



# 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 two 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  $\pm 9\%RH$
- Measures ambient light up to 100K Lux with an accuracy of  $\pm 15\%$  Lux
- BRTSys's LDSBus protocol. Wired data/power transmission through LDSBus Quad T-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>)



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## 2 Part Numbers/Ordering Information

| <b>Part#</b> | <b>Description</b>   |
|--------------|--|
| 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    |

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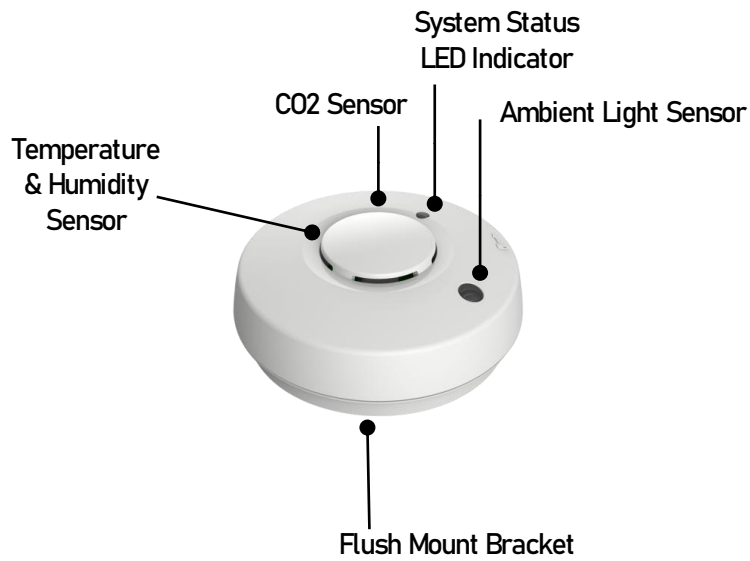
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### 3 Specifications

|  |   |   |
|--|---|---|
| <b>Features</b>                              | Sensors   | CO2 Sensor/ CO2 Sensor Pro  |
|  |   | Ambient Light Sensor  |
|  |   | Temperature Sensor  |
|  |   | Humidity Sensor   |
|  | Interface   | RS485   |
| LED Indicator (RGB)                          | System Status Indicator (Please refer to <a href="#">LED</a> section) |   |
|  | Mounting  | Flush Mount - Fixed Angle Installation  |
| Swivel Mount – Adjustable Angle Installation |   |   |
| <b>Power</b>                                 | Input Voltage   | 5V DC Bus Power   |
|  | Typical Power   | 112mW   |
|  | Max. Power  | 295mW   |
| <b>CO2 Sensor</b>                            | 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)                |   |   |
| Update Interval                              | 5 seconds (minimum)   |   |
| <b>Ambient Light Sensor</b>                  | Range   | 0.001 to 100K Lux   |
|  | Accuracy  | ±15%  |
| <b>Temperature Sensor</b>                    | Range   | -10°C to 60°C   |
|  | Accuracy  | ±1.5°C  |
|  | Resolution  | 0.1°C   |
| <b>Humidity Sensor</b>                       | Range   | 0 to 100% RH  |
|  | Accuracy  | ±9% RH  |
| <b>Physical Characteristics</b>              | Color   | White   |
|  | Housing   | Polycarbonate   |
|  | Dimensions  | 62mm x H25mm (Flush)  |
| 62mm x H60mm (Swivel)                        |   |   |
| <b>Environmental Limits</b>                  | Operating Temperature   | 0 to 60°C   |
|  | Storage Temperature   | -20 to 85°C   |
|  | Ambient Relative Humidity   | 5 to 95% (non-condensing)   |
| <b>Package Contents</b>                      | Device  | 1X LDSBus CO2 Sensor with Flush Mount <b>(or)</b><br>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



