IOT747

St John's Innovation Centre, Cowley Road,
CB40WS, Cambridge, United Kingdom
www.iot747.com

Device description
●Development board for IDC707 Module
●Powered and Connects to PC through USB cable
●Modules Pinout brought out on Headers
●Allows to control module through commands
●Includes Mini USB cable to connect to a PC

Applications
●Evaluation/testing IDC747 Module
●Development on IDC747 Module
●Development of Bluetooth Audio MVPs
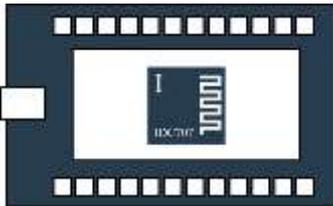
Development Kit to evaluate the IDC747 Module
•Powered through mini-USB interface
•Includes FTDI chip for USB/UART for UART commands
•IDC747 module pins brought out on headers
•Connected module LEDs for visual control of state
•Control GPIOs connected to buttons for control of module
•Small Simple to use development board
•Dual Mode Bluetooth and Bluetooth Low Energy
•Integrates IDC747 module and AudioAgent firmware
•Small form factor 7.5cmx5cm
•Stereo Mic In/ Line In via 3.5mm jack plug
•Stereo Headphone Out via 3.5mm jack plug
•I2S, Differential Audio easy access headers
•PIO and I2C easy access headers
•Access to UART via USB (FTDI on board) or PIO header

Summary
IDC747-DISKIT is a simple to use development board to evaluate, test or develop with the IDC707 module. It has a mini-USB interface. The board is powered through that interface but also enumerate as a COM port. So developers can connect it to a PC and control the module through UART commands. IDC747-KIT is the only device needed to evaluate and develop with the IDC747 module. Control of the module is through high level commands so no prior technical knowledge of the Bluetooth protocol is needed to start developing.

For additional questions or to submit technical question, go to www.iot747.com or send an email to info@iot747.com.

Step1: Powering the board

1) Connect the supplied USB cable to the USB TO UART plug on your board.

2) Plug in the USB into a PC (Laptop or Desktop).

3) You should see:

a) The red LED next to the USB connector light up and,

b) LED0 alternating to indicate the module is in pairing mode

4) You are all set to go! Read on to find out how.

Figure1: Complete Set-Up

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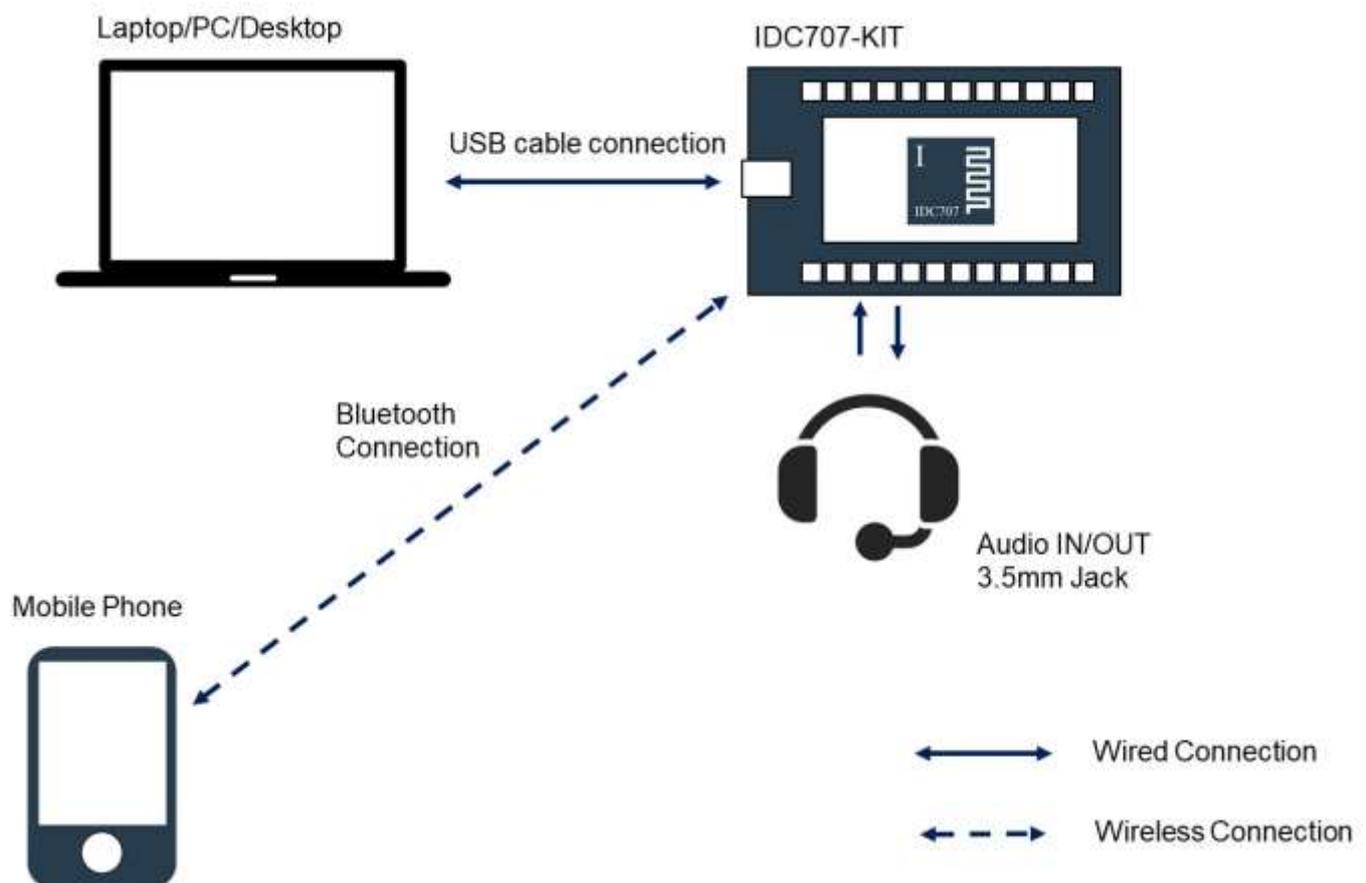
Step2: Connecting from a mobile phone

