



LDSBus 4CH Solid State Relay Datasheet



1 Introduction

LDSBus 4CH **S**olid **S**tate **R**elay (SSR) incorporates 4 relay controllers with an AC load current handling capacity of 1.80A. The relays can switch AC loads between 50Hz and 60Hz. Additional zero-cross features are included in the LDSBus 4CH solid state relay.

LDSBus 4CH Solid State Relay controllers are ideal for forward and reverse motor control applications, switching loads on and off, and handling inrush current efficiently.

Enhance your illumination control with our cutting-edge product tailored for precise LED strip management. Engineered with meticulous technical precision, our solid-state relay incorporates zero-cross detection technology, providing a distinct advantage in efficiency and performance. This innovative feature ensures optimal synchronization with the AC power waveform, mitigating electrical stress during switching and minimizing potential flickering issues.

1.1 Features

Key Features and Functions of LDSBus 4CH Solid State Relay

- 4 Channels Solid State Relay
- Status LEDs indicate relay activation states.
- Supports AC loads up to 1.8A per relay channel.
- Supports AC (20VAC to 240VAC)
- Supports zero-cross turn-on circuitry.
- Fast-blow fuse protection
- Supports BRTSys LDSBus protocol. Wired data/power transmission through LDSBus Quad T-Junction
- Low power consumption of 271mW (typical)
- Operating temperature from 0°C to 70°C
- Flush mount and DIN Rail mounting options.
- Supported applications:
 - BRTSys IoTPortal (www.iotportal.com)
 - LDSBus Python SDK
 - LDSBus .Net SDK

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



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2 Part Numbers/Ordering Information

| Part# | Description |
|--------------|-------------------------------------|
| LC010201A | HB_082_LDSBus_4CH_Solid_State_Relay |

Table 1 – LDSBus 4CH Solid State Relay Part Numbers & Description

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3 Specifications

| | | |
|---------------------------------|---------------------------|-------------------------------------------------------------------------------|
| Features | Interface | RS485 |
| | System Status Indicator | 1x RGB LED |
| | Relay Status Indicator | 2x RG LEDs |
| | Power Indicator | 1x Green LED |
| | Mounting | Flush Mount DIN-Rail Mount |
| Power | Operating Voltage | 5V DC Bus Power |
| | Operating Power | Typ:271mW Max:421mW |
| Relay | Number of SSR Channel | 4 |
| | Relay Type | AC Solid State Switch, dual power SCR thyristor outputs, Zero-Cross Detection |
| | Contact arrangement | Solid State Switch |
| | Rated voltage | 20VAC~ 240VAC |
| | Max. switching voltage | 240VAC |
| | Rated power | 1.80A @240VAC / 440W @240VAC |
| | Load continuous current | 1.80A |
| Maximum Surge Current | 30A, t<16ms | |
| Physical Characteristics | Colour | White |
| | Housing | Polycarbonate |
| | Dimension | L138.2mm x W76.0mm x H31.9mm |
| Environmental Limits | Operating Temperature | 0 to 70°C |
| | Storage Temperature | -20 to 85°C |
| | Ambient Relative Humidity | 5 to 95% (non-condensing) |
| Package Contents | Device | 1x LDSBus 4CH Solid State Relay |
| | Installation (Optional) | 1x DIN Rail Bracket set |
| | Wire Assembly | 1x 5m RJ11 Cable |
| | Warranty label | 1 |

Table 2 - LDSBus 4CH Solid State Relay 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.

