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ARINC 429 Transmit and Receive Bus Multiplexing

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Revision History

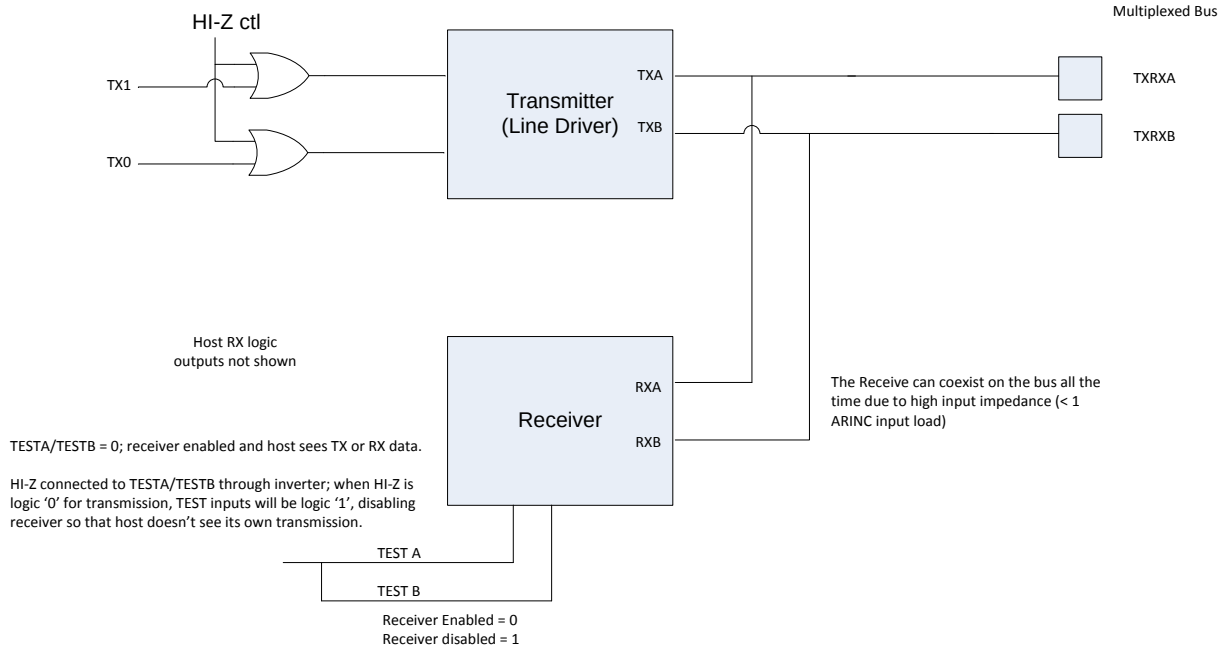
Revision	Date	Description of Change
AN-167_New	01/28/20	Initial Release

Introduction

Instrumentation test platforms can benefit from multiplexing transmitter outputs with Receiver inputs on a single bus. A control signal or board jumper can be used to select whether the bus pair acts as a receiver or transmitter channel. This technical note describes how to accomplish this.

Solution

Connect both transmit bus pins to the receiver bus pins as shown. The line-driver needs Hi-Z ability in order to do this. Holt's HI-8596, HI-8597 and HI-8503/8504/8505/8506/8507 line drivers all have this capability. The host sets the Hi-Z control signal high to disable the transmitter when the host wants to receive data from an external transmitter on the bus. In Holt products, when both TX1 and TX0 are high, the line driver configures the outputs into a Hi-Z state (see relevant data sheet).



In addition, the TESTA and TESTB receiver pins may be connected to the Hi-Z control signal through an inverter to prevent the host from seeing its own transmission. The TEST pins can optionally be connected to ground and the host can just ignore the transmitted message appearing on the receiver.

Suitable Holt ARINC 429 Transmitters and Receivers

Holt has a variety of receiver and transmitter (line-driver) IC's to choose from. The HI-8597 includes built-in DO-160G Level 3 lightning protection and the HI-85XX family features HI-Z on the outputs when power is removed. The HI-8596 is similar to the HI-8597 except without built-in Level 3 lightning protection.

Summary

This Application Note shows how to multiplex ARINC 429 transmitter and receiver signals onto a single bus pair.