PicoIRIS v1.1 User Manual

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Contents

Getting Started

1.1   Powering the Device

PicoIRIS needs to be powered with a **Mobile Phone Charger of 5V/2A** power rating for full functionality. It can also be powered with other chargers/adapters of 5V/1A or lower current rating, but this will accordingly limit the current output of the device.

> **Note:** Use good quality branded mobile phone chargers for best results. Power line noise or ripples, if any, will affect the quality of signals measured/generated.

Figure 1.1: Micro-USB Type-B connector

Connect the 5V/2A mobile phone charger with MicroUSB Type-B cable to the **'Power Only' Micro-USB Type-B** port of the PicoIRIS device. Optionally, your device could also have a USB Type-C port or a DC Barrel Jack or a 2-pin Screw Terminal for power.

> **Warning:** Do not connect any of the 'Power Only' ports to PC/Laptop or any other host devices. These ports are designed only to power the PicoIRIS device using 5V/2A charger/adapter. Connecting to these ports can damage your PC/Laptop or the host device by drawing more than 2A of current.

1.2   Connecting to PC/Laptop

PicoIRIS can connect to the PC/Laptop either by using Bluetooth or USB. Based the device's model, PicoIRIS could be equipped with either Bluetooth or USB hardware for connectivity.

1.2.1   Bluetooth Connectivity

If the PicoIRIS device is equipped with Bluetooth, you will find a sticker on the device with the Device-ID and PIN for Bluetooth connectivity. PicoIRIS's Bluetooth needs to be paired with the PC/Laptop before establishing connection.

1.2.1.1 On Windows

On system with Windows 10, click on Windows Start icon and search for 'Bluetooth'. Select the 'Bluetooth and other devices settings' option from the results.
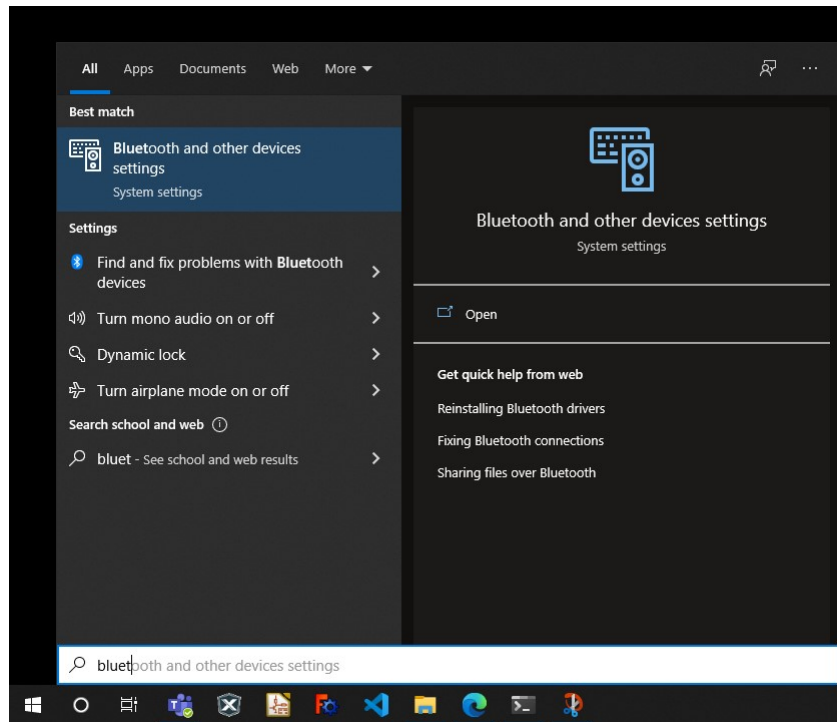

Figure 1.2: Screenshot of Bluetooth search

In the 'Bluetooth & other devices' settings window, select 'Add Bluetooth or other devices' option.
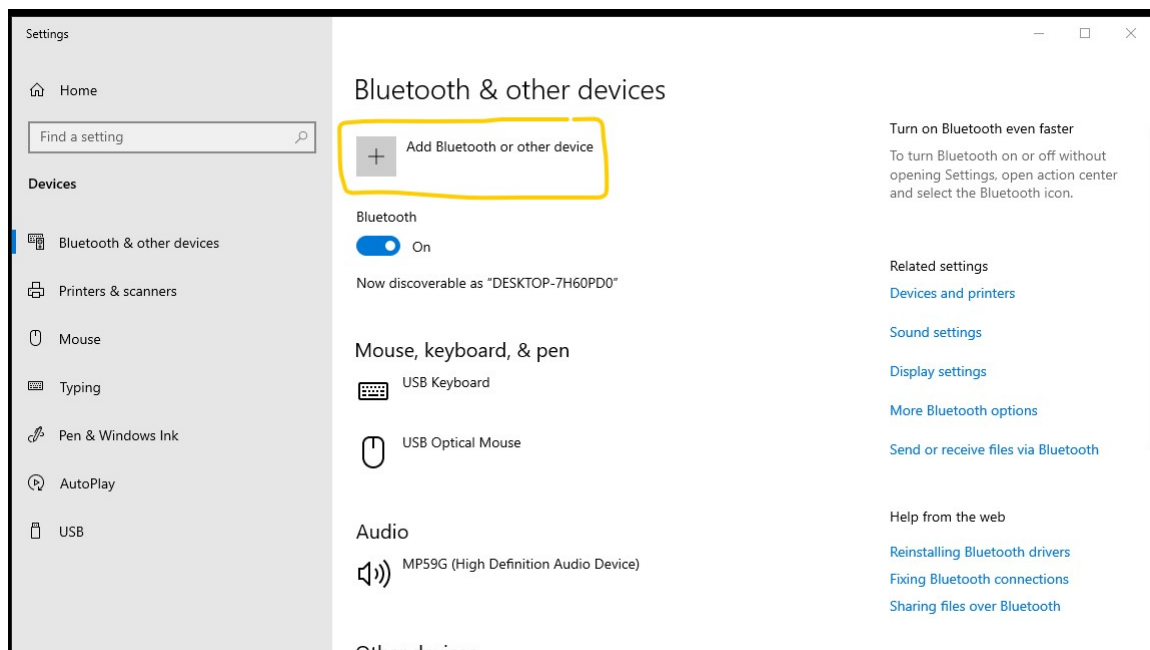