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

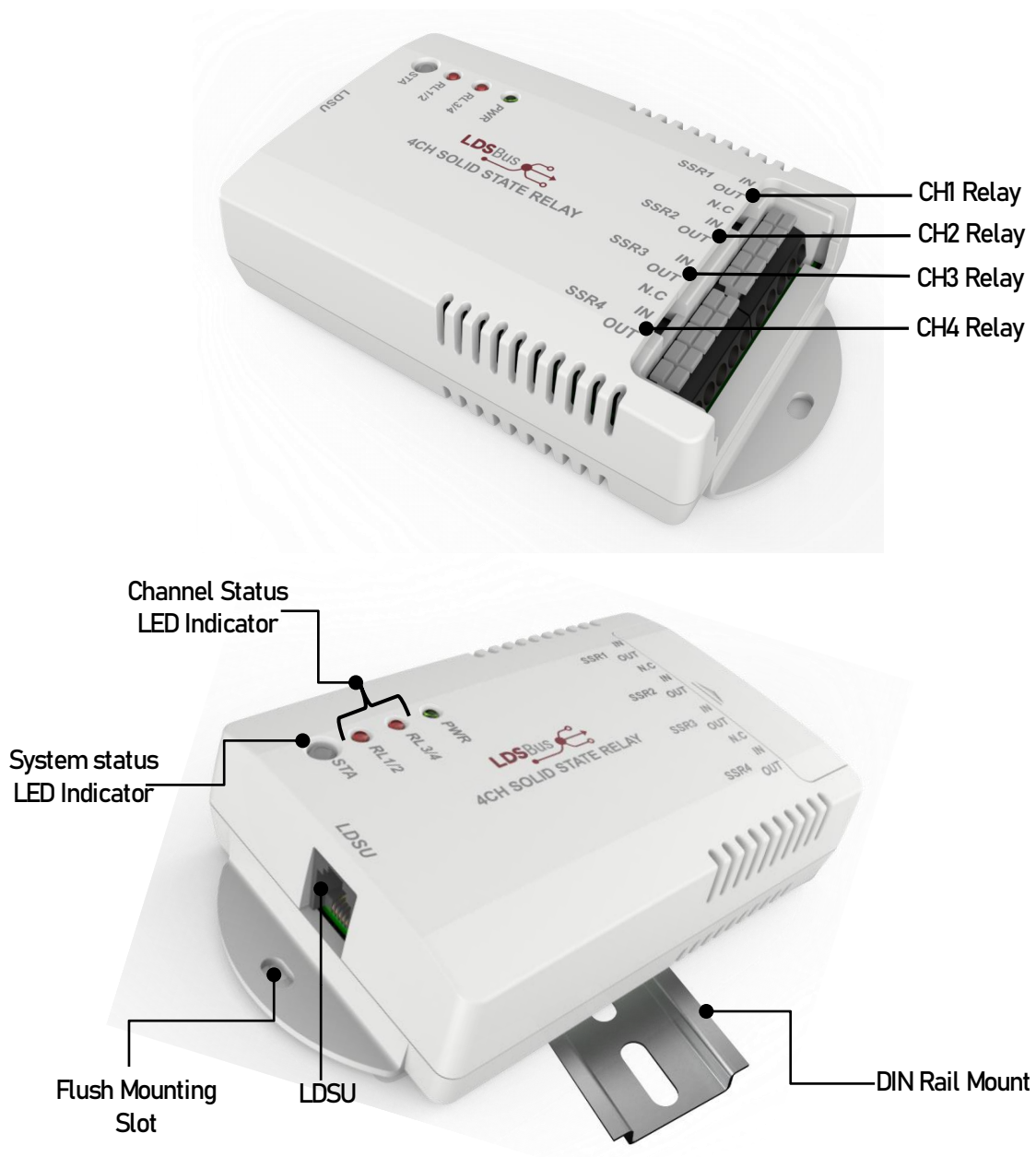


Figure 1 – LDSBus 4CH Solid State Relay Hardware Features

5.1 CH1/CH2/CH3/CH4 Relay

Channel 1/ Channel 2/ Channel 3/ Channel 4 relay.

5.2 System status LED indicator

A LED indicates 4CH SSR device status representing a certain application event. Refer to [section 9](#) for more details.

5.3 Channel Status LED Indicator

A LED Indicates SSR channels status - (ON/OFF). Refer to [section 10](#) for more details.

5.4 Flush Mounting Slot

The Flush Mounting Slot allows mounting of devices into openings or enclosures. During installation, the device is mounted on the front side and secured on the rear side.

5.5 DIN Rail Mount

DIN Rail mount is a method of installing and securing electronic devices on a standardized metal rail. It provides a simple and cost-effective way to organize and install multiple devices in an electrical or control panel, without requiring custom brackets or hardware.

