

SlimChip™ Embedded IPC6071

HSPA MID Module

2G/3G with High-Performance HSDPA/HSUPA

User Manual

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Revision History

Revision	Description of Changes	Date
V 11	Initial revision	09.24.09

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications could void the user's authority to operate the equipment

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1 Introduction

1.1 Getting Started

This manual provides instructions for using and testing the IPC6071 Mobile Internet Device (MID) HSPA module using the Debug Card to access its communications ports. It describes the features and interfaces of the MID module and Debug card, and provides step by step instructions for setting up the hardware, installing the application software, and for using the MID module's communication features and debug tools.

This user manual will allow you to become familiar with the features and operation of the IPC6071 MID module and to start working with it quickly and effectively.

1.2 IPC6071 MID / Debug Test Setup Block Diagram

Figure 1-1 is a high-level block diagram showing the IPC6071 MID HSPA module integrated components and debug wings. It illustrates the MID module is connections to the debug card, external power supply, and antenna for the purpose of testing.

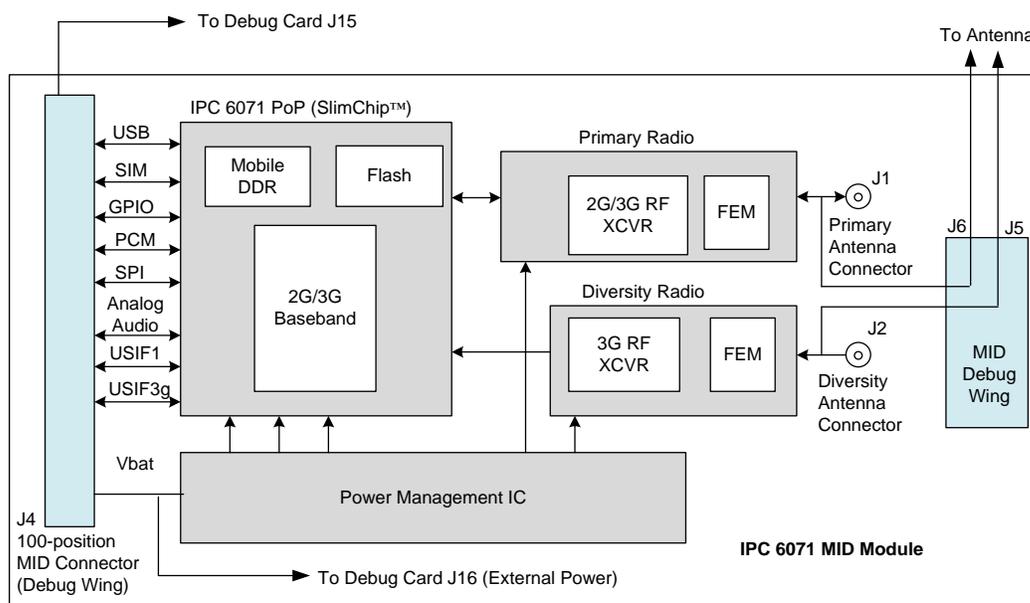


Figure 1-1. IPC6071 MID Module (With Debug Wings) Block Diagram

2 Overview

2.1 MID Module

The IPC6071 Mobile Internet Device (MID) HSPA module is built on the InterDigital® IPC6071 SlimChip™ platform that features a 2G/3G dual mode modem with High-Speed Downlink Packet Access (HSDPA) and High-Speed Uplink Packet Access (HSUPA) capabilities. The IPC6071 platform comprises a complete GSM/GPRS/EDGE and WCDMA/HSDPA/HSUPA modem solution.

The IPC6071 MID module modem design is a compact wireless module that utilizes UMTS, GSM and GPRS. The small size of the MID module allows it to be integrated easily into the mobile device.

2.1.1 MID Module Key Features

Table 2-1 summarizes the main features of the IPC6071 MID HSPA module.

Table 2-1. MID Module Key Features

		IPC6071 MID HSPA Module	
Interface	Physical interfaces	100 position	
		100 position (on debug wing)	
	Data Interface	SPI or FS USB 2.0	
	Audio Interface	PCM or Analog Audio	
	Voice Codecs	Full-rate (FR), enhanced full rate (EFR), half rate (HR), adaptive multi-rate (AMR)	
	Antenna Interfaces	Ultra Miniature Coaxial Interconnect (MCD) SMA Coaxial Connectors (on debug wing)	
	Command protocol	AT command set	
	Universal Subscriber Identification Module (USIM) interface	Compatible with off-board, 1.8/3 V Mini Subscriber Identity Module (SIM)	
Power	Voltage	3.0 V to 4.2 V	
	Peak Current at 3.3 V	100us period: 2750 mA; 1s period: 1100 mA	
Radio Features	Frequency Bands	Main Antenna	Diversity Antenna
		GSM850: 824-894 MHz GSM900: 880-960 MHz DCS1800: 1710-1880 MHz PCS1900: 1850-1990 MHz UMTS I: 1920-2170 MHz UMTS II: 1850-1990 MHz UMTS V: 824-894 MHz	UMTS I: 1920-2170 MHz UMTS II: 1850-1990 MHz UMTS V: 824-894 MHz

2.1.2 MID Module Feature Summary

Table 2-2 summarizes the features of the IPC6071 MID HSPA module.

Table 2-2. Feature Summary

Feature	MID Module
Multi-band Options:	<ul style="list-style-type: none"> • IMM6071- M01: GSM850 / GSM1900 / UMTS I with Receive Diversity • IMM6071- M02: GSM850 / GSM1900 / UMTS I w/o Receive Diversity • IMM6071- M03: UMTS I with Receive Diversity • IMM6071- M04: UMTS I without Receive Diversity
HSUPA / HSDPA / UMTS	<ul style="list-style-type: none"> • Power Class 3 (+24 dBm) • HSUPA mode: up to 2 Mbps: category 5 • HSDPA modes: <ul style="list-style-type: none"> ○ HSDPA 1.8: Categories 1-4, 11 and 12 ○ HSDPA 3.6: Categories 5 and 6 ○ HSDPA 7.2: Category 7 and 8 • Capable of Simultaneous Equalization and Rx Diversity • UMTS: 384 Kbps operation in downlink, 384 Kbps in uplink • Support UL and DL Compressed Modes • Circuit-switched data: 64, 14.4 and 9.6 Kbps
EDGE /GPRS / GSM	<ul style="list-style-type: none"> • GSM Power Class 4 (2W) for GSM850 / GSM900 bands • Power Class 1 (1W) for GSM1800 / GSM1900 bands • EDGE class E2 (+27 dBm in GSM850 / GSM900 bands, +26 dBm in DCS1800 / PCS1900 bands) • GPRS / EDGE Multi-slot Class 12 (4 slots Rx, 4 slots Tx) • GPRS / EDGE Class A Type 2 MT • GPRS CS1-CS4; EDGE MCS1-MCS9 • Circuit-switched data: 9.6 Kbps
Terminal Equipment Interfaces	<ul style="list-style-type: none"> • USB 2.0 FS • AT interface with standard modem emulation • Extended AT command set • NDIS and modem interface drivers • Multiple PDP contexts supported (3) • Modem interface to allow 3rd party application support • EAP-SIM / EAP-AKA support
Environmental	<ul style="list-style-type: none"> • Operating Ambient Temperature range: -25°C to +65°C • Storage Temperature: -55°C to +125°C • Humidity: 5 to 95% non-condensing
Approvals and Certifications	<ul style="list-style-type: none"> • GCF Certified • Vendor IOT / Operator IOT • Microsoft Windows WHQL • CE mark • FCC • ROHS
Operating Systems Supported	Linux, Windows Mobile 6.1, Android
Physical Dimensions	35 mm x 24 mm x 5 mm (max height with shield)

2.1.3 MID Module Connectors

The IPC6071 MID HSPA module debug wing connector J4 is located on the MID primary side as shown in Figure 2-1. The main interface connector J7 is located on the secondary side (Figure 2-2).

