeat operation.

12.14 Setting Flexi-Flash LED Modules - *this selects how many lamps (and which ones) activate for the function, as shown in Fig 2).*

a) Ensure the Lightbar is in 'Standby' mode

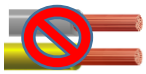
b) Apply the programmed Flexi-Flash function wire to +ve permanently



c) Apply the yellow *(sync)* wire to -ve permanently

d) Apply the grey *(Config)* wire to +ve permanently

e) Apply the brown *(Pattern Select)* wire to +ve momentarily until the required number of LED modules is set



f) Release the grey and yellow wires

Fig. 1

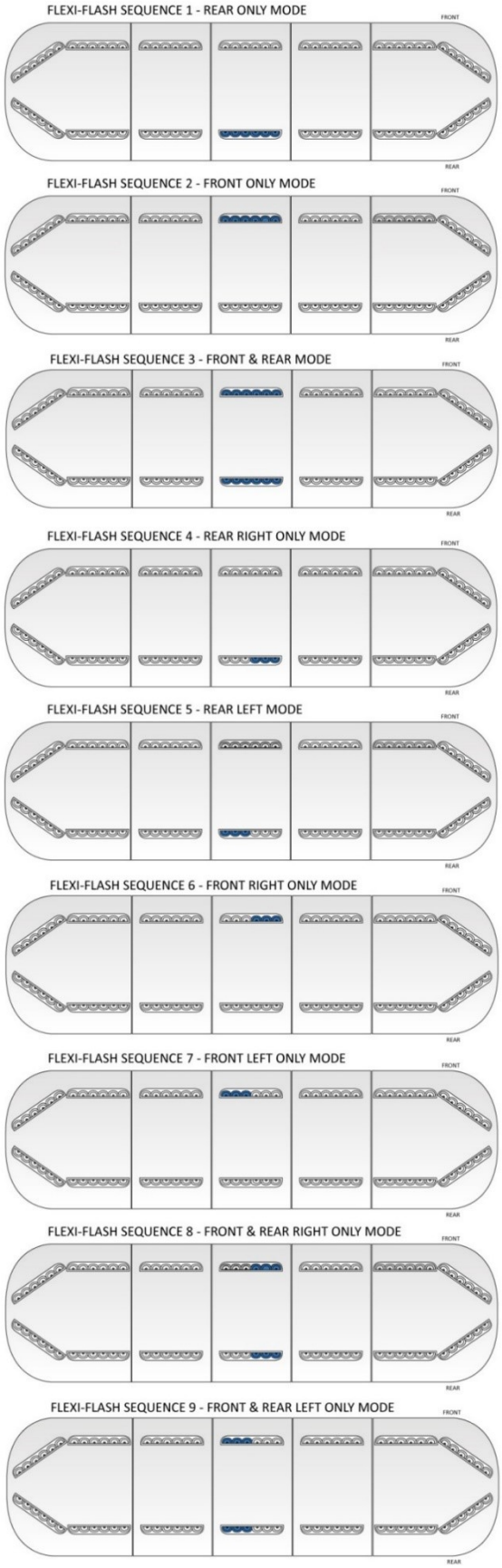
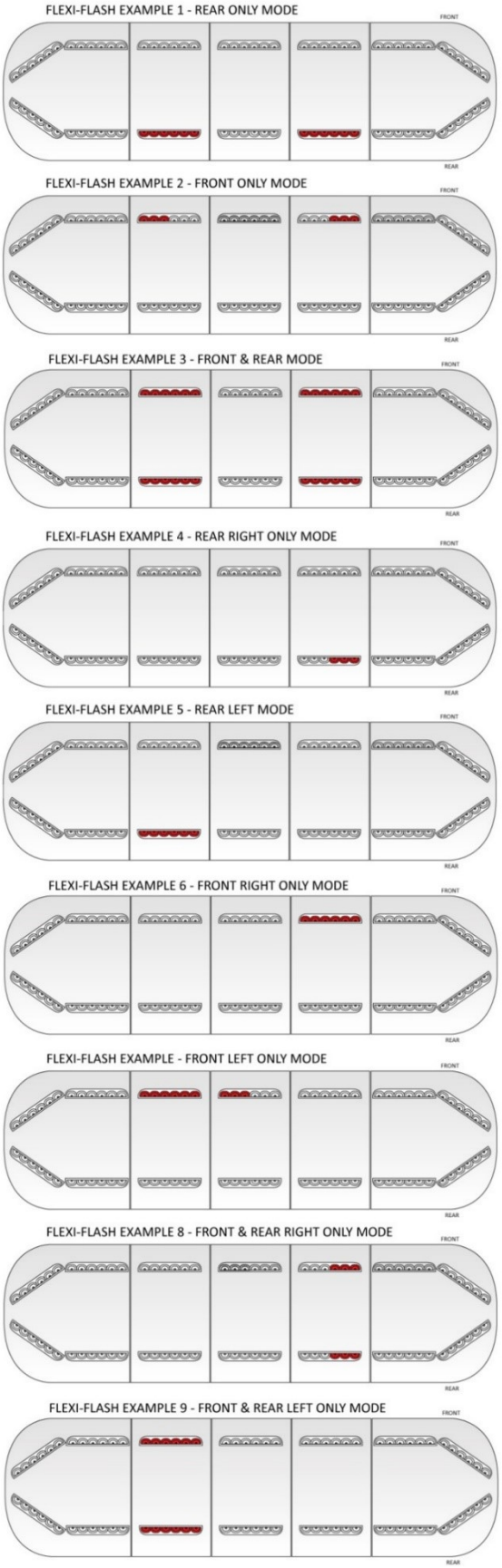