Step2A:

1) Enable Bluetooth on your device and start searching (often labelled as 'discovering')
2) You will be displayed all the discoverable Bluetooth devices around you.
3) Look for a device named "AA-XXXXXX". X are Hex Numbers (0 to F).
4) Press on the device or select 'Pair'. You may be asked to confirm this action.
5) Your device will tell you if pairing was successful
6) Your IDC747-KIT will indicate that it is connected by flashing LED1.
7) You are now ready to listen to music and handle calls.

Step2B:

Listening to and Controlling Music on your DISKIT

1) Plug in your headset into the AUDIO OUT jack.
2) Open your music player on your device and start playing music.
3) You should now hear music on your headphones.
4) You can now adjust volume by using the VOL UP/VOL DOWN buttons on the DISKIT

Step2C:

Voice Calls on your IDC747KIT

If you are connected to your KIT with a phone, phone calls will automatically be routed to it.

1) Connect Headphones and a Microphone to the AUDIO OUT and STEREO MIC
2) Press the PLAY/PAUSE key to answer the call.
3) You can hang-up by pressing PLAY/PAUSE again.
4) To redial the last number dialled from your phone, you can double press PLAY/PAUSE.

Step3: Controlling the KIT with UART commands

To start you need to have a:
•Laptop, PC, desktop or any computer with a USB port and a,
•Serial terminal such as HyperTerminal or PuTTY installed on your computer

These can be found at PuTTY: http://www.chiark.greenend.org.uk/~sgtatham/putty/ or
http://www.hw-group.com/products/hercules/index_en.html. Please install one of these or
any serial terminal you prefer. In this document, we will describe how it works on a
Windows10 machine and Hercules terminal.

1) Connect the board to your PC using the USB cable. Plug in the USB cable into your
   computer and into the Discovery board in the USB plug labelled " USB<>UART". The
   board will enumerate as an FT232R USB UART Interface. Your computer should
   automatically find and install the required FTDI drivers.

2) Go to StartUp/Devices and Printers. You will see your board will be under FT232R
   USB UART. When you look at Properties you will see under which COM port it has
   enumerated.

