Field Test Procedure

Model DX-7101

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-7101 to be tested to the DCE RS-232 mode by setting the DIP switch as follows:
   Positions 2, 3, 4, 5, 6, 7 and 8 OFF
   Positions 1, 9 and 10 ON

Apply & check Power

2. Connect operating power (+12 to +15 VDC or AC) to the DX-7101 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 digital voltmeter.

Check the no data transmitting state

3. Connect a digital voltmeter with the positive (+) lead to pin 3 of the 25 pin data connector. Connect the negative (–) lead to pin 7 of the data connector. Verify that the DVM measurement is between -7 and -9 Volts DC.
4. Connect 9 volt battery to pins 2 and 7 of the 25 pin data connector with the (+) of the battery going to pin 7 and the (-) of the battery going to pin 2. Verify that the DVM still indicates -7 to -9 volts DC and that only the **Pwr** indicator lights.

Check the data transmitting state

5. Reverse the polarity of the 9 volt battery so that the positive terminal (+) of the battery now goes to pin 2 and the negative terminal (-) of the battery now goes to pin 7 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. Reconnect the 9 volt battery so that the (+) terminal of the battery goes to pin 2 and the (-) of the battery goes to pin 7. 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, then the RS-232 mode operation of the DX-7101 being tested is operating correctly. Before installing back in to your system you may have to adjust the dip switch settings according to your installation.

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.

The Liteway DX-7101 RS-232 fiber optic transmission system allows the end user to select either protocol. When set to the DCE mode, pin 2 should be connected to the signal to be transmitted onto the fiber optic cable. Pin 3 will then be the signal being received from the fiber optic cable. If the unit is set to the DTE mode then pin 3 should be connected to the signal to be transmitted onto the fiber optic cable and pin 2 will then be the signal being received from the fiber optic cable. Pin 7 will be the common in both cases.

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.