



## Technical Note

### BRTSYS\_TN\_001

# LDSBus Quad T-Junction Usage

Version 1.1

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This technical note provides essential supplementary information for this product's usage e.g., calculate total rating value per LDSBus.

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## **Table of Contents**

<b>1 Introduction .....</b>	<b>3</b>
<b>2 LDSBus Host &amp; Devices Connection Diagram .....</b>	<b>4</b>
<b>3 Connection Limitation.....</b>	<b>5</b>
<b>3.1 Total Rating Formula.....</b>	<b>6</b>
<b>3.2 Maximum Total Rating Allowed Per LDSBus for PSU Gateway.....</b>	<b>6</b>
<b>3.3 Maximum Total Rating Allowed Per LDSBus for POE Gateway.....</b>	<b>6</b>
<b>3.4 Total Rating Calculation Example (Aquaculture Fish Tank Setup) .....</b>	<b>6</b>
<b>4 Contact Information .....</b>	<b>7</b>
<b>Appendix A – References .....</b>	<b>8</b>
<b>Document / Web References .....</b>	<b>8</b>
<b>Acronyms and Abbreviations.....</b>	<b>8</b>
<b>Appendix B – List of Tables &amp; Figures .....</b>	<b>9</b>
<b>List of Tables.....</b>	<b>9</b>
<b>List of Figures .....</b>	<b>9</b>
<b>Appendix C – Revision History .....</b>	<b>10</b>

## **1 Introduction**

The LDSBus Quad T-Junctions are used to connect LDSBus Devices (sensors /actuators) to the LDSBus. They serve as a data and power interface between the LDSBus host and the LDSBus devices.

This technical note describes how to calculate the Total Rating Value (refer to Table 1) per LDSBus to ensure it is within the maximum value.

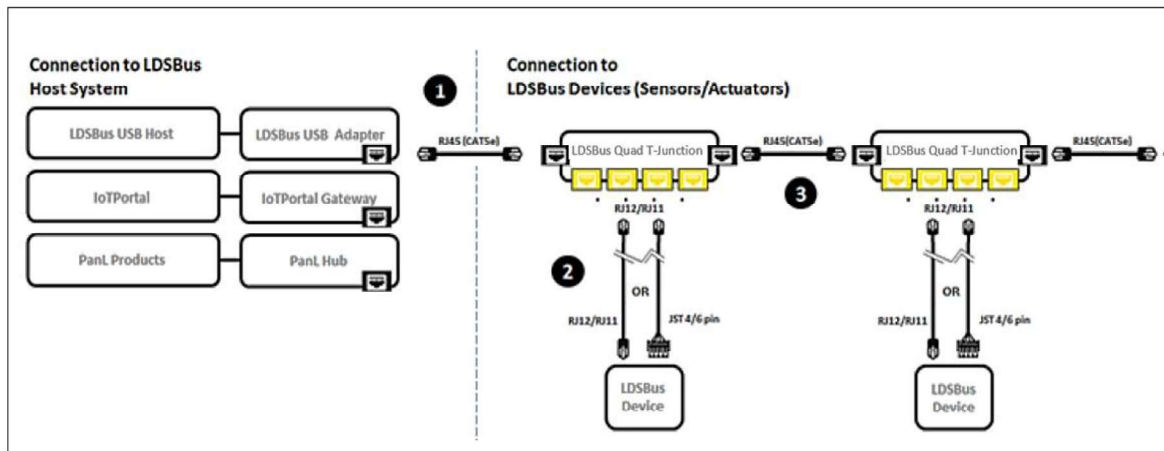
## 2 LDSBus Host & Devices Connection Diagram

Figure 1 shows how the LDSBus Quad T-Junction (LDSBus Device) is used to connect LDSBus devices to the LDSBus system. Depending on the LDSBus host system being used, the LDSBus host could be an LDSBus USB Adapter, an IoTPortal gateway or a PanL Hub.

### Setup Instructions:

- ❶ Connect the first LDSBus Quad T-Junction to any of the LDSBus Host Systems using an RJ45 (CAT5e) cable.
- ❷ Connect the configured LDSBus Device(s) to the LDSBus Quad T-Junction.
- ❸ If there is more than one LDSBus Quad T-Junction, daisy-chain them together.

Appendix A – References provides the reference links to view the full application, setup and installation guides.



**Figure 1 – Using LDSBus Quad T-Junctions in LDSBus System**

### 3 Connection Limitation

Each LDSBus Quad T-Junction caters for a maximum of four LDSBus Devices.

As shown in Figure 1, multiple LDSBus Quad T-Junctions may be daisy-chained to add more LDSBus devices to a single bus.

The following table provides the Rating Values of LDSBus devices (sensors and actuators).