Figure2: Correct USB COM port enumeration on a PC
(Please note your COM port number may differ).
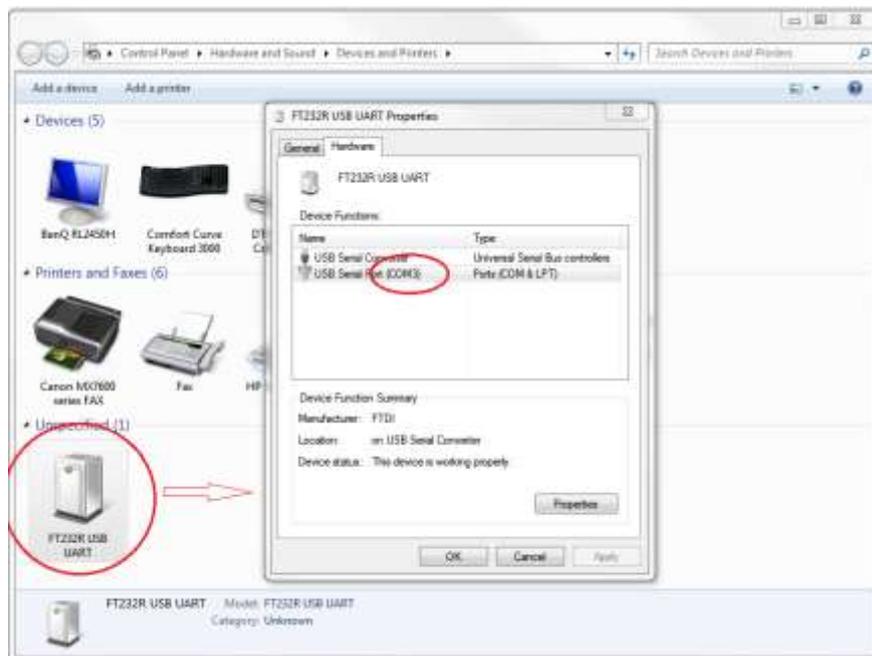
3) Launch your chosen serial terminal utility. Please use the following parameters for the UART settings (these are the default settings).

•Baud rate   : 9600bps
•Data bits   : 8
•Stop bits   : 1
•Parity bit   : No parity
•HW Flow Control   : Disabled

Note: Some specific version of firmware will have RTS/CTS enabled.

Ensure that when you type 'RETURN/ENTER' no additional characters (such as a line feed) are sent. This is usually under the line endings setting of your serial terminal application. If you are using PuTTY you do not need to change anything, however, please refer to Figure3 below to confirm that this is set OK.

For your convenience, you may also wish to enable the "Local Echo" option. This will display what you have just typed into your terminal. Most terminal applications have this set to off by default. Please refer to Fig. 2 below on how to set this on for PuTTY.

Figure3: PuTTY settings: Enabling 'Local Echo' and using correct line endings.
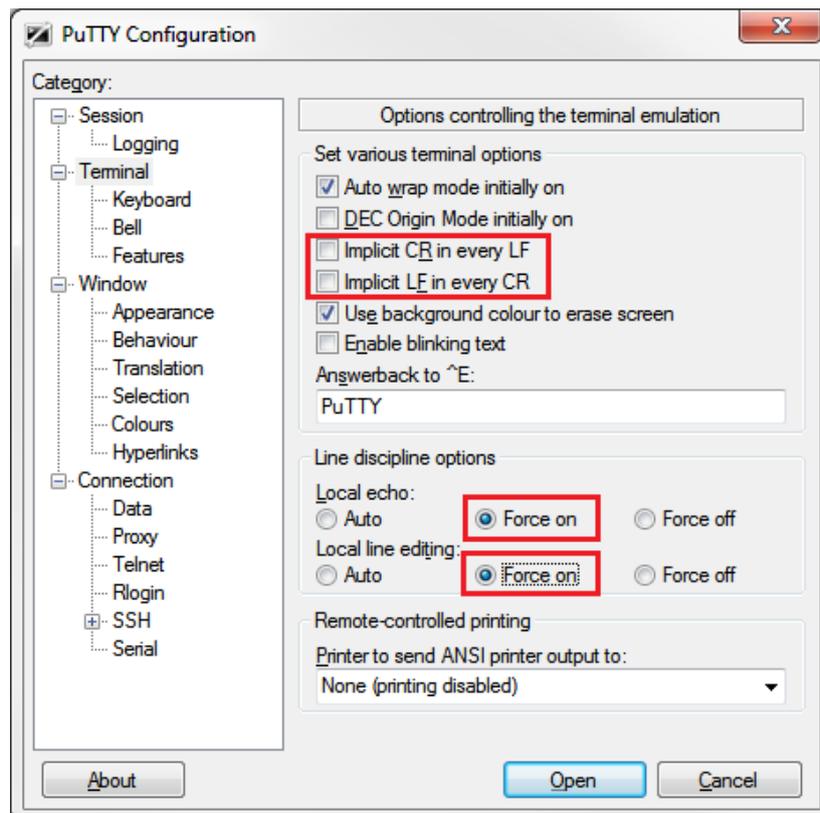
4) In your terminal window, type Reset and then press Enter. You should then see the Audio Agent prompt. You are now ready to use the board.

