



LDSBus Modbus/SDI-12 Adapter Datasheet



1 Introduction

The LDSBus Modbus / SDI-12 Adapter converts the Modbus-RTU device and SDI-12 device standard protocols (Sensors / Actuators) into LDSBus protocol.

It serves as a data and power interface between the LDSBus host and the Modbus / SDI-12 devices. LDSBus Modbus / SDI-12 Adapter output voltage is programmable based on the connected device operation voltage.

Typical applications include construction, industry, agriculture, and aquaculture. LDSBus Modbus / SDI-12 adapters are designed to be waterproof and dustproof, so they are suitable for indoors and outdoors.

An LDSBus Modbus / SDI-12 Adapter can be used with a single Modbus-RTU device or a single SDI-12 device, such as a Modbus Soil Sensor, Modbus Relay Controller Module, SDI-12 Air Humidity Sensor, SDI-12 Liquid Temperature Sensor, etc.

1.1 Features

- LDSBus Modbus / SDI-12 Adapter connects to LDSBus Host through the M12 LDSU Port
- Supports Modbus-RTU device connection through the Modbus / SDI-12 Port
- Supports SDI-12 (Version 1.3 Onwards) device connection through the SDI-12 Port
- Built-in programmable DC-DC converter for supply power for sensor device. Power supply can be configured to 9V, 12V or 24V output.
- Supports baud rate for Modbus device from 1200bps to 115200bps.
- Short circuit protection on Modbus / SDI-12 ports
- Waterproof enclosure with flush mount.
- Operating temperature range: 0°C to +70°C
- Supported applications:
 - BRTSys IoTPortal (www.iotportal.com)
 - LDSBus Python SDK
 - LDSBus .Net SDK

Visit <https://brtsys.com/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. BRT Systems Pte Ltd (BRTSys) 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, 1 Tai Seng Avenue, Tower A, #03-01 Singapore 536464. Singapore Registered Company Number: 202220043R.

2 Part Numbers/Ordering Information

Part#	Description
LA-1401-01A	LDSBus Modbus / SDI-12 Adapter
LA-1501-01A	LDSBus M12 4-Pin Male-Male Cable (5m)
LA-1601-01A	LDSBus M12-RJ12 Extension Cable (15cm)

Table 1- Part Numbers / Ordering Information

Table of Contents

1	Introduction.....	1
1.1	Features.....	1
2	Part Numbers/Ordering Information	2
3	Specifications.....	4
4	FCC Compliance Statement	5
5	Hardware Features.....	6
5.1	LDSU Connector	8
5.2	Modbus / SDI-12 Connector	8
6	Configuration, Installation & Application	9
6.1	Connection Diagram.....	9
7	Flush Mount	11
8	Mechanical Dimension.....	12
9	Contact Information.....	14
	Appendix A - References	15
	Document References	15
	Acronyms and Abbreviations.....	15
	Appendix B - List of Figures and Tables	16
	List of Figures	16
	List of Tables.....	16
	Appendix C – Revision History	17

3 Specifications

Features	LDSU Interface	RS485
	Modbus Interface	Modbus-RTU Default 9600 bps (Configurable from 1200bps to 115200bps)
	SDI-12 Interface	SDI-12 (Version 1.3 / Version 1.4) Fixed 1200 bps
	Mounting	Flush Mount
Power	Operating Voltage	5V DC Bus Voltage
	Operating Power	Typ:310mW Max:388mW
	Modbus Interface Voltage	Configurable as 9V / 12V / 24VDC output
	SDI-12 Interface Voltage	12VDC output (fixed)
	Voltage Output Tolerance	±10%
	Max Output Power	9VDC Voltage Output – Max: 600mW 12VDC Voltage Output – Max: 600mW 24VDC Voltage Output – Max: 500mW
	Short Circuit Protection	Yes
Physical Characteristics	Colour	Light Gray
	Housing	ABS
	Dimensions	L132.0mm x W68.6mm x H50.0mm
Environmental Limits	Operating Temperature	0 to 70°C
	Storage Temperature	-20 to 85°C
	Ambient Relative Humidity	5 to 95% (non-condensing)
	Ingress Protection	Waterproof, Dustproof
Package Contents	Device	1x LDSBus Modbus / SDI-12 Adapter
	Cable Assembly	1x LDSBus M12 4-Pin Male-Male Cable (5m)
	Extension Cable	1x LDSBus M12-RJ12 Extension Cable (15cm)

