



LDSBus CO2 Sensor Datasheet

1 Introduction

LDSBus CO2 Sensor is a true CO2 sensor that features four sensors in a compact, low-profile design. It includes sensors to measure CO2, temperature, humidity and ambient light. The device can be flush mounted on the ceiling or swivel mounted on the wall. LDSBus CO2 Sensors are compatible with the BRTSys's IoTPortal, PanL Smart Living and LDSBus Python SDKs. The sensor is available in 2 versions, namely Basic and Pro.

1.1 Features

- Temperature, humidity and ambient light sensors are integrated in the CO2 Sensor
- Measures CO2 up to 40000ppm
- CO2 measurement accuracy:
 - Basic version: +/-50ppm (400-2000ppm) and
 - Pro version: +/-40ppm (400-5000ppm)
- Measures temperature up to 60°C with an accuracy of $\pm 1.5^{\circ}\text{C}$
- Measures humidity from 0 to 100% with an accuracy of $\pm 9\% \text{RH}$
- Measures ambient light up to 100K Lux with an accuracy of $\pm 15\% \text{ Lux}$
- BRTSys's LDSBus protocol. Wired data/power transmission through LDSBus HVT-Junction
- Low power consumption 300mW
- Operating temperature range: 0°C to +60°C
- Swivel mount and Flush mount options
- Supported platform application: BRTSys's PanL Smart Living, IoTPortal and LDSBus Python SDK
(Visit <https://brtsys.com/resources>)



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. BRT Systems 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. BRT Systems Pte Ltd, 178 Paya Lebar Road, #07-03, Singapore 409030. Singapore Registered Company Number: 202220043R.

2 Part Numbers

Part#	Naming
LS110101A	LDSBus CO2 Sensor, Temperature & Humidity Sensor & ALS Sensor - Flush
LS111101A	LDSBus CO2 Sensor, Temperature & Humidity Sensor & ALS Sensor - Swivel
LS110201A	LDSBus CO2 Sensor Pro, Temperature & Humidity & ALS Sensor - Flush
LS111201A	LDSBus CO2 Sensor Pro, Temperature & Humidity & ALS Sensor - Swivel

Table of Contents

1	Introduction	1
2	Part Numbers	2
3	Product Specifications.....	4
4	Hardware Features.....	5
5	Configuration, Installation & Application	6
5.1	Connection Diagram.....	6
6	Mounting Instructions.....	7
6.1	Flush Mount	7
6.2	Swivel Mount	9
7	System Status LED Indicators	11
8	Mechanical Dimension.....	12
9	Contact Information.....	15
	Appendix A - References	16
	Document References	16
	Acronyms and Abbreviations.....	16
	Appendix B - List of Figures and Tables	17
	List of Figures	17
	List of Tables.....	17
	Appendix C – Revision History	18

3 Product Specifications

Features	Sensors	CO2 Sensor/ CO2 Sensor Pro Ambient Light Sensor Temperature Sensor Humidity Sensor
	Interface	RS485
	LED Indicator (RGB)	System Status Indicator (Please refer to LED section)
	Mounting	Flush Mount - Fixed Angle Installation
		Swivel Mount – Adjustable Angle Installation
Power	Input Voltage	5V DC Bus Power
	Typical Power	112mW
	Max. Power	295mW
CO2 Sensor	CO2 Output Range	0-40000 ppm
	Specified Range	400-2000 ppm
		400-5000 ppm (Pro)
	Accuracy	± (50ppm+5% of Reading) ± (40ppm+5% of Reading) (Pro)
Response Time	60 s	
Ambient Light Sensor	Range	0.001 to 100K Lux
	Accuracy	±15%
Temperature Sensor	Range	-10°C to 60°C
	Accuracy	±1.5°C
	Resolution	0.1°C
Humidity Sensor	Range	0 to 100% RH
	Accuracy	±9% RH
Physical Characteristics	Color	White
	Housing	Polycarbonate
	Dimensions	62mm x H25mm (Flush) 62mm x H60mm (Swivel)
Environmental Limits	Operating Temperature	0 to 60°C
	Storage Temperature	-20 to 85°C
	Ambient Relative Humidity	5 to 95% (non-condensing)
Package Contents	Device	1X LDSBus CO2 Sensor with Flush Mount (or) 1X LDSBus CO2 Sensor with Swivel Mount
	Wire Assembly	1X 5m RJ11-JST Cable
	Self-Tapping Screws	2X M3*16mm (Thread)

