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
- Supports the BRTSys LDSBus protocol
- Low power consumption
- Operating temperature range: 0°C to +55°C
- Flush mount and DIN Rail mounting options
- Supported platforms:
  - PanL Smart Living
  - LDSBus Python SDK
  - LDSBus .Net SDK

Visit https://brtsys.com/resources for more information.

2 Part Numbers/Ordering Information

Part#	Description
LC-0301-01A	LDSBus Trailing Edge Light Dimmer
LA-0501-01A	LDSBus RJ11-RJ11 Cable (5m)
LA-1201-01A	LDSBus DIN Rail Mount Set

Table 1- Part Numbers / Ordering Information

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3 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
	Wire Assembly	1x LDSBus RJ11-RJ11 Cable (5m)
Optional	Mounting Accessories	1x LDSBus DIN Rail Mount set

Table 2 - LDSBus Trailing Edge Light Dimmer Specifications

4 FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) These devices may not cause harmful interference, and

(2) These devices must accept any interference received, including interference that may cause undesired operation.

NOTE: The equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF exposure guidelines, at least 20cm of separation distance between the device and the user's body must be always maintained.

FCC Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment and it also complies with Part 15 of the FCC RF Rules. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and consider removing the no-collocation statement.

Caution

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

5 Hardware Features

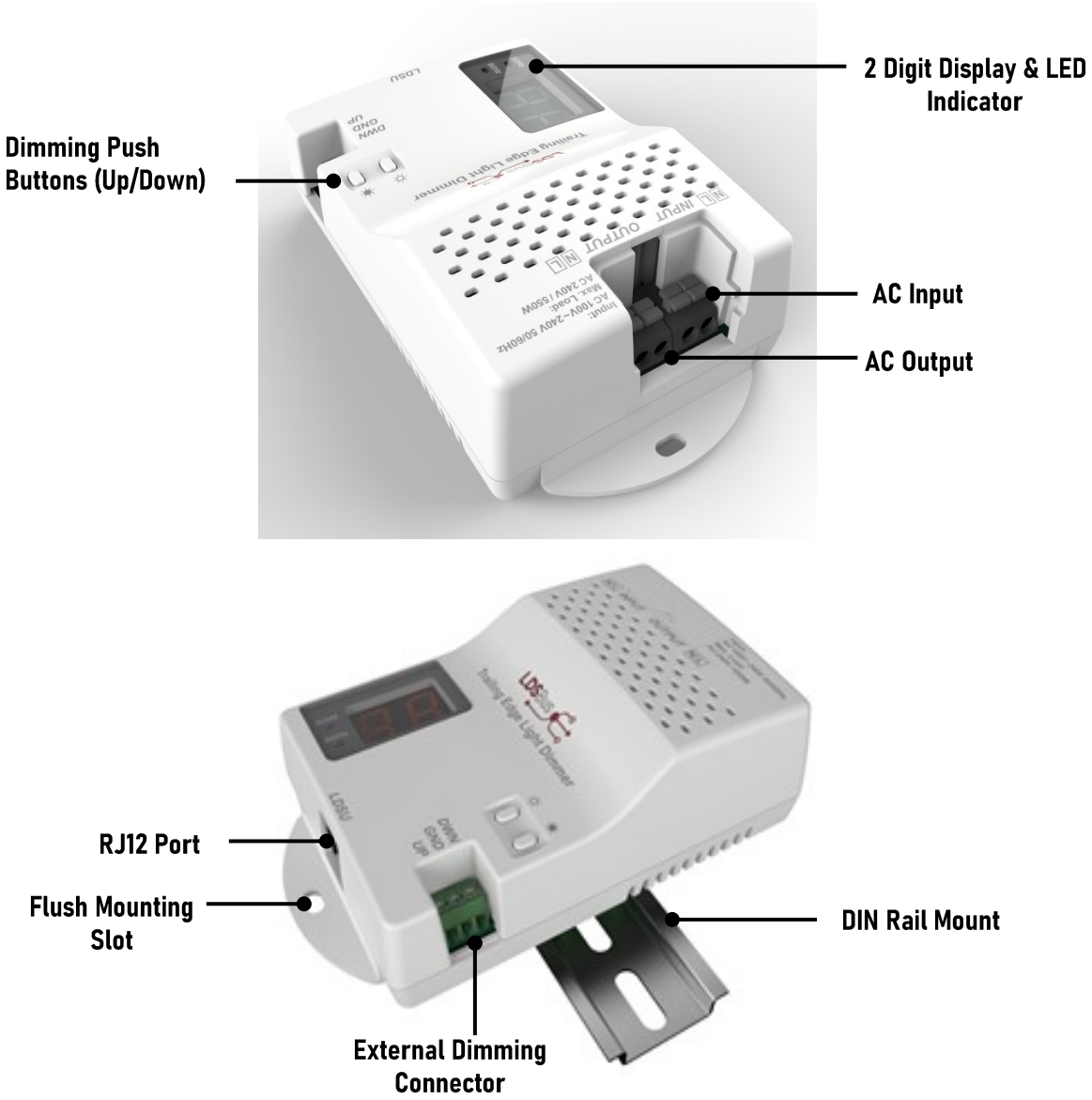


Figure 1 - LDSBus Trailing Edge Light Dimmer Controller

Function	Labels	Description
AC Input	Input (N,L)	Input Voltage to use for the load (100VAC – 240VAC / Frequency – 50Hz/ 60Hz, +/- 3Hz)
AC Output	Output (N,L)	Output Voltage to the load (Max. Load – 550W@240VAC / Max. Current – 2.30A)
Dimming Push Buttons	☀	To increase brightness
	☼	To reduce brightness
External Dimming Connector	Down/GND/Up	To control the brightness using external buttons
RJ12 Port	LDSU	LDSBus data and power interface port. The physical port is RJ12. The connection interface can be RJ11/RJ12.

Table 3 - LDSBus Trailing Edge Light Dimmer Hardware Features

6 Light Dimmer Configuration and Installation

Please refer to LDSBus Configuration Utility User Guide on how to configure the device name, address, and termination settings before using it for your application.

6.1 Connection Diagram

Figure 2 illustrates the connection of the LDSBus Trailing Edge Light Dimmer (LDSBus Device) to the LDSBus. Please visit https://brtsys.com/resources to view the full device application, setup and installation guides.

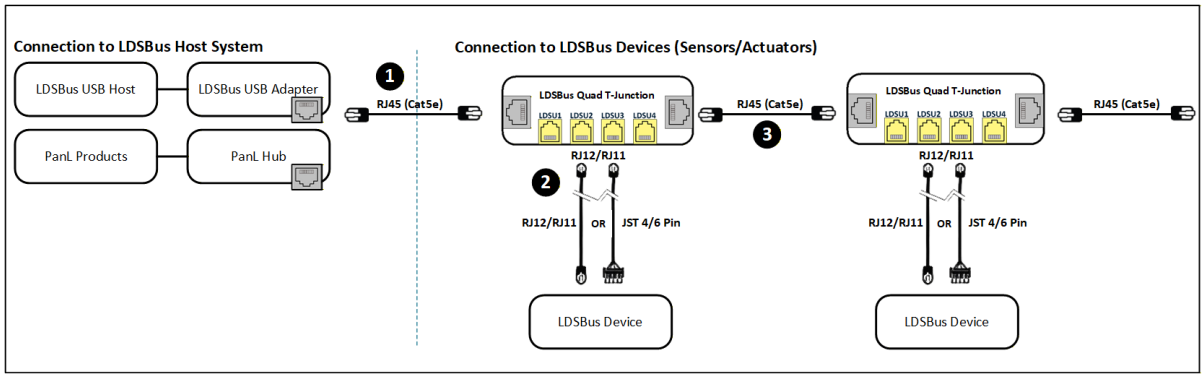


Figure 2 - Connection Diagram

Setup Instructions:

1. Connect the first LDSBus Quad T-Junction to any of the LDSBus Host System using a RJ45(CAT5e) cable as shown in Figure 2.