Figure 1.3: Screenshot of Bluetooth settings

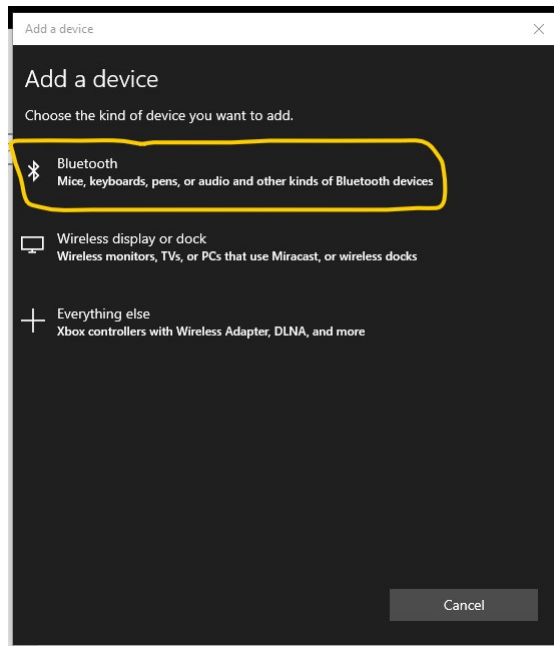In the 'Add a device' window, select 'Bluetooth'.

Figure 1.4: Screenshot of Add a device

After few seconds of searching, list of visible Bluetooth devices should appear.

> **Note:** For the PicoIRIS's Device-ID to appear, PicoIRIS must be powered on.

PicoIRIS device should appear as `PicoIRIS-Bxxx`, where `xxx` denotes the corresponding device number.
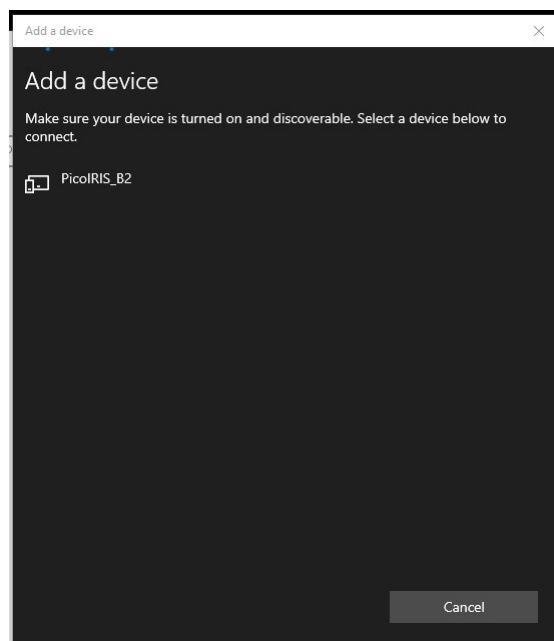

Figure 1.5: Screenshot of visible Bluetooth devices

Click on the PicoIRIS's Device-ID, enter the Bluetooth PIN corresponding to that device and select 'Connect' for pairing. By default the Bluetooth PIN is '`1234`'.
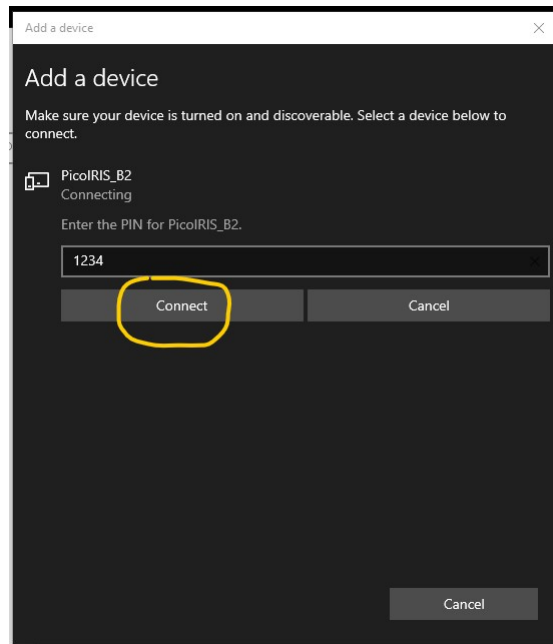
Figure 1.6: Screenshot of Bluetooth pairing

If all goes well, your PicoIRIS's Bluetooth should be paired with the PC/Laptop successfully.

