# LDSBus Trailing Edge Light Dimmer

# Datasheet



## 1 Introduction

LDSBus Trailing Edge Light Dimmer can be integrated with dimmable LED lamps for adjusting the percentage of light dimming. Our trailing edge technology uses a current that is turned off when the AC waveform ends. The operation is smoother, soft starting and silent. It can control up to 550W@240VAC or 230W@100VAC for single-change loading.

The LDSBus Trailing Edge Light Dimmer has a 2 digit display to show the percentage of dimming.

Zero crossing detection determines whether the AC input frequency is 50Hz or 60Hz before enabling dimming.

Additionally, an external dimmer controller can be used to control light dimming.

## 1.1 Features

- Suitable for dimmable LEDs and lamps with single channel AC inputs and loading
- Trailing edge AC control to provide smooth dimming control
- Detects zero crossings and produces symmetrical pulses around them
- LED indicators indicate 50Hz or 60Hz AC
- 2 Digit dimming percentage display
- UP/DOWN push buttons for manual override of dimming
- Support for external dimmer control with UP/DOWN connectors
- Bridgetek LDSBus protocol. Data/power transmission via the LDSBus HVT-Junction
- Low power consumption
- Operating temperature range : 0°C to +55°C
- Flush mount and DIN Rail mounting options
- Supported platforms: Bridgetek IoTPortal, PanL Smart Living and LDSBus Python SDK Visit http://bit.ly/ldsbus-resources for more information

Neither the whole nor any part of the information contained in, or the product described in this manual, may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder. This product and its documentation are supplied on an as-is basis and no warranty as to their suitability for any particular purpose is either made or implied. Bridgetek Pte Ltd will not accept any claim for damages howsoever arising as a result of use or failure of this product. Your statutory rights are not affected. This product or any variant of it is not intended for use in any medical appliance, device or system in which the failure of the product might reasonably be expected to result in personal injury. This document provides preliminary information that may be subject to change without notice. No freedom to use patents or other intellectual property rights is implied by the publication of this document. Bridgetek Pte Ltd, 178 Paya Lebar Road, #07-03, Singapore 409030. Singapore Registered Company Number: 201542387H

# 2 Part Numbers

| Part# | Naming |
|---|---|
| LC030101A | LDSBus Trailing Edge Light Dimmer |
| LA120101A | LDSBus DIN Rail Mount Set |

Copyright © Bridgetek Pte Ltd

# Table of Contents

1 Introduction ..... 1
1.1 Features ..... 1
2 Part Numbers ..... 2
3 Product Specifications ..... 4
4 Hardware Features ..... 5
5 Configuration and Installation ..... 6
6 Mounting Options ..... 7
6.1 Flush Mount ..... 7
6.2 DIN Rail Mount ..... 7
7 Terminal Wiring Instructions on AC Input & Output .. 8
7.1 AC Input and Output Setup ..... 9
8 Terminal Wiring Instructions on External Dim Up/Down ..... 10
8.1 External Dimming Up/Down Setup ..... 11
9 LED Display ..... 12
10 Mechanical Dimension ..... 13
11 Contact Information ..... 14
Appendix A – References ..... 15
Document References ..... 15
Acronyms and Abbreviations ..... 15
Appendix B – List of Tables & Figures ..... 16
List of Tables ..... 16
List of Figures ..... 16
Appendix C – Revision History ..... 17