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

3. If there are more than one LDSBus Quad T-Junctions, chain them together as shown in Figure 2.

   Enable termination for the last device in LDSBus.

7 Mounting Instructions

7.1 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.

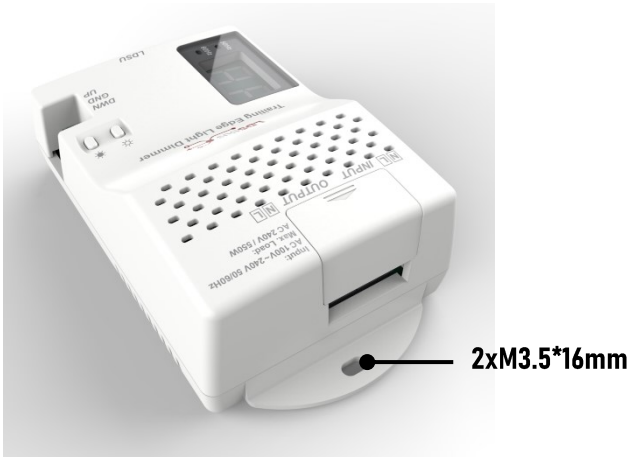


Figure 3 - LDSBus Trailing Edge Light Dimmer Flush Mount

7.2 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

8 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 do wiring and remove the cable from the connector using a flat head screwdriver to push the push buttons and pull out the wire.

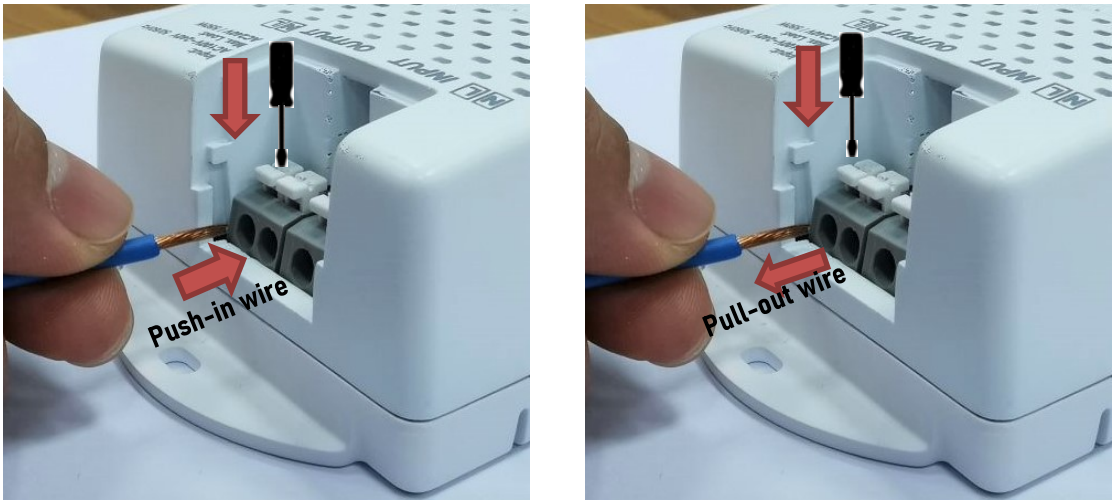


Figure 5 - Push-in Wire and Pull-out Wire

Table 4 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 4 - 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.