FLEXI-FLASH SEQUENCE 1 - REAR ONLY MODE
FLEXI-FLASH SEQUENCE 2 - FRONT ONLY MODE
FLEXI-FLASH SEQUENCE 3 - FRONT & REAR MODE
FLEXI-FLASH SEQUENCE 4 - REAR RIGHT ONLY MODE
FLEXI-FLASH SEQUENCE 5 - REAR LEFT MODE
FLEXI-FLASH SEQUENCE 6 - FRONT RIGHT ONLY MODE
FLEXI-FLASH SEQUENCE 7 - FRONT LEFT ONLY MODE
FLEXI-FLASH SEQUENCE 8 - FRONT & REAR RIGHT ONLY MODE
FLEXI-FLASH SEQUENCE 9 - FRONT & REAR LEFT ONLY MODE

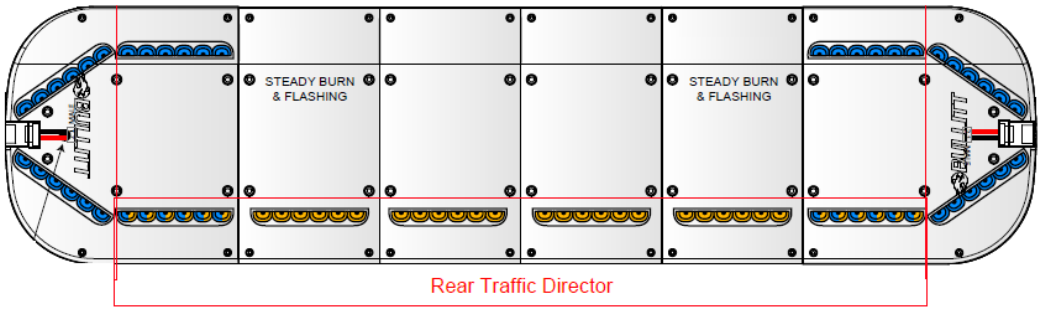
Fig. 2

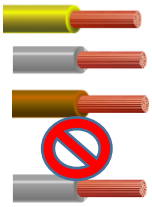

FLEXI-FLASH EXAMPLE 1 - REAR ONLY MODE
FLEXI-FLASH EXAMPLE 2 - FRONT ONLY MODE
FLEXI-FLASH EXAMPLE 3 - FRONT & REAR MODE
FLEXI-FLASH EXAMPLE 4 - REAR RIGHT ONLY MODE
FLEXI-FLASH EXAMPLE 5 - REAR LEFT MODE
FLEXI-FLASH EXAMPLE 6 - FRONT RIGHT ONLY MODE
FLEXI-FLASH EXAMPLE - FRONT LEFT ONLY MODE
FLEXI-FLASH EXAMPLE 8 - FRONT & REAR RIGHT ONLY MODE
FLEXI-FLASH EXAMPLE 9 - FRONT & REAR LEFT ONLY MODE

12.15 Inclusion / Exclusion flag

Within the lightbar, there are various features, mainly on 'single colour modules' that may 'clash' with another feature setup on the lightbar.

For example: Below the lightbar is set up as Blue 360/2 (Blue lights) – but you wouldn't want the traffic director to flash in Amber when the Blues are flashing as standard – in such case – you use this 'inclusion / exclusion flag' feature on setup to eliminate the Amber lights from flashing whilst the Blue lights are active on 360/1





a) With the Lightbar in 'Standby' mode
b) Apply the relevant function wire to +ve permanently (for instance as 360/2)
c) Apply the yellow *(sync)* wire to -ve permanently
d) Apply the grey wire to +ve permanently
e) Apply the brown wire to +ve momentarily
f) This will either turn off the lamps that you do not want to appear in the setup or will turn them on (if required)
g) Release the grey wire
h) Repeat the process to revert back

This feature does have many formulated setups available, but in general we would request that if you are experiencing problems with setting up the 'inclusion / exclusion flag' you need to contact the factory to ensure the function you are trying to include or exclude is possible.