5.6 LDSU

A RJ12 LDSU port for communication and power.

6 Relay Configuration and Installation

Please visit <https://brtsys.com/resources> to access the LDSBus Configuration Utility guide on how to configure the device name, LDSBus device address and termination settings before using it for your application.

6.1 Connection Diagram

Figure 2 illustrates the connection of the LDSBus 4CH Solid State Relay (LDSBus Device) to the LDSBus. Please visit <https://brtsys.com/resources> and refer to LDSBus Configuration Utility Guide.

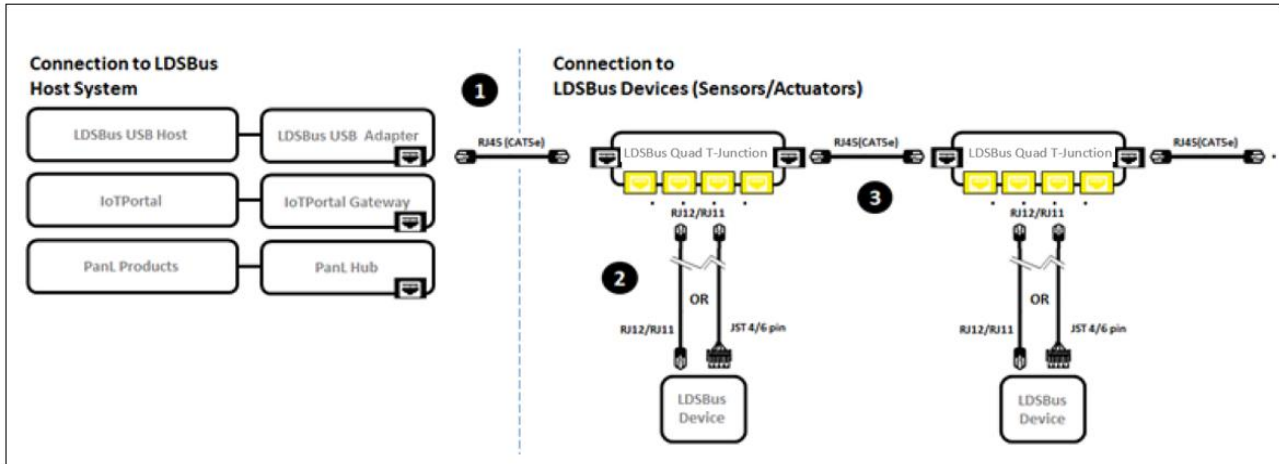


Figure 2 - LDSBus 4CH Solid State Relay - Connection Diagram

Setup Instructions:

1. Connect the first LDSBus Quad T-Junction to any of the LDSBus Host Systems using an RJ45(CAT5e) cable.
2. Connect the configured LDSBus 4CH Solid State Relay to the LDSBus Quad T-Junction as shown in Figure 2 (Step 2).
3. If there is more than one LDSBus Quad T-Junction, chain them together as shown in Figure 2. (Step 3)

7 Mounting Options

7.1 Flush Mount

The LDSBus 4CH Solid State Relay can be flush mounted directly on a wall or any flat surface using 2 M3.5*16mm (thread) screws.