Copyright © Bridgetek Pte Ltd

# 3 Product Specifications

| | | |
|---|---|---|
| **Features** | Interface | RS485 |
| | 50Hz indicator | Red LED |
| | 60Hz indicator | Red LED |
| | Dimming Indicator | 2 digit 7-segment LED display |
| | Buttons | UP / DOWN |
| | Mounting | Flush Mount |
| | | DIN-Rail Mount |
| **Power** | Input Voltage | 5V DC Bus Power |
| | Typical Power | 390mW |
| | Max. Power | 625mW |
| **AC Input** | Input Voltage | 100VAC - 240VAC |
| | Frequency | 50Hz/ 60Hz, +/- 3Hz |
| **AC Output** | Max. Load | 550W@240VAC |
| | Max. Current | 2.30A |
| **Dimming Range** | Percentage | 0% - 99% and FULL |
| **Physical Characteristics** | Color | White |
| | Housing | Polycarbonate |
| | Dimension | L138.2mm x W76mm x H41.7mm |
| **Environmental Limits** | Operating Temperature | 0 to 55°C |
| | Storage Temperature | -20 to 85°C |
| | Ambient Relative Humidity | 5 to 95% (non-condensing) |
| **Package Contents** | Device | 1x LDSBus Trailing Edge Light Dimmer |
| | Installation (Optional) | 1x Din Rail Bracket set |
| | Wire Assembly | 1X 5m RJ11 Cable |
| | Warranty label | 1 |