Figure4: Hercules settings: Enabling 'Local Echo' and using correct line endings.
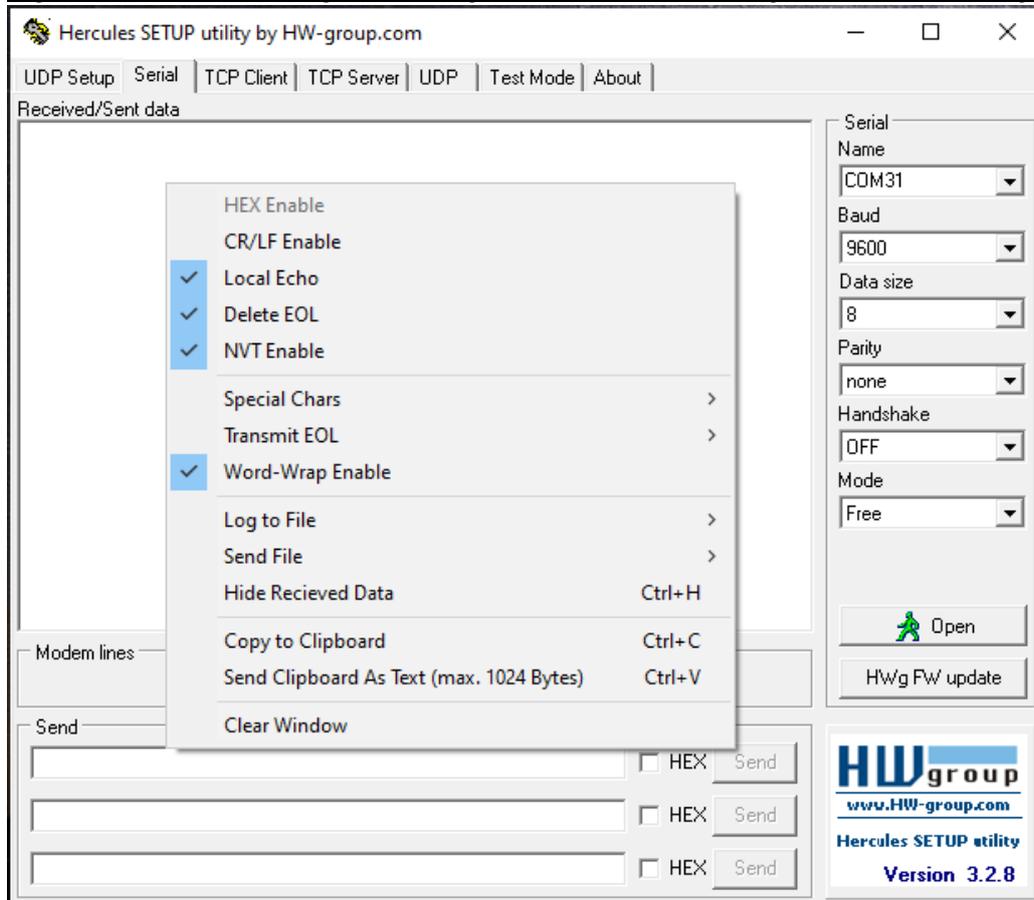
If you type RESET (and ENTER /n), the IDC747 module will reboot and you should see the prompt again. For more information on the different commands to control the module and different notifications, you should refer to the UART command manual. If you do not have a copy of the manual, please contact info@iot747.com to request one.

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Board Button

Below is a figure explaining the different settings on the board.
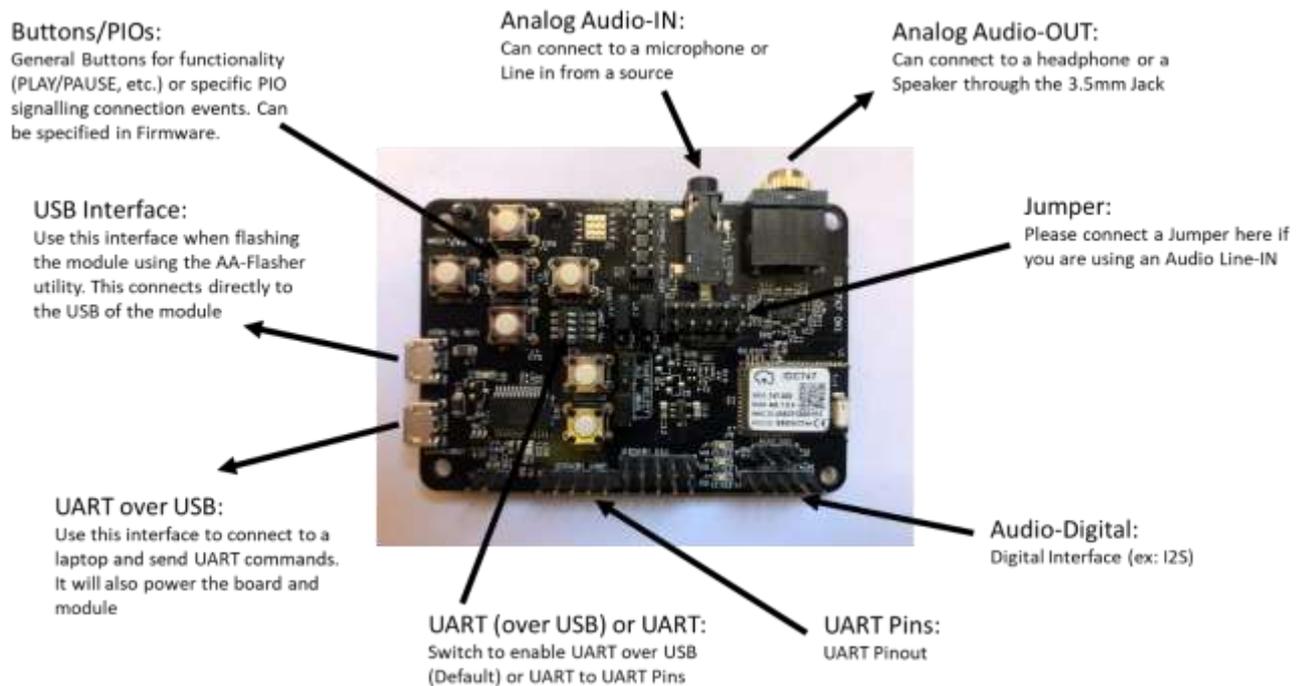
Table 1: Button functions