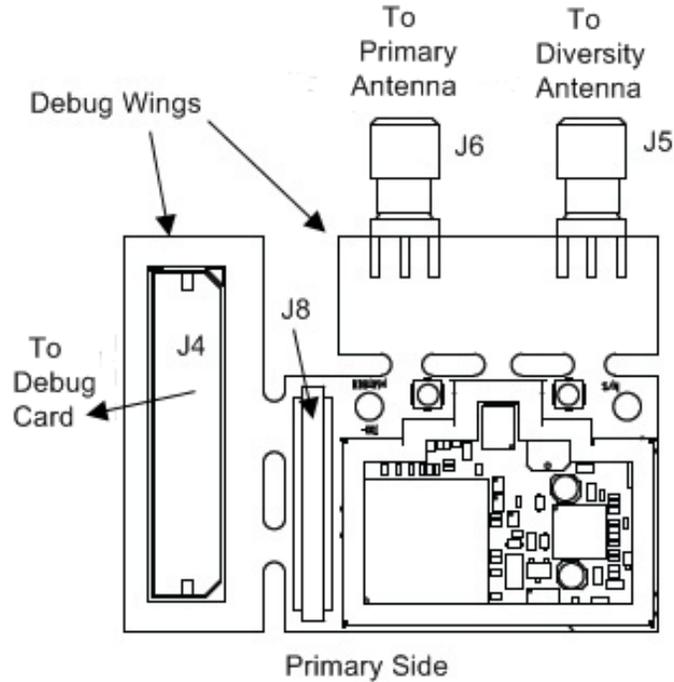


Figure 2-1. IPC6071 MID HSPA Module Primary Side (with Debug Wings)

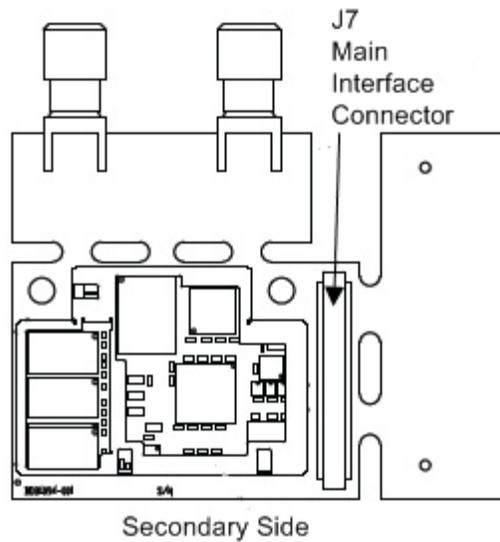


Figure 2-2. IPC6071 MID HSPA Module Secondary Side (with Debug Wings)

2.2 Debug Card

The Debug Card is used to validate and test the MID module. The debug card has access to the debug signals of the PoP on the MID module which includes the serial ports, JTAG, audio, etc. In addition, the debug board emulates all relevant MID module interface signals. The debug card connects to the MID module through a 100-pin Samtec high density connector. 1

The debug card has universal serial Interfaces that can be used for debugging and to interface to PC tools such as the Flash tool, Phone tool, and Mobile Analyzer. It uses serial to USB converters to provide a convenient high speed interface to a PC. Three USIF ports (USIF1, USIF2, and 3G-USIF) are connected to USB ports through RS-232 to USB devices. The fourth USB interface is directly connected to the MID card for purpose of data interface/flow.

The debug board is powered through an external 3.3 V supply. The MID is powered on from this supply when it is used with debug board for purpose of debugging and testing.

The debug card interfaces and communications ports are shown in Figure 2-3 and described in Table 2-3. For more detailed information, refer to the IDCC ½ Mini PCI-E Debug Card Specification, SP74647.

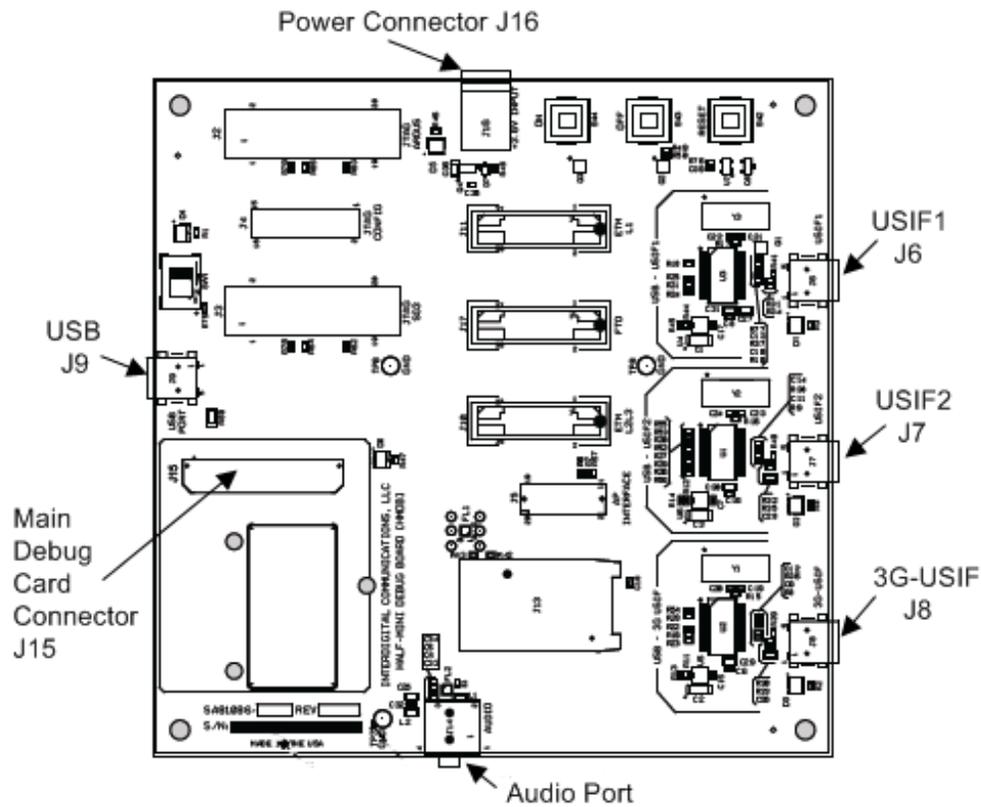


Figure 2-3. Debug Card Connectors

Table 2-3. Debug Card Interfaces

Interface	Debug Card Connector	Description
Power	J16	For connection to external power source.
Main Connector	J15	Interface to 100-pin MID connector J4.
USB-USIF1	J6	Supports MID asynchronous serial interface, UART device. Can be used to connect an AT/MMI interface, FlashTool, or PhoneTool.
USB-USIF2	J7	Supports MID synchronous serial interface, e.g., the Mobile Analyzer Trace tool.
USB-3G-USIF	J8	InterDigital Debug Controller Serial interface used for MID debug tools and for collecting debug logs.
USB	J9	High-speed USB port; supports full-speed USB 2.0 (12 Mbps) data transfer to/from PC and AT commands.
Audio Port		Analog audio interface.
USIM	J13	Interface for external SIM card.

3 Hardware Setup

3.1 External Power Supply

A Host platform (Laptop) with PCI MID interface or equivalent is the standard interface for supplying all required power to the IPC6071 MID module. If a bench top configuration is used for testing, then an External DC Power Supply can be connected to the IPC6071 MID in place of connecting to a Host PCI MID interface; here an external USB (J9) connection to a control PC for data communication is required.

Warning: If powering the IPC6071 MID from an external DC Power Supply (via connector J16) then make sure the IPC6071 MID is not inserted into or connected to a Host (Laptop) via PCI MID interface or equivalent interface. Otherwise, damage to the Host hardware and/or the IPC6071 MID may result.

The safe input voltage range for the IPC6071 MID module is 3.0 to 4.2 VDC, 3.6 VDC nominal. The IPC6071 MID module does have over-voltage protection and reverse polarity protection, but it does not have over-current protection; so care must be taken when connecting it to a power source. If an external DC power supply is used in a bench top configuration, it is recommended to set the power supply current limit to 3.0A maximum.

3.2 Connecting the MID and Debug Card Interfaces

Refer to Figure 3-1 which illustrates the MID module and Debug card test platform, and basic connections.

1. Plug the IPC6071 MID module connector J4 into debug card connector J15.
2. Connect the external power supply to debug card connector J16.
3. Connect the laptop USB connector to debug card high-speed USB port at J9.

Connect the Control PC Serial Port COMx to PC-Card USB USIF1 (J6). Where 'x' typically represents the COM Port assigned by the Prolific driver on the Control PC.

4. Connect an external antenna to the MID module primary SMA connector J6.

The IPC6071 MID module can be directly connected to an external antenna. J6 is the primary RF antenna connection and J5 is the diversity RF antenna connection.

5. The host serial port for the Flash tool will be connected to USIF1 port J6.

The USIF1 port at J6 can be used to connect an AT/MMI interface, Flash Tool, or Phone Tool. Connect the Control PC Serial Port COM4 to PC-Card USB USIF1 (J6), where '4' typically represents the COM Port assigned by the Prolific driver on the Control PC.

6. The host serial port for the Mobile Analyzer Trace tool will be connected to USIF2 J7 (Optional).

Connect the Control PC Serial Port COM5 to PC-Card USB USIF2 (J7), where '5' typically represents the COM Port assigned by the Prolific driver on the Control PC.

7. The host serial port for the InterDigital Debug Controller tool will be connected to 3G USIF port J8 (Optional).

Connect PC Serial Port COM6 to PC-Card USB 3G-USIF port at J8, where '6' typically represents the COM Port assigned by the Prolific driver on the Control PC.