1.2.1.2 On Ubuntu 21.04 or higher

On system with Ubuntu 21.04 or higher, click on 'Activities' at the top left corner of the screen, and search for 'Bluetooth'.
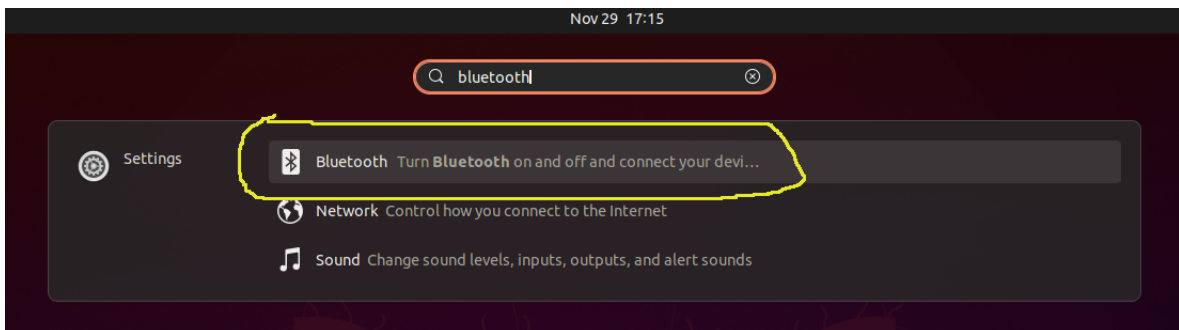

Figure 1.7: Screenshot of Ubuntu search

In the Bluetooth settings window, the PicoIRIS Device-ID should be visible. Remember to power on PicoIRIS device.
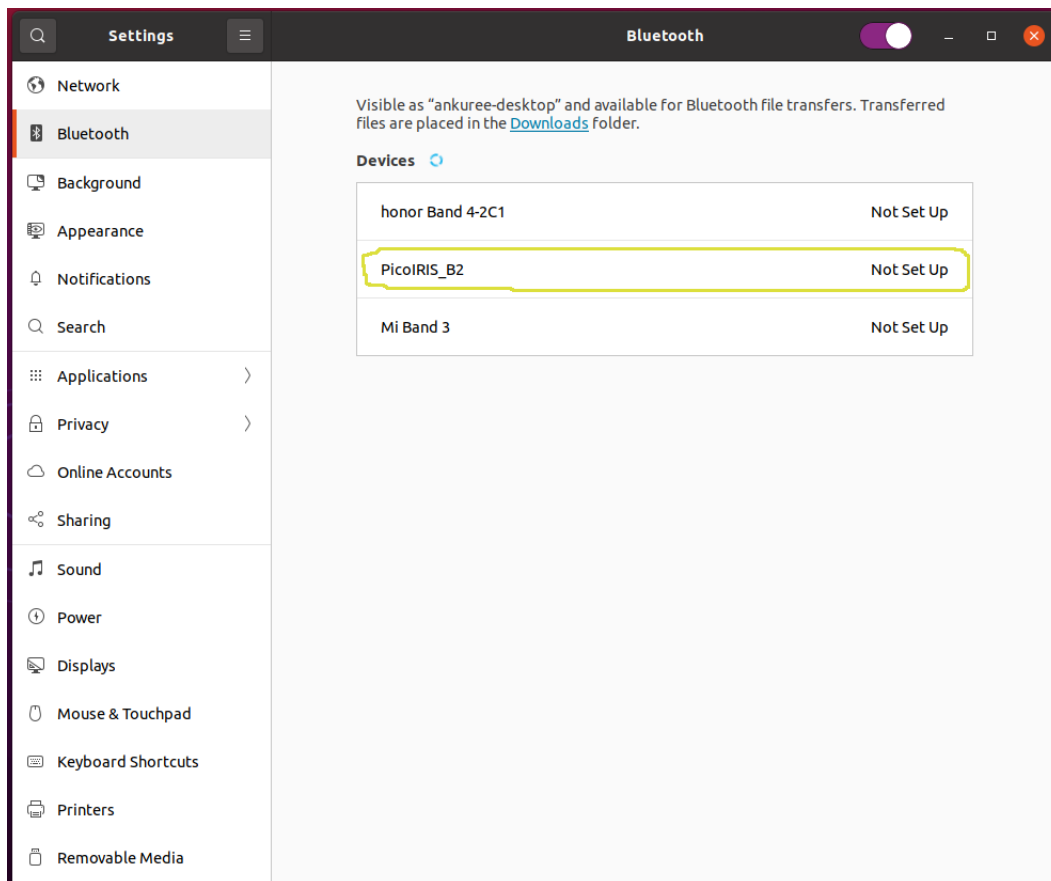
Figure 1.8: Screenshot of Bluetooth Settings