Table 1 - LDSBus CO2 Sensor Specifications

4 Hardware Features

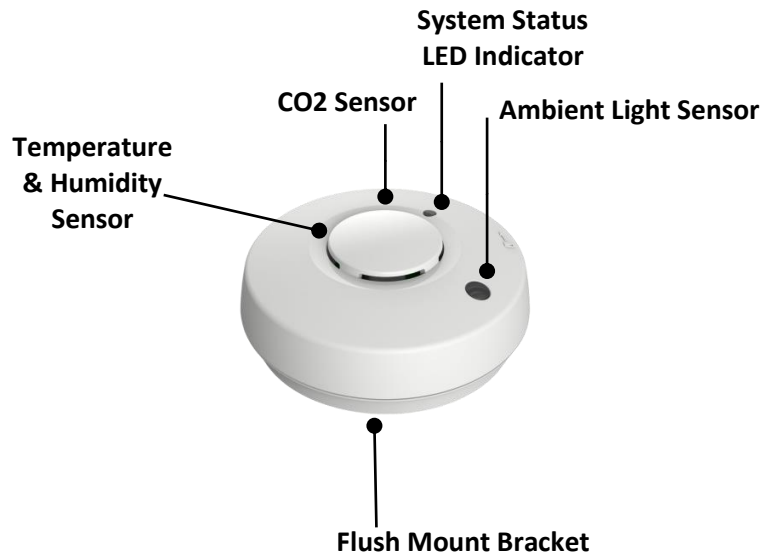


Figure 1 - LDSBus CO2 Sensor Hardware Features

5 Configuration, Installation & Application

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

5.1 Connection Diagram

Figure 2 illustrates the connection of the LDSBus CO2 Sensor (LDSBus Device) to the LDSBus. Please visit <https://brtsys.com/resources> to view the full device application, setup, and installation guides.

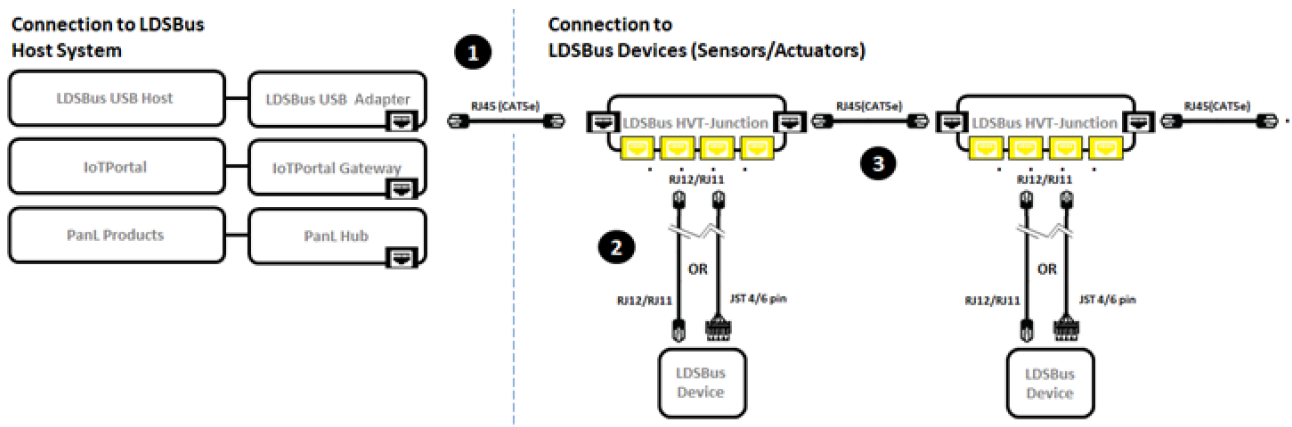


Figure 2 - LDSBus CO2 Sensor to LDSBus – Connection Diagram

Setup Instructions:

1. Connect the first LDSBus HVT-Junction to any of the LDSBus Host Systems using an RJ45 (CAT5e) cable.
2. Connect the configured LDSBus CO2 Sensor 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.

6 Mounting Instructions

Make sure the device has been configured using the LDSBus Configuration Utility before mounting.