Table 2 - LDSBus Modbus / SDI-12 Adapter Specifications

4 FCC Compliance Statement

LDSBus Modbus SDI-12 Adapter 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 **LDSBus Modbus / SDI-12 Adapter** 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

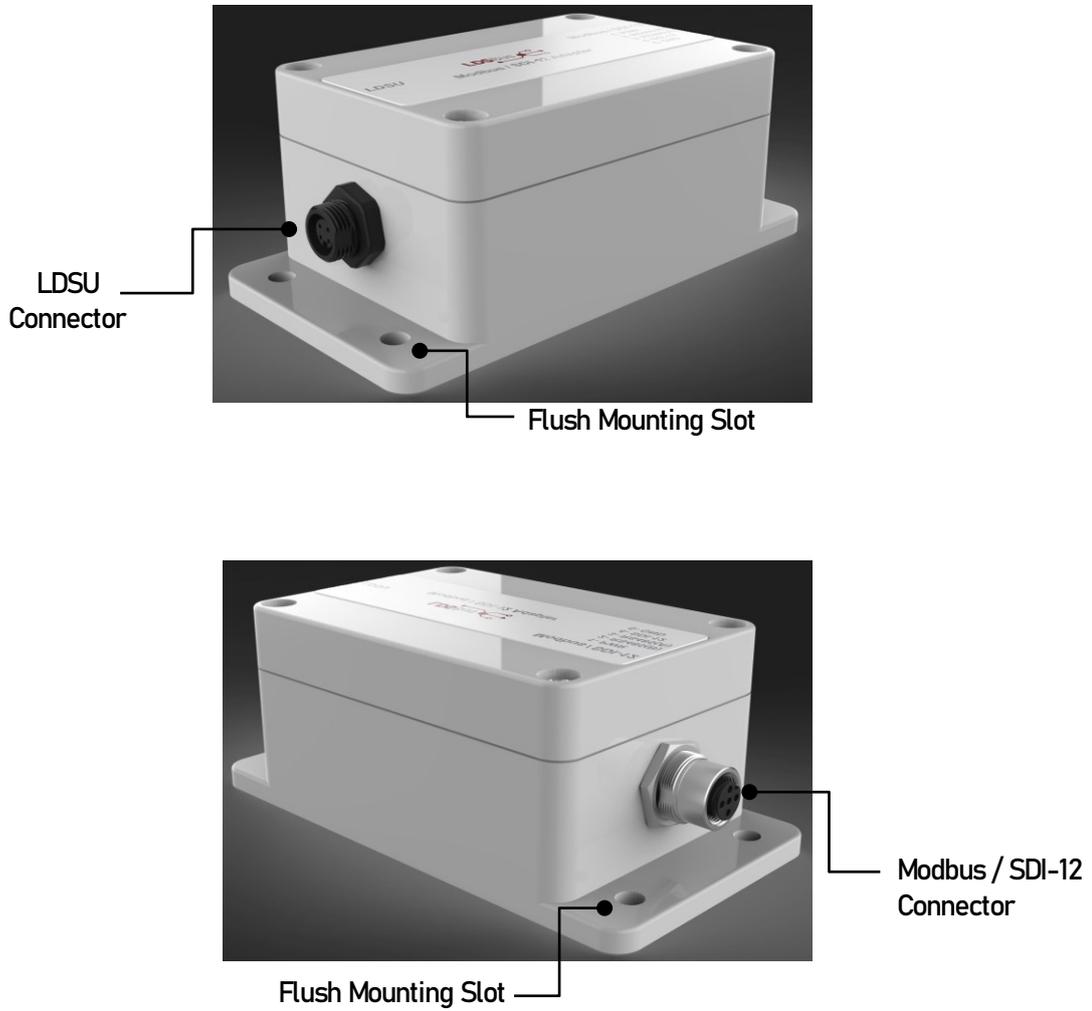


Figure 1 - LDSBus Modbus / SDI-12 Adapter Flush Mount – Hardware Features



Figure 2 - LDSBus M12 4-Pin Male-Male Cable (5m)



Figure 3 - LDSBus M12-RJ12 Extension Cable (15cm)

5.1 LDSU Connector

LDSU connector is a M12 4-Pin female waterproof panel mount connector.