**Table 1 - LDSBus Trailing Edge Light Dimmer Specifications**

Copyright © Bridgetek Pte Ltd

# 4 Hardware Features

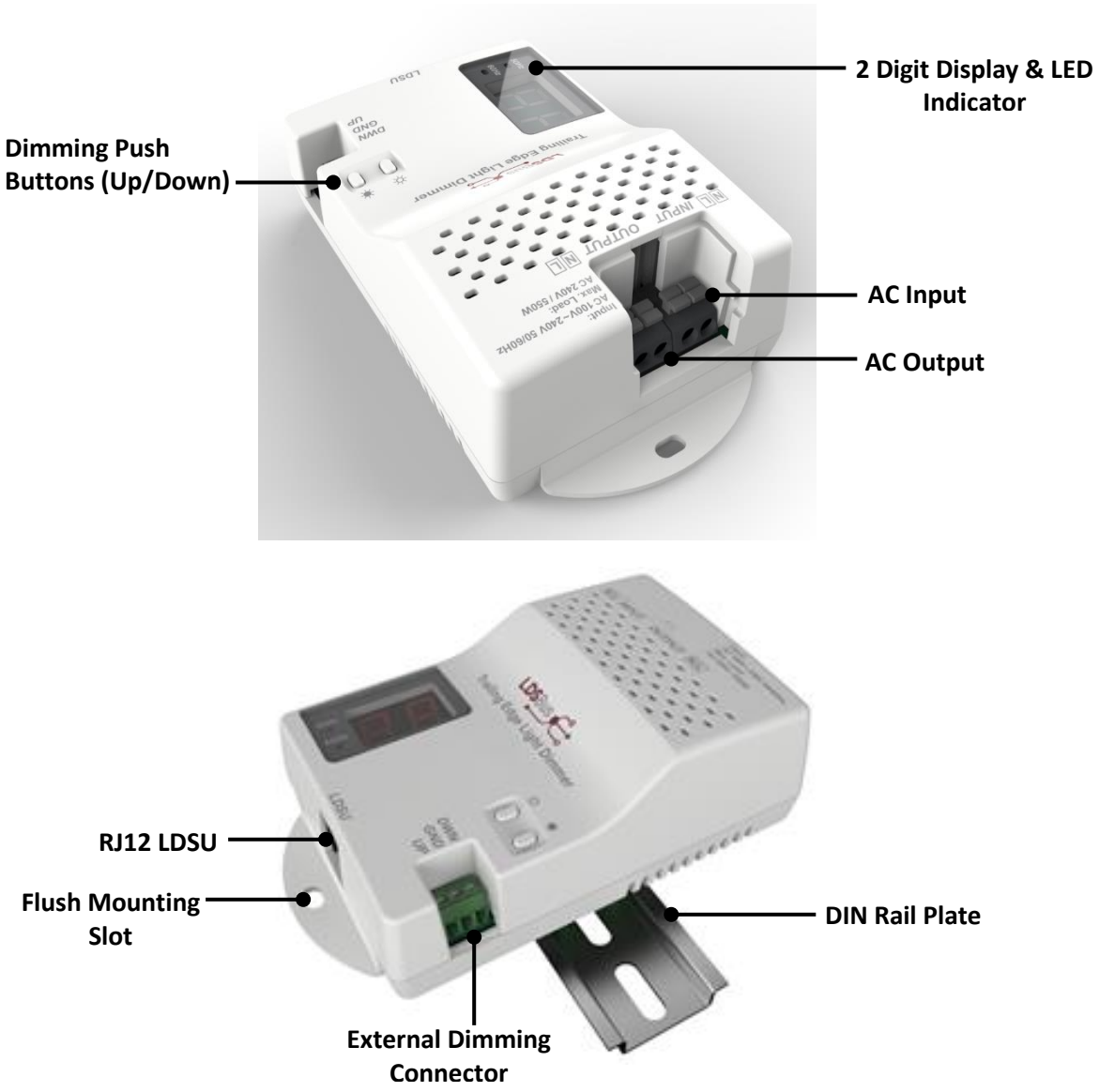



**Figure 1 - LDSBus Trailing Edge Light Dimmer Controller**

# 5 Configuration and Installation

Please visit http://bit.ly/ldsbus-resources to access the LDSBus Configuration Utility guide on how to configure the device name, device address and termination settings before using it for your application.

## 5.1 Connection Diagram

Figure 2 illustrates the connection of the LDSBus Trailing Edge Light Dimmer (LDSBus Device) to the LDSBus. Please visit http://bit.ly/ldsbus-resources to view the full device application, setup and installation guides.

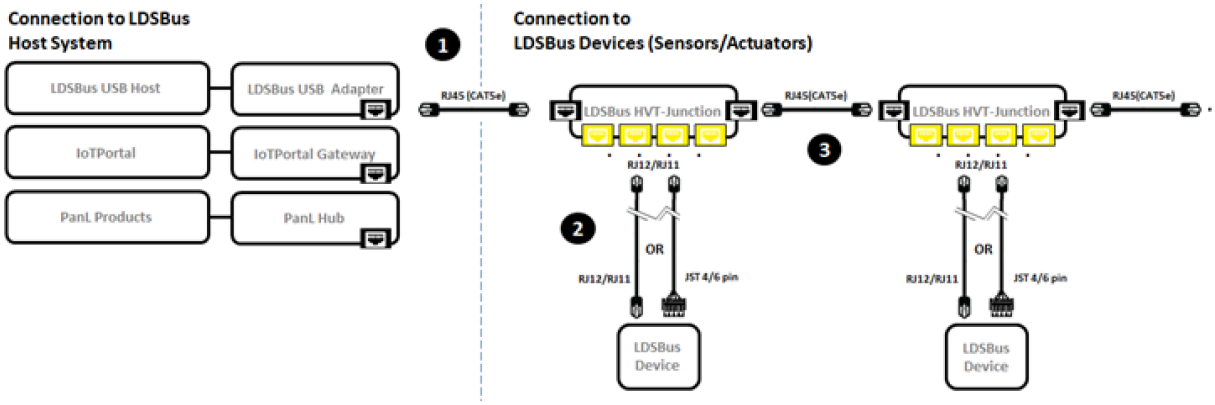



**Figure 2 - LDSBus Trailing Edge Light Dimmer - Connection Diagram**

**Setup Instructions:**

1. Connect the first LDSBus HVT-Junction to any of the LDSBus Host Systems using a RJ45(CAT5e) cable.

2. Connect the configured LDSBus Trailing Edge Light Dimmer to the LDSBus HVT-Junction as shown in Figure 2.

3. If there is more than one LDSBus HVT-Junction, chain them together as shown in Figure 2.

4. Enable terminator for the last device in LDSBus.

Copyright © Bridgetek Pte Ltd

# 6 Mounting Options

## 6.1 Flush Mount

The LDSBus Trailing Edge Light Dimmer can be flush mounted directly on a wall or any flat surface using 2 M3.5*16mm (thread) screws.




**Figure 3 - LDSBus Trailing Edge Light Dimmer Flush Mount**

## 6.2 DIN Rail Mount

The DIN Rail Mount can be fixed using a DIN Rail bracket that has two mounting holes. The package includes mounting screws and a backplate. (The DIN Rail Bracket is not included in the package).