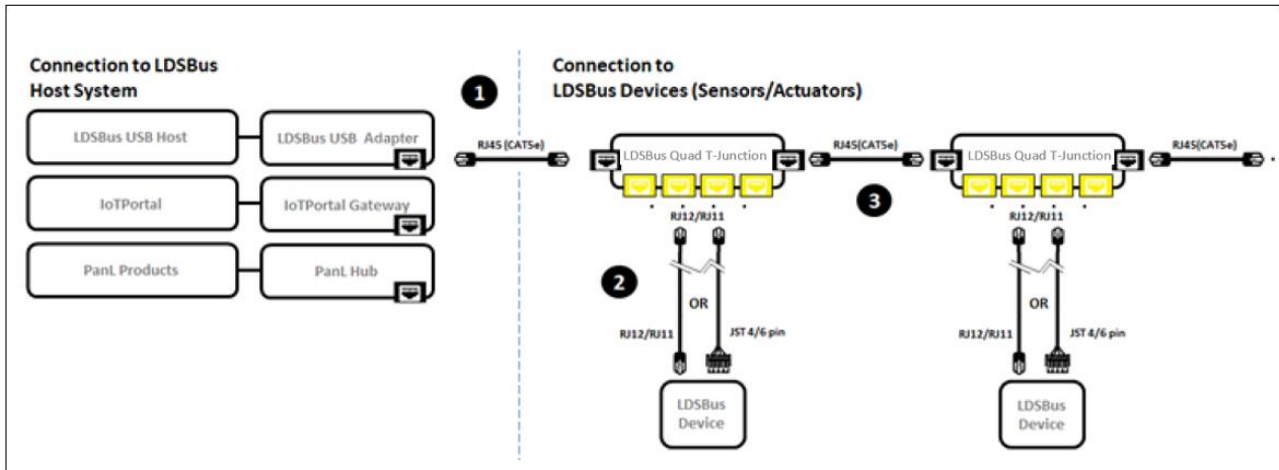
**Figure 1 - LDSBus CO2 Sensor Hardware Features**

## 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 Quad T-Junction to any of the LDSBus Host Systems using an RJ45 (CAT5e) cable.
2. Connect the configured LDSBus CO2 Sensor to the LDSBus Quad T-Junction as shown in Figure 2.
3. If there is more than one LDSBus Quad T-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.



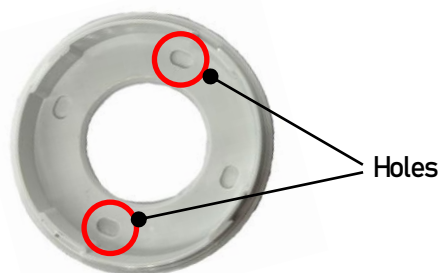
**Figure 3 - LDSBus CO2 Sensor**

Follow these steps to fix the flush mount -

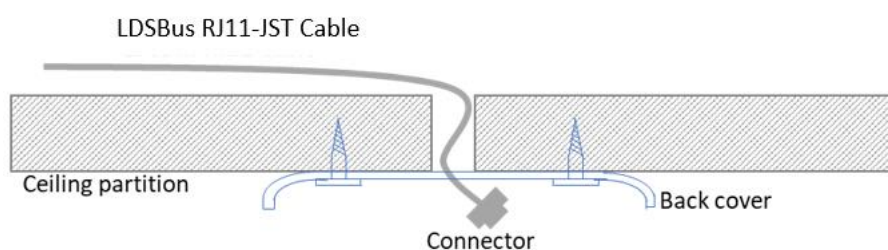
1. Unlock the back cover. Twist the top cover in the anti-clockwise direction to unlock.