Click on 'PicoIRIS-Bxxx' where xxx is your device number, enter the Bluetooth PIN as prompted and select 'Confirm'. The default Bluetooth PIN is '1234'.
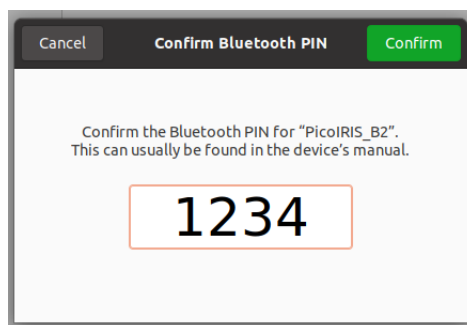

Figure 1.9: Screenshot of Bluetooth Setting's PIN prompt

If all goes well, PicoIRIS's Blueooth should be paired to your system successfully.

1.2.1.3 On Ubuntu 16.04 or higher

On system with Ubuntu 16.04 or higher, click on 'Ubuntu Search' icon at the top left of the screen and search for 'bluetooth'. Open the 'Bluetooth' application that appears.

Figure 1.10: Screenshot of Bluetooth

In the 'Bluetooth Settings' window, click on '+' icon at the bottom to add a new device to the system.
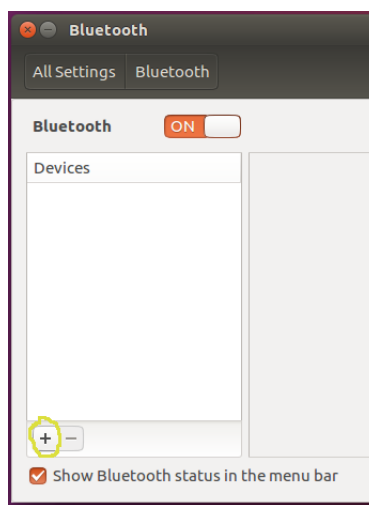

Figure 1.11: Screenshot of Bluetooth

In the 'Device Search' window, PicoIRIS's Device-ID should be visible. Remember to power on PicoIRIS device. Select 'PicoIRIS-Bxxx' where xxx is your device number and click on 'PIN options...' button below.
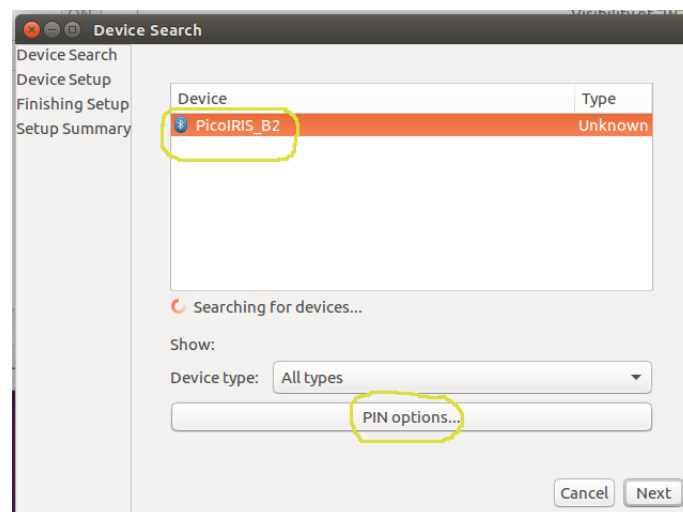

Figure 1.12: Screenshot of Bluetooth

In the 'PIN Options' window, select 'Custom PIN', enter the Bluetooth PIN mentioned on the PicoIRIS device and click 'Close'. Default Bluetooth PIN is '1234'.
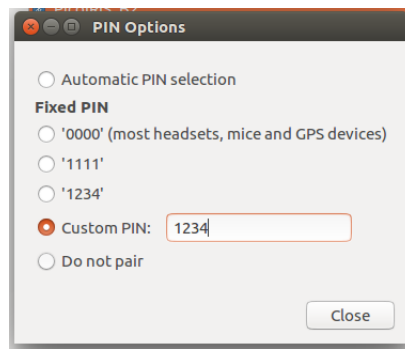

Figure 1.13: Screenshot of Bluetooth

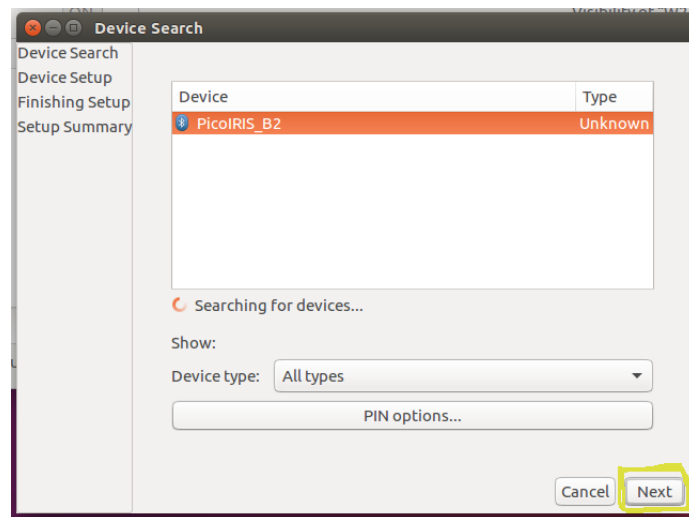Back in the 'Device Search' window, click 'Next'.