**Figure 4 - LDSBus Trailing Edge Light Dimmer DIN Rail Mount**

Copyright © Bridgetek Pte Ltd

# 7 Terminal Wiring Instructions on AC Input & Output

The connections are made with Push-in CAGE CLAMP technology. When using solid conductor wire or stranded wire insulation ferrule, the stripped conductor can simply be inserted into the clamp until it hits the backstop without requiring a screwdriver. Figure 5 shows how to remove the cable from the connector using a flat head screwdriver to push the push buttons and pull out the wire.

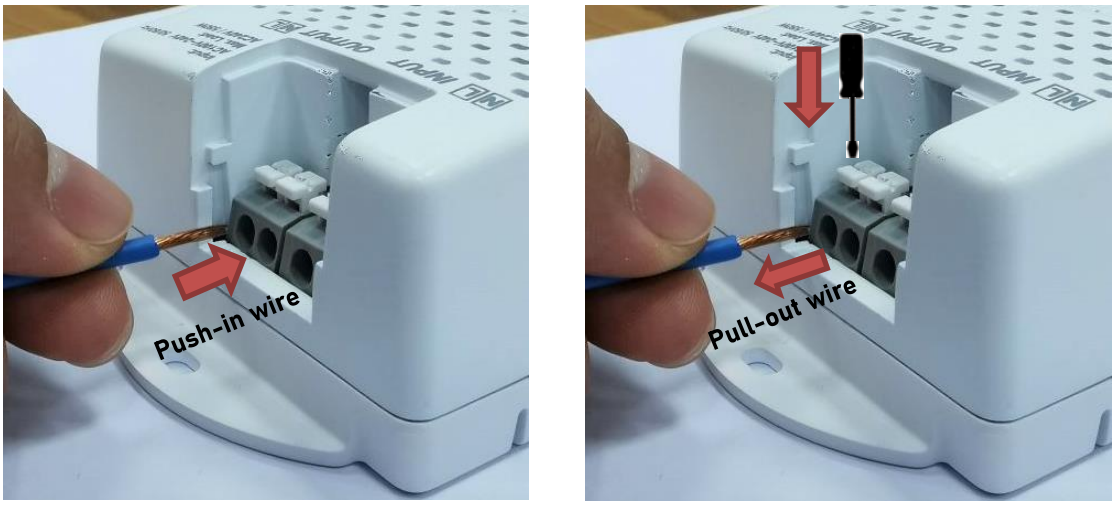



**Figure 5 - Push-in Wire and Pull-out Wire**

Table 2 provides a list of American Wire Gauges (AWGs) that can be used in the Terminal Blocks on AC Input and Output load.

| **Conductor Type** | **Wire dimeter/AWG** |
|---|---|
| Solid conductor | 0.25~2.5mm$^2$/20~12 AWG |
| Stranded conductor | 0.25~2.5mm$^2$/20~12 AWG |
| Stranded conductor; with insulated ferrule | 0.25~1.5mm$^2$ |

**Table 2 - AWG to use in terminal block on AC Input and Output load**

As shown in Figure 6, the wire strip is 8mm to 12mm long.

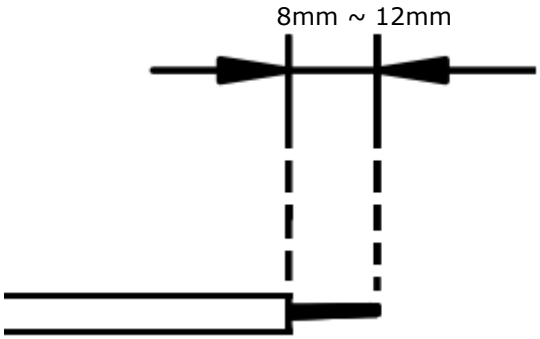


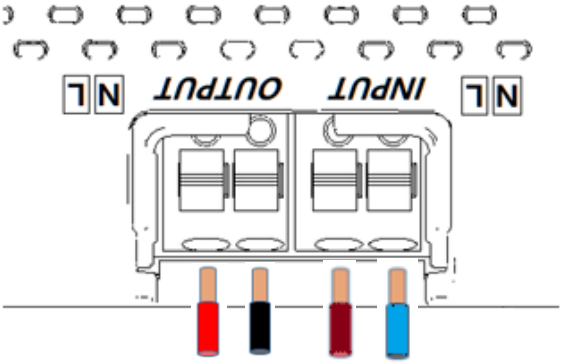

**Figure 6 - 8mm to 12mm wire strip**

Copyright © Bridgetek Pte Ltd

## 7.1 AC Input and Output Setup

The AC terminals support AC 100VAC – 240VAC input and dimmable lights and LEDs on the output. The connection is illustrated below:

**Note:** Ensure that the dimmable light/LED is compatible with the AC voltage connected to the input terminal when selecting it.




