

**HUGHES NETWORK SYSTEMS**

**FIELD SERVICE BULLETIN**

<b>SUBJECT:</b> Measuring IFL Cable DC Loop Resistance on HNS Broadband / DirecWay systems.	<b>FSB NUMBER:</b> 051019_01A
<b>SUBMITTED BY:</b> D. Ricker / T. Jackson	<b>FSB ISSUE DATE:</b> 05/27/05  <b>APPROVED BY:</b> D. Dostalík

**CHANGE TO BE IMPLEMENTED BY:**  
 AUTHORIZED HUGHES REPRESENTATIVE  CUSTOMER

**DOCUMENTATION AFFECTED:** HNS Satellite Installation Guides , Training Documentation and Web Sites

**CATEGORY:**  
 HARDWARE  FIRMWARE  SOFTWARE  OTHER

**EFFECTIVE DATE:**  
**IMPLEMENT:**  IMMEDIATELY  
 NEXT SERVICE CALL  
 OTHER

**COMMENTS:**

- High DC loop resistance (combined resistance of the center conductor and shield) on the IFL cable may exhibit itself as poor or intermittent transmit and receive performance in the satellite system.
- Disconnecting and reconnecting the IFL connectors during the replacement of an ODU or IDU may mask the problem and allow the system to resume operation in a degraded performance mode.
- **New Installs** –At the time of installation, measure the IFL cable DC loop resistance to ensure that it does not exceed the limits in Table 1. If the DC loop resistance is greater than the limits in Table 1 you must locate and correct the problem before proceeding with the installation.
- **Service Calls** –**Before replacing the ODU (Outdoor Unit / Radio) or IDU (Indoor Unit) at any DIRECWAY site:**
  1. Inspect each IFL connector for any evidence of corrosion. If any corrosion is found, replace all IFL connectors with compression type connectors from the approved list in **HNS Field Service Bulletin 050518\_01C – HNS Broadband requirements for RG-6 and RG-11 IFL cable connectors, Ground Blocks and Ground Block location.** and weatherproof them with dielectric grease and silicone tape.
  2. Measure the IFL cable DC loop resistance. If the DC loop resistance is greater than that specified in Table 1, the IFL cable, ground block or connectors are suspect and the problem must be corrected before replacing the ODU or IDU.

**REMOVED MATERIAL DISPOSITION**

<b>SHIP TO</b>	N/A
<b>ATTENTION</b>	N/A
<b>COMMENTS</b>	N/A

**BACKGROUND:**

This FSB describes the method for measuring DC loop resistance on HNS Broadband (DirecWay) IFL cable. This procedure will allow you to determine if there are deficiencies in the IFL cable such as shorts, opens, corrosion in the connectors thru the cable run, or if the cable run is too long for that type of cable.

**MATERIALS REQUIRED:**

- Digital or analog meter capable of measuring resistance in one tenth (0.1) ohm increments.
- Alligator clip or other device to create a short at one cable end.

**HOW TO MEASURE DC LOOP RESISTANCE:**

**Caution: Make sure the IDU power is off so there is no voltage on the IFL cable before making resistance measurements.**

1. Label and disconnect the TX, and RX IFL cables from the IDU (Indoor Unit).
2. Label and disconnect the TX, and RX IFL cables from the ODU (Outdoor Unit / Radio).
3. Inspect each IFL connector for any evidence of corrosion. If any corrosion is found, replace all IFL connectors with compression type connectors from the approved list in **HNS Field Service Bulletin 050518\_01C – HNS Broadband requirements for RG-6 and RG-11 IFL cable connectors, Ground Blocks and Ground Block location.**
4. When reconnecting any outdoor IFL Connector, fill it with Dielectric grease and seal the finished connection with weatherproof tape from the approved list in **HNS Field Service Bulletin 050518\_01C.**

**MEASURING OPEN LOOP RESISTANCE:**

1. If you are using an analog meter, **set the ohm meter to the R100 scale**, short the meter leads together and zero out the meter.
2. With the IFL cable disconnected from the IDU and ODU, and without any shorting clips installed, measure the open loop resistance between the center conductor and connector barrel of each cable. Record the result. The cable should read open and resistance should be infinite ( $\infty$ ) ohms.

**Note:** If the open loop resistance measures anything less than infinite ( $\infty$ ) ohms, the IFL cable run or a connector may be damaged and is developing a short. This will cause RF signal failure through the cable. Isolate the failure and determine if repair / replacement of the cable or a connector is required.

**MEASURING CLOSED (SHORTED) LOOP RESISTANCE:**

1. **At the IDU**, use Alligator clips to short the center conductor of each IFL cable to the barrel of the connector.
2. If you are using an analog meter, **set the ohm meter to the R1 scale**, short the meter leads together and zero out the meter.
3. **At the ODU**, measure the closed (shorted) loop resistance of the center conductor to the barrel of the connector. Record the result.

**Closed loop resistance of either cable should not exceed the resistance shown in this Table**

<b>TABLE 1 Acceptable Maximum Resistance by ODU Type</b>		
<b>6. 0 Ohm (1 Watt DirecWay ODUs)</b>	<b>5.0 Ohm (2 Watt DirecWay ODUs)</b>	<b>3.5 Ohm (2 Watt ODU)</b>
1029514-xxxx Chinnon	1033505-xxxx Pure Isis	1028350-xxxx Tigris KU Band
1032009-xxxx Pure Isis	1035817-xxxx Pure Orisis	1028050-xxxx Tigris C-Band
1035007-xxxx Pure Osris	1033506-xxxx Isis TG2	1034468-xxxx MTI C Band
1032552-xxxx Isis TG2	1035818-xxxx Orisis TG2	1035636-xxxx ST202 KA Band
1035008-xxxx Osiris TG2		
1025901-xxxx Tigris, .5 or 1.0 W series		

- If both measurements are good (open resistance =  $\infty$  ohms, and DC closed (shorted) loop resistance is less than the maximum acceptable resistance shown in Table1), then the cables are ok.
- If the measured DC closed (shorted) loop resistance is greater than the value shown in Table1, it is possible the cable is damaged, the ground block is corroded, or the IFL cable run is too long for the cable that was used. Isolate the failure and repair or replace the cable / connector, ground block as required.
- During fault isolation, the cable can be broken at any existing connection point, (ground blocks, splices etc.) Test intermediate runs of the cable using the procedure above to isolate the failure point.

**Note:** Outdoor splices are not allowed per HNS FSB 050518\_01C HNS Broadband requirements for RG-6 and RG-11 IFL cable connectors, Ground Blocks and Ground Block location