iQUBE^2® and 920i Fiber-Optic RX/TX Option
Restoring Fiber-Optic Connection

Products: iQUBE^2 Fiber-Optic Option (PN 77143) and 920i Fiber-Optic Option (PN 77788)

Issue: No communication over fiber-optic connection

Cause: Oversaturation of receiver

Solution: Pull fiber-optic slightly away from transmitter/receiver connection or lower baud rate

Manuals are available from Rice Lake Weighing Systems at **www.ricelake.com/manuals**

Warranty information is available at **www.ricelake.com/warranties**

WARNING: *Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death. Includes hazards that are exposed when guards are removed.*

CAUTION: *Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury.*

Oversaturation

iQUBE^2 and 920i Fiber-Optic Option Board receivers were updated from an IF-D96F to a more sensitive IF-D95OC. This change increases the maximum transmission distance. Further testing shows this combination of components and drive strengths can cause the receiver to become oversaturated. No communication over the fiber-optic occurs when supersaturation is present. This issue is typically seen in applications where baud rates exceed 57600 and/or plastic fiber distances shorter than 100 ft are used.

Multiple fiber-optic part components are used in Rice Lake Weighing Systems designs, each with unique optical properties such as intensity and minimum light required to trigger. Oversaturation usually occurs when the highest intensity transmitter IF-E93 is paired with the highest sensitivity receiver IF-D95OC.

In short plastic fiber distances, the transmitter produces a high intensity light pulse. This causes the detector to remain in an active state after the light pulse has ended.

Also, baud rates exceeding 57600 can cause issues by tightening UART timing constraints while lower plastic fiber length decreases optical loss inside the fiber. Decreased optical loss increases intensity into the receiver which consequently increases the transmission delay (see Figure 1).
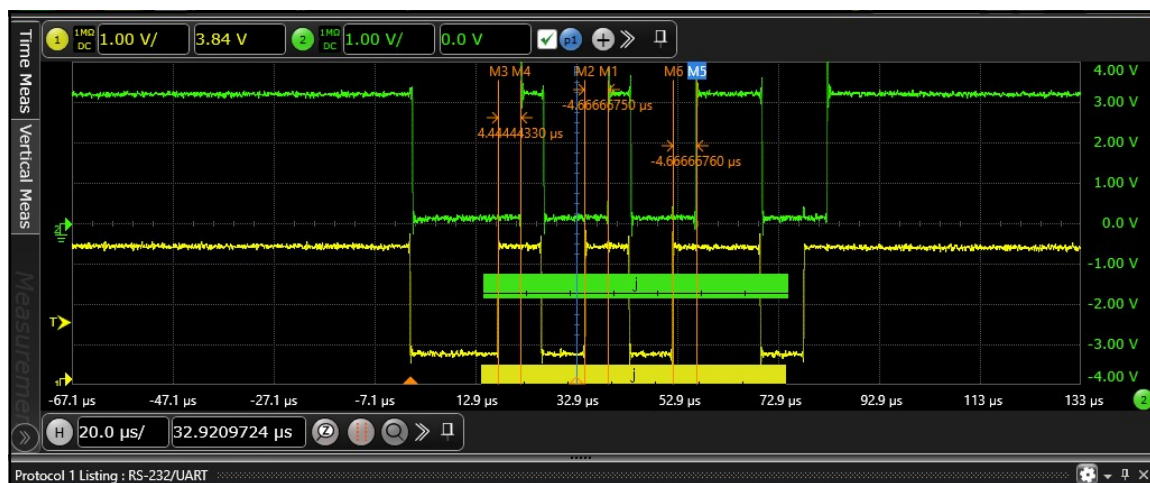

Figure 1. UART Timing Constraints at 115200 Baud

Solutions

⚠️ *WARNING: Before attempting the following procedures, ensure that power cables are disconnected from all power sources. Do NOT handle the RX/TX Option Boards without using an anti-static mat and wrist strap.*

⚠️ *CAUTION: Use care not to break or damage Fiber-Optic cables when handling.*

Reduce Baud Rate

1. Reduce the baud rate from 115200 to 57600 or lower while leaving the fiber fully seated (see Section 4.1.3 in the 106113 iQUBE[2] Installation Manual or Section 4.7.5 in the 67887 920i Technical Manual for how to configure baud rate).
2. Test if communication has been restored.

Loosen and Pull Fiber Away from Connector

1. Turn the blue screw cap counter-clockwise to loosen.
2. Pull the fiber 1/16 inch away from the IF-E93 transmitter.

📝 *NOTE: This introduces an air gap between the fiber surface and the transmitter, reducing the optical power within detector tolerances.*

3. Test if communication has been restored.
4. Repeat Steps 2 to 3 until fiber communication is successful (the average working distance is 3/16 in, but results will vary).

If communication fails:

1. Turn the black screw cap counter-clockwise to loosen.
2. Pull the fiber 1/16 inch away from the IF-D95OC receiver.
3. Test if communication has been restored.
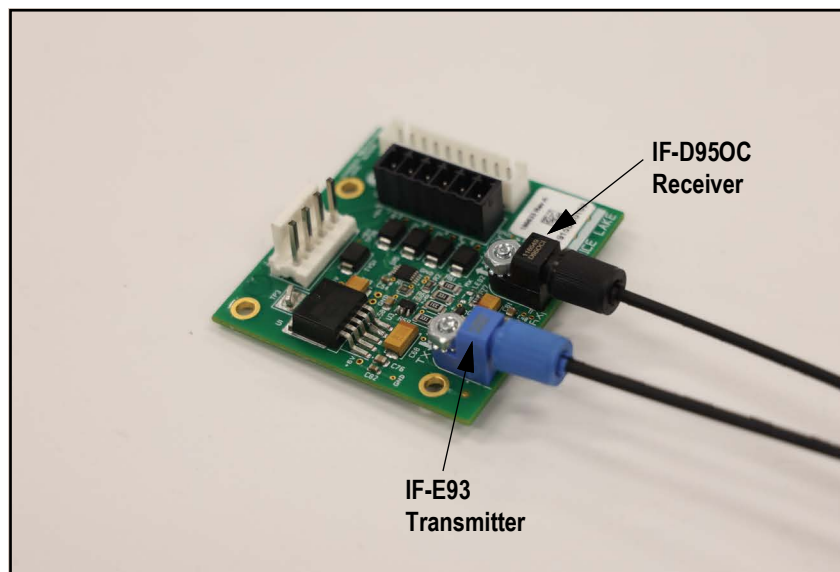4. Repeat Steps 2 to 3 until fiber communication is successful.

Figure 2. RX/TX Fiber-Optic Option Board

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