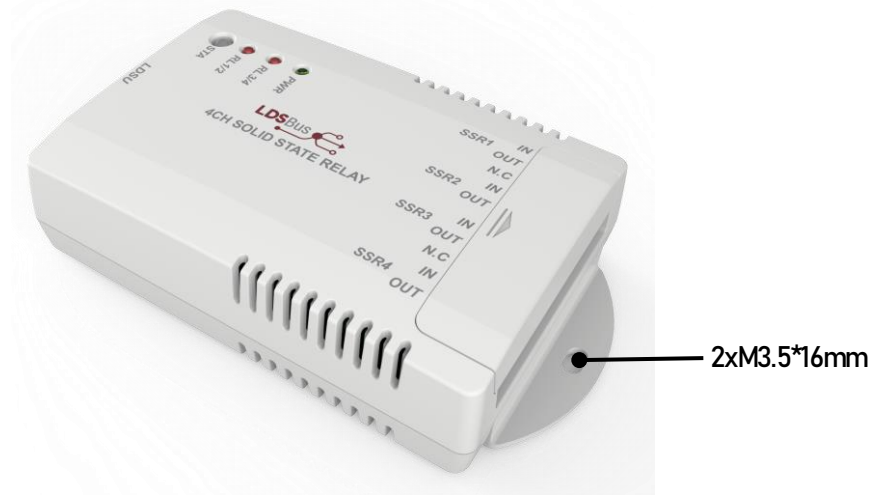


Figure 3 - LDSBus 4CH Solid State Relay Flush Mount

7.2 DIN Rail Mount

The LDSBus 4CH Solid State Relay can be mounted on a DIN Rail using the LDSBus DIN Rail Mount set. This set is optional and includes the bracket and mounting screws.



Figure 4 - LDSBus 4CH Solid State Relay DIN Rail Mount

8 Terminal Wiring Instruction SSR Channel

8.1 Connection and wire

Connections are made with Push-in CAGE CLAMP technology. If using solid conductor wire / clamp with insulation ferrule, the stripped conductor is easily inserted into the clamp until it hits the backstop without the need for a screwdriver. If using soft conductor wire, use a flat head screwdriver to press down the push button and push in the wire, as shown, until it hits the backstop. To remove the conductor wire from its connector, use a flat head screwdriver to press down the push button and pull out the wire as shown in Figure 5.

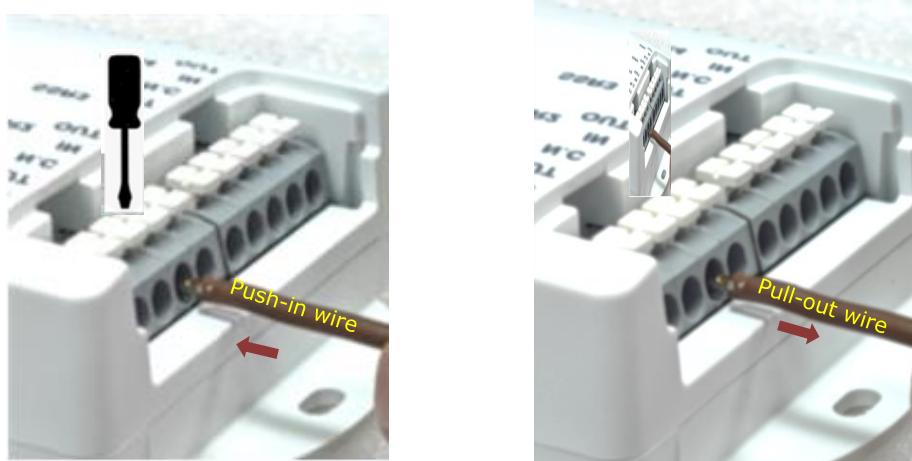


Figure 5 - Terminal Wiring on SSR Channel (Push-in wire & Pull-out wire)

Table 3 provides a list of American Wire Gauges (AWGs) that can be used in Terminal Blocks.

| Conductor Type | Wire diameter/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 3 - AWG to use in Terminal Block

As shown in Figure 6, the wire strip may be 8mm to 12mm long. For safety, ensure that the stripped conductor is always fully inserted, and no part of the conducting surface is exposed.