Use AWG 20~12; The BROWN wire indicates that it comes from AC Live

→ Connect to the Input Live

Use AWG 20~12; The BLUE wire indicates that it comes from AC Neutral

→ Connect to the Input Neutral

Use AWG 20~12; The RED wire indicates that it connects to dimmable Light / LED Live

→ Connect to the Output Live

Use AWG 20~12; The BLACK wire indicates that it connects to dimmable Light/ LED Neutral

→ Connect to the Output Neutral

Copyright © Bridgetek Pte Ltd

# 8 Terminal Wiring Instructions on External Dim Up/Down

The terminal block is connected by screws. Figure 7 shows how to clamp the wire using a 0.4mm x 2.5mm slotted screwdriver and rotate in a clockwise direction. To release the wire, turn anticlockwise.




**Figure 7 - Clamping wire with screwdriver in clockwise direction**

Table 3 provides a list of American Wire Gauges (AWGs) that can be used in Terminal Blocks on External Dim Up / down.

| **Conductor Type** | **Wire dimeter/AWG** |
|---|---|
| Solid conductor | 0.2~1.5mm$^2$/26~16 AWG |
| Stranded conductor | 0.2~1.5mm$^2$/26~16 AWG |
| Stranded conductor; with insulated ferrule | 0.25~0.75mm$^2$ |

**Table 3 - AWG to use in terminal blocks on external Dim up/down**

As shown in Figure 8, the wire strip is 3mm to 5mm long.

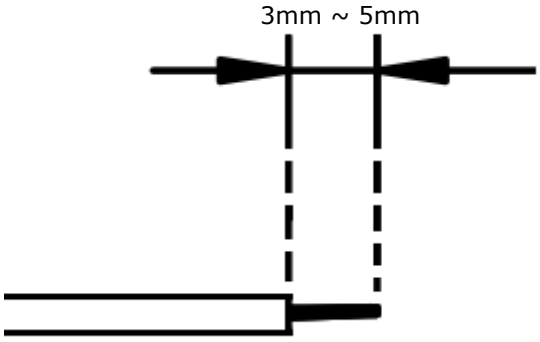
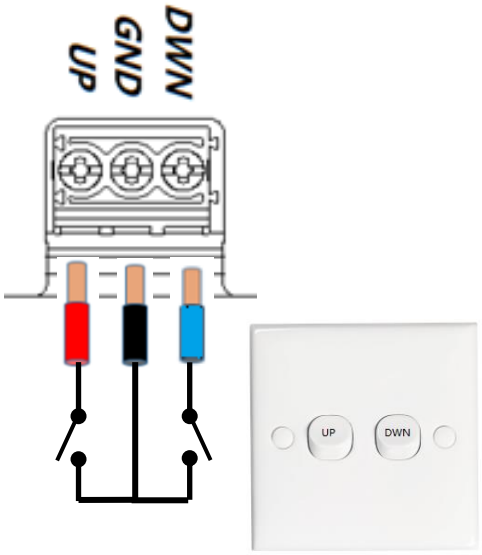



**Figure 8 - 3mm to 5mm wire strip**

Copyright © Bridgetek Pte Ltd

## 8.1 External Dimming Up/Down Setup

A dimmable external connector supports UP / DOWN dimming. The connection is illustrated below:




Use AWG 26~16; The RED wire indicates that it comes from dimmer button

→ Connect to the UP switch

Use AWG 26~16; The BLUE wire indicates that it comes from dimmer button

→ Connect to the DWN switch

Use AWG 26~16; The BLACK wire indicates that it comes from dimmer button

→ Connect to the GND

Copyright © Bridgetek Pte Ltd

# 9 LED Display

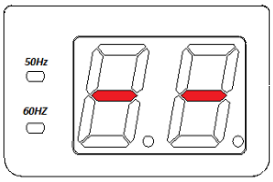
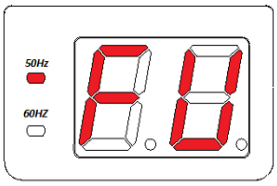
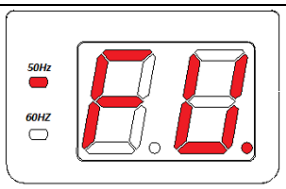
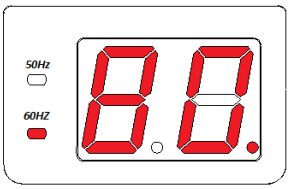
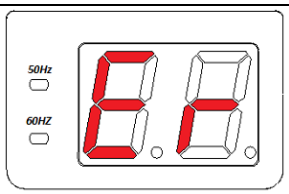
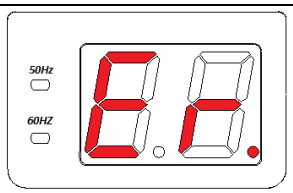
| Device Status | LED | Description |
|---|---|---|
| No AC Input Voltage |  | AC input voltage no power ON<br>Display "- -" |
| 50Hz AC Frequency FULL dimming |  | AC input frequency is 50Hz<br>AC input voltage power ON<br>Brightness Mode 100%<br>Display "FU" |
| |  | AC input frequency is 50Hz<br>AC input voltage power ON<br>PWM Mode 100%<br>Display "FU." |
| 60Hz AC Frequency 80% dimming |  | AC input frequency is 60Hz<br>AC input voltage power ON<br>Brightness Mode 80%<br>Display "80" |
| |  | AC input frequency is 60Hz<br>AC input voltage power ON<br>PWM Mode 80%<br>Display "80." |
| Error |  | AC input frequency is unknown<br>AC input voltage power ON<br>Brightness Mode stop<br>Display " Er" |
| |  | AC input frequency is unknown<br>AC input voltage power ON<br>PWM Mode stop<br>Display "Er." |

**Table 4 - LDSBus Trailing Edge Light Dimmer – LED Display**

A 7-segment LED in the controller indicates the brightness percentage when used with an external host application e.g. Bridgetek IoTPortal, LDSBus Python SDK or PanL Smart Living. The LED displays the internal PWM percentage when using the on-board buttons or external dimming interface. When an application sets the brightness, the display returns to brightness percentage.

