PROBLEM ADVISORY

CAES

1. TITLE **SpaceWire Transmission Stall for the UT200SpW4RTR Router**	**2. DOCUMENT NUMBER** SPO-2013-PA-0004
	3. DATE *(Year, Month, Date)* 2013, SEPT, 23

4. MANUFACTURER NAME AND ADDRESS CAES 4350 CENTENNIAL BOULEVARD COLORADO SPRINGS, COLORADO 80907	**5. MANUFACTURER POINT OF CONTACT NAME** Jennifer Larsen
	6. MANUFACTURER POINT OF CONTACT TELEPHONE (719)594-8000
	7. MANUFACTURER POINT OF CONTACT EMAIL Larsen@cobhamaes.com

8. CAGE CODE 65342	9. LDC START ALL	10. LDC END ALL	11. PRODUCT IDENTIFICATION CODE WD41A	12. BASE PART UT200SpW4RTR
13. BLANK			**14. SMD NUMBER** 5962-08244	**15. DEVICE TYPE DESIGNATOR** ALL
			16. RHA LEVELS ALL	**17. QML LEVEL** ALL
			18. NON QML LEVEL PROTO and HIREL	**19. BLANK**

20. PROBLEM DESCRIPTION / DISCUSSION / EFFECT

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

Please see the CAES Errata for a complete discussion of this problem.

For the reader's convenience, this problem advisory includes an appended version of the errata that is in effect at the release date of this document.

Affected Part Numbers	
UT200SpW4RTR-ZPC	5962R0824401QXC
UT200SpW4RTR-ZEC	5962R0824401VXC
UT200SpW4RTR-SPA	5962R0824401QYA
UT200SpW4RTR-SEA	5962R0824401VYA
UT200SpW4RTR-CPA	
UT200SpW4RTR-CEA	

21. ACTION TAKEN / PLANNED

Ensure the receivers' buffer is >16 bytes and can credit a minimum of two outstanding Flow Control Tokens.

22. DISPOSITIONARY RECOMMENDATION:	CHECK & ☐ USE AS IS	CONTACT ☐ MANUFACTURER	REMOVE & ☐ REPLACE	CORRECT & ☒ USE AS SPECIFIED
23. ADEPT REPRESENTATIVE **Timothy L. Meade**	**24. SIGNATURE** *Timothy L Meade*			**25. DATE** **23 September 2013**

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.

Release Date: 08/01/13   Page 1 of 1   Modification Date: 09/02/13