The connector pinout is shown in Figure 4.

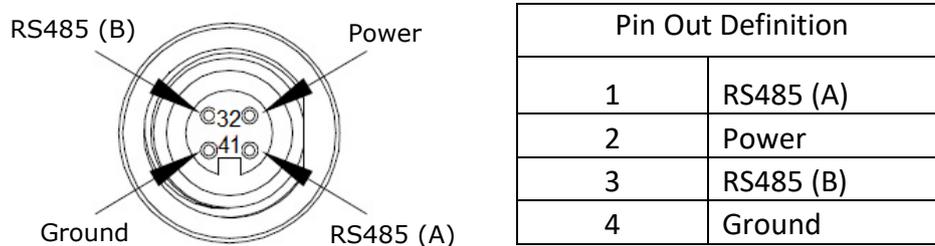


Figure 4 - LDSU Connector Pinout -Front View

5.2 Modbus / SDI-12 Connector

Modbus / SDI-12 connector is a M12 A-code 5-Pin female waterproof panel mount connector.

The connector pinout is shown in Figure 5.

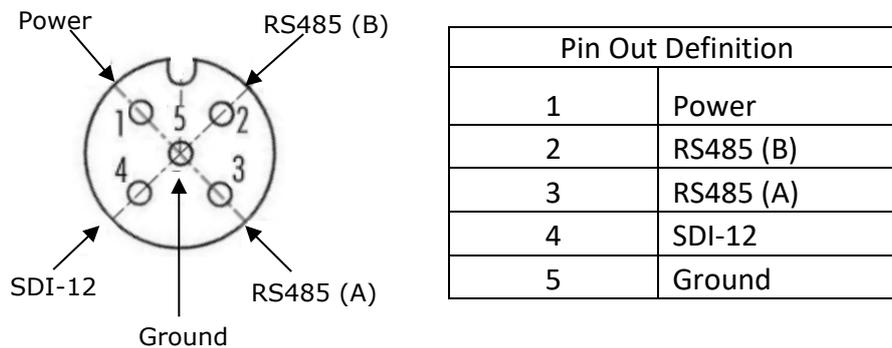


Figure 5 - Modbus / SDI-12 Connector Pinout -Front View

Note: The LDSBus Modbus / SDI-12 Adapter comes with Dust caps for LDSU and Modbus/SDI-12 connectors. Dust caps are used to seal the connector interface and provide dust protection when the connector is not in use.

6 Configuration, Installation & Application

Please visit <https://brtsys.com/resources> to access the LDSBus Configuration Utility guide on how to configure the device name, LDSU ID, termination and set the following parameter depending on interface use before using it for your application.

1. Modbus interface: output voltage, baud rate and slave address setting
2. SDI-12 interface slave address setting

6.1 Connection Diagram

LDSBus Modbus / SDI-12 Adapter with Waterproof LDSBus Quad T-Junction setup in LDSBus System

Figure 6 illustrates the connection of the LDSBus Modbus / SDI-12 Adapter interface with Waterproof LDSBus Quad T-Junction in the LDSBus system.