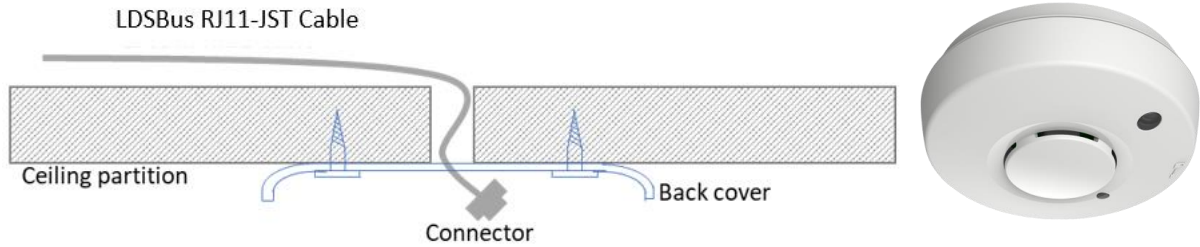
2. Make two holes in the back cover using the indentations as guides.



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 -

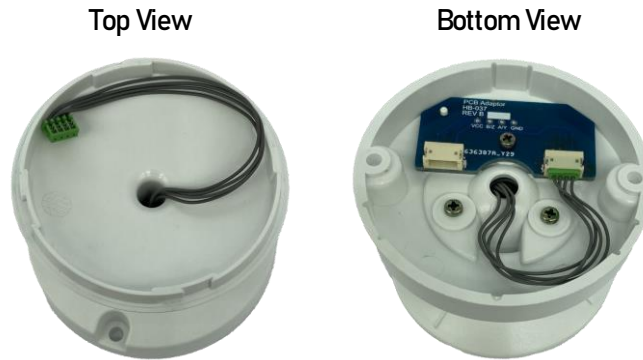


4. Attach the cable to the JST connector of the sensor.
5. Twist the front face in a clockwise direction to attach it to the back cover and lock it.



## 6.2 Swivel Mount

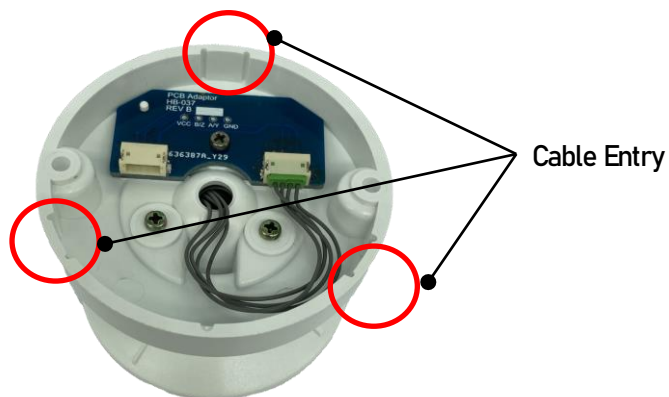
The swivel mount is shown in Figure 4.



**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.

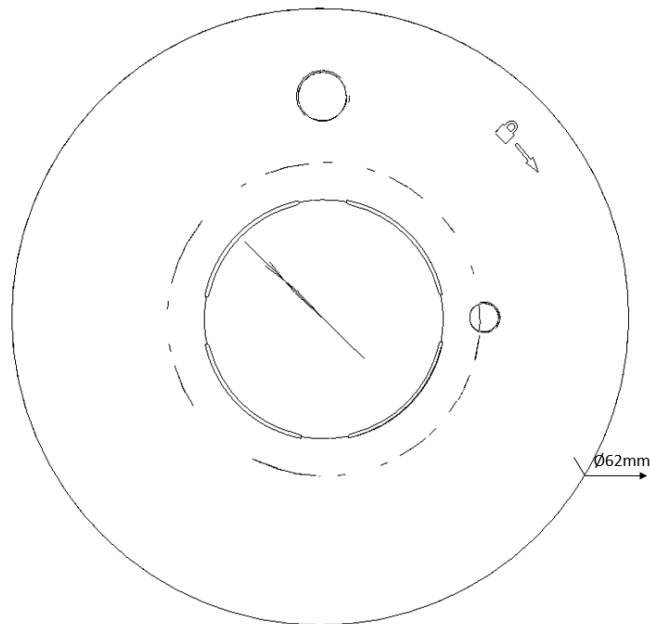
Status display colors

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)