Copyright © Bridgetek Pte Ltd

# 10 Mechanical Dimension

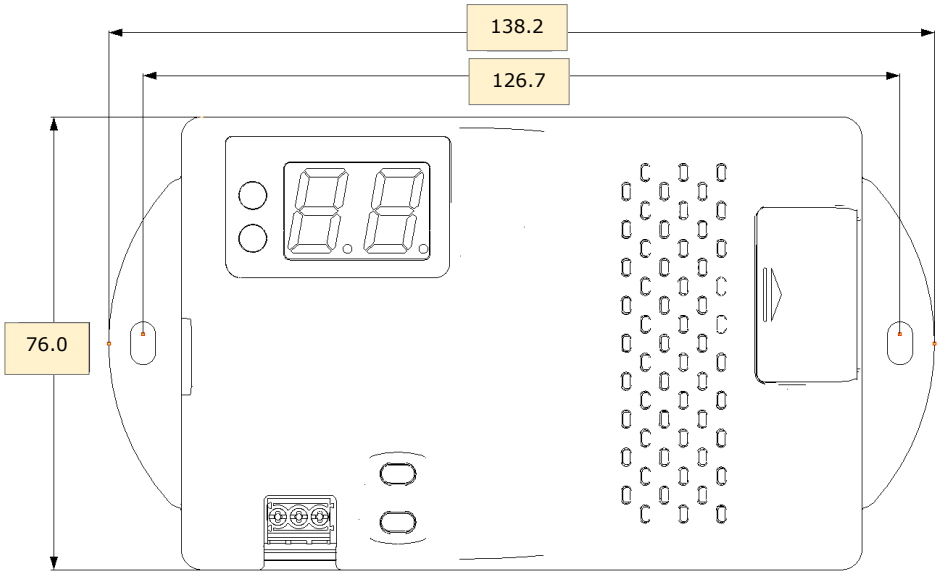



**Figure 9 - LDSBus Trailing Edge Light Dimmer Dimension – Top View**

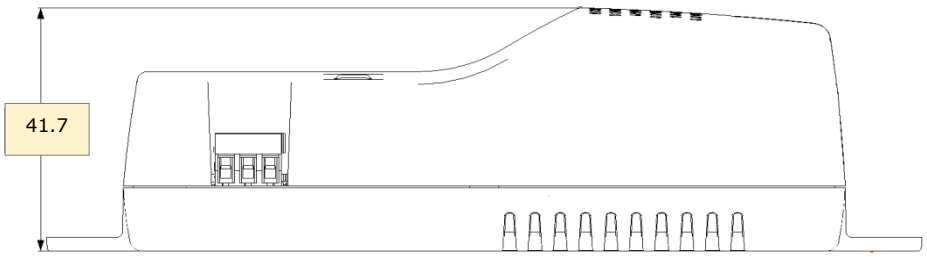



**Figure 10 - LDSBus Trailing Edge Light Dimmer Dimension – Side View**

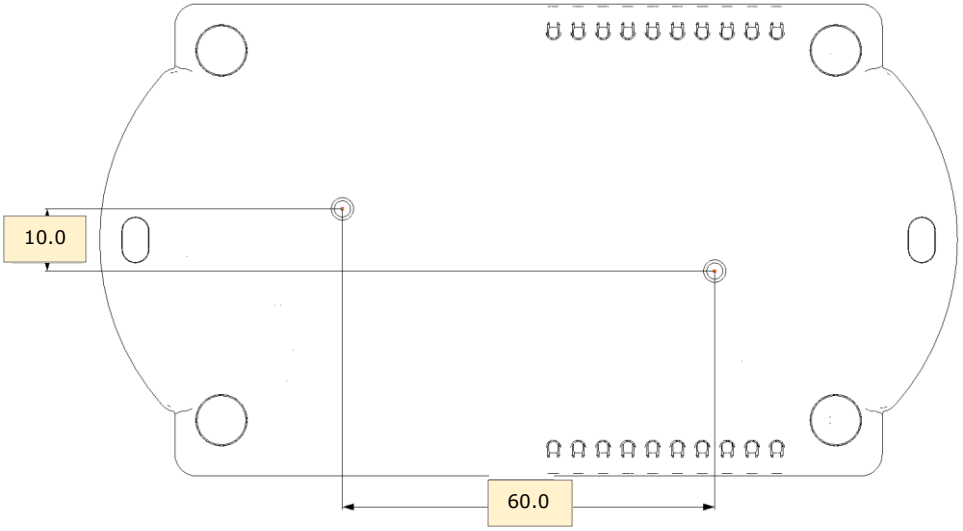



**Figure 11 - LDSBus Trailing Edge Light Dimmer Dimension – Bottom View**

Copyright © Bridgetek Pte Ltd

# 11 Contact Information

**Head Quarters – Singapore**

Bridgetek Pte Ltd
178 Paya Lebar Road, #07-03
Singapore 409030
Tel: +65 6547 4827
Fax: +65 6841 6071

E-mail (Sales) sales.apac@brtchip.com
E-mail (Support) support.apac@brtchip.com

**Branch Office – Taipei, Taiwan**

Bridgetek Pte Ltd, Taiwan Branch
2 Floor, No. 516, Sec. 1, Nei Hu Road, Nei Hu District
Taipei 114
Taiwan, R.O.C.
Tel: +886 (2) 8797 5691
Fax: +886 (2) 8751 9737