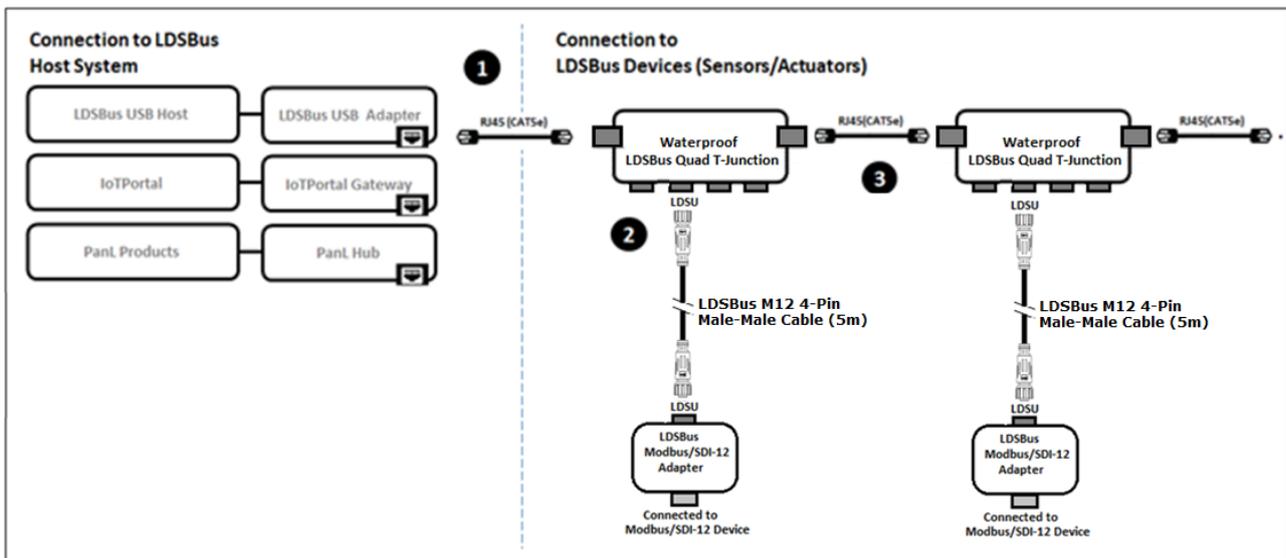


Figure 6 - LDSBus Modbus / SDI-12 Adapter with Waterproof LDSBus Quad T-Junction in LDSBus System

Setup Instructions:

1. Connect the first LDSBus Quad T-Junction to any of the LDSBus Host Systems using the RJ45 (CAT5e) cable.
2. Connect the configured LDSBus Modbus / SDI-12 Adapter to the **Waterproof LDSBus Quad T-Junction** using the **LDSBus M12 4-Pin Male-Male Cable (5m)** as shown in Figure 7.
3. If there is more than one LDSBus Quad T-Junction, chain them together as shown in Figure 6.

Please visit <https://brtsys.com/resources> to view the full application, setup and installation guides.

LDSBus Modbus / SDI-12 Adapter with Standard LDSBus Quad T-Junction setup in LDSBus System

Figure 7 illustrates the connection of the LDSBus Modbus / SDI-12 Adapter interface with Standard LDSBus Quad T-Junction in the LDSBus system.

