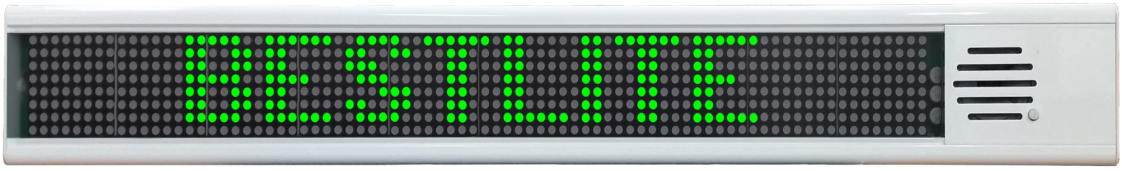


Clift Innovations
Bestlite 3.4 User's Manual

2025-09-22

Bestlite-3 is a tri-colour LED message sign with an integrated tone generator, for use in aged care facilities and other light commercial environments. It is available in double sided and single sided models, and can be mounted to walls or ceilings. It is controlled using an addressable protocol over an RS485 bus.

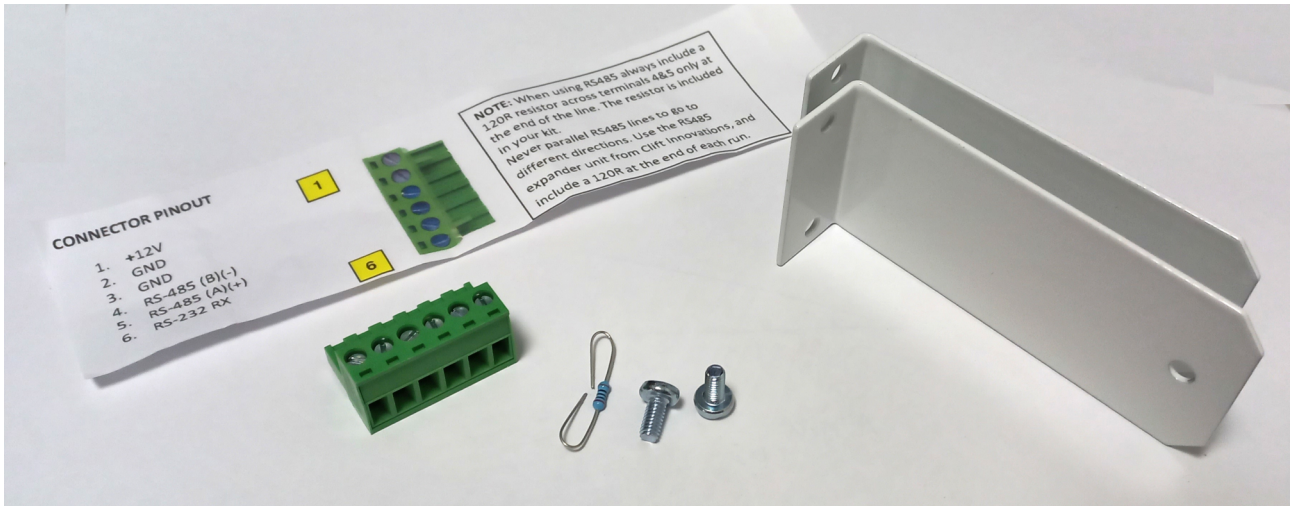
Key features:

- Low voltage 8.5-26V DC operation.
- Addressable protocol over RS485.
- Terminal Block or Modular jack termination.
- 3 Font sizes, 4x7, 5x7, 8x8.
- 80x8 resolution.
- 3 colours red, green, amber.
- Scrolling, flashing, or static messages.
- Brightness controlled by RS485 (useful for dimming at night).
- All standard nurse call Alert tones available.
- Alert tone volume controlled by RS485 and/or local volume knob.
- Supported by WAC-07M message controller.

Safety note - Installation must only be carried out by suitably qualified personnel holding an Australian open cabling registration, in accordance with local regulations.

Mounting

Bestlite is enclosed in an aluminium extrusion with a length of 750mm. Each display is supplied with a pair of brackets (pictured below), and M4 screws. At the centre of each end plate is an M4 nutsert for fixing the brackets. The display can be angled after mounting.



RS485 Cabling requirements

The cabling used for the RS485 data pair should have a characteristic impedance of 100Ω. A **single** pair of a CAT5 Ethernet cable is appropriate. The end of the RS485 run should be terminated with a 120ohm resistor. This resistor is supplied with each display.