Figure 1.14: Screenshot of Bluetooth

If all goes well, PicoIRIS's Bluetooth should be successfully paired with the system.

1.2.2 USB Connectivity

1.2.2.1 On Windows

If your PicoIRIS device is equipped with Prolific-PL2303HXA USB hardware, you will need the USB drivers for the same. Go to `https://ankur-iitb.github.io/PicoIRIS-Manual/` and select 'Prolific-USB-UART-Driver' link. This should open a Google Drive zip file with the driver installer.

Download this zip file to your computer and extract it. Run the 'PL2303-Prolific-GPS-1013-20090319.exe' file by double clicking it. Follow the on screen instructions to install the driver successfully.

Note: Do not connect PicoIRIS's USB to PC/Laptop before installing the driver software.

After the driver is installed successfully, connect PicoIRIS's Prolific USB device to PC/Laptop. Open 'Device Manager' and look under 'Ports (COM & LPT)' list. If all goes well, 'Prolific USB-to-Serial Comm Port (COMxx)' should be listed.
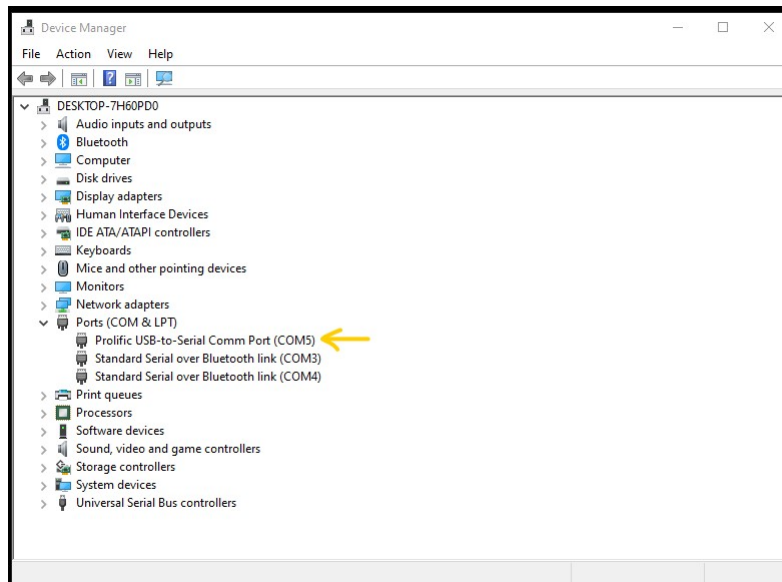
Figure 1.15: Screenshot of Device Manager with PicoIRIS-USB connected

1.2.2.2 On Ubuntu

PicoIRIS's USB is supported by default on Ubuntu. To see the connected devices, in 'Terminal' run `lsusb` command. It will list all the USB devices connected to the system. PicoIRIS's USB with Prolific hardware will be list as below.

```
Bus xxx Device xxx: ID xxxx:xxxx Prolific Technology, INC. PL2303 Serial..
```

1.3 Downloading PicoIRIS-GUI Software

To use PicoIRIS, download the **PicoIRIS-GUI** software from the following link - `https://ankur-iitb.github.io/PicoIRIS-Manual/`. Under the 'Software' section, latest versions of the PicoIRIS-GUI software are available for both Windows and Ubuntu systems.

1.3.1 For Windows

If you are on a Windows 10 system, download the 'PicoIRIS-GUI-xxxxxx-windows-10.zip' file to your computer. Extract this zip file to your desired folder to get the 'PicoIRIS-GUI-xxxxxx-windows-10.exe' file. Double click this exe file to directly open the software. No installation is required.

This software is not designed to work on Windows 7 or earlier versions, as they are obsolete. It may or may not work on these systems.

1.3.2 For Ubuntu

- If you are on Ubuntu 21.04 or higher version, download the 'PicoIRIS-GUI-xxxxxx-ubuntu-21-04' file to the desired location on your computer.

- Else if you are on Ubuntu 16.04 or higher version, download the 'PicoIRIS-GUI-xxxxxx-ubuntu-16-04' file to the desired location on your computer.

> **Note:** On Ubuntu, this software requires `sudo` previlege to connect to the PicoIRIS device.

To run this software, go to folder where the software was downloaded. Right-click and select 'Open Terminal' to open the default terminal window. Or else, open your desired Terminal application, navigate to the directory of the downloaded software.