8. Connect an earpiece to the Analog Audio port. (Optional).
9. Place the SIM card in the Debug card SIM socket. (Optional).

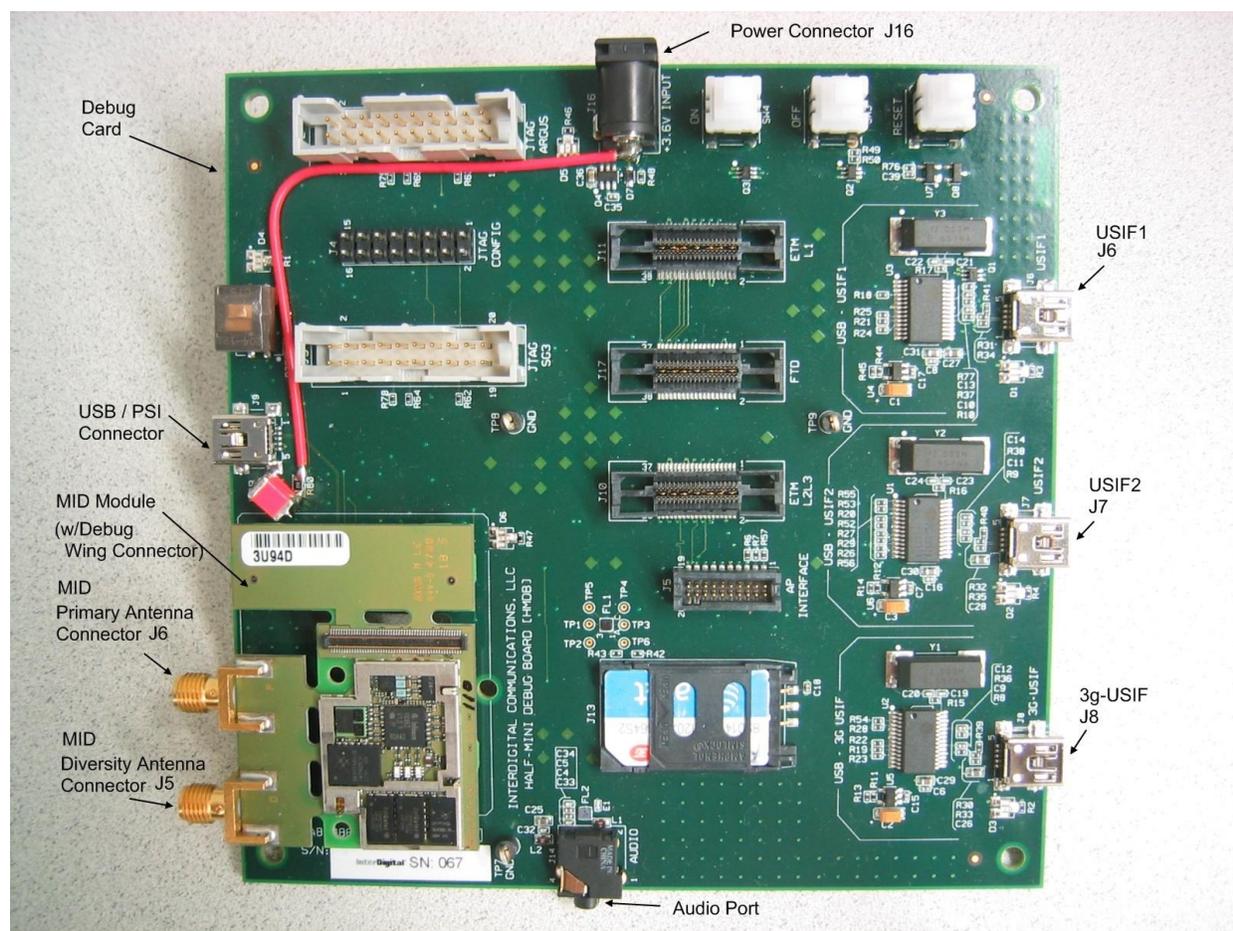


Figure 3-1. IPC6071 MID HSPA Module and Debug Card (Preliminary)

3.3 IPC6071 MID Module Support Files

Download all necessary IPC6071 MID Module support files from the Customer Support site (https://www.interdigital.com/customer_support) or InterDigital FTP server (<https://secure.interdigital.com>)

4 Installing the IPC6071 MID Application Software and Tools

This section provides instructions for installing the following application software and drivers for IPC6071 MID module testing and debug:

- USB-to-Serial driver (Loaded on host laptop when communicating via debug wing and not MID module connector)
- Host USB driver
- Cellular Connection Manager
- Flash Tool vE2
- Mobile Analyzer v09

Note: For more complete information and up-to-date documentation for each tool, go to the Customer Support site or the InterDigital FTP server.

4.1 MID Module Application Software Setup and Installation

After making all necessary connections to the MID and Debug card, perform the following to begin the setup and installation procedures. This procedure will load all necessary USB drivers and IPC6071 MID application software and tools.

Need to Verify procedures.

1. Turn **on** the external power supply.
The Found New Hardware message appears on the laptop. The Setup application begins to load.

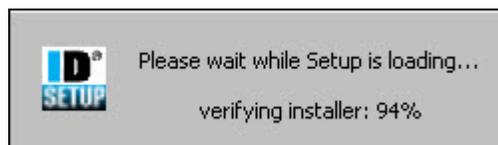


Figure 4-1. Setup is Loading

- The Setup window appears.

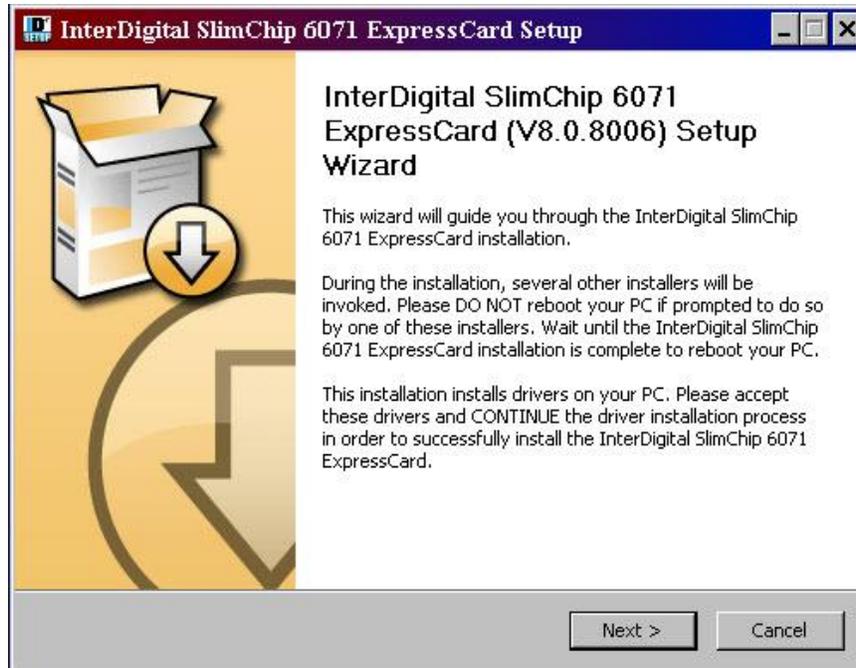


Figure 4-2. Setup Wizard

- Click **Next**. A screen appears prompting you to select an installation location.

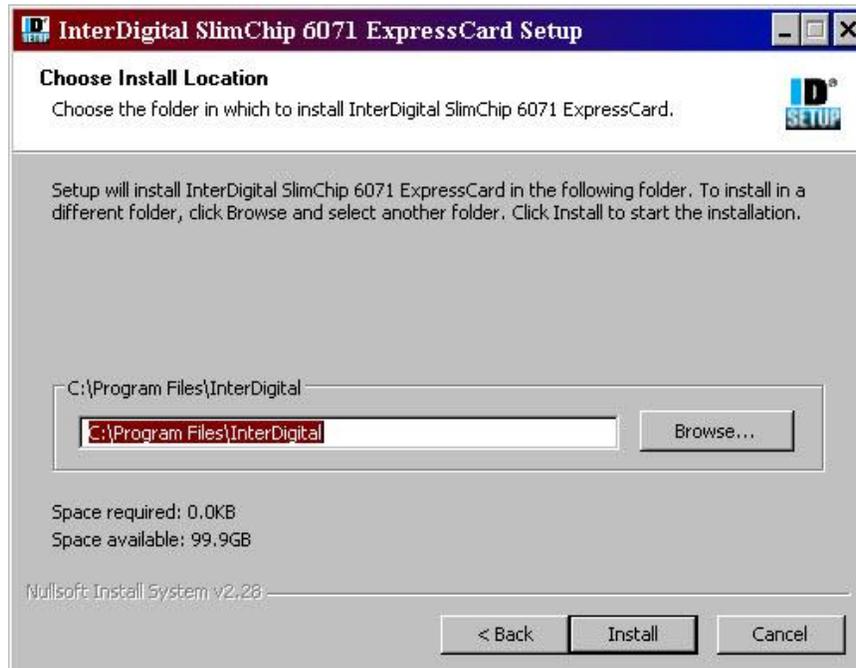


Figure 4-3. Choose Install Location

- Click **Install**.