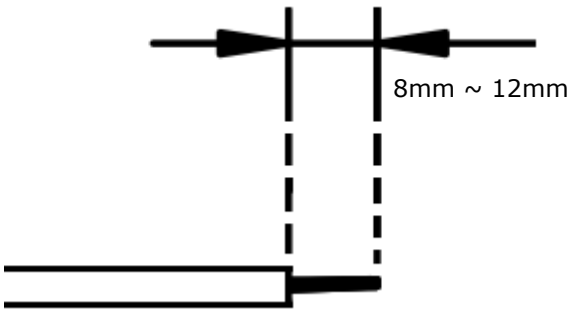
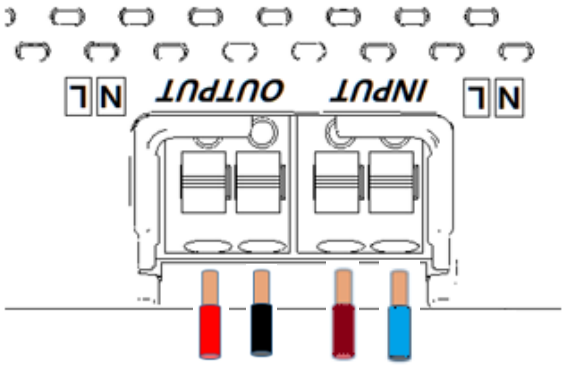


Figure 6 - Wire Strip Length

8.1 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

WARNING! Turn off power to the unit and electrical circuit before attaching the wires.

9 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 5 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 5 - AWG to use in terminal blocks on external Dim up/down

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

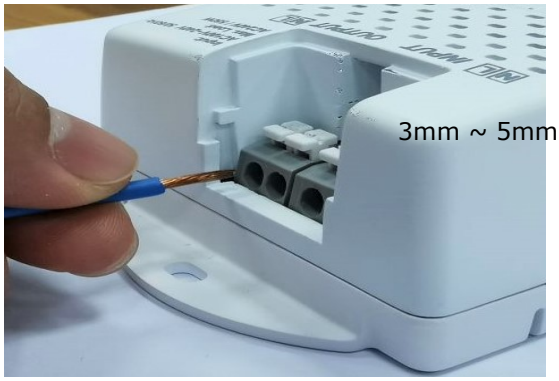
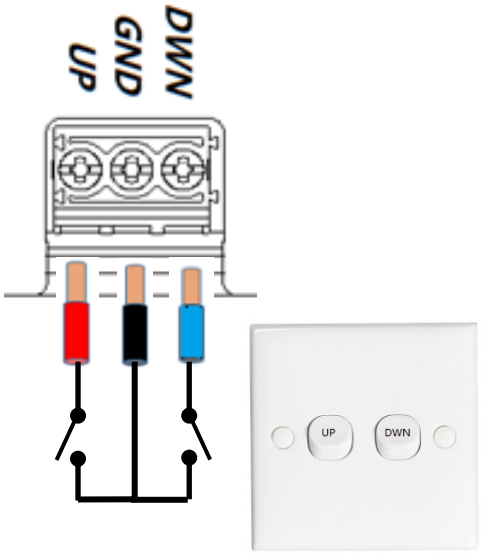