13.0 Lightbar Upgrades

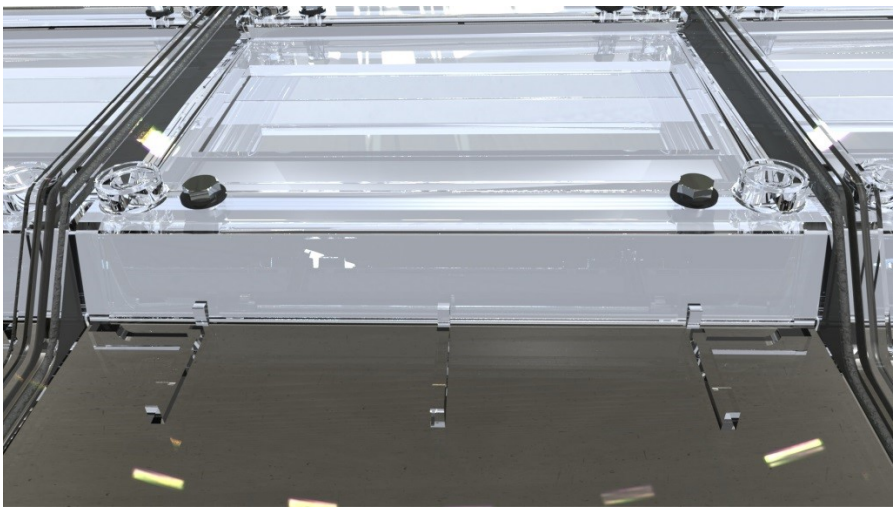
The unique design of the Bullitt Advanced permits certain user upgrades to be carried out giving improved visibility or additional functionality, such as Traffic Director, Stop/Tail/Indicator or Alley Lights. Some programming will be required dependant on the type of upgrade *(refer to 10.0 Programming the Lightbar).* Please contact your sales representative to confirm that the upgrades you require are possible before proceeding

When carrying out any upgrade, the Lightbar should ideally be de-installed from the vehicle. Where this is not practicable, the Lightbar ***MUST*** be isolated from the vehicle's battery. Failure to do so may result in the Lightbar being reset to factory settings.

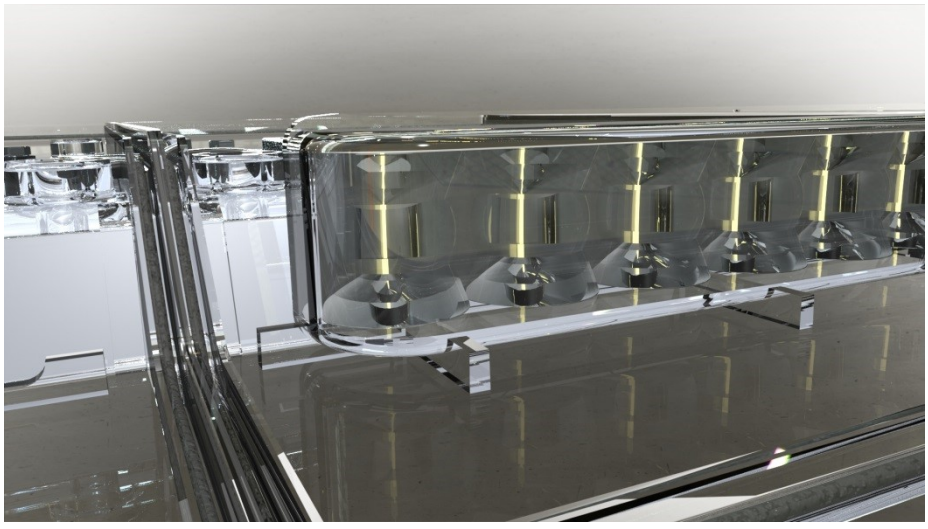
13.1 LED Modules

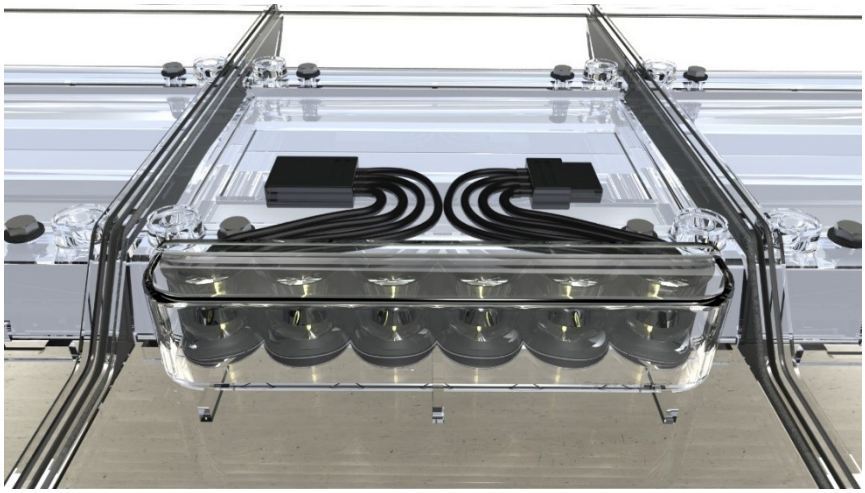
a) Carefully remove the M4 and M6 socket cap screws and washers from the top lenses and place to one side.

b) Remove the top lenses and place carefully to one side. Ensure that the silicone rubber seals remain in place within the base lenses.