Enter the following command in the Terminal. Make sure to substitute '`xx`' with the exact name of the file you downloaded.

```
sudo ./PicoIRIS-GUI-xxxxxx-ubuntu-xx-xx
```

Enter your password when prompted. After a few seconds delay, the PicoIRIS-GUI software should open.

1.3.3   Safety Undertaking

Figure 1.16: Scrennshot of Safety Undertaking on Windows 10

Once the PicoIRIS-GUI software is opened, a 'Safety Undertaking' message pops-up. Please read the message carefully before you agree to use the device with care. In case you disagree to the safety undertaking, the software would close automatically.

> **Warning:** PicoIRIS is a sensitive Test & Measurement electronic instrument. Please do not connect signals with voltages higher than 10 volt in either polarity. All signals, both input and output, are measured with respect to the device's 'GND'.

1.3.4   Connecting to PicoIRIS

Next step is to connect PicoIRIS-GUI with the PicoIRIS device via either Bluetooth or USB. The process to connect is different between Windows and Ubuntu.

1.3.4.1   On Windows

On a system with Windows 10, both USB or Bluetooth based PicoIRIS devices are shown as `COMxx` ports. Clicking on '–Select device to connect–' option, displays the list to devices available to connect.
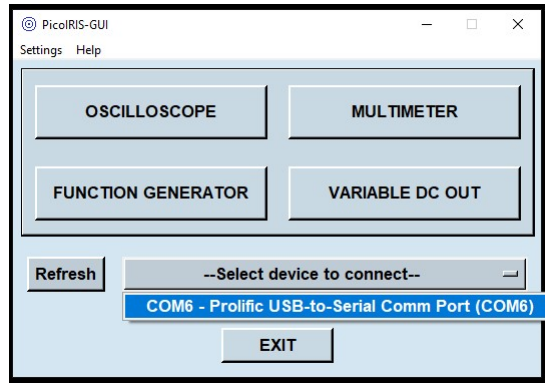
Figure 1.17: Scrennshot of PicoIRIS-GUI with USB devices listed

USB based PicoIRIS is listed as 'COMx - Prolific USB to Serial Comm Port'.
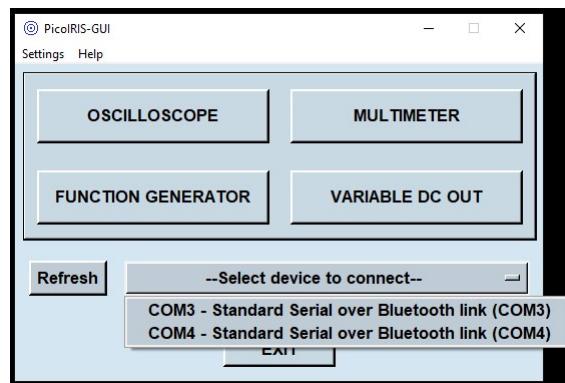

Figure 1.18: Scrennshot of PicoIRIS-GUI with Bluetooth devices listed

Bluetooth based PicoIRIS is listed as 'COMx - Standard Serial over Bluetooth link'. As you can notice, there are two Bluetooth COM ports listed for each PicoIRIS device. Only one among the two COM ports is usable. Connecting to the other port throws error. This is a known issue of HC-05 Bluetooth hardware module on Windows.

1.3.4.2 On Ubuntu

On a system with Ubuntu, the method in which Bluetooth devices get connected is different from that of USB devices. Because of this, you will have to first select the type of connection, 'USB' or 'Bluetooth' in the option. The software then scans for the available devices and updates the list. You can then select the particular device you want to connect to.

—— Images Pending ——

1.3.4.3 'PL2303HXA Phased out' error on Windows

Sometimes, on a system with Windows, while trying to connect to a Prolific USB hardware based PicoIRIS, the device's name shows '**PL2303HXA PHASED OUT SINCE 2012. PLEASE CONTACT YOUR SUPPLIER.**'. This happens when Windows updates to the latest driver. To solve this issue, we will have to rollback to the old driver version-3.3.
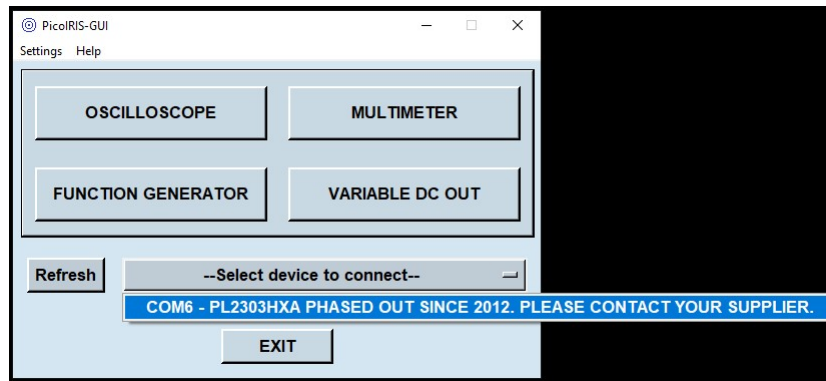
Figure 1.19: Scrennshot of PL2303HXA Phased out Error

