Field Test Procedure

Model DX-7001

Tools required;
Digital Volt Meter
9-Volt Battery (used to simulate a data bit)
Two Electrical jumper leads (to connect battery to data connector)
Fiber optic jumper multi mode, if –1 or –3 unit
Fiber optic jumper single mode, if –7 or –9 unit

Set the dip switch

1. Set the DX-7001 to be tested to the RS-232 mode by setting the DIP switch as follows:
   Positions 2 and 6 ON
   All other positions OFF

Apply & check Power

2. Connect operating power (+12 to +15 VDC) to the DX-7001 to be tested. Connect the positive (+) power lead to the **Pwr** connector terminal position 2 and the negative (–) power lead to terminal position 1. Do not make any connection to terminal position 3. Verify that only the **Pwr** indicator lights. If it does not, check voltage input with a meter.

Check the no data transmitting state

3. Connect a digital voltmeter with the positive (+) lead to terminal 4 of data connector. Connect the negative (–) lead to terminal 3 of the data connector. Verify that the DVM measurement is between -7 and -9 Volts DC.
4. Connect 9 volt battery with the positive (+) to terminals 1 and 3 with the + of the battery going to terminal 3 and the - of the battery going to terminal 1. Verify that the DVM still indicates -7 to -9 volts DC and only the **Pwr** indicator lights.

Check the data transmitting state

5. Reverse the polarity of the 9 volt battery so that the positive (+) of the battery now goes to terminal 1 and the negative (-) of the battery now goes to terminal 3 of the data connector. Verify that the **Td** indicator lights and the DVM still indicates between -7 to -9 volts.
6. Remove the positive (+) lead of the 9 volt battery. Verify that the **Td** indicator goes off but the DVM reading does not change still reads between -7 to –9 volts.

Fiber Loop-back test

7. Connect a fiber optic jumper from the **Td** Optical port of the unit being tested to the **Rd** optical port. If the unit is a multi-mode fiber unit be certain that multi-mode fiber is used. If the unit is a single-mode unit be certain that single-mode fiber is used. Verify that the DVM still reads between -7 to -9 volts and that only the **Pwr** indicator lights.
8. Reverse the polarity of the 9 volt battery so that the + of the battery now goes to terminal 1 and the - of the battery now goes to terminal 3. Verify that the **Td** indicator lights, the **Rd** indicator lights and that the DVM now reads between +7 to +9 volts.

If all of the above tests are completed as indicated the RS-232 mode operation of the DX-7001 being tested appears to be operating correctly.

The most common problems;

Improper Electrical connections
Improper dip switch settings
Crossed fiber connections (eg transmit optic to transmit optic)
Missed matched fiber type. (eg using single mode fiber on a multi-mode unit)

Understanding DTE / DCE;

In RS-232 transmission systems, particularly those employing 25 pin D type connectors, the wiring of the connectors can conform to one of two equipment types. The DCE (Data Communications Equipment) type specifies that pin 2 of the DB-25 connector is the signal to be transmitted and pin 3 is the signal being received. The DTE(Data Terminal Equipment) type reverses these connections with pin 3 of the DB-25 connector being the signal to be transmitted and pin 2 being the signal being received. Pin 7 is always the common between the transmitted and received signal in both versions.

With the DX-7101 fiber optic transmission system set in RS-232 mode, the data terminal block connector is as follows;

Pin 1 should be connected to the signal to be transmitted onto the fiber optic cable.
Pin 4 will then be the signal being received from the fiber optic cable.
Pin 3 signal ground common to both transmit and receive.

It should be noted that either side of the fiber optic link could be set to the same or different protocols depending on the requirements of the external equipment being employed.