- On the Setup Wizard Welcome screen, click **Next**.
 - A prompt appears stating that the previous version of the software will be uninstalled.
- Click **Next**. The Choose Install Location appears prompting you to select an installation location.
- Click **Install**.
- At the Window Logo Testing prompt, click **Continue Anyway**.
- At the prompts to install each of the software drivers, repeat steps 6 and 7 to install and confirm as the prompts occur.
- When driver installation is complete, the installation complete window appears.

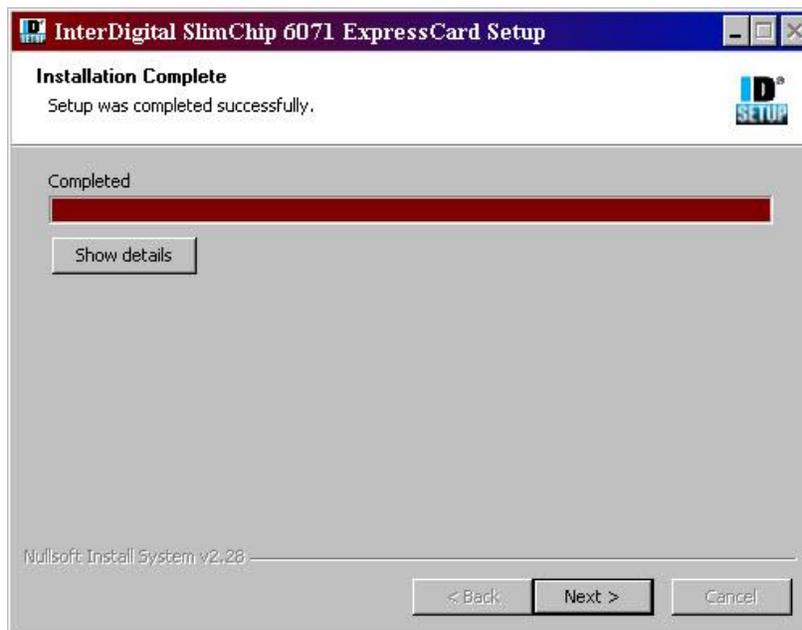


Figure 4-4. Setup Installation Complete

- Click **Next** then click **Finish** on the Setup Wizard. A prompt appears asking you to restart.
- Select **No**. Installation Complete appears.
- Click **Next**. The Setup Wizard prompts you to reboot now (default).

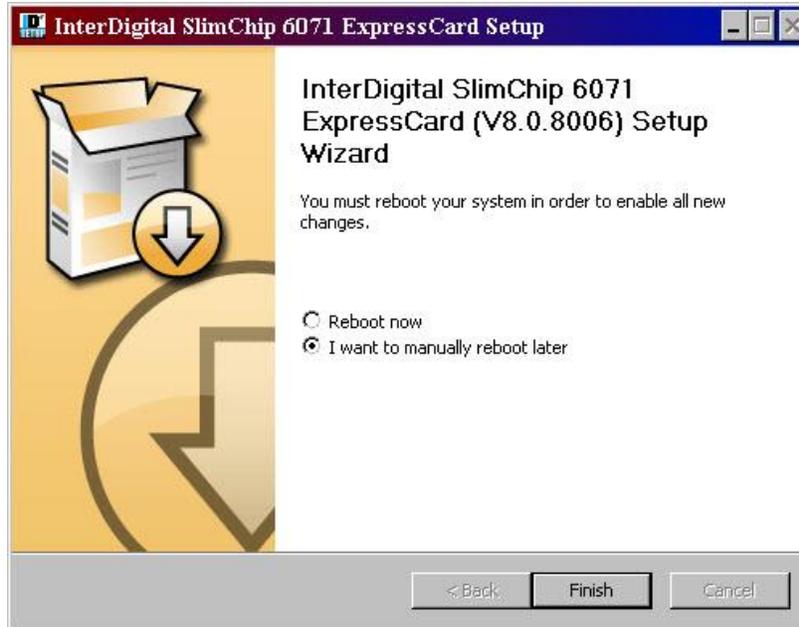


Figure 4-5. Reboot Prompt

- Select Reboot later and click **Finish**.
- Set the power to **Off**, then **On**. The Found New Hardware Wizard appears.



Figure 4-6. Found New hardware

- Click **Next**. The Wizard informs that IDCC Interface 1 is to be installed.



Figure 4-7. Install Hardware Prompt

- Click **Next** to install IDCC Interface 1, then click **Continue Anyway** at the Window Logo Testing prompt. On completion, repeat this step to install the following additional software:
 - IDCC Management Port
 - IDCC Interface 2
 - IDCC Interface 3
 - IDCC User Application Port
 - IDCC Wireless Modem



Figure 4-8. Installation Complete

- Click **Finish**. Installation is complete.

4.2 Updating IPC6071 MID Software Using FlashTool v.xxxx

The FlashTool allows you to download software updates to the IPC6071 MID module.

For additional information on the FlashTool and procedures, refer to the *InterDigital SlimChip™ 6071 Flash Tool User Manual, MA72924*.

Perform this procedure only when firmware updates are available from InterDigital.

1. Connect a USB cable from the PC USB port to the MID module debug card USIF1 port (J6).
2. Open the Flash Tool from its installed location. Click on **Start – Programs – IPC6071-PC Card vx.x.x – Flash Tool**. The Download Setup screen appears.

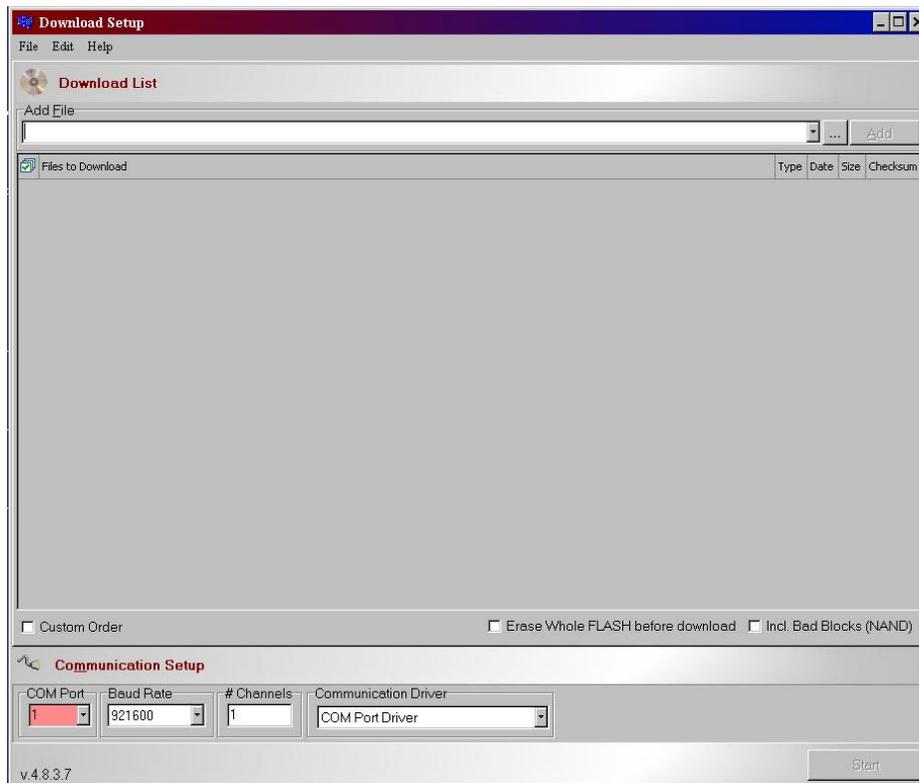


Figure 4-9. Download Setup Screen

3. Browse for the files you want to flash to the MID module by clicking on the three dots at the end of the Add File box.