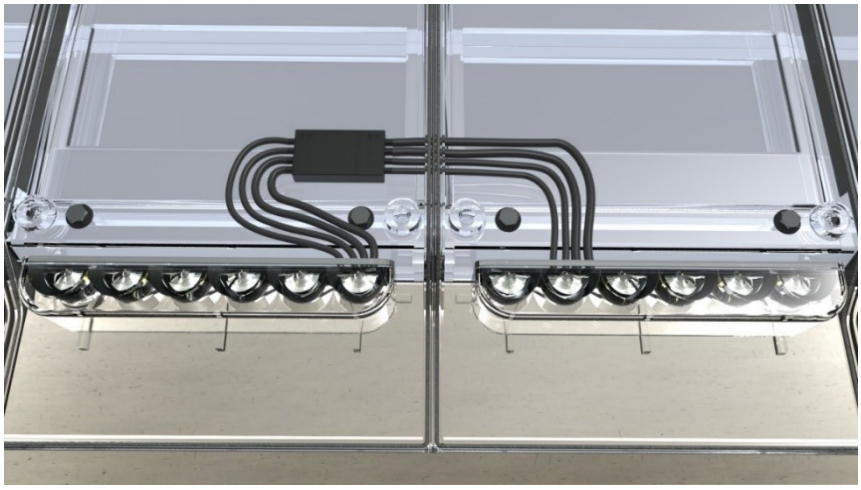


c) Position the LED module(s) into the base lens, ensuring it is seated correctly on the base lens stanchions

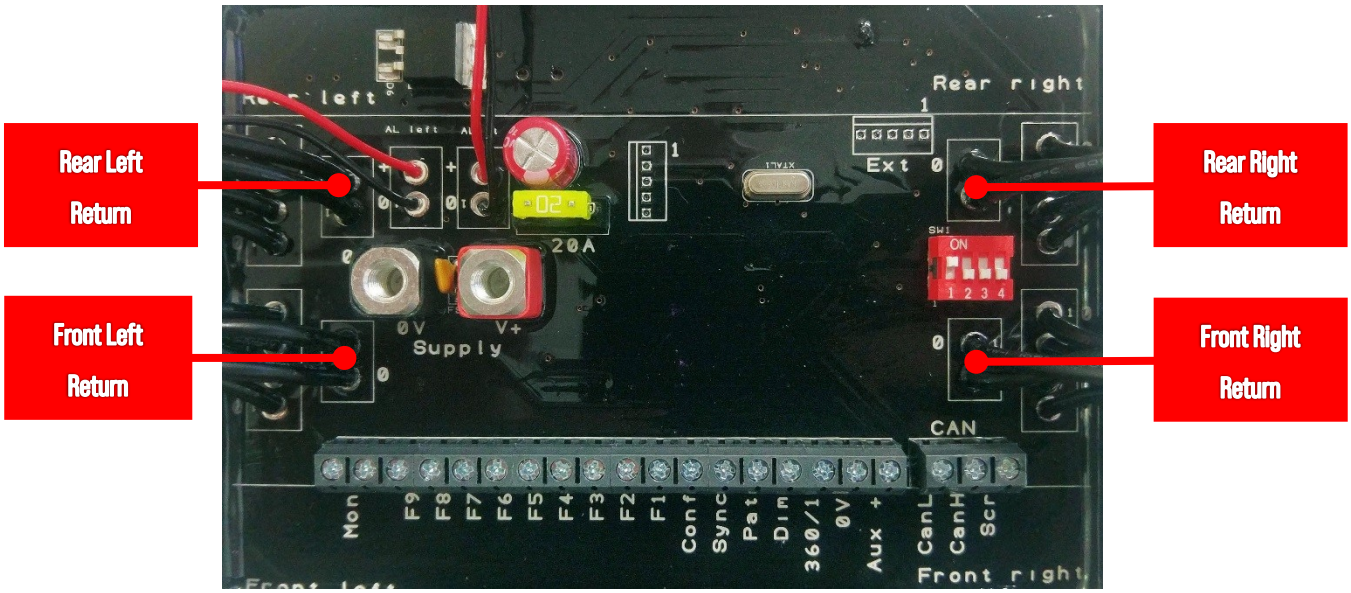




d) Connect the module to the existing string via the 4-way connector



e) If the string contains **four (4) or more** LED modules the return connector loom on the LBAR Main Controller must be used



f) With the new LED modules in position, carefully replace the top lenses and secure using the M4 and M6 socket cap screws and washers - ***All fixings must be inserted with a torque setting of 1.8Nm (18.4Kg/cm, 15.9in/lbs, 1.33ft/lbs)***

g) Reconnect to the vehicle battery

h) Refer to 10.0 Programming the Lightbar

i) For Dual and Multi-Colour Lightbars refer to 9.0 Setting the Colour

13.2 Adding Alley Light modules (EM315WC/BL (internal stock code S.EM315WC/BL))

a) Carefully remove the M4 and M6 socket cap screws and washers from the top lenses and place to one side

b) Remove the top lenses and place carefully to one side. Ensure that the silicone rubber seals remain in place within the base lenses

c) Position the Alley Light(s) into the base lens end section, ensuring it is seated correctly *(Fig. 1)*

d) Connect the 2-core cable for each Alley Light to the LBAR Main Controller *(Fig. 2)*

e) With the Alley Lights in position, carefully replace the top lenses and secure using the M4 and M6 socket cap screws and washers - ***All fixings must be inserted with a torque setting of 1.8Nm (18.4Kg/cm, 15.9in/lbs, 1.33ft/lbs)***