Ideally the RS485 should be a single straight run of cable with no branches. However, short stubs (or patch cables) off the network will be needed if the displays are cabled via a distribution plate. These stubs should be kept <50cm.

Power Cabling requirements on 24V

For power cabling from a 24V supply, the maximum allowable conductor resistance (in mΩ/m) can be calculated using the sum of the distance of each unit back to the power supply.

$$\frac{5000}{distance} = max\,cable\,resistance\,\text{in}\,m\Omega/m$$

For example, if 3 units were spaced 20m apart, with the first unit 20m from the power supply, the sum of these distances would be 20+40+60 = 120m.

$$\frac{5000}{120} = 41.6\,m\Omega/m$$

Looking up the following table suggests 21 AWG or heavier for the above example.
https://en.wikipedia.org/wiki/American_wire_gauge

Power Cabling requirements on 12V

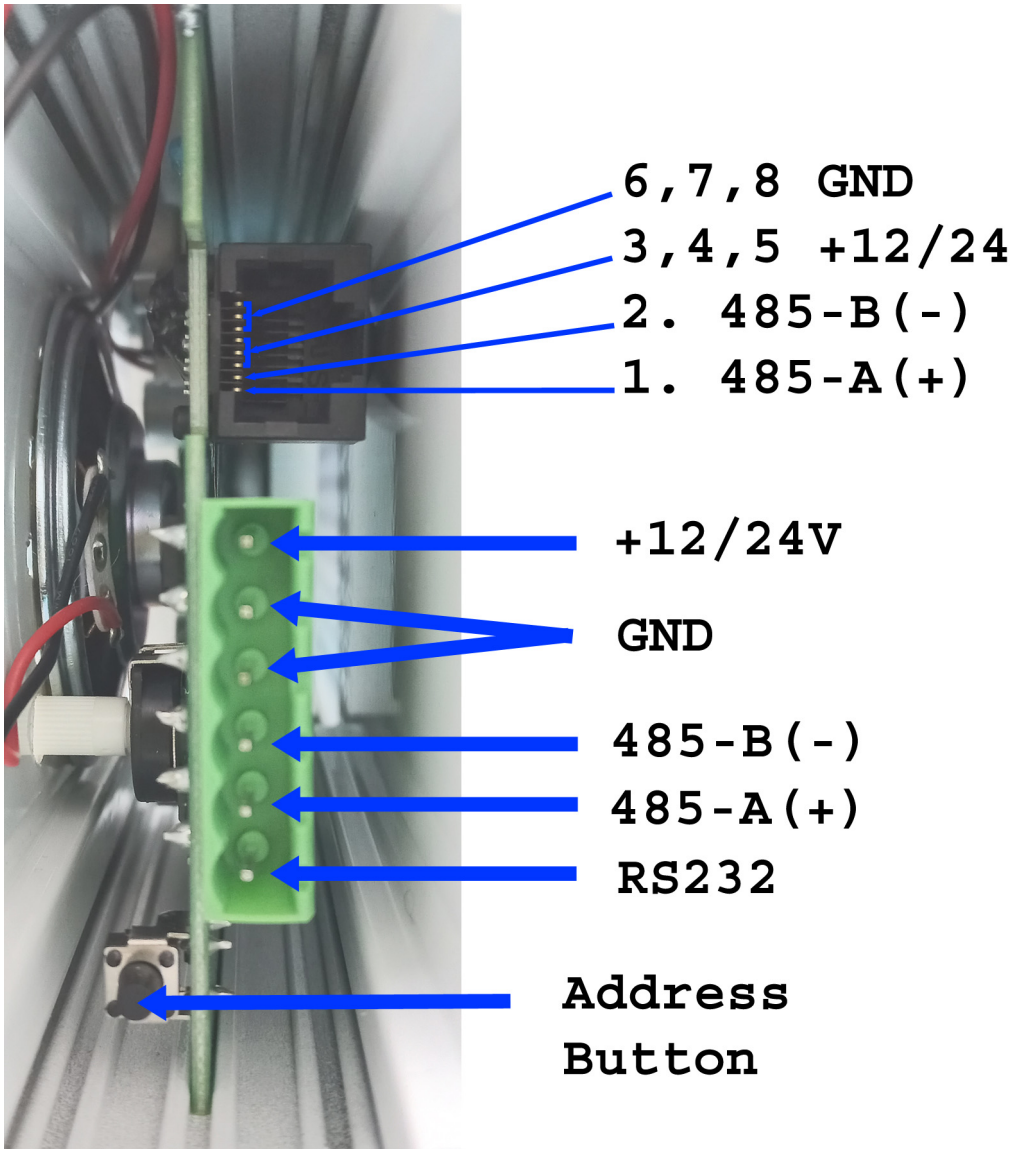
For 12V operation it is recommended to use a local power supply at the display, rather than running a length of power cable. However the maximum allowable conductor resistance (in mΩ/m) can be calculated with:

$$\frac{1458}{distance} = max\,cable\,resistance\,\text{in}\,m\Omega/m$$

Under voltage behaviour

When the voltage drops below 8V, the display will start to flicker, and the audio may fail. If the voltage drops below 7.75V the display will reset.

Connections



Note that matching connections shown are physically connected between the jack and the green header. So if the last display on a run is connected via the modular jack, then the 120Ω terminating resistor may be fitted to this units green terminal block.

Address setting
The display can be on 1 of 30 address channels. To change this simply press the address button until the display shows the channel you want. The setting is saved and takes affect immediately. To see the setting without changing it, just press the button once.

Watchdog
If the display does not see any activity on the RS485 bus for more than 5min, it will show the message “NOCOMS” in red. To disable this, press and hold the address button for 2 seconds, and you will see “COMWD OFF”. To turn it back on press and hold until you see “COMWD ON”. The address channel will be displayed momentarily when doing this, but the address will not be changed.

RS485 Protocol

Serial format - 9600,N,8,1

Addressing scheme
Channel messages are framed within 1 or more 'Select Channel' commands, and a Deselect command.

Select Channel - 0xB0
<0xB0><channel address>

Channel address is 2 ASCII digits 00-30

Each display is configured for a channel in the range of 01-30. Displays will ignore received data, until reception is enabled using this command. This command can be issued for multiple channels before sending a message. An address of 00 is global and will enable reception on ALL displays.

Deselect all channels - 0xB1
<0xB1>

Disable all channels previously enabled with the Select Channel command. Unlike the Select Channel command, this command is always global. All displays will ignore messages until re-enabled with the Select Channel command.

Examples
Select channels 1,5,7

0xB0, 0x30, 0x31, 0xB0, 0x30, 0x35, 0xB0, 0x30, 0x37
[Channel message for displays set to 1, 5 or 7]
0xB1
0xB0, 0x30, 0x39
[Channel message for displays set to 9]
0xB1

If no Deselect is issued, additional channels may be enabled even after sending messages.

Example:

0xB0, 0x30, 0x36
[Channel message for displays set to 6]
0xB0, 0x31, 0x32
[Channel message for displays set to 6 or 12]
0xB1

Channel messages.
Within a channel message, commands are available for generating sounds, configuring volume or brightness, and displaying text. Multiple commands may be issued before the channel is deselected.

Sound - 0xB4
<0xB4><Sound ID>

Sound ID is a single character, identifying 1 of 19 sounds, at either full volume, or at night level volume. The sound will commence as soon as this command is received, and will continue if it is a repeating sound.

Available sounds and their ID characters:

Sound	Full volume	Night volume
Silence	0	0
2 beeps	1	A
8 fast beeps	2	B
8 beeps	3	C
Repeated beeping	4	D
Ding Dong	5	E
Ding repeated 2.8sec	6	F
Ding Dong, repeated 4.2sec	7	G
Dong Dong	8	H
Ding Ding Ding	9	I
Repeating 2 tone siren	J	M
2 beeps repeated 10sec	K	N
1 long beep repeated 30sec	L	O
Ding repeated 1sec	P	S
Ding Ding repeated 5sec	Q	T
Ding repeated 10sec	R	U
2 beeps repeated 3.4sec	V	a
3 beeps repeated 1sec	W	b
Ding-Dong-Ding repeated 30sec	X	c

Example to sound 2 beeps on channel 5 at full volume:
0xB0, 0x30, 0x35, 0xB4, 0x31, 0xB1

Set Night level - 0xB5
<0xB5><level '0'-'5'>

Night level is specified using a single ASCII digit in the range 0-5, where 0 is full volume, and 5 is complete silence. This command affects sounds generated using the 'Night volume' identifiers listed above. The default night level at power up is -18dB. Once changed with this command, the new night level remains in effect until it is changed again, or power is cycled on the display.