6.1 Flush Mount

The flush mounting procedure assumes a flat hollow surface behind which the LDSBus RJ11-JST cable is concealed and made accessible through an opening. Figure 3 shows the front face of the LDSBus CO2 Sensor device. Note the lock/unlock direction in the cover.



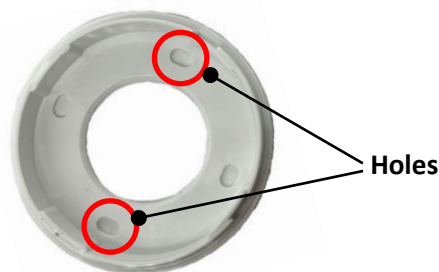
Figure 3 - LDSBus CO2 Sensor

Follow these steps to fix the flush mount -

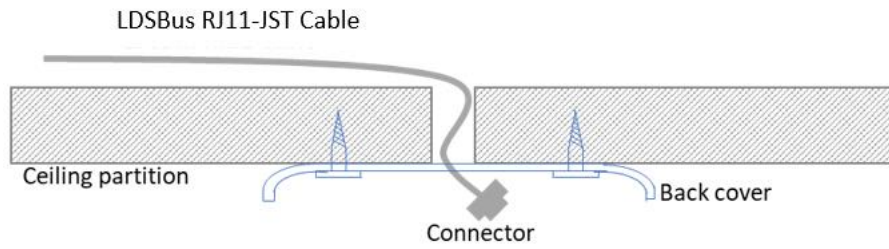
1. Unlock the back cover. Twist the top cover in the anti-clockwise direction to unlock.



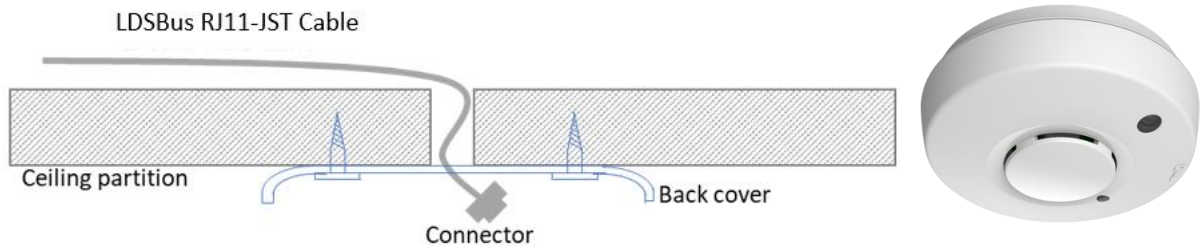
2. Make two holes in the back cover using the indentations as guides.



3. Prepare the ceiling and route the RJ11-JST cable through the ceiling opening. Run the LDSBus RJ11-JST cable through the centre (hole) of the back cover and fasten the back cover to the ceiling with self-tapping screws as shown in the picture below -



4. Attach the cable to the JST connector of the sensor.
5. Twist the front face in a clockwise direction to attach it to the back cover and lock it.



6.2 Swivel Mount

The swivel mount is shown in Figure 4.

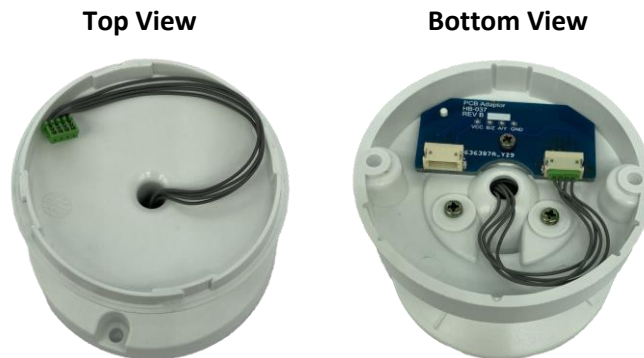
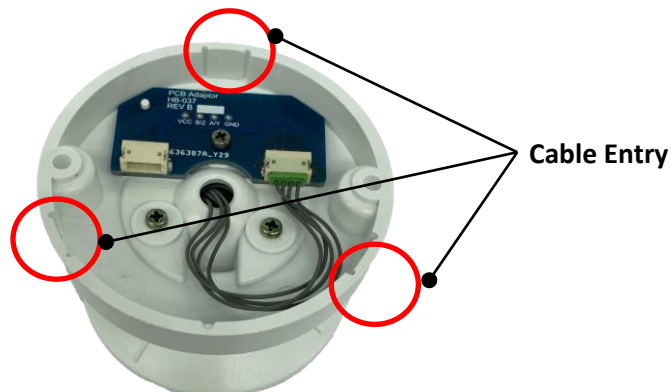