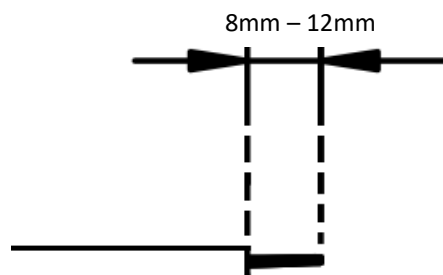


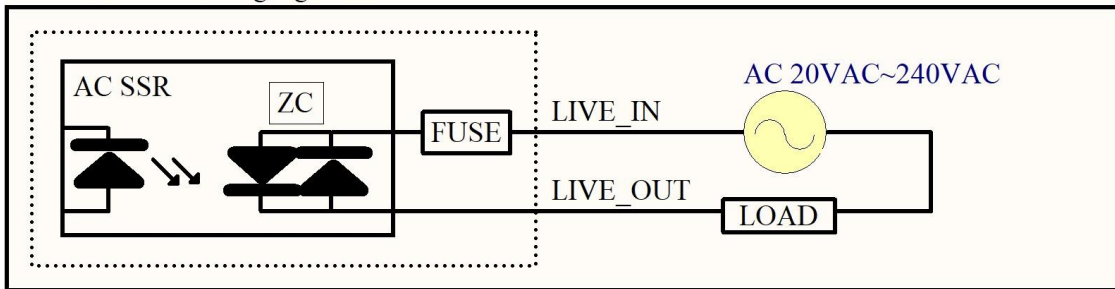
Figure 6 - Wire Strip Length

8.2 Setup

WARNING:

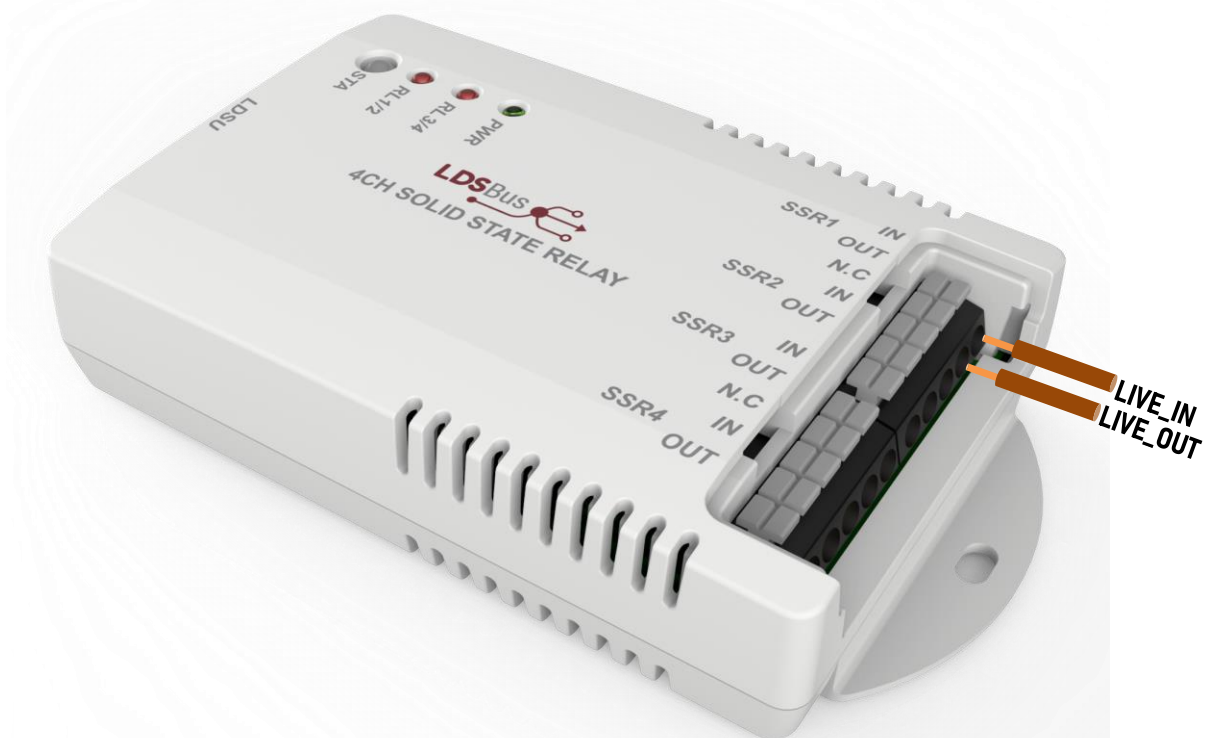
Please ensure that the power to the AC load device is turned off before initiating the setup process to prevent any potential hazards. Prioritize safety by disconnecting power sources before proceeding with installation or configuration.

An AC SSR switching a generic load



Consider the LDSBus 4CH Solid State Relay, Channel 1, as an illustration. The LDSBus 4CH Solid State Relay is designed to facilitate the control of AC loads, capable of managing a maximum load of 240VAC/1.80A per channel. Provided below are recommended wiring configurations and wire specifications for optimal usage.