0. Full volume
1. -6dB
2. -12dB
3. -18dB (default night level)
4. -24dB
5. Silence

Example to sound 2 beeps on channel 5 at -12dB:
0xB0, 0x30, 0x35, 0xB5, 0x32, 0xB4, 0x41, 0xB1

Display brightness - 0xB6
<0xB6><brightness '0'-'9'>

Brightness is specified using a single ASCII digit in the range 0-9, where 0 is dim and 9 is full brightness. The default brightness is maximum. After the brightness is changed with this command, it remains in effect until it is changed again, or power is cycled on the display.

Example to dim displays on channel 5
0xB0, 0x30, 0x35, 0xB6, 0x30, 0xB1

Write message - 0xB2 or 0xB3
<0xB2><Display mode><message text><0x00>

Display mode is a byte in the range of 0xA0 - 0xA3
- 0xA0 scrolling message (right to left)
- 0xA1 static message
- 0xA2 scroll up
- 0xA3 fade

Message text is the actual message shown, and may contain a number of control characters which modify the text colour, font size, or pause the display cycle. A number of different messages can be contained within one Write Message command, and will be cycled through on the display:

<0xB2><Display mode><message text>...<Display mode><message text><0x00>

Colours

The following characters may be used within the message text, to change the colour of the following text. The default colour at the start of each message is red.

0x80 Black (off)
0x81 Red
0x82 Green
0x83 Amber
0x84 Flash Red
0x85 Flash Green
0x86 Flash Amber

Fonts

The following characters may be used to change the font of the following text. The default font at the start of each message is 5x8 standard.

0x91 5x8 standard font
0x92 8x8 LARGE font
0x93 Small font

Other

0x90 Pause 5 seconds.

The 5 second pause can be used to halt a scrolling message, or if the display is cycling through a number of messages, it can be used to extend the display time of a message.

Examples:

Select channel 8, sound Ding Dong and show "ALARM" in red using large font, de-select all channels:

0xB0, 0x30, 0x38, 0xB4, 0x35, 0xB3, 0xA1, 0x81, 0x92, 0x41, 0x4C, 0x41, 0x52, 0x4D, 0x00, 0xB1

Select channel 6, set brightness to minimum, set night volume to -24dB, sound 2 beeps at night volume, and show "NIGHT" in flashing green using small font, de-select all channels:

0xB0, 0x30, 0x36, 0xB6, 0x30, 0xB5, 0x34, 0xB4, 0x41, 0xB3, 0xA1, 0x85, 0x93, 0x4E, 0x49, 0x47, 0x48, 0x54, 0x00, 0xB1

Specifications

Dimensions (full)	750mm x 95mm x 40mm
Dimensions (mini)	440mm x 95mm x 40mm
Resolution (full)	80 x 8
Resolution (mini)	40 x 8
Operating voltage	8.5V – 26.0V
Current consumption max @12V	1.2A (*1)
Current consumption typical @12V	885mA (*2)
Current consumption max @24V	645mA (*1)
Current consumption typical @24V	493mA (*2)
RS485 input impedance	96kΩ
RS485 common mode range	+/- 7V
RS485 serial format	9600,N,8,1

*Note *1 – 50% LEDs on amber, double sided, max brightness, max volume.*
*Note *2 – "ABCDEFGHIJKLMN" 5x8 font amber, double sided, max brightness, max volume.*

Ordering information

Single sided full length	BL3-SS-10
Double sided full length	BL3-DS-10
Single sided ½ length (mini)	BL3-SS-05
Double sided ½ length (mini)	BL3-DS-05

Compliance

This product has been tested and found to comply with the requirements of **AS/NZS CISPR 15**: *Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment*.

Compliance with CISPR 15 allows this equipment to be used in residential, commercial, and light-industrial environments without causing harmful electromagnetic interference.

The product is intended for operation from a **safety extra-low voltage (SELV) supply** and for connection only to an RS485 communication bus. Installation must be carried out in accordance with local regulations by qualified personnel.

This equipment bears the **Regulatory Compliance Mark (RCM)** in accordance with the requirements of the Australian Communications and Media Authority (ACMA).