Figure 4 - LDSBus CO2 Sensor – Swivel Mount – Top & Bottom View

Follow these steps to fix the swivel mount –

1. Choose the position for the wall mount and drill holes for mounting the swivel mount on the wall.
2. Route and affix the LDSBus RJ11-JST cable on the wall through a buried or wall mounted conduit to butt against the base of the swivel mount.
3. Break off one of the three cable entry locations on the base plate for cable routing.



4. Connect the LDSBus RJ11-JST cable to the JST connector (Swivel Mount bottom section) as shown in the Figure.



5. Fasten the swivel mount to the wall using the mounting screws. Ensure that the cable is sitting in the cable entry slot.
6. Remove the sensor from the flush mount back cover by turning it in an anti-clockwise direction.



7. Connect the JST cable from the top section of the swivel mount to the JST connector located on the back of the device.



8. Attach the device to the top section of the swivel mount.



9. Turn the device clockwise to secure it to the swivel mount.



7 System Status LED Indicators

LDSU devices come with a tri-color LED. The LED status colors are described in the table below.

Status display colors

1. RED - Device in error condition
2. YELLOW - Un-configured device
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	Un-configured 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 2 – LDSBus CO2 Sensor – System Status LED Indicator

8 Mechanical Dimension

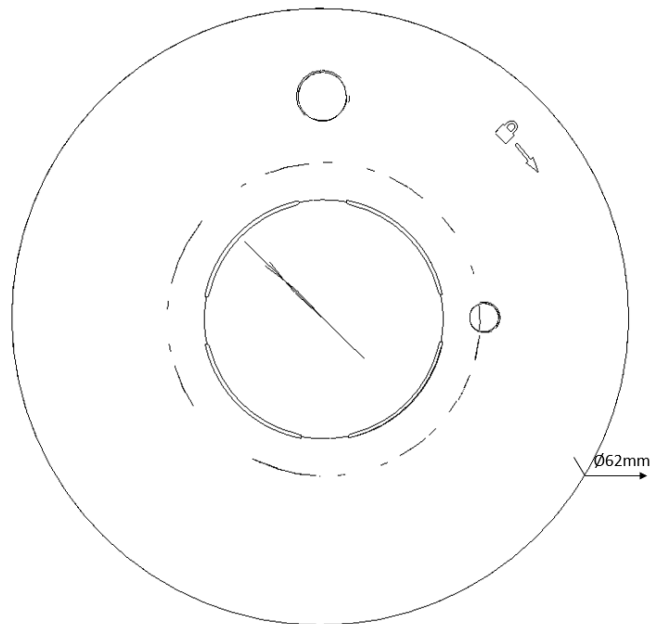


Figure 5 - LDSBus CO2 Sensor Dimension – Top View

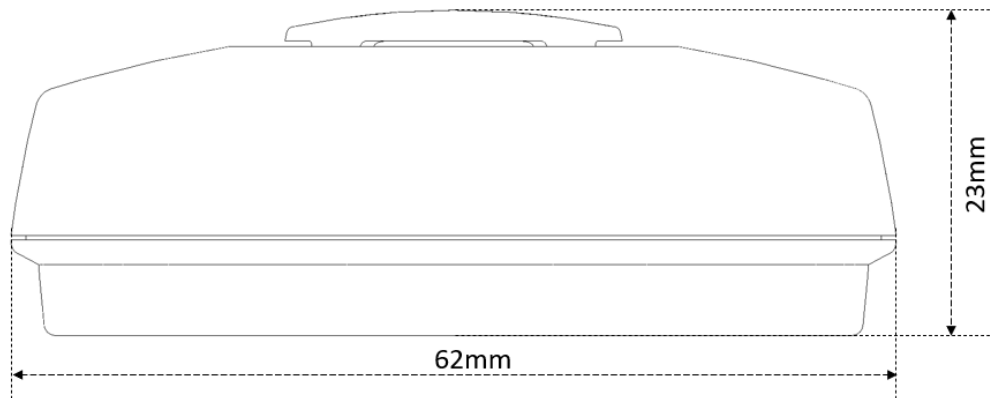


Figure 6 - LDSBus CO2 Sensor Dimension – Side View Flush Mount

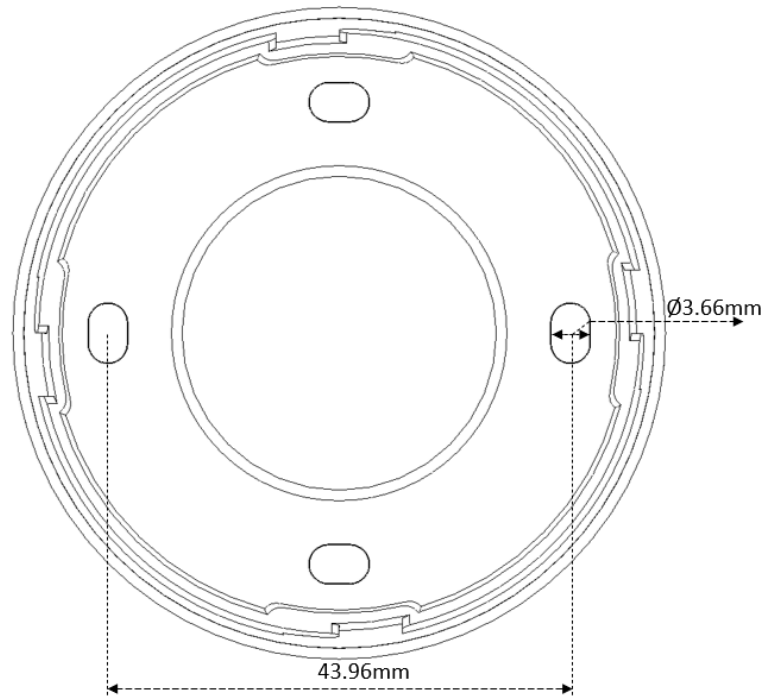


Figure 7 - LDSBus CO2 Sensor Mounting Holes – Flush Mount

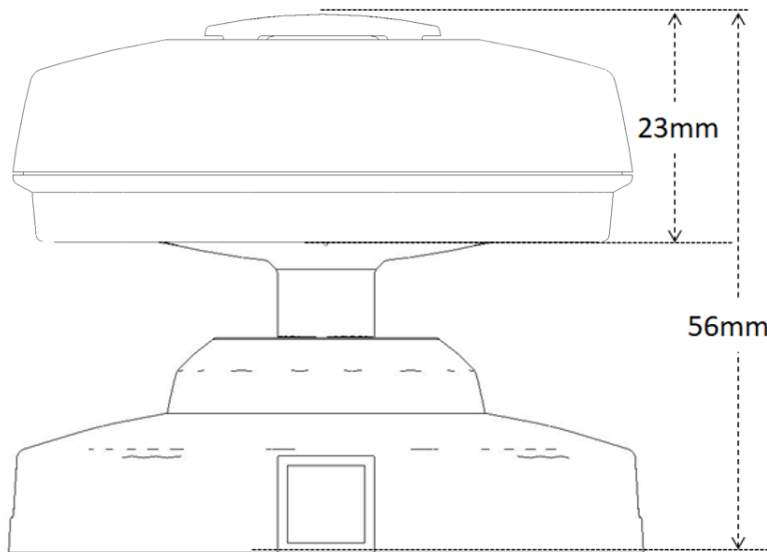


Figure 8 - LDSBus CO2 Sensor Dimension – Side View- Swivel Mount

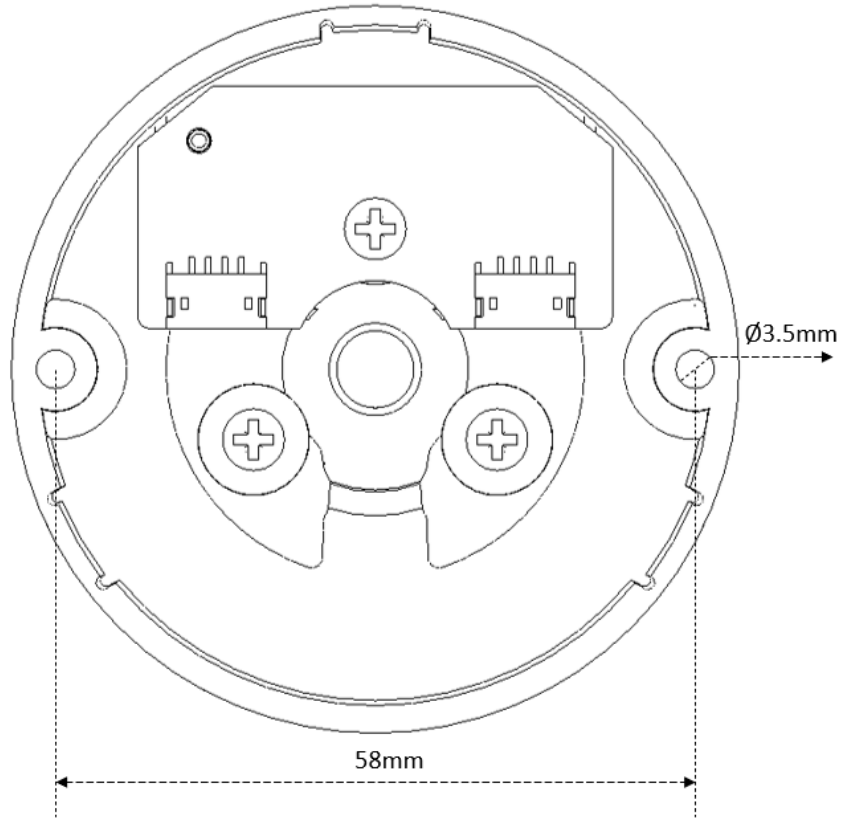


Figure 9 - LDSBus CO2 Sensor Mounting Holes – Swivel Mount

Note: All dimensions are in millimetres.

9 Contact Information

Head Quarters – Singapore

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

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

Web Site

<http://brtsys.com/>

Distributor and Sales Representatives

Please visit the Sales Network page of the [BRT Systems 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 BRT Systems Pte Ltd (BRTSys) 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 BRTSys devices and other materials) is provided for reference only. While BRTSys has taken care to assure it is accurate, this information is subject to customer confirmation, and BRTSys disclaims all liability for system designs and for any applications assistance provided by BRTSys. Use of BRTSys 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 BRTSys 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. BRT Systems Pte Ltd, 178 Paya Lebar Road, #07-03, Singapore 409030. Singapore Registered Company Number: 202220043R.