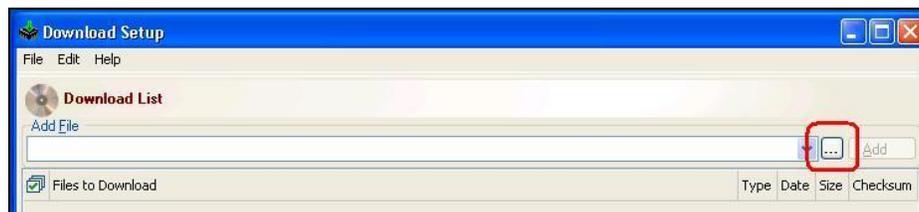


Figure 4-10. Browsing for Files to Download

4. Click **Add** for each file selected.
 - The download list of files appears in the Download Setup screen.

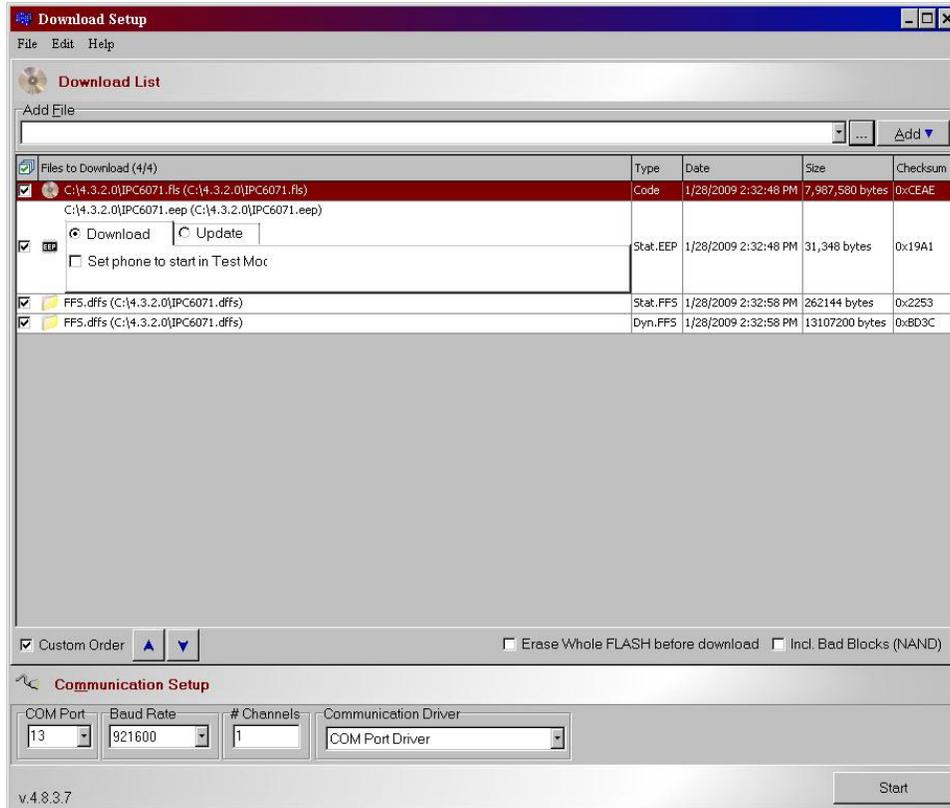


Figure 4-11. Selecting Files to Download

5. Make sure the files you selected have been added to the list of files to download and the checkboxes are selected for each file. Files displayed in the list that are not selected will not be written to Flash memory. These files must match the current software version.
6. Select the **Custom Order** check box.
7. Using the Custom Order arrow buttons, place the three files in the following order:
 - IPC6071.flc (required for 2G/3G protocol stack)
 - IPC6071.eep (required for 2G/3G protocol stack)
 - IPC6071.dffs (required for all tools including Connection Manager and FlashTool)
8. On the Communications Setup pane, using the arrow, set the COM port number of the USB port to which you have connected the MID module. To find the COM port number:
 - a. Open the Device Manager and check the COM port number auto-assigned to the USB port. The Device Manager can be opened by following these steps in Windows XP.
 - 1) Click on Start/Settings/Control Panel.
 - 2) Make sure that the Control Panel is in Classic View. If that is not the case, locate the option "Switch to Classic View" and click on it.

- 3) Select the icon labeled System and click on it.
- 4) Select the Hardware tab. The System Properties window appears.



Figure 4-12. System Properties

- 5) Click on the Device Manager button.
- 6) Expand Ports (COM and SPT) by clicking on the plus sign. If you do not see this folder, remove and replace the USIF1 (J6) connector and wait for the window to refresh itself.
 - b. Verify the COM Port number on the Communications Setup COM port box and in the Device Manager match (COM13 in this example). If necessary, set the COM Port box to the correct port number.
9. On the external power supply, turn **off** power to the debug card.
10. On the Download Setup screen, click **Start**. The Download screen appears.

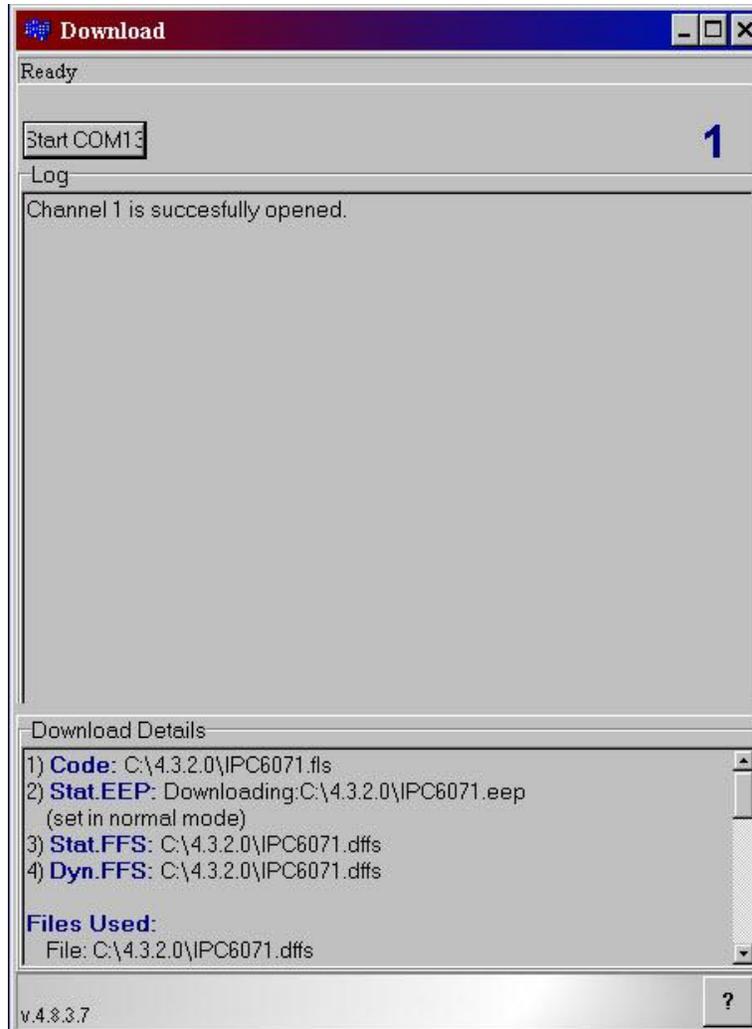


Figure 4-13. Ready to Download

11. Click **Start COMxx**. A message appears indicating that Channel 1 is successfully opened.
12. On the external power supply, turn the power **on**. The Downloading message appears and Device Synchronized is indicated.

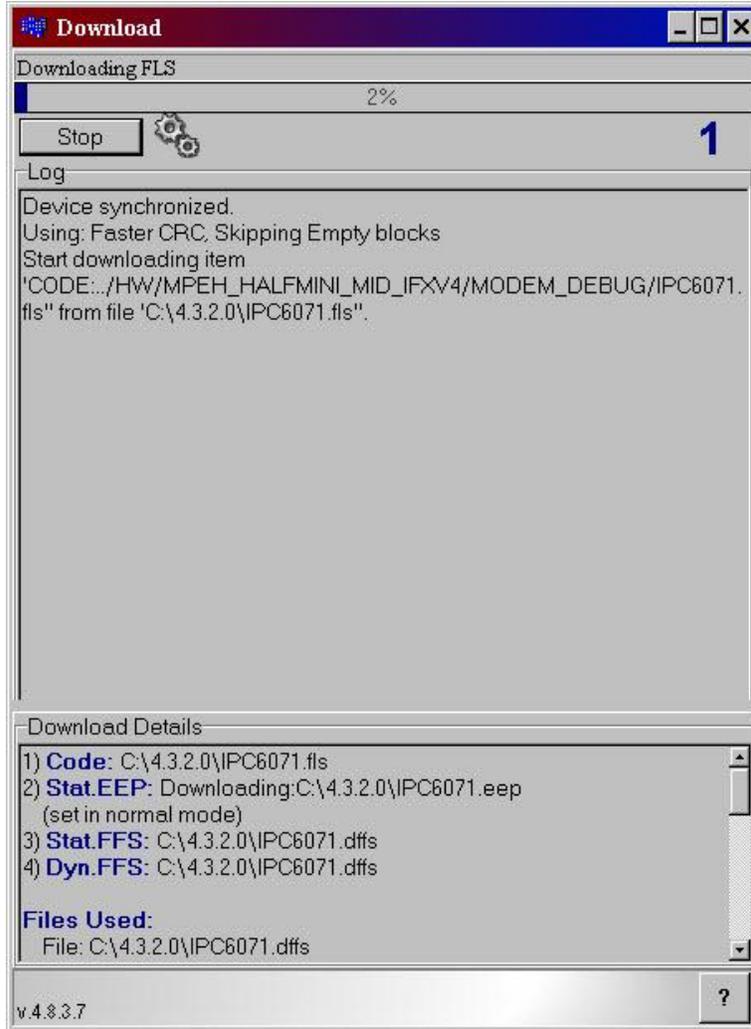


Figure 4-14. Download in Progress

13. The flash process takes about 4 – 5 minutes. The Success message appears indicating successful software download to the MID module.