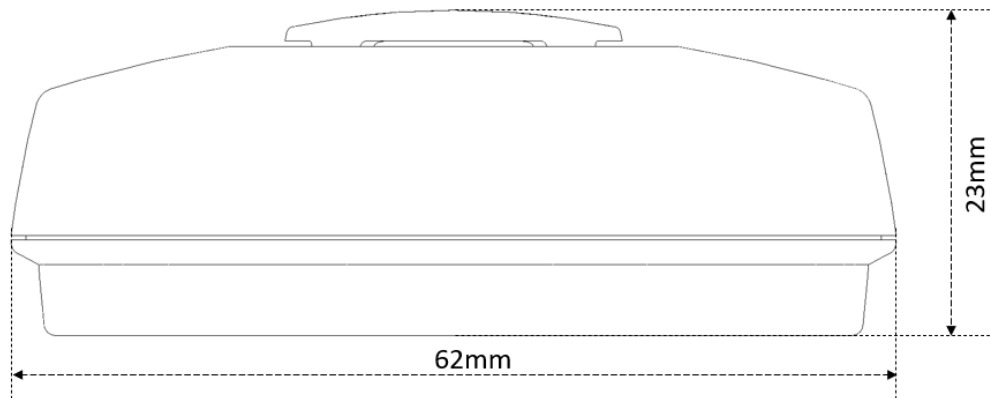
| Device Status        | LED Color  | Flashing Frequency    | Description   |
|----------------------|--|-----------------------|---|
| Un-configured device | YELLOW    | LED flashing @1Hz     | Un-configured device with factory default address (126) |
| Configured device    | GREEN     | Steady – Non-flashing | 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**