Figure 8 - 3mm to 5mm wire strip

9.1 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

10 LED Display

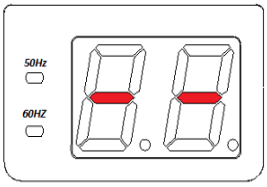
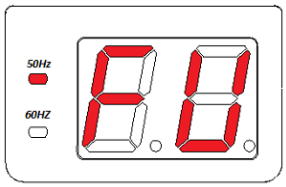
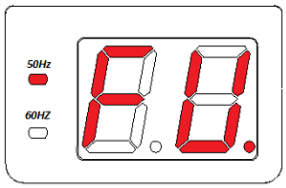
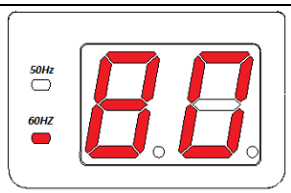
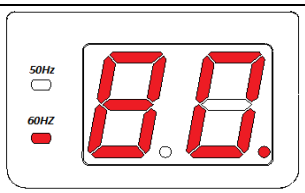
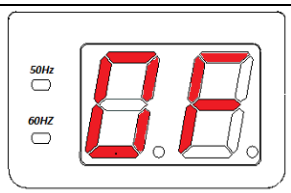
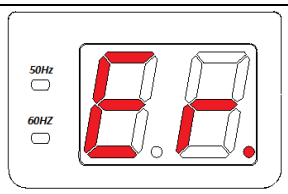
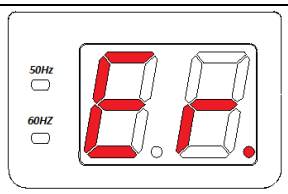
Device Status	LED	Description
No AC Input Voltage		AC input voltage no power ON Display "- -"
50Hz AC Frequency FULL dimming		AC input frequency is 50Hz AC input voltage power ON Brightness Mode 100% Display "FU"
50Hz AC Frequency FULL dimming		AC input frequency is 50Hz AC input voltage power ON PWM Mode 100% Display "FU."
60Hz AC Frequency 80% dimming		AC input frequency is 60Hz AC input voltage power ON Brightness Mode 80% Display "80"
60Hz AC Frequency 80% dimming Error		AC input frequency is 60Hz AC input voltage power ON PWM Mode 80% Display "80."
Power OFF the light through App		Power OFF Mode Display "OF"
Error		AC input frequency is unknown AC input voltage power ON PWM Mode stop Display "Er."
		AC input frequency is unknown AC input voltage power ON PWM Mode stop Display "Er."

Table 6 - 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., BRTSys's 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.