Fig. 1

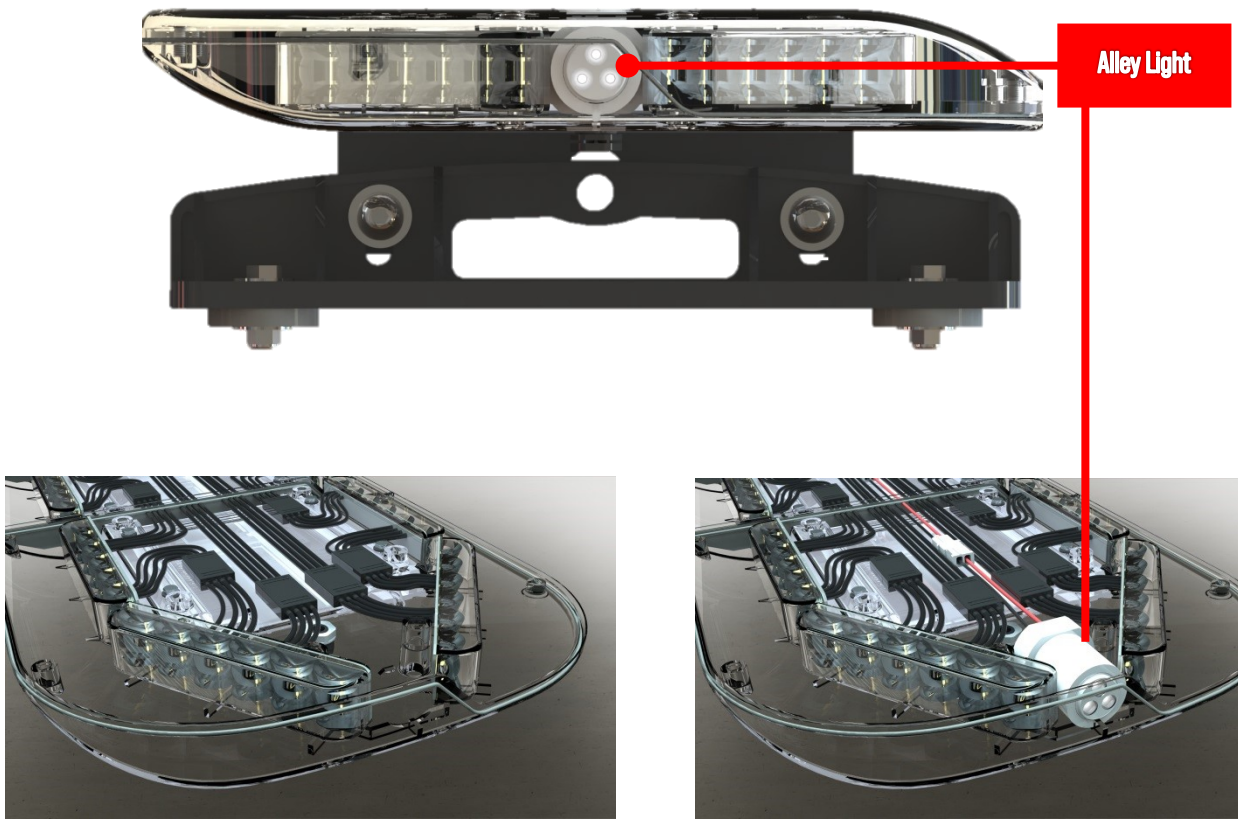
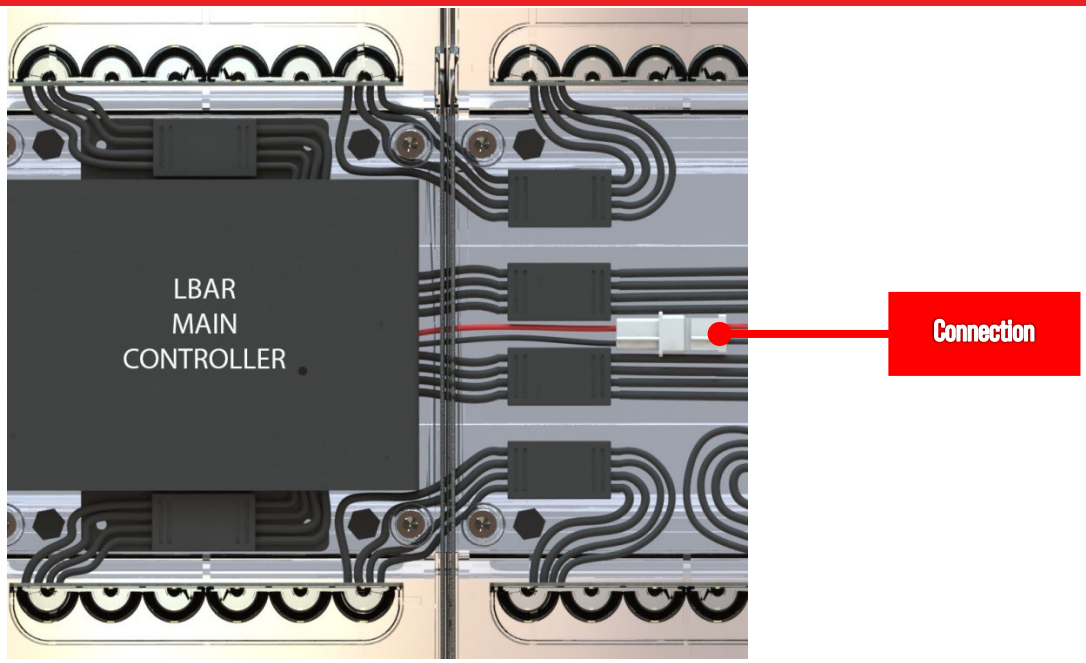
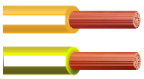