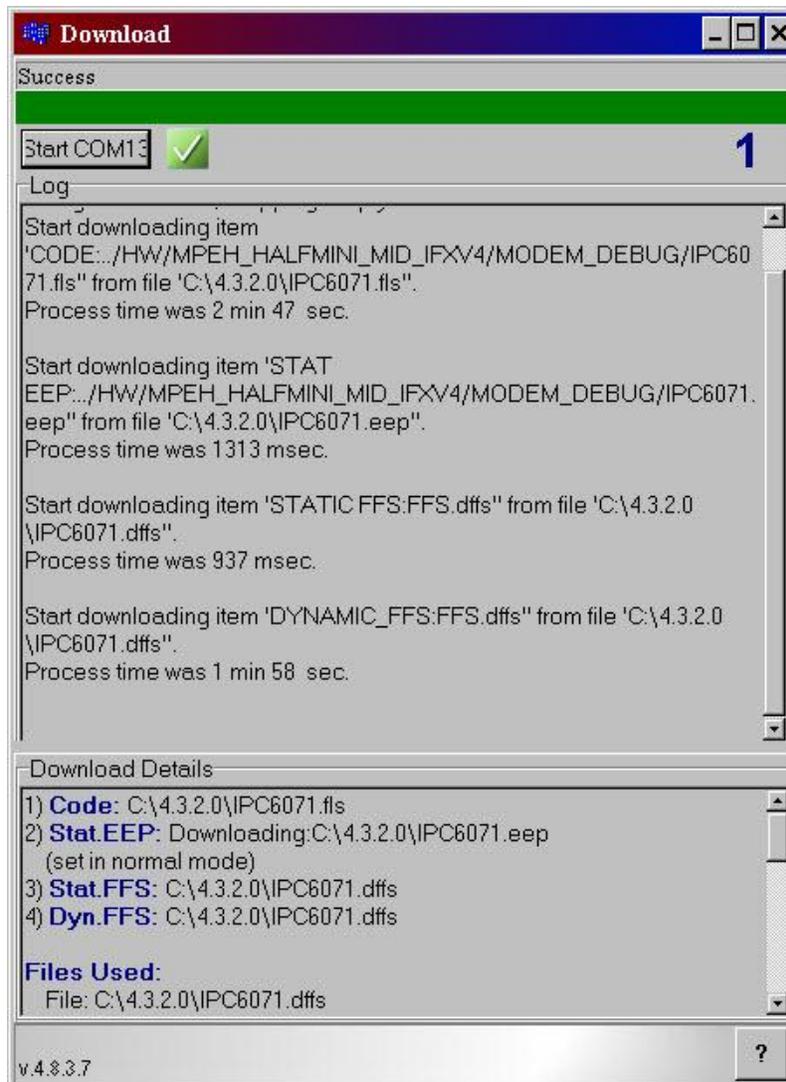


Figure 4-15. Download Complete

14. When the Flash process is complete, close the window (if left open it will still occupy the port and interfere with the use of other tools).

4.3 Installing and Setting Up Mobile Analyzer v09

The Mobile Analyzer is a tool for capturing the trace of operations inside the mobile station software with a desktop computer system and for decoding the captured/logged data (called a Trace).

The following steps are intended to be a quick setup guide. For more detailed information, refer to the *Mobile Analyzer User Manual, MA72925*, which is located under the Help menu option (depicted by a question mark) of the application.

1. Install the Application.

As part of this procedure, Java JRE application is installed.

The typical install location for Mobile Analyzer is:

C:\Program files\Mobile_Analyzer_V09

2. Setup a Repository Location

A Repository decode library must be selected in order to decode captured PDUs. This decode library must match the version of the software within the mobile station in order to properly decode the trace data stream.

Pending how the site Repository is maintained, it may be required to specify a location based on a Local Drive (default - use Step 2a) or a LAN location (optional - use step 2b).

- **For Repository Located on Local Drive**

If the site Repository is maintained on a Local Drive, use the following procedure:

- a. Start the Mobile Analyzer application, from Windows select:

Start/Programs/Mobile Analyzer V09/Mobile Analyzer V09

- b. Set the Repository Location. From the Mobile Analyzer application, select the menu option:

Repository/Locations...

On the right side of the window Mobile Analyzer Options, locate and highlight menu item Repository. Check the Active radio button and then set the "Repository Location on Local Drive 1" using the browse button or by entering the full path for the repository manually (i.e. \\Mobile Analyzer v09\src\Repository).

Make sure you have the file mobile_Analyzer_component_repository.xml in the repository folder in order for the Mobile Analyzer to find the various libraries. This allows the Mobile Analyzer application to list all the library's components.

- c. Set the Repository Access file. From the Mobile Analyzer application, select:

Repository/Access... , then select the specific decode Library to match the version of the software within the mobile station for example (22.23.01), select:

Dual Mode SGold (Decode Libraries for Dual Mode Stack)/dfs22.23.01_MPEH), with the build version highlighted, click on the USE button to make this active.

- d. The Mobile Analyzer application will restart to use this new configuration.

- **Repository Located on LAN (Optional)**

If the site Repository is maintained on a LAN, use the following procedure:

- a. Start the Mobile Analyzer application, from Windows select:
Start/Programs/Mobile Analyzer v09/Mobile Analyzer v09
 - b. Set the Repository Location. From the Mobile Analyzer application, select:
Repository/Locations...
then highlight menu item Repository and check Active and then set the "Repository Location on LAN Drive" using the browse button. Select the LAN location of the desired repository, select Active button for this feature and then click Apply.
Make sure you have the file mobile_Analyzer_component_repository.xml in the repository folder in order for the Mobile Analyzer to find the various libraries. This allows the Mobile Analyzer application to list all the library's components.
 - c. Set the Repository Access file. From the Mobile Analyzer application, select:
Repository/Access... , then select the specific decode Library to match the version of the software within the mobile station for example (22.18.01), select:
Dual Mode SGold (Decode Libraries for Dual Mode Stack)/dfs22.18.01_MPEH_bid2815), with the build version highlighted, click on the USE button to make this active.
 - d. The Mobile Analyzer application shall restart to use this new configuration.
3. Trace Decode Setup
To ensure that the messages displayed in the Mobile Analyzer are decoded properly, it is recommended to use the following configuration. On the main menu, select Files/Config File/Load Default from MessageLibrary.
 4. Latest Update Kit (Optional)
The Mobile Analyzer application may be updated with Update Kits.
An easy way to find out the Kit version already installed is to look at the Mobile Analyzer window's title bar.
To install the latest update Kit:
 - a. Start the Mobile Analyzer application and go to:
Repository/Access
 - b. Expand the Patches\Updates folder then select the desired update you need.
 - c. Click on Use to make it active. The Mobile Analyzer application will then restart to use this new configuration.
 - d.
 5. Trace Interface Settings
This section requires that the USB-to-Serial driver is already installed as described in section 2.1 above.
The Mobile Analyzer uses the IPC6071 MID module's USB port called USIF1 as the source to capture the PDU trace.
 - a. To configure the USB interface go to:
Setup/Interface

b. Use the following COM Port Settings:

COM Port:	COM4 (or the COM port associated to USIF1)
Bit Rate:	921600
Data Bits:	8
Parity:	None
Stop Bits:	1
Handshake:	None
DTS/RTS:	None selected

6. AT Command Console Settings (Optional)

This section requires that the USB-to-Serial driver is already installed as described in section 2.1 above.

Note: The Mobile Analyzer AT Command Console application uses the same PC COM port as typically provided for the FlashTool, a HyperTerminal, or the PhoneTool, so make sure these applications are closed before starting the Mobile Analyzer AT Interface application program.

The Mobile Analyzer AT Command Console may be used to send AT commands to the IPC6071 MID module's USB on port USIF1; this will work similar to a HyperTerminal interface.

a. To open the AT Console, select:

Tools/AT Command Console

b. On the AT Console window with the connection disconnected, select:

Connection/Settings...

c. Use the following AT Connection Interface settings:

COM Port:	COM4 (or the COM port associated to USIF1)
Bit Rate:	3000000
Data Bits:	8
Parity:	None
Stop Bits:	1
Handshake:	None
DTS/RTS:	RTS selected

d. To use the AT Console, select:

Connection/Connect

Selecting buttons/command from the AT Button Panel shall automatically send the selected command to the COM port, additionally commands can be type on the input line for which pressing SEND will send the typed command to the COM port.