1. Click on the 'Windows' logo at the bottom left corner of your screen, type 'Device Manager' and select 'Device Manager' option to open it.
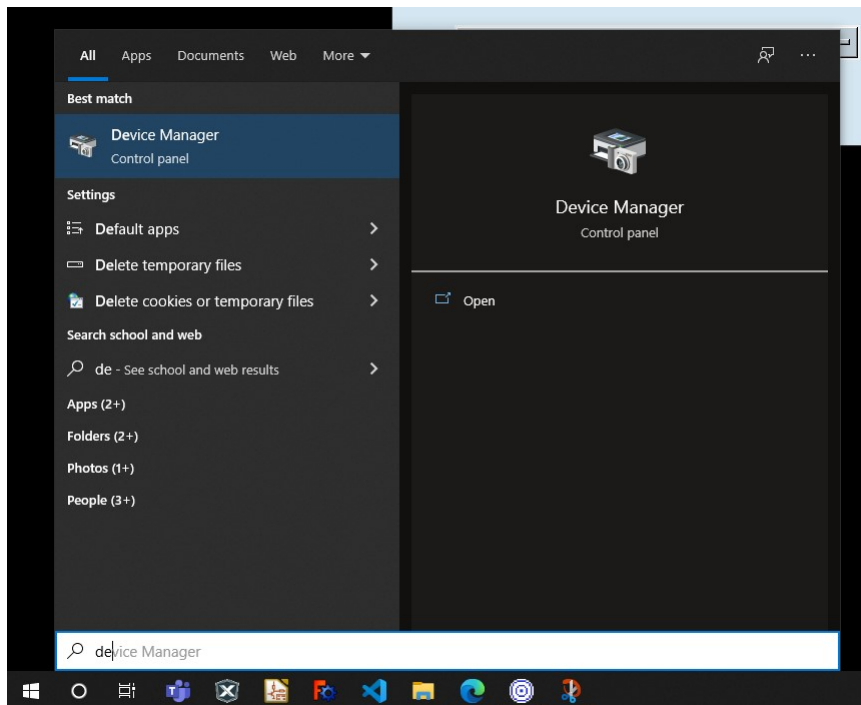

Figure 1.20: Scrennshot of Windows Start search for Device Manager

2. In the 'Device Manager' window, under 'Ports (COM & LPT)' you will find your device listed with the 'Phased out' error. Right-click on it and go to 'Properties'.
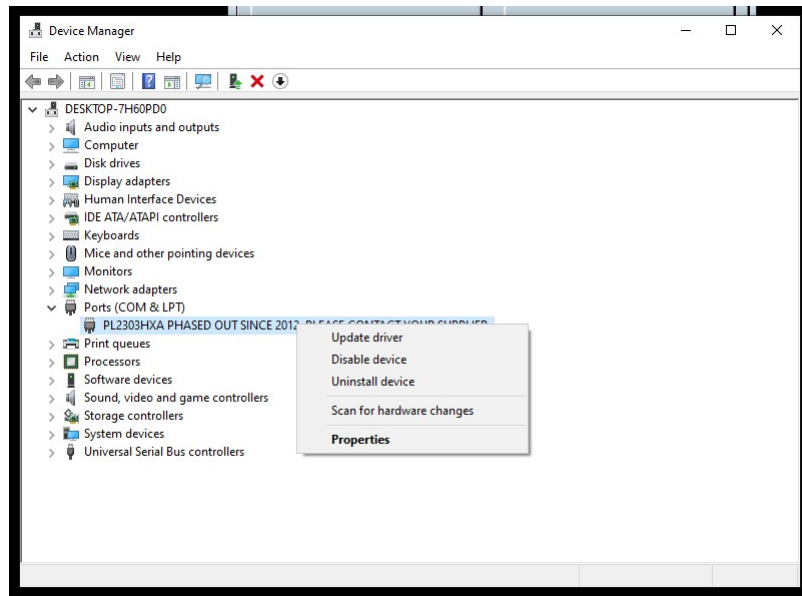
Figure 1.21: Scrennshot of Device Manager with PL2303HXA listed

3. In the 'Device Properties' window, under 'Driver' tab, look at the 'Driver Version' number. It would be **3.8** or higher. We need to roll this back to the original **3.3** version that we had installed earlier.
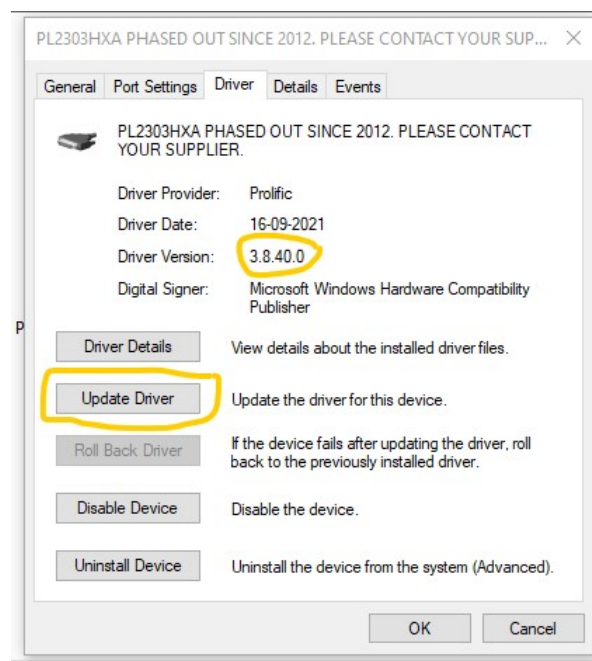