Fig. 2





f) Reconnect to the vehicle battery

g) Alley Lights are normally connected to F7 *(white/yellow)* and F8 *(white/orange)*, therefore there is no requirement to programme the input as this is the default wiring

h) Should any other input wire be used refer to 10.0 Programming the Lightbar

i) Refer to 5.2 to set the required operation of each Alley Light

14.0 Fuse Requirements

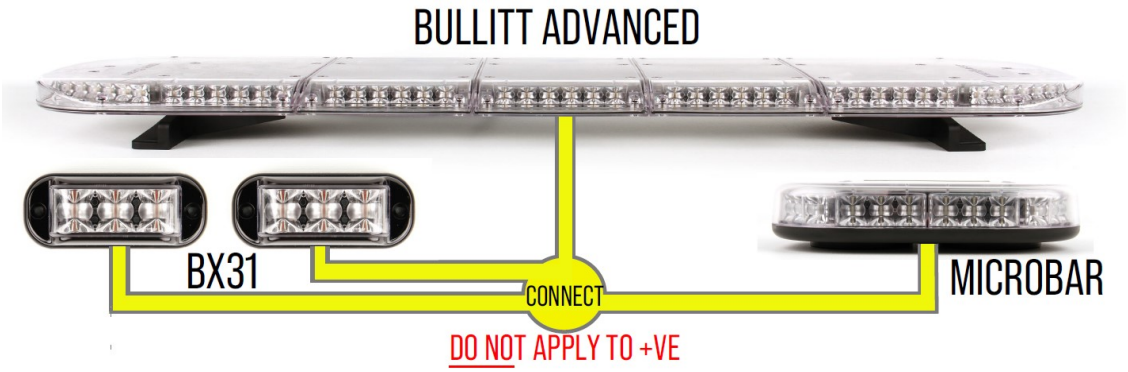
The following table can be used as a guide to determine the maximum current for standard builds. 24v vehicles will draw approximately half the current shown in the table below. Installers should contact their sales representative if unsure of the fusing requirements.

Lightbar Size	Type	No. of LED's	Flash Pattern	3 Watt Max Current 12v	Dim Mode 50% Max Current 12v	Dim Mode 25% Max Current 12v
55cm	BL3	48	Double	1.2 Amps	0.6 Amps	0.3 Amps
71cm	BL2	96	Double	2.4 Amps	1.2 Amps	0.6 Amps
88cm	BL2	144	Double	3.5 Amps	1.7 Amps	0.85 Amps
105cm	BL3	168	Double	4 Amps	2 Amps	1 Amp
121cm	BL3	192	Double	4.6 Amps	2.3 Amps	1.15 Amps
138cm	BL3	216	Double	5.2 Amps	2.6 Amps	1.3 Amps
154cm	BL3	240	Double	5.8 Amps	2.9 Amps	1.45 Amps
171cm	BL3	264	Double	6.48 Amps	3.24 Amps	1.6 Amps
187cm	BL3	288	Double	7 Amps	3.5 Amps	1.75 Amps
204cm	BL3	312	Double	7.6 Amps	3.8 Amps	1.9 Amps

15.0 Synchronisation *(Sync)*

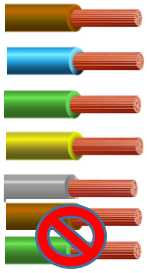
The Sync input/output is used to synchronise flashing with other Redtronic products. The Sync wire *(yellow)* should be connected to all other products that require synchronising with the Lightbar.

DO NOT APPLY THE YELLOW WIRE TO +VE SUPPLY IN ANY CIRCUMSTANCE.