Button	PIO	PIN	Description
RESET	-	-	RESET board
VOL UP single	3	23	Increases volume (separate levels for voice and music).
VOL DOWN single	8	24	Decreases volume (separate levels for voice and music).
PLAY/PAUSE single	2	50	Starts playing music or stop playing music. If there is an incoming voice call it will answer the call. During an ongoing call it will end the call.
BACKWARD single	5	26	Sends AVRCP instruction BACKWARD.
FORWARD single	7	25	Sends AVRCP instruction FORWARD (Next track).

Board Schematics:
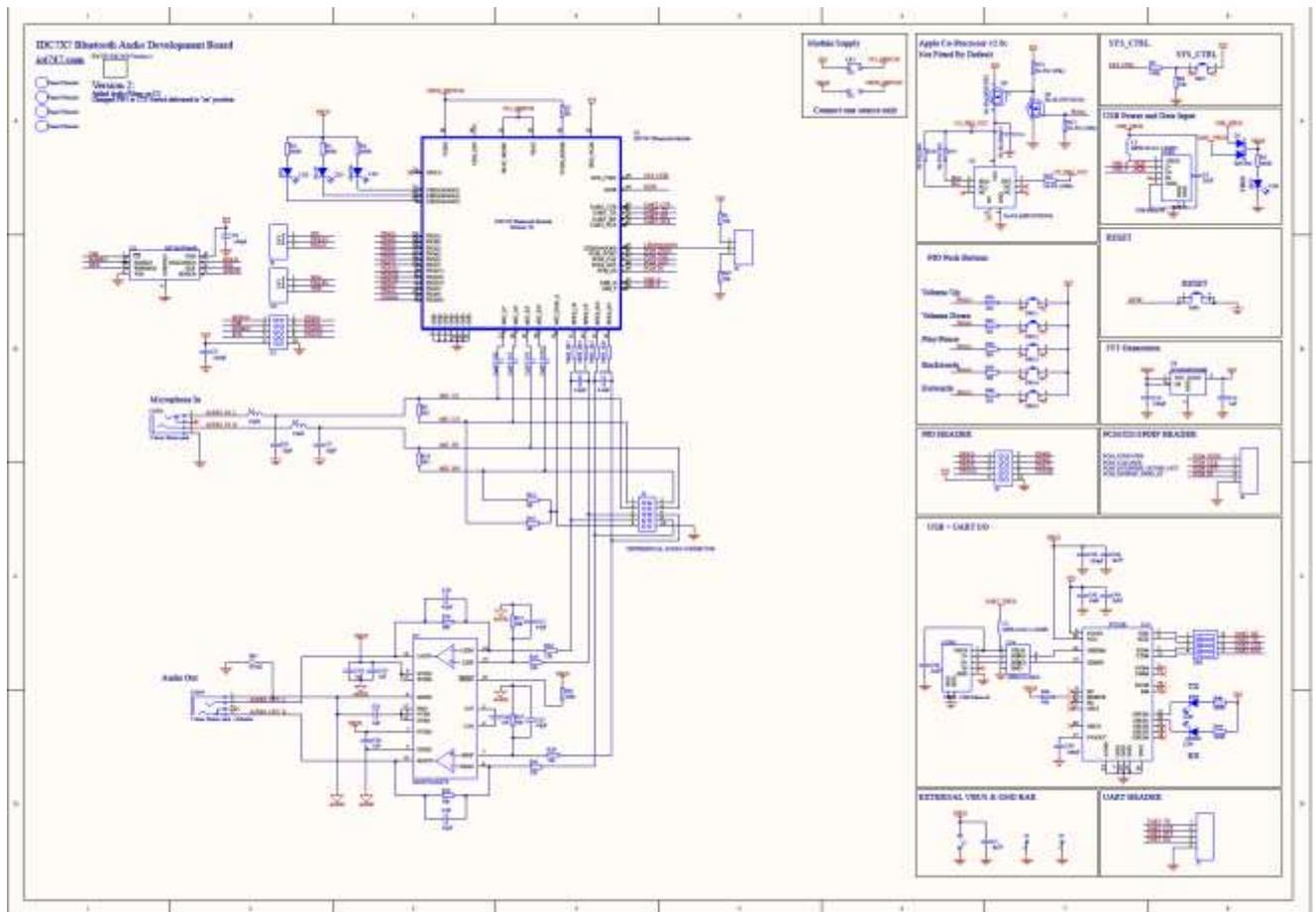
Figure 4: Differential audio header
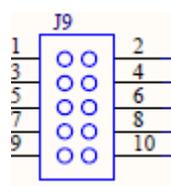
Function	Pin	Pin	Function
Left microphone positive input	1	2	Right microphone positive input
Left microphone negative input	3	4	Right microphone negative input
Left headphone positive out (unamplified)	5	6	Right headphone positive out (unamplified)
Left headphone negative out (unamplified)	7	8	Right headphone negative out (unamplified)
Microphone bias	9	10	Ground