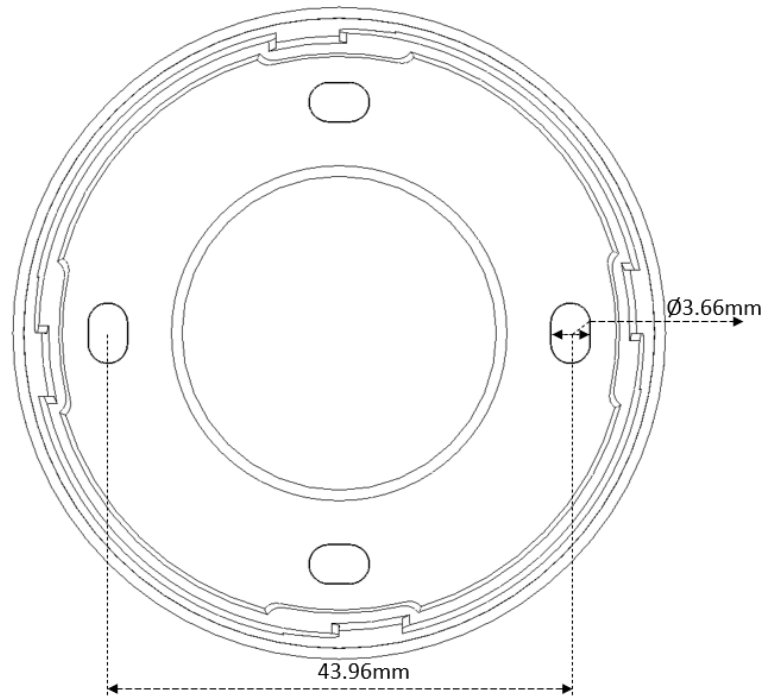
## 8 Mechanical Dimension



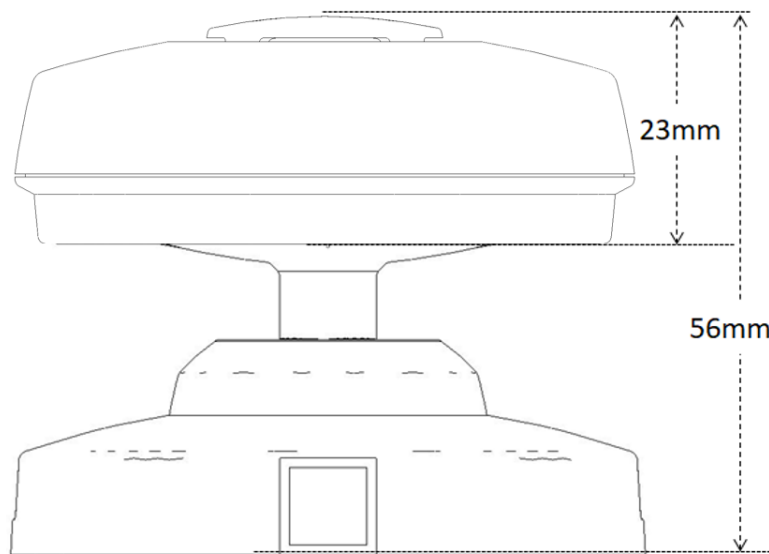
**Figure 5 - LDSBus CO2 Sensor Dimension – Top View**



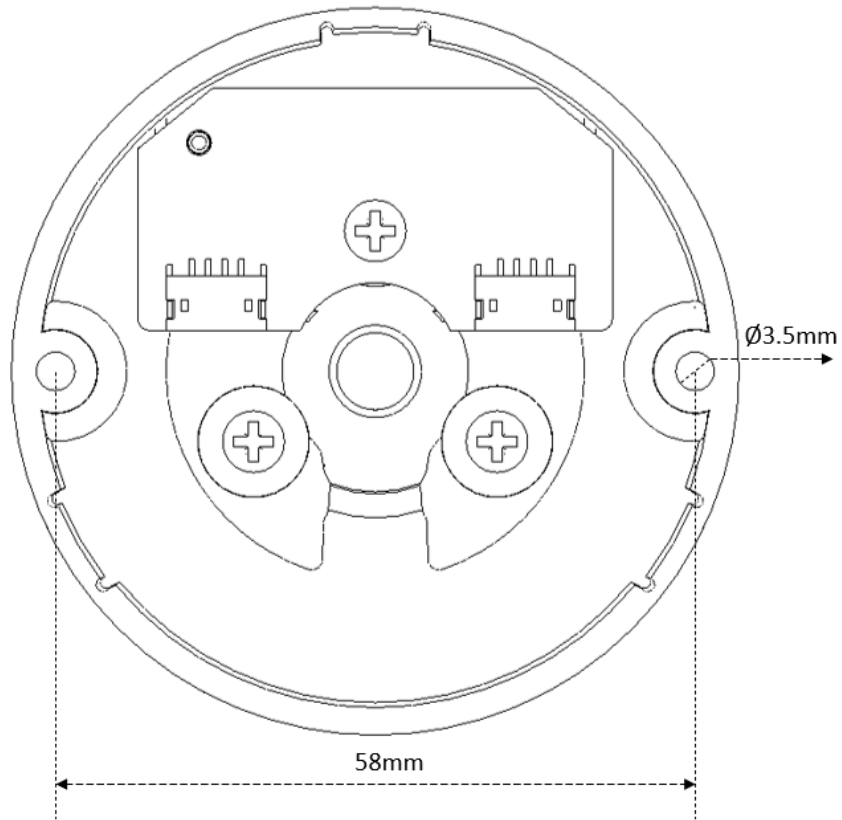
**Figure 6 - LDSBus CO2 Sensor Dimension – Side View Flush Mount**



**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

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](#)

[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  |

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## 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 |
| Version 1.2 | Updated the following – HVT references to Quad T-Junction; Singapore address                    | 11-09-2023 |
| Version 1.3 | Updated specifications table – Response Time – 60 S” to “Update interval – 5 seconds (minimum)” | 05-02-2024 |