E-mail (Sales) sales.apac@brtchip.com
E-mail (Support) support.apac@brtchip.com

**Branch Office - Glasgow, United Kingdom**

Bridgetek Pte. Ltd.
Unit 1, 2 Seaward Place, Centurion Business Park
Glasgow G41 1HH
United Kingdom
Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-mail (Sales) sales.emea@brtichip.com
E-mail (Support) support.emea@brtchip.com

**Branch Office – Vietnam**

Bridgetek VietNam Company Limited
Lutaco Tower Building, 5th Floor, 173A Nguyen Van Troi,
Ward 11, Phu Nhuan District,
Ho Chi Minh City, Vietnam
Tel : 08 38453222
Fax : 08 38455222

E-mail (Sales) sales.apac@brtchip.com
E-mail (Support) support.apac@brtchip.com

**Web Site**

http://brtchip.com/

**Distributor and Sales Representatives**

Please visit the Sales Network page of the Bridgetek Web site for the contact details of our distributor(s) and sales representative(s) in your country.

System and equipment manufacturers and designers are responsible to ensure that their systems, and any Bridgetek Pte Ltd (BRTChip) devices incorporated in their systems, meet all applicable safety, regulatory and system-level performance requirements. All application-related information in this document (including application descriptions, suggested Bridgetek devices and other materials) is provided for reference only. While Bridgetek has taken care to assure it is accurate, this information is subject to customer confirmation, and Bridgetek disclaims all liability for system designs and for any applications assistance provided by Bridgetek. Use of Bridgetek devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold harmless Bridgetek from any and all damages, claims, suits or expense resulting from such use. This document is subject to change without notice. No freedom to use patents or other intellectual property rights is implied by the publication of this document. Neither the whole nor any part of the information contained in, or the product described in this document, may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder. Bridgetek Pte Ltd, 178 Paya Lebar Road, #07-03, Singapore 409030. Singapore Registered Company Number: 201542387H.

# Appendix A – References

## Document References

LDSBus Configuration Utility Guide

## Acronyms and Abbreviations

| Terms | Description |
|---|---|
| AC | Alternating Current |
| AWG | American Wire Gauges |
| DC | Direct Current |
| IoT | Internet of Things |
| LED | Light Emitting Diode |
| LDSBus | Long Distance Sensor Bus |

Copyright © Bridgetek Pte Ltd

# Appendix B – List of Tables & Figures

## List of Tables

Table 1 - LDSBus Trailing Edge Light Dimmer Specifications ..... 4
Table 2 - AWG to use in terminal block on AC Input and Output load ..... 8
Table 3 - AWG to use in terminal blocks on external Dim up/down ..... 10
Table 4 - LDSBus Trailing Edge Light Dimmer – LED Display ..... 12

## List of Figures

Figure 1 - LDSBus Trailing Edge Light Dimmer Controller ..... 5
Figure 2 - LDSBus Trailing Edge Light Dimmer - Connection Diagram ..... 6
Figure 3 - LDSBus Trailing Edge Light Dimmer Flush Mount ..... 7
Figure 4 - LDSBus Trailing Edge Light Dimmer DIN Rail Mount ..... 7
Figure 5 - Push-in Wire and Pull-out Wire ..... 8
Figure 6 - 8mm to 12mm wire strip ..... 8
Figure 7 - Clamping wire with screwdriver in clockwise direction ..... 10
Figure 8 - 3mm to 5mm wire strip ..... 10
Figure 9 - LDSBus Trailing Edge Light Dimmer Dimension – Top View ..... 13
Figure 10 - LDSBus Trailing Edge Light Dimmer Dimension – Side View ..... 13
Figure 11 - LDSBus Trailing Edge Light Dimmer Dimension – Bottom View ..... 13

Copyright © Bridgetek Pte Ltd

# Appendix C – Revision History

Document Title: LDSBus Trailing Edge Light Dimmer Datasheet

Document Reference No.: BRT_000380

Clearance No.: BRT#190

Product Page: https://brtchip.com/ldsbus/

Document Feedback: Send Feedback

| Revision | Changes | Date |
|---|---|---|
| 1.0 | Initial Release | 01-03-2022 |

Copyright © Bridgetek Pte Ltd