16.0 Restore Factory Settings

In extreme cases, it may be necessary to restore the Lightbar to factory settings



a) Ensure the Lightbar is in 'Standby' mode
b) Apply the brown *(Pattern Select)* wire to +ve permanently
c) Apply the blue *(Pattern Select)* wire to +ve permanently
d) Apply the green *(360/1)* wire to +ve permanently
e) Apply the yellow *(sync)* wire to -ve permanently
f) Apply the grey *(Config)* wire to +ve momentarily
g) Release the brown and green wires
h) Factory settings have now been restored
i) To re-programme to user specification refer to 10.0 Programming the Lightbar

Default Factory Settings

Function	Ident	Colour	Description
360 0/P1	360/1	Green	Flash entire bar, pattern & colour set 1
Dim	Dim	Blue	Dim Input
Pattern	Pat	Brown	Programme flash pattern. Also used for configuration
Sync	Sync	Yellow	Sync In/Out
Configure	Conf	Grey	Enables set-up of system configuration
Function 1	F1	Orange	Traffic Director Left
Function 2	F2	Violet	Traffic Director Right
Function 3	F3	Pink	Traffic Director Centre-out
Function 4	F4	Wh/Grn	360/2 (colour 2)
Function 5	F5	Wh/Blu	Flash Rear Only (Rear Split)
Function 6	F6	Wh/Brn	Rotate Flash Pattern (Ends)
Function 7	F7	Wh/Yel	Left Alley
Function 8	F8	Wh/Or	Right Alley
Function 9	F9	Wh/Pink	Colour Select (only applicable for Dual / Multi-colour lightbar)

17.0 Cleaning the Lightbar

It is important to adhere to the following guidelines when cleaning the Lightbar:

Warning: Only use fresh water free from detergents to clean the Bullitt Advanced lightbar.
Using detergents or cleaning solutions with the product can cause stress and discolouration to the polycarbonate lenses, causing significant damage to the product.

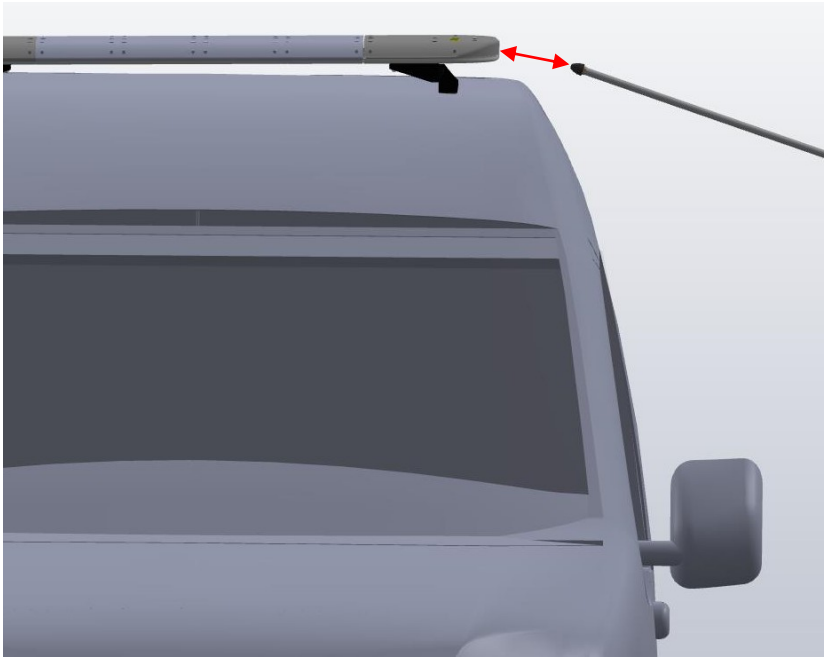
No car washes

No brush washes

Microfibre cloths

When pressure washing a vehicle fitted with a Bullitt Advanced lightbar, adhere to the following guidelines:

Keep the pressure washer nozzle a minimum distance of 15cm from the lightbar



- Use clean water free of detergents
- Ensure the minimum distance of the pressure washer nozzle from the lightbar is 15cm
- Ensure the water pressure does not exceed 100 bar
- Ensure the water flow rate does not exceed 15 litres / min
- Ensure the water temperature does not exceed 80 degrees Celsius

18.0 Troubleshooting

Symptom	Possible Cause	Solution
Lightbar has no power	Poor connection to vehicle battery - improper fusing	Ensure red and black wires from the Lightbar are properly connected and fused *(see 14.0 for fuse requirements)*
Input function will not programme	Poor connection	Check connection to +ve when programming. If problem persists contact Redtronic
Not all LED's are working	Configuration	Apply Yellow to -ve and grey wire to +ve momentarily. If that does not resolve the issue, follow section 10.0 to reset the modules
	Inclusion Flag - An input function has been re-programmed	Refer to 10.0 Programming the Lightbar, to re-enable excluded LED modules
All LED's flash at the same time 'blinking'	CAP168 / Airport mode enabled	De-select dipswitch 2. Change flash pattern - Apply brown *(pattern select)* to +ve momentarily
Reduced LED brightness	Dim activated	Disable Dim function
	10-12v Low power (begins to reduce below 12v for blue, green & white LED's)	Charge vehicle battery
	10-11v Brightness & current consumption steadily reduces to ease load on a flattening battery	
Lightbar has shutdown	9.5v Lightbar shutdown	Charge vehicle battery

19.0 Additional Equipment

There is a programming kit available for distributors to assist with programming the Lightbar using push buttons rather than relying on cable connections. Simply order **BLTR1**. This unit is not required to programme the Lightbar, it just simplifies the process.