11 Mechanical Dimensions

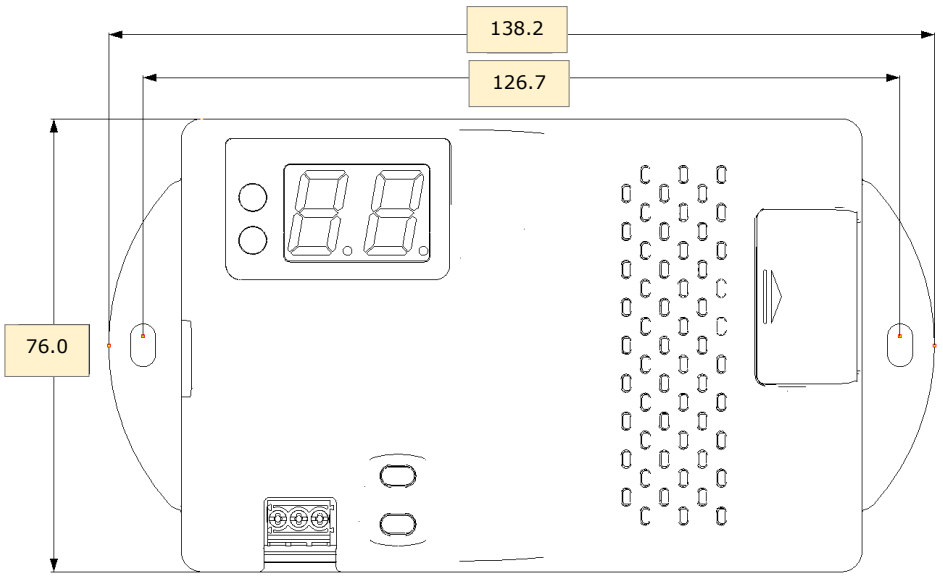


Figure 9 - LDSBus Trailing Edge Light Dimmer Dimension – Top View

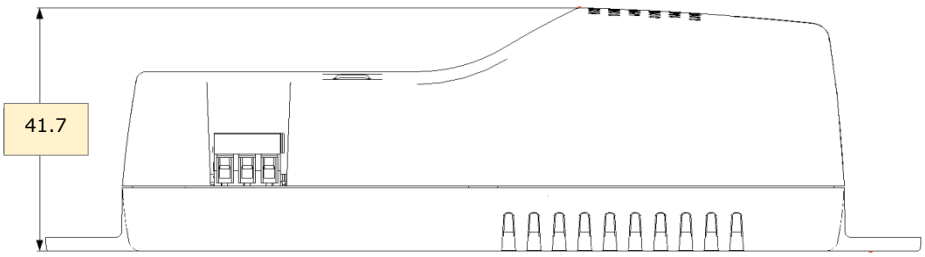


Figure 10 - LDSBus Trailing Edge Light Dimmer Dimension – Side View

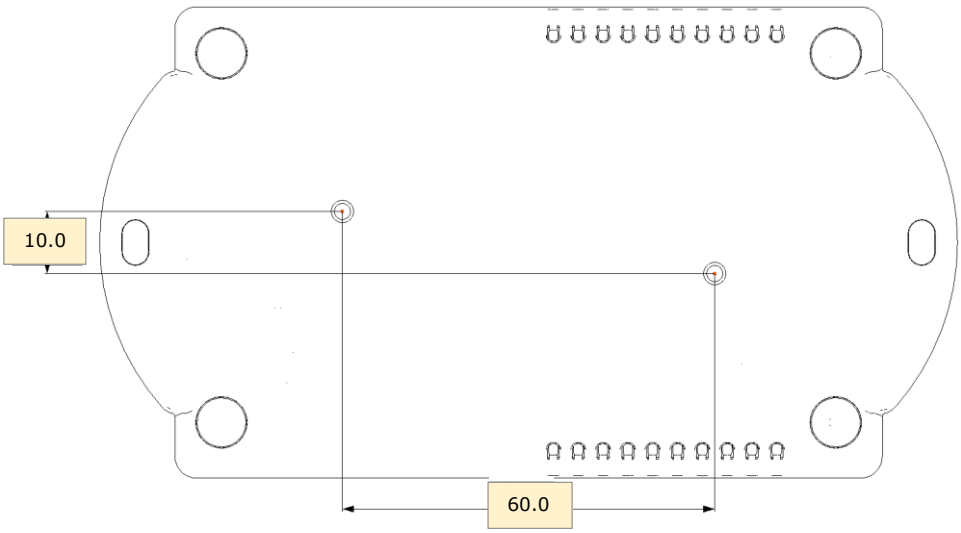


Figure 11 - LDSBus Trailing Edge Light Dimmer Dimension – Bottom View

Note: All dimensions are in millimeters.

12 Contact Information

Refer to https://brtsys.com/contact-us/ for contact information.

Appendix A – References

Document References

LDSBus Configuration Utility User Guide

LDSBus Python SDK V3.0.0 Guide

LDSBus .Net SDK V3.0.0 Guide

3rd Party Compatible Probes Specifications

Sensors and Actuators Quick Start Guide for USB Hosts

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

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Appendix C – Revision History

Document Title: LDSBus Trailing Edge Light Dimmer Datasheet

Document Reference No.: BRTSYS_000010

Clearance No.: BRTSYS#008

Product Page: https://brtsys.com/product/trailing-edge-light-dimmer/

Document Feedback: Send Feedback

Revision	Changes	Date
Version 1.0	Initial Release	01-03-2022
Version 1.1	Updated release under BRT Systems	15-09-2022
Version 1.2	Corrected BRTSYS to BRTSys	24-03-2023
Version 1.3	Updated the following: HVT references to Quad T-Junction; Singapore address	11-09-2023
Version 1.4	Updated Section 3. Specifications	04-09-2024
Version 1.5	Section 1.1 - Added .Net SDK to Supported platforms; ROHS icon added Section 2 - Added LA-0501-01A in part number Section 3 - Updated "Wire Assembly" Section 4 – Added FCC statement Section 5 - Added Table 3; Updated Figure 1 (Changed from "RJ11" to RJ12" for LDSU port) Section 8.2 - Added "Warning" Section 11 – Added "Note" Appendix A – References > Document References - updated	23-01-2026