Appendix A - References

Document References

[BRTSYS AN 001 LDSBus Configuration Utility Guide](#)

[BRTSYS API 001 LDSBus Python SDK Guide](#)

Acronyms and Abbreviations

Terms	Description
DC	Direct Current
LDSBus	Long Distance Sensor Bus
LED	Light Emitting Diode
PIR	Passive infrared sensor

Appendix B - List of Figures and Tables

List of Figures

Figure 1 - LDSBus CO2 Sensor Hardware Features	5
Figure 2 - LDSBus CO2 Sensor to LDSBus – Connection Diagram	6
Figure 3 - LDSBus CO2 Sensor	7
Figure 4 - LDSBus CO2 Sensor – Swivel Mount – Top & Bottom View	9
Figure 5 - LDSBus CO2 Sensor Dimension – Top View	12
Figure 6 - LDSBus CO2 Sensor Dimension – Side View Flush Mount	12
Figure 7 - LDSBus CO2 Sensor Mounting Holes – Flush Mount	13
Figure 8 - LDSBus CO2 Sensor Dimension – Side View- Swivel Mount	13
Figure 9 - LDSBus CO2 Sensor Mounting Holes – Swivel Mount	14

List of Tables

Table 1 - LDSBus CO2 Sensor Specifications	4
Table 2 – LDSBus CO2 Sensor – System Status LED Indicator	11

Appendix C – Revision History

Document Title: LDSBus CO2 Sensor Datasheet
Document Reference No.: BRTSYS_000030
Clearance No.: BRTSYS#033
Product Page: <https://brtsys.com/ldsbus/>
Document Feedback: [Send Feedback](#)

Revision	Changes	Date
Version 1.0	Initial Release	13-02-2023
Version 1.1	Updated mounting instructions pictures	24-03-2023