No.	Part No	LDSBus Device	Device's Rating Value
1	LC060101A	LDSBus Isolated IO Controller	35
2	LS120101A	LDSBus ORP Sensor Adapter	30
3	LS040101A	LDSBus pH Sensor Adapter	24
4	LC011101A	LDSBus 2CH Relay	10
	LC010101A	LDSBus 2CH Relay + iSense	10
5	LC050101A	LDSBus RFID Reader	10
6	LC020101A/ LC021101A	LDSBus IR Blaster – Flush / Swivel	10
7	LC030101A	LDSBus Trailing Edge Light Dimmer	10
8	LS130101A	LDSBus Salinity Sensor Adapter	10
9	LS050101A	LDSBus Electrical Conductivity (EC) Sensor Adapter	10
10	LS100101A	LDSBus Dissolved Oxygen Sensor Adapter	3
11	LS030101A	LDSBus Thermocouple Sensor Adapter	2
12	LS010101A/ LS011101A	LDSBus 4in1 Sensor - Flush / Swivel	2
13	LS110101A / LS111101A	LDSBus CO2 Sensor, Temp & Humidity Sensor & Ambient Light Sensor (ALS) – Flush / Swivel	2
14	LS110201A / LS111201A	LDSBus CO2 Sensor Pro, Temp & Humidity Sensor & ALS Sensor – Flush / Swivel	2
15	LC010201A	LDSBus 4CH Solid State Relay	10
16	LA140101A	LDSBus Modbus/SDI-12 Adapter	10
17	LS020301A/ LS021301A	LDSBus Gas and TrueVOC Sensor – Flush/Swivel	5
18	LS020401A/ LS021401A	LDSBus Air Quality Sensor – Flush/Swivel	5

**Table 1 - Rating Values of LDSBus Devices**

It is necessary to ensure that the Total Rating Value of any set of LDSBus devices connected in a single LDSBus port falls within the maximum limit of less than score 100 for IoTPortal Gateway (PSU version) and less than score 90 for IoTPortal Gateway (POE version) before connecting them.

### 3.1 Total Rating Formula

Each LDSBus port's Total Rating Value is calculated by adding all its sensors and actuator's rating values together.

### 3.2 Maximum Total Rating Allowed Per LDSBus for PSU Gateway

The maximum Total Rating Value allowed per LDSBus port is less than score 100.

### 3.3 Maximum Total Rating Allowed Per LDSBus for POE Gateway

The maximum Total Rating Value allowed per LDSBus port is less than score 90.

### 3.4 Total Rating Calculation Example (Aquaculture Fish Tank Setup)

Consider an aquaculture fish tank setup that requires LDSBus Thermocouple sensors, LDSBus pH sensors, LDSBus EC sensors, LDSBus Dissolved Oxygen (DO) sensors and LDSBus ORP Sensors. Additionally, LDSBus Isolated IO Controllers with water level sensor and LDSBus 2CH Relay as actuators are required.

To determine if all these devices may be connected on the single LDSBus, first calculate their Total Rating Value as follows:

Thermocouple (2) + pH Sensor (24) + EC Sensor (10) + DO Sensor (3) + ORP Sensor (30) + IO Controller (35) + Relay (10)

Total Rating Value is  $2+24+10+3+30+35+10= 114$  Units.

The Total Rating Value, however, exceeds the maximum limit of 100 Units. Avoiding to this issue; the sensors and actuators should be redistributed into two separated LDSBus Ports from the IoTPortal Gateway in the following manner:

#### **LDSBus1:**

Thermocouple (2) + pH Sensor (24) + EC Sensor (10) + DO Sensor (3) + ORP Sensor (30).  
Bus1 Total Rating Value is  $2+24+10+3+30= 69$  Units

#### **LDSBus2:**

IO Controller (35) + Relay (10).  
Bus2 Total Rating Value is  $35+10= 45$  Units

By doing so, the two LDSBus Total Rating Values are within the acceptable limit of less than score 100 per bus for PSU version Gateway and less than score 90 per bus for POE version Gateway.

## 4 Contact Information

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

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## Appendix A – References

### Document / Web References

<https://brtsys.com/resources/>

Please scroll through this webpage to:

- Refer to LDSBus Configuration Utility Guide
- Refer to LDSBus Quad T-Junction Datasheet
- Refer to LDSBus Quad T-Junction Quick Start Guide
- Refer to LDSBus Python SDK Guide

<https://brtsys.com/ldsbus/software/>

Please scroll through this webpage to:

- Refer to LDSBus Configuration Utility

### Acronyms and Abbreviations

Terms	Description
LDSBus	Long Distance Sensor Bus



## **Appendix B – List of Tables & Figures**

### **List of Tables**

Table 1 - Rating Values of LDSBus Devices..... 5

### **List of Figures**

Figure 1 – Using LDSBus Quad T-Junctions in LDSBus System ..... 4

## Appendix C – Revision History

Document Title: BRTSYS\_TN\_001 LDSBus Quad T-Junction Usage  
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Product Page: <https://brtsys.com/ldsbus/product/quad-t-junction/>  
Document Feedback: [Send Feedback](#)

Revision	Changes	Date
1.0	Initial Release	08-01-2024
1.1	Added POE Gateway rating information Added 4 new LDSBus Devices Rating	02-08-2024