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Figure 5: Other Headers Description

PIO HEADER

PIO(3)	1		2	PIO(8)
PIO(2)	3		4	PIO(6)
PIO(5)	5		6	PIO(7)
3V3 PIO(21)	7		8	PIO(20)
	9		10	

J3

PCM/I2S/SPDIF HEADER

PCM_SYNC/-/WS
PCM_CLK/-/SCK
PCM_OUT/SPDIF_OUT/SD_OUT
PCM_IN/SPDIF_IN/SD_IN

PCM_SYNC	1
PCM_CLK	2
PCM_OUT	3
PCM_IN	4
	5

J4

UART HEADER

UART_TX	1
UART_CTS	2
UART_RTS	3
UART_RX	4
	5

J1

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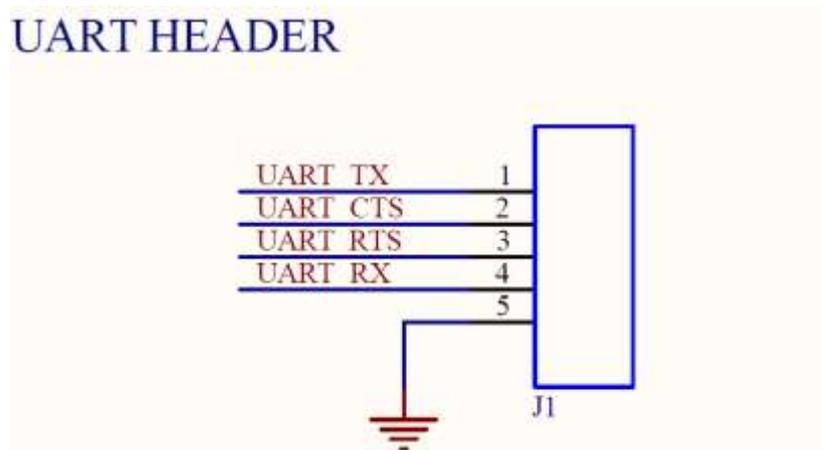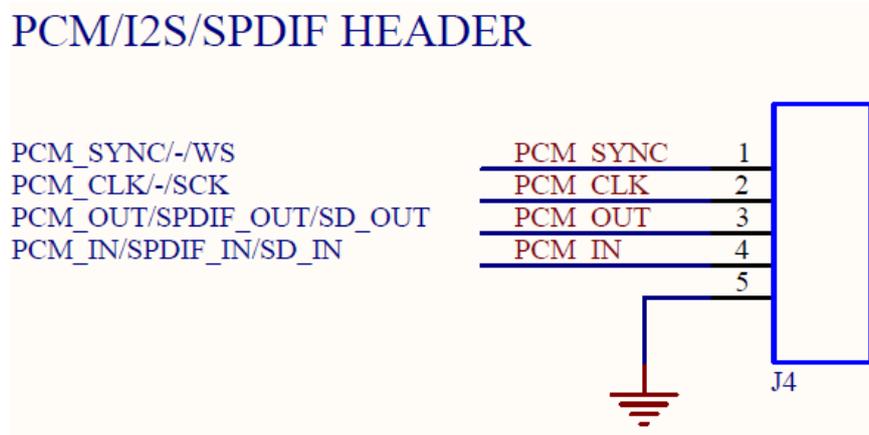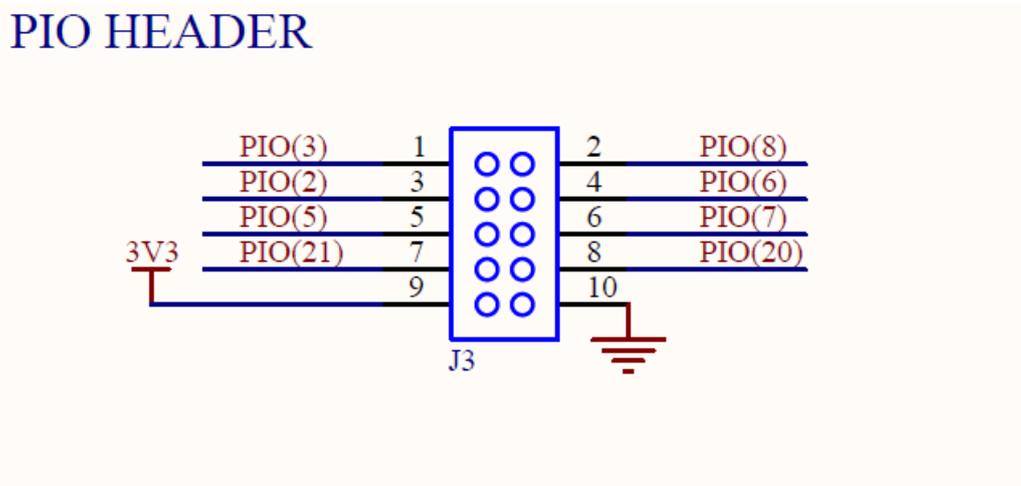
Trouble-Shooting