The following is connection diagram:



Use AWG 20~12; A Brown wire indicates that it comes from an AC Source line

→ Connect to SSR 'IN'

Use AWG 20~12; A Brown wire indicates that it comes to an AC load line

→ Connect to SSR 'OUT'

9 System Status LED Indicators

The system status LED (STA) is a tri-colour LED, and the following table describes the various system states and the corresponding LED colour.

Status display colours

- | | | | |
|----|--------|---|--------------------------------------------------------|
| 1. | RED | - | Device in error condition |
| 2. | YELLOW | - | Unconfigured device or firmware update is in progress. |
| 3. | GREEN | - | Device in normal state (Device termination is OFF) |
| 4. | BLUE | - | Device in normal state (Device termination is ON) |










| Device Status | LED Color | | Flashing Frequency | Description |
|----------------------|-----------|-------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------------|
| Un-configured device | YELLOW |  | LED flashing @1Hz | Unconfigured device with factory default address (126) |
| Configured device | GREEN |  | Steady – non-flashing | Configured device (Device ID 1-125) and device is idle. |
| | BLUE |  | | |
| Addressed device | GREEN |  | LED flashing @5Hz | Device is busy communicating. |
| | BLUE |  | | |
| Identified device | GREEN |  | LED flashing @1Hz | Device in identify state. |
| | BLUE |  | | |
| Device error | RED |  | Steady – non-flashing | Device error has occurred. |
| Firmware update | YELLOW |  | Steady – non-flashing | Device firmware update. |

Table 4 - LDSBus 4CH Solid State Relay – System Status LED Indicators

10 Channel Status LED Indicators

There are 2 channel status LEDs, and these LEDs are dual-color LEDs. RL1/2 indicates the status of relay channels 1 and 2 and RL3/4 indicates the status of channels 3 and 4.











| Device Status | LED Color |  | SSR1 | SSR2 | Description |
|---------------|-----------|-------------------------------------------------------------------------------------|-------------|-------------|---------------------------------|
| RL1/2 | OFF |  | OFF | OFF | SSR1 and SSR2 both are Inactive |
| | Red |  | ON | OFF | SSR1 Active and SSR2 Inactive |
| | Green |  | OFF | ON | SSR2 Active and SSR1 Inactive |
| | Yellow |  | ON | ON | SSR1 and SSR2 both are Active |
| | | | SSR3 | SSR4 | |
| RL3/4 | OFF |  | OFF | OFF | SSR3 and SSR4 both are Inactive |
| | Red |  | ON | OFF | SSR3 Active and SSR4 Inactive |
| | Green |  | OFF | ON | SSR4 Active and SSR3 Inactive |
| | Yellow |  | ON | ON | SSR3 and SSR4 both are Active |
| PWRGreen | Green |  | - | - | SSR All Channel Power Enabled |