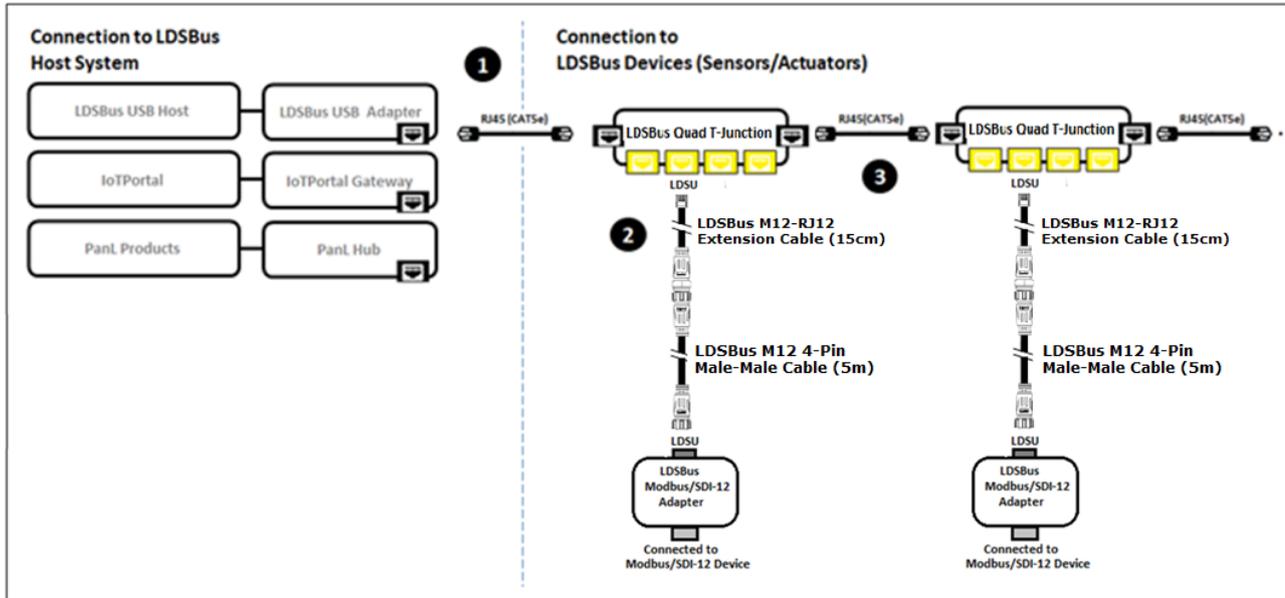


Figure 7 - LDSBus Modbus / SDI-12 Adapter with Standard LDSBus Quad T-Junction in LDSBus System

Setup Instructions:

1. Connect the first LDSBus Quad T-Junction to any of the LDSBus Host Systems using the RJ45 (CAT5e) cable.
2. Connect the configured LDSBus Modbus / SDI-12 Adapter to the **Standard LDSBus Quad T-Junction** using the **LDSBus M12 4-Pin Male-Male Cable (5m)** together with **LDSBus M12-RJ12 Extension Cable (15cm)** as shown in 7.
3. If there is more than one LDSBus Quad T-Junction, chain them together as shown in figure 7.

Please visit <https://brtsys.com/resources> to view the full application, setup and installation guides.

7 Flush Mount

The LDSBus Modbus / SDI-12 Adapter can be flush mounted directly on a wall or any flat surface using 4 M3.5 (thread) screws.



Figure 8 - LDSBus Modbus / SDI-12 Adapter - Flush Mounting

8 Mechanical Dimension

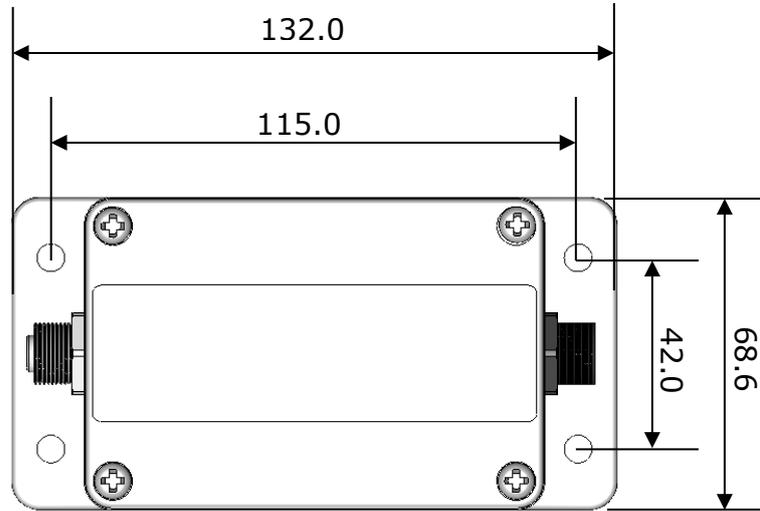


Figure 9 - LDSBus Modbus / SDI-12 Adapter – Top View

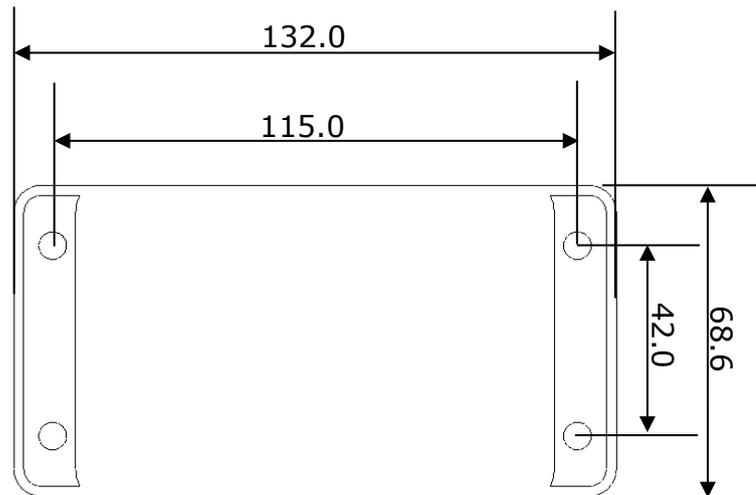


Figure 10 - LDSBus Modbus / SDI-12 Adapter – Bottom View

Note: All dimensions are in millimetres.