If your board does not seem to work, please go through the most common problems below and the suggested troubleshooting steps. If you are still having issues, please contact info@iot747.com.

Power:

If when you connect the USB cable your device does not start flashing LED0, you may not be supplying power over USB or not in DISCOVERABLE mode. Check the red LED next to the USB TO HOST connector on the board. If it is not lit up, you are not supplying power to the board. Try plugging into a different USB port or charger and then try a different cable.

FTDI Driver:

The PC usually automatically installs the USB FTDI drivers when you first plug in the board. If the drivers are not successfully installed, unplug the board and plug it into a different USB port. If that does not work please follow the steps in FTDI Trouble-Shooting

UART:

If your FTDI driver installed correctly but you do not see anything or you see garbage on your serial terminal, please check if your UART settings are as described in Step3: Controlling the KIT with UART commands.

Bluetooth:

If you want to connect to your board, make sure that the module is in discoverable state - LED0 should be flashing. If this is not the case, single press on RESET. Alternatively, if you have UART connected, the STATUS command should return 'DISCOVERABLE CONNECTABLE'. If this is not the case, please type in 'DISCOVERABLE ON'. Refer to the UART Command Manual for more information.

To restore the IDC747 to its original configuration, please power ON the module while pushing the VOL UP button (holding high PIO3/PIN23).

FTDI Trouble-Shooting

Drive Update and Reinstallation

If the device has not enumerated correctly or you may need to re-install the driver. This is done by going to Properties/Change Settings/Update Driver as in the figure above.

You can also try Properties/Change Settings/Un-install. When you plug the board back in, the PC will look on Internet for the drivers.

While Windows should find the latest version of the driver for your system, you may want to go to the FTDI website and download and install the latest drivers yourself: http://www.ftdichip.com/Drivers/VCP.htm

