

SpaceWire Transmission Stall for the UT200SpW4RTR Router

Table 1: Cross Reference of Applicable Products

Product Name:	Manufacturer Part Number	SMD #	Device Type	Internal PIC*
4-PORT SPACEWIRE ROUTER	UT200SpW4RTR	5962-08244	All	WD41B

*PIC = Product Identification Code

1.0 Overview

When the UT200SpW4RTR interfaces to a small receive buffer (e.g. 16Bytes or fewer) a credit count handling problem may occur and cause data transmission to stall.

2.0 Description

An anomaly exists within the 4-Port SpaceWire (SpW) router that causes transmission of N-Char's (as described in ECSS-E-ST-50-12C) to stall when a flow control token is processed on the same cycle that the internal credit count transitions to zero.

The erroneous behavior occurs when the internal credit count logic, which controls the transmit logic of the UT200SpW4RTR, is prevented from sending N-Chars due to improper credit count handling. If the credit count is transitioning to zero, and a flow control token (FCT) is received and processed on that same clock cycle, the UT200SpW4RTR still suspends transmission. However, the credit count is updated properly. The device resumes data transmission when it receives a second FCT and the credit count correctly stands at 16 N-Chars.

3.0 Impact

Transmissions stall until a second FCT is received. Some users may experience a delay in receiving a complete packet. The smaller the receive buffer (contained in the SpW link to which the UT200SpW4RTR connects), the higher the frequency of the anomaly.

4.0 Corrective Action

The condition is only encountered when the credit count is about to transition to zero. Keeping the credit count above zero, and using larger receive buffers capable of supporting a minimum of two outstanding FCTs (FIFO size greater than 16 bytes), prevents the anomaly.