7. IPC6071 MID Module Trace Activation

For the Mobile Analyzer to be able to receive trace messages from the IPC6071 MID module, the user must activate the IPC6071 port to send trace messages.

- a. Using either the above Mobile Analyzer AT Command Console or a HyperTerminal connection, power-ON the IPC6071 MID module and send the following AT command:

AT+TRACE=1,3000000

- b. To keep the trace messages active after a reboot, send the following AT command:

AT+CPWROFF -or- AT+CFUN=0

These AT commands will save the trace settings and shutdown the IPC6071 MID module.

Note: The trace settings are lost after a SW download and must be re-activated.

5 Using the Connection Manager

The Cellular Connection Manager is a Windows-based application that provides basic capabilities to configure, monitor, and control the IPC6071 MID. This application runs on a notebook PC using Windows XP or Windows Vista.

This section describes the Connection Manager screens and has general procedures for using the software to make incoming calls and for receiving calls and messages.

For more detailed information and procedures, refer to the *InterDigital SlimChip™ Cellular Connection Manager User Manual, MA72926*.

To use the Connection manager:

1. Launch the Connection Manager: click on **Start – Programs – IPC6071 Applications – Connection Manager**. The Cellular Connection Manager Card Configuration tab appears.
2. Select a Configuration or Service tab as needed.

5.1 Card Configuration Tab

The Card Configuration (Figure 5-1) displays when the Cellular Connection Manager first runs. It provides information about the attached modem and allows the user to configure and display a variety of modem features.

The individual functional groups include Hardware Information with details about a currently-connected PC card, USIM Information with details on a currently-connected SIM card, and also information about the network, device status, and hardware control.

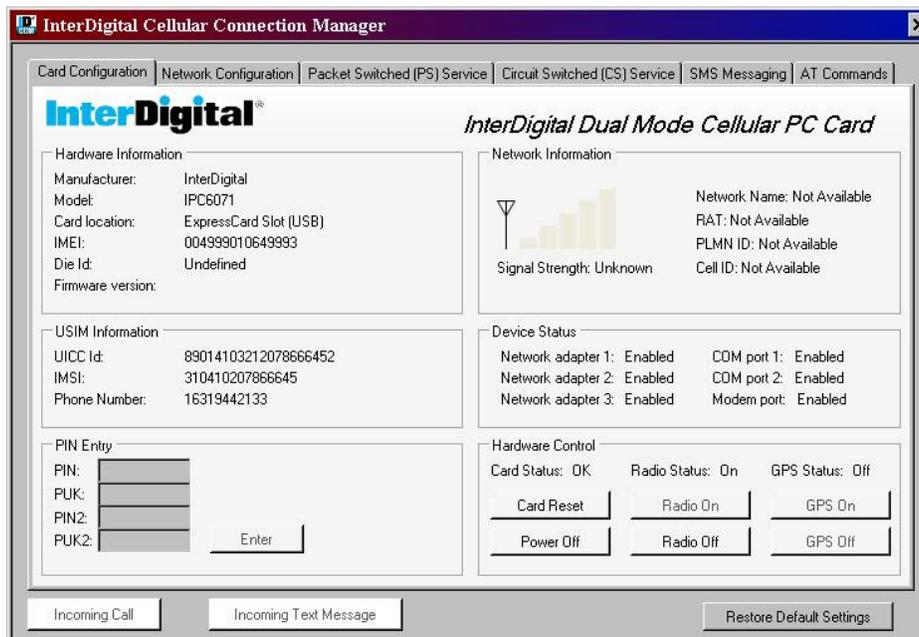


Figure 5-1. Card Configuration Tab

5.2 Network Configuration Tab

The Network Configuration tab allows the user to configure and display parameters related to cellular network selection, registration, and attachment.

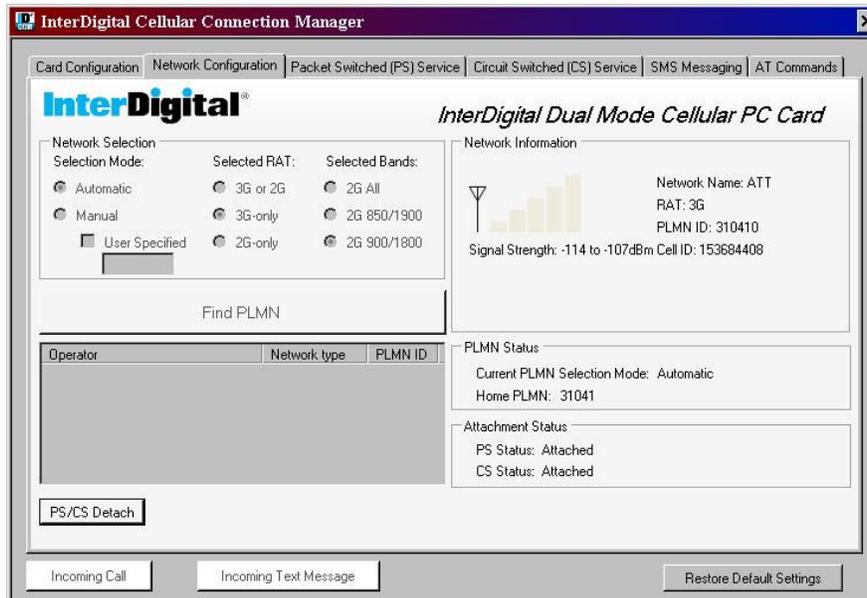


Figure 5-2. Network Configuration Tab

5.3 Packet Switched Service Tab

The Packet Switched Service tab allows the user to control packet-switched services and monitor the status of the session.

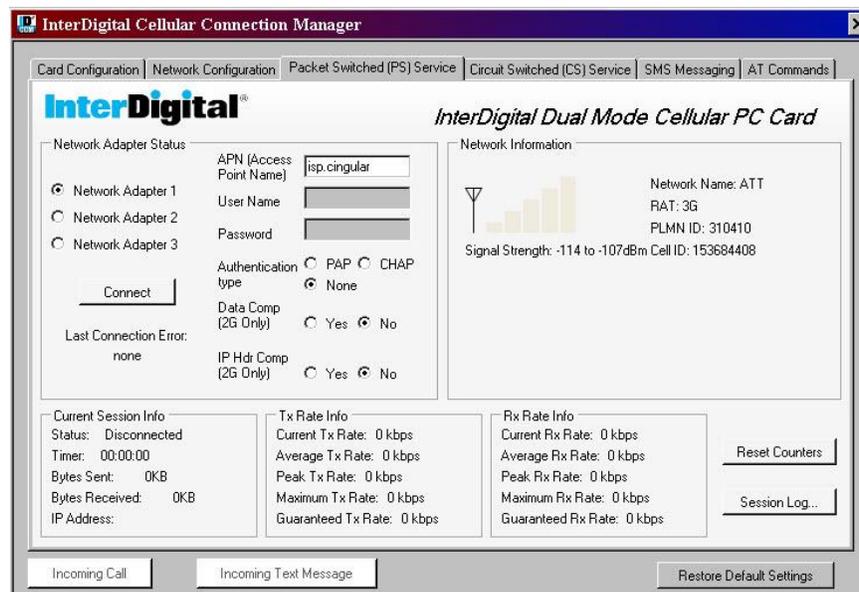


Figure 5-3. Packet Switched Service Tab

5.4 Circuit Switched Service Tab

The Circuit Switched Service tab allows the user to initiate circuit-switched services and monitor the status of the connection. Currently, the CS services supported by this application include speech calls only.