Figure 6: Driver Update for FTDI

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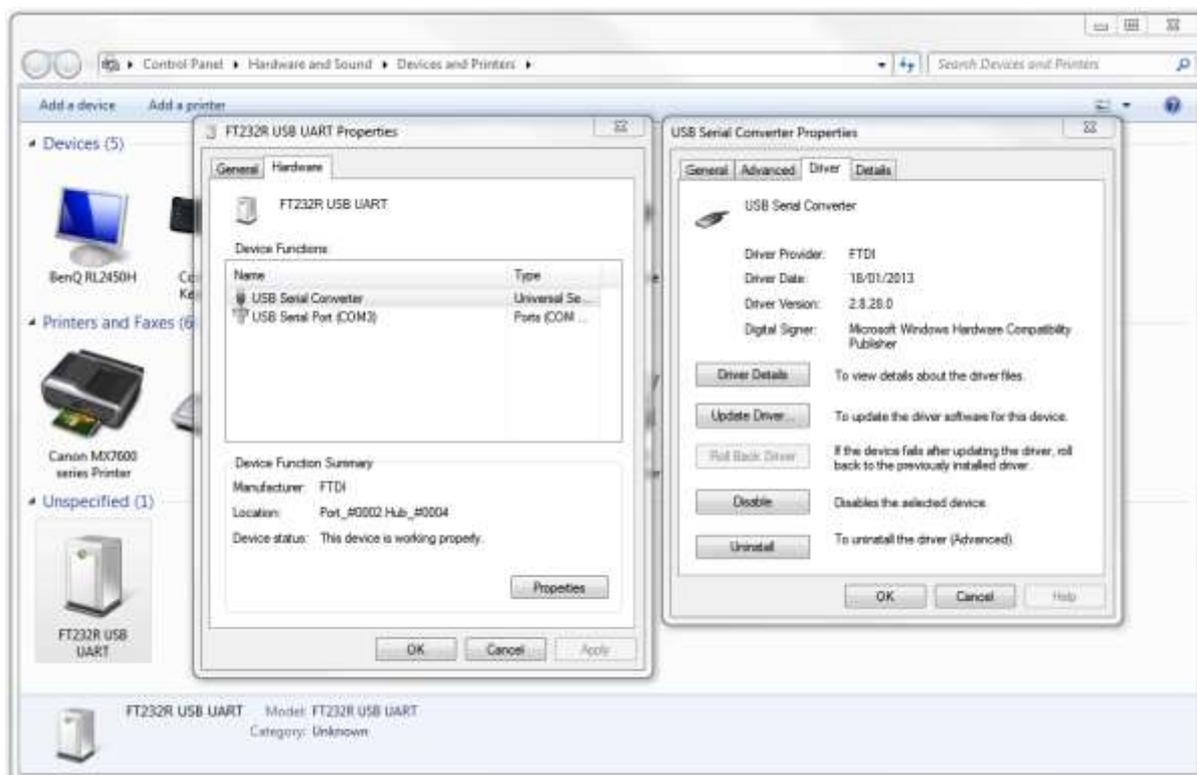
Driver Cleaning

If you need to clean a previous install of the FTDI driver from your system and/or clear any COM Ports added to the registry then you should obtain the CDM Uninstaller from the following link:

http://www.ftdichip.com/Support/Utilities/CDMUninstaller_v1.4.zip

Extract the contents of this ZIP file into a folder on your desktop or elsewhere and run the CDMuninstallerGUI.exe file. You should see the following dialogue box which already has the FT232R Product/Vendor IDs in the box.

Figure 7: CDM Uninstaller Load Screen
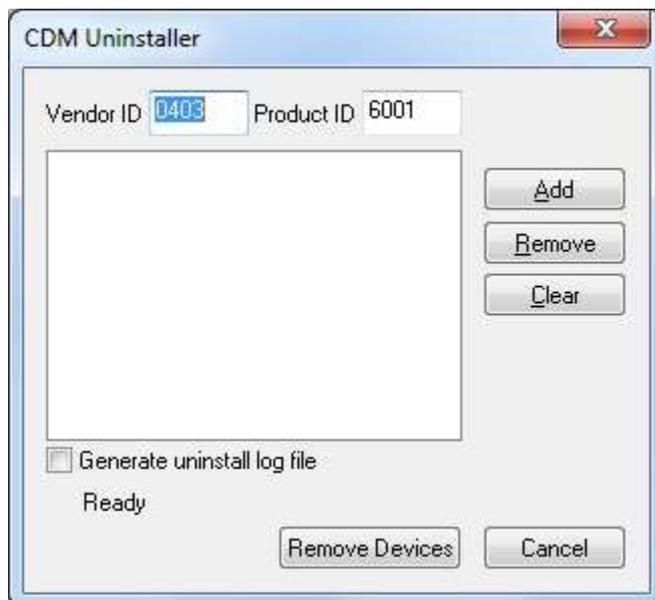
Click the "Add" button to add this Product/Vendor ID to the list of devices to remove. Optionally you can check the "Generate log file" checkbox for a record of what operations were performed and which COM Port entries were removed. Now press the "Remove Devices" button. Once completed you should restart your computer so that the O/S can clean things up. You should then be ready to re-install your drivers as listed above.

IDC747-KIT-MANUAL
Product Information Data Sheet
Ref: KIT747-MAN-V002
Latest Update: April, 2022

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Figure 7: CDM Uninstaller after FTDI Vendor and Product ID have successfully been added

Download the latest driver from the FTDI website at the following link:

http://www.ftdichip.com/Drivers/VCP.htm

When installing the driver, ensure you have sufficient user privileges to install devices on your computer.