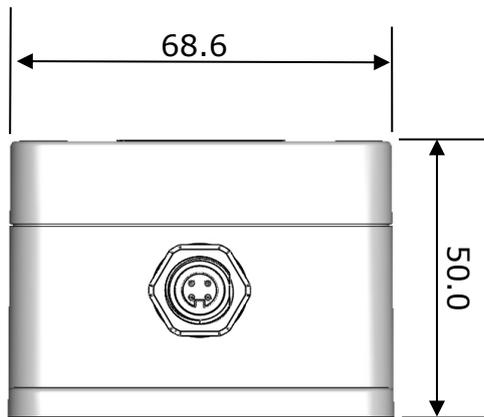


Figure 11 - LDSBus Modbus / SDI-12 Adapter – Side View (LDSU Connector)

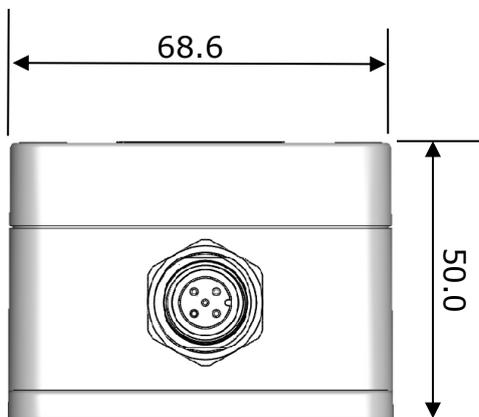


Figure 12 - LDSBus Modbus / SDI-12 Adapter – Side View (Modbus / SDI-12 Connector)

Note: All dimensions are in millimetres.

9 Contact Information

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

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, 1 Tai Seng Avenue, Tower A, #03-01, Singapore 536464. Singapore Registered Company Number: 202220043R.

Appendix A - References

Document References

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

Acronyms and Abbreviations

Terms	Description
DC	Direct Current
Max	Maximum
Typ	Typical
RTU	Remote Terminal Unit
IoT	Internet of Things
Modbus	Serial Communication Protocol
SDI-12	Serial Digital Interface at 1200 baud

Appendix B - List of Figures and Tables

List of Figures

Figure 1 - LDSBus Modbus / SDI-12 Adapter Flush Mount – Hardware Features.....	6
Figure 2 - LDSBus M12 4-Pin Male-Male Cable (5m).....	7
Figure 3 - LDSBus M12-RJ12 Extension Cable (15cm)	7
Figure 4 - LDSU Connector Pinout –Front View	8
Figure 5 - Modbus / SDI-12 Connector Pinout –Front View	8
Figure 6 - LDSBus Modbus / SDI-12 Adapter with Waterproof LDSBus Quad T-Junction in LDSBus System	9
Figure 7 - LDSBus Modbus / SDI-12 Adapter with Standard LDSBus Quad T-Junction in LDSBus System	10
Figure 8 - LDSBus Modbus / SDI-12 Adapter - Flush Mounting	11
Figure 9 - LDSBus Modbus / SDI-12 Adapter – Top View	12
Figure 10 - LDSBus Modbus / SDI-12 Adapter – Bottom View.....	12
Figure 11 - LDSBus Modbus / SDI-12 Adapter – Side View (LDSU Connector)	13
Figure 12 - LDSBus Modbus / SDI-12 Adapter – Side View (Modbus / SDI-12 Connector)	13

List of Tables

Table 1- Part Numbers / Ordering Information	2
Table 2 - LDSBus Modbus / SDI-12 Adapter Specifications	4

Appendix C – Revision History

Document Title: LDSBus Modbus SDI-12 Adapter Datasheet
Document Reference No.: BRTSYS_000120
Clearance No.: BRTSYS#081
Product Page: <https://brtsys.com/ldsbus/>
Document Feedback: [Send Feedback](#)

Revision	Changes	Date
Version 1.0	Initial Release	26-07-2024
Version 1.1	Added LDSBus M12-RJ12 Extension Cable (15cm) in Part Numbers/Ordering Information and specification table and added photo in Hardware Feature. Updated Setup Instructions and figure 6 & 7.	24-10-2024