Table 5 - LDSBus 4CH Solid State Relay – Channel Status LED Indicators

11 Mechanical Dimensions

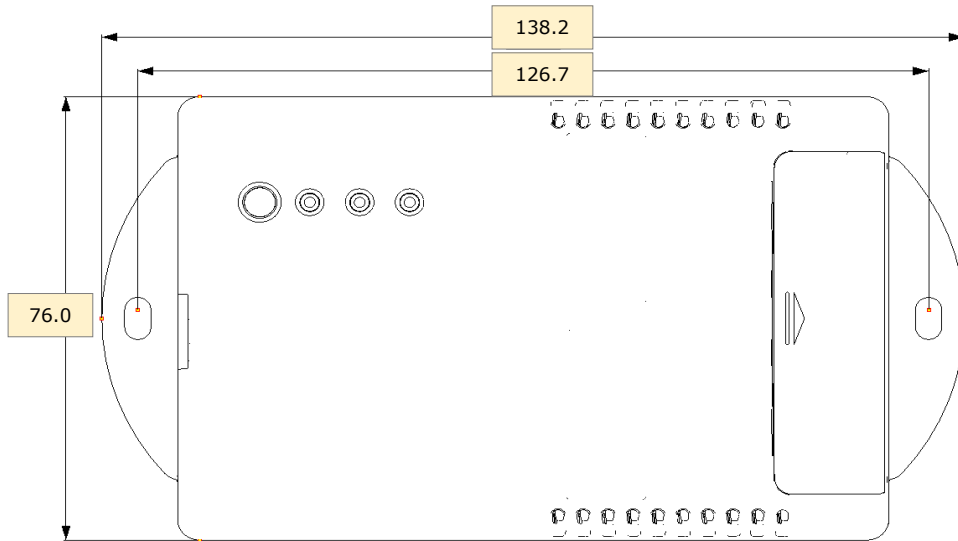


Figure 7 – LDSBus 4CH Solid State Relay Dimension – Top View

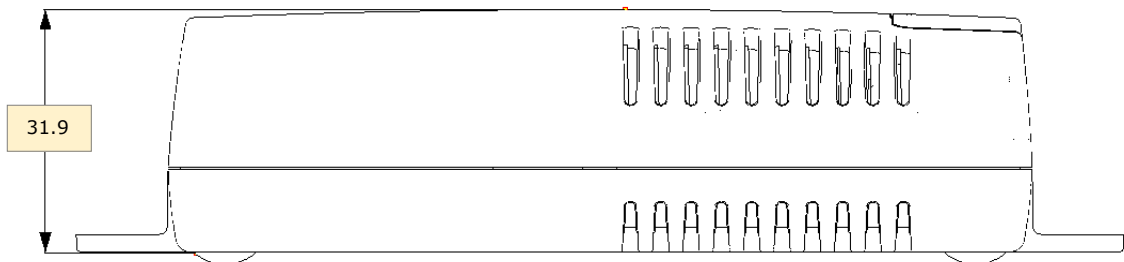


Figure 8 – LDSBus 4CH Solid State Relay Dimension – Side View

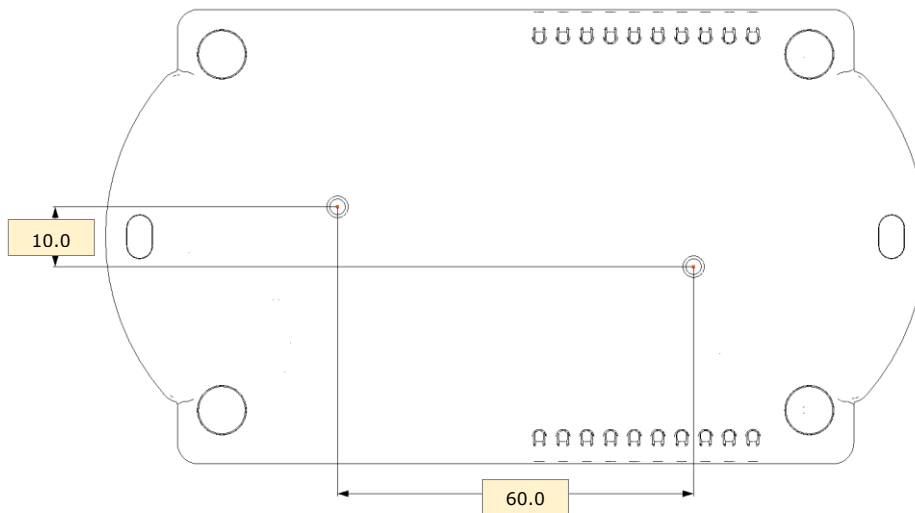


Figure 9 - LDSBus 4CH Solid State Relay Dimension – Bottom View

Note: All dimensions are in millimetres.

12 Contact Information

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

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Appendix A - References

Document References

[BRTSYS AN 001 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 |
| SSR | Solid State Relay |
| 4CH | 4 Channels |
| RL1/RL2/RL3/RL4 | Solid State Relay Channel 1/2/3/4 |
| PWR | Power |
| N.C | No Connection |

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Appendix C – Revision History

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Document Reference No.: BRTSYS_000098
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Document Feedback: [Send Feedback](#)

| Revision | Changes | Date |
|-------------|-----------------|------------|
| Version 1.0 | Initial Release | 20-03-2024 |