APPENDIX 1 – Dipswitch settings

Dipswitch	Use	Off	On
1	For use on single & dual colour lightbars - offers only 3 colour settings (not all 10)	10 colour options	3 colour options (100% brightness)
2	Enable airport flash mode within standard pattern selection mode	No airport mode selectable within patterns – has to be set up on separate cruise or rotate function instead	Introduce 4 x cap168 patterns to flash pattern options. See section 6.0
3	For use on single colour lightbar only - offers 1 colour setting only	10 colour options	1 colour option
4	Not used	N/A	N/A

APPENDIX 2 – Diagnostics -LED located on top of the LBAR Main Controller. When a selectable function has been activated during programming, the LED will flash accordingly giving confirmation that required function has been set

Input Function	Feature Code	Default	Selectable Function	Default Cable	Diagnostic LED
360 O/P 2	1	F4	Flash Entire Bar	White/Green	Short flash
Colour	2	F9	Programme Colour	White/Pink	2 short flashes
Left	3	F1	Main Traffic Director Left	Orange	3 short flashes
Right	4	F2	Main Traffic Director Right	Purple	4 short flashes
Centre	5	F3	Main Traffic Director Centre	Pink	1 long flash
Rotate	6	F6	Rotate Ends	White/Brown	1 long, 1 short flash
Front Only	7		Flash Front Only		1 long, 2 short flashes
Rear Only	8	F5	Flash Rear Only	White/Blue	1 long, 3 short flashes
Ends Glow	9		Glow Ends (Cruise Mode)		1 long, 4 short flashes
Front Flood Flash	10		Flash Selected Front LED's		2 long flashes
Front Floods	11		Selected LED's Permanent On		2 long, 1 short flash
Flexi-Flash	12		Flash Selected LED's, flexible position		2 long, 2 short flashes
Alley Left	13	F7	Energise Alley Left	White/Yellow	2 long, 3 short flashes
Alley Right	14	F8	Energise Alley Right	White/Orange	2 long, 4 short flashes
Stop Light	15		Energise Stop Light, full then 50% brightness		3 long flashes
Tail Light	16		Energise Stop Light 25% brightness		3 long, 1 short flash
Indicator Left	17		Energise Indicator Left		3 long, 2 short flashes
Indicator Right	18		Energise Indicator Right		3 long, 3 short flashes
Left Front	19		Front Traffic Director Left		3 long, 4 short flashes
Right Front	20		Front Traffic Director Right		4 long flashes
Centre Front	21		Front Traffic Director Centre		4 long, 1 short flash
Rear Worklamp	22		Steady Work Light Rear		4 long, 2 short flashes
360 Worklamp	23		Steady Work Light all-round		4 long, 3 short flashes

APPENDIX 3 - Glossary of Terms

CANBUS	A vehicle bus standard designed to allow electronic control units and devices to communicate with each other in applications without a host computer
CAP168	The standards required at aerodromes relating to management systems, operational procedures, physical characteristics, assessment and treatment of obstacles, visual aids, rescue and fire-fighting services and medical services
CFD	Computational Fluid Dynamics
Config	Configuration function of a Lightbar
DC	Direct Current
Default	Preset value of a user configurable function
Dim	A function to reduce the full brightness of a Lightbar
ECE R65	United Nations standard for beacons, lightbars and other vehicle warning lamps
F1 - F9	Programmable Inputs
ft/lb	Foot-Pounds
fpm	Flashes Per Minute
Gnd	Ground *(high current connector)*
in/lb	Inch-Pounds
IP	Ingress Protection Rating
Inclusion Flag	Enable/Disable programmed function as part of the flash pattern
Kg/cm	Kilogrammes Per Square Centimetre
LED	Light Emitting Diode
mA	Milliamps
Nm	Newton Meter
Module	Bullitt Advanced LED slave board
Pat	Pattern Select *(change flash pattern of the Lightbar)*
R65 Monitor	A positive output to indicate that R65 is functioning
Serial	Serial interface connection
Standby Mode	Lightbar is connected to a power source & fused correctly
S/T/I	Stop/Tail/Indicator
Sync	The matching of Redtronic products to enable them to flash together
TDIR	Traffic Director
Torque	Application of force acting at a radial distance and tending to cause rotation
+ve	Positive
-ve	Negative
V+	Power in positive *(high current connector)*
360 O/P 1	Primary Lightbar Output *(flash entire bar)*
360 O/P 2	Secondary Lightbar Output *(programmable)*