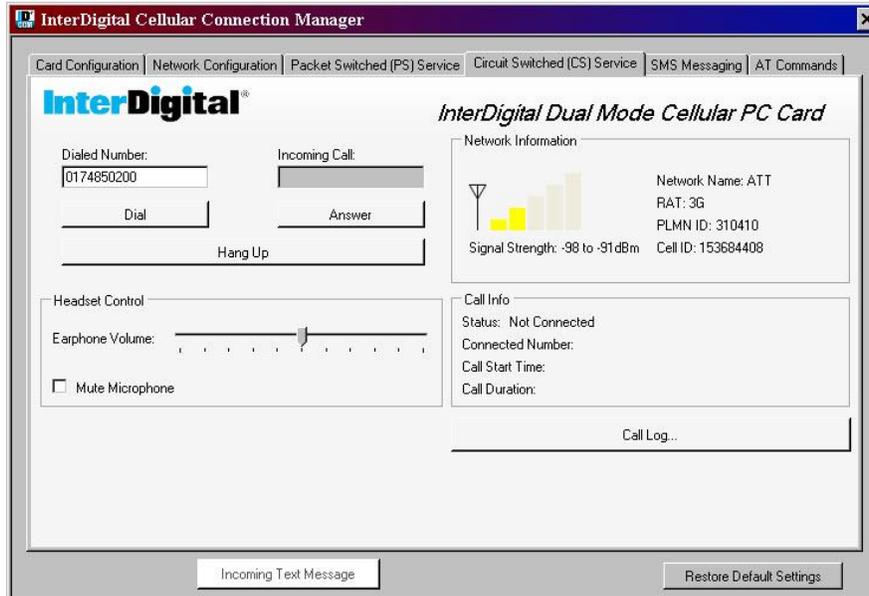


Figure 5-4. Circuit Switched Service Tab

5.4.1 Making a Call

To make an outgoing call:

1. Enter valid dialing information (Valid alphanumeric digits include: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, *, #, +, A, B, and C).
2. Click **Dial**. The call connection status is displayed in the Call Info pane.

5.4.2 Receiving a Call

When an incoming call occurs, the **“Incoming Call”** indicator at the bottom of the screen will flash green and the incoming phone number information is displayed in the Incoming Call box.

If a new incoming call occurs while already connected, the incoming call may not be answered until the current call is hung up. Call Waiting supplementary service is not currently supported in this version of the Connection Manager.

5.5 SMS Messaging Tab

The SMS Messaging tab allows the user to send and receive SMS text messages. Note the following;

- The SMS / CS / PS tabs are grayed out until the modem has been registered. After registration if the modem is only in a CS or PS service area (and not registered in both domains) the appropriate tabs are made available at that time. I
- For SMS tabs, the user cannot select preferred mode if the modem only has been registered in one domain.

For Emergency Call, the CS tab allows call even if UE is not registered.

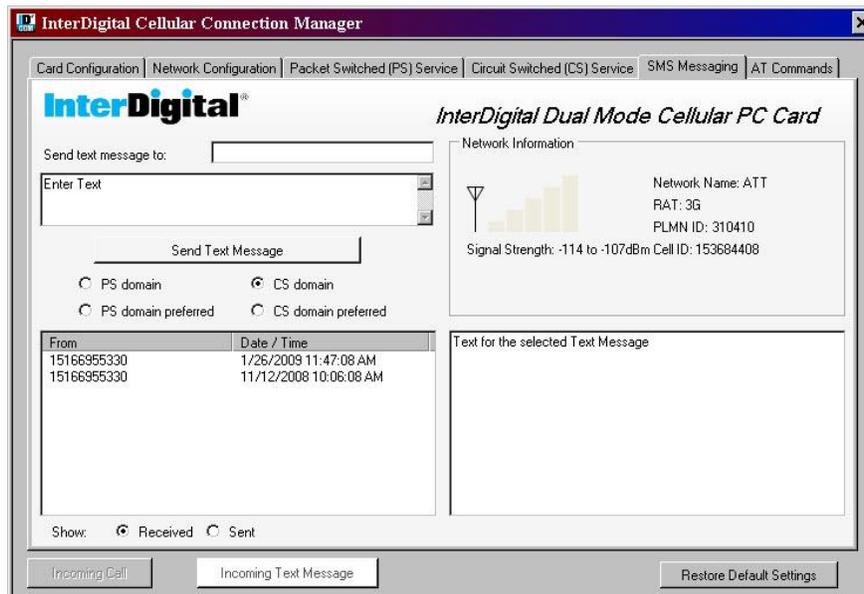


Figure 5-5. SMS Messaging Tab

5.5.1 Sending an SMS Message

To send an SMS message:

1. Select the domain to send the text messages through (either a PS or CS domain) or a preferred domain to (try PS domain first or CS domain first).
2. Enter the phone number in the text box to the right of the Send text message to:
3. Type in the message text in the text box provided. Note that the maximum length of the SMS message is 160 characters.
4. Click Send Text Message.

5.6 AT Commands Tab

The AT Commands tab allows the user to exchange AT commands with the PC card via a command line interface within a basic terminal emulation window. User may also load and send script files via this tab.

This tab consists of a text box for entering or selecting the command data to be sent, and a log window containing a log of sent and received AT command and responses. Buttons are provided for sending the selected AT command/script, for clearing the displayed command log, and for pausing the log.

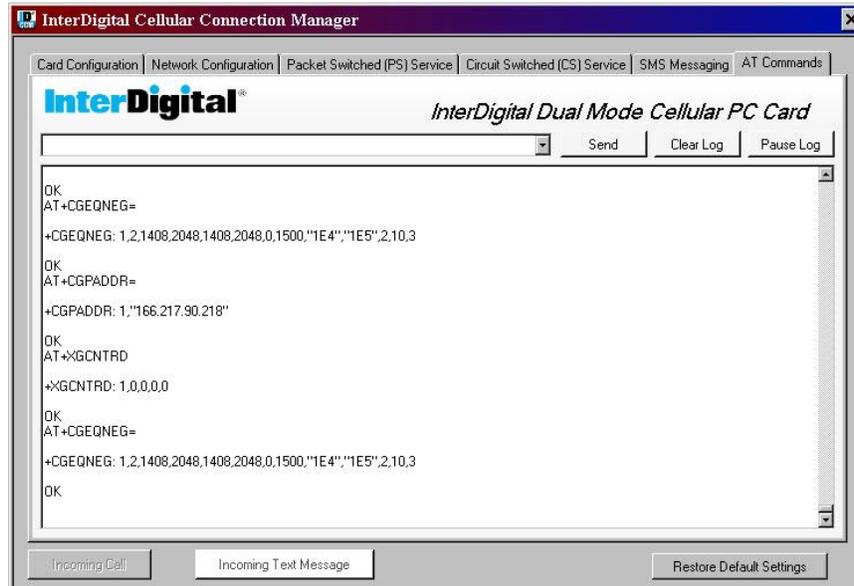


Figure 5-6. AT Commands Tab

5.6.1 Sending an AT Command (via command line entry)

To send a single AT command:

1. Enter the command data into the text box directly above the command log window.
2. Click the **Send** button. The Sent command data, and the received response from the Cellular PC Card are displayed in the log window.

6 Additional Tools

6.1 Debug Controller

The Debug Controller software is used to perform diagnostic tests on the MID module.

6.2 Phone Tool

Refer to the Installation, Setup, and Operation procedures in the *InterDigital SlimChip™ 6071 Phone Tool User Manual, MA72923*.

6.3 RF Calibration Tool

The Calibration Tool is a standalone application which is capable of doing RF adjustments as described in “ITA - MP-EH UMTS RF adjust_vxx.doc” and “ITA_RF_adjust_MPE.doc” for UMTS and GSM calibration respectively. This involves a complete RX and TX adjustment for target platforms (supports both UMTS and GSM calibration).

For a more detailed description of this tool refer to the *InterDigital SlimChip™ 6071 Calibration Tool User manual*.

6.4 RF QuickTest Tool

The tool helps with a list of measurements that should be performed to verify that the UMTS RF driver and firmware fulfills RF performance requirements. The measurements are roughly divided to non-signaling and signaling measurements. Receiver, Transmitter and Synthesizer measurements are done in each mode. System measurements are based on the 3GPP 25.101 and 3GPP 34.121 specifications.

For a more detailed description of this tool refer to the *UMTS Quick Test* specification.

7 Abbreviations and Acronyms

Definitions and abbreviations used in this document are defined in the following table:

AMR	Adaptive Multi-rate
DCS	Digital Cellular System; GSM variant at 1800 MHz
DPCH	Dedicated Physical Channel
EDGE	Enhanced Data Rates for GSM Evolution
EFR	Enhanced Full Rate
FR	Full Rate
FS	Full Speed
GPIO	General Purpose I/O
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HR	Half Rate
HS	High Speed (used to denote HSDPA and/or HSUPA)
HSDPA	High Speed Downlink Packet Access
HSUPA	High Speed Uplink Packet Access (mode in which E-DCH is used)
MID	Mobile Internet Device
OMAP	Open Multimedia Applications Platform
PCM	Pulse Code Modulation
PCIe	Peripheral Component Interconnect Express
PCS	Personal Communication Services; GSM variant at 1900 MHz
PLL	Phase Locked Loop
PMIC	Power Management Integrated Circuit
PoP	Package on Package
Rx	Receive
SPI	Serial Peripheral Interface
Tx	Transmit
UART	Universal Asynchronous Receiver Transmitter
UMTS	Universal Mobile Telecommunications System
USIF	Universal Serial Interface
USIM	Universal Subscriber Identity Module
VSWR	Voltage Standing Wave Ratio
WCDMA	Wideband Code-Division Multiple Access
WWAN	Wireless Wide Area Network