Figure 1.22: Scrennshot of PL2303HXA device properties

4. If the 'Roll Back Driver' option is active, click on this option to go back to **3.3** version of the driver. But if the 'Roll Back Driver' option is inactive, you will have to manually change the driver by clicking on the 'Update Driver' option.
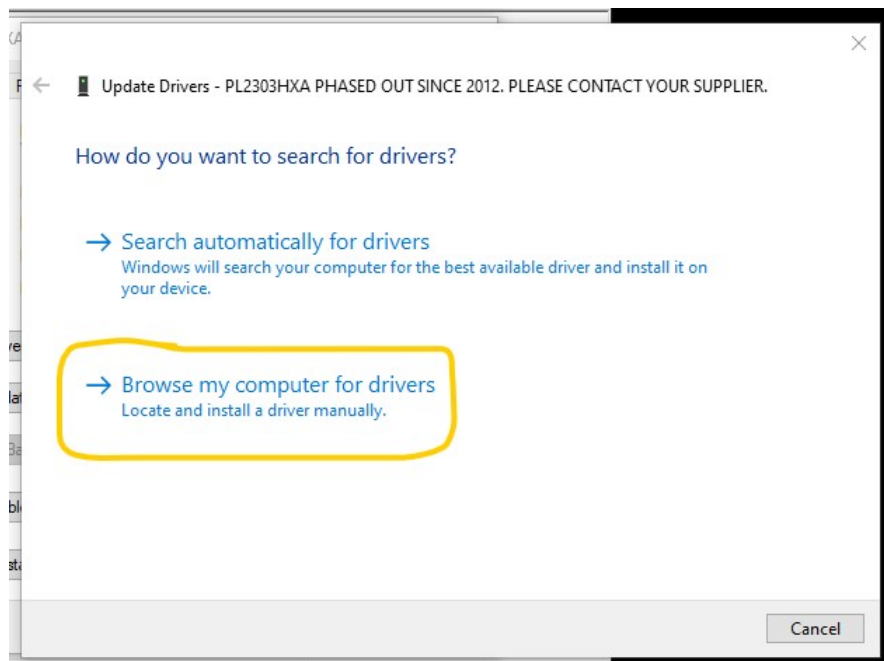
Figure 1.23: Scrennshot of Update Drivers screen

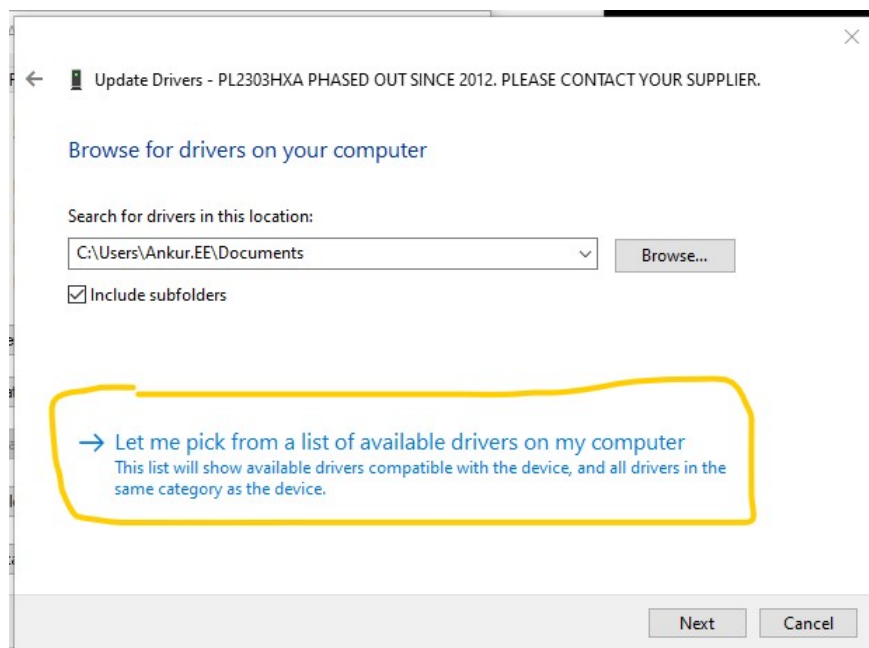5. In the 'Update Drivers' window, select 'Browse my computer for drivers' option.

Figure 1.24: Scrennshot of Update Drivers screen

6. In the next 'Update Drivers' screen, select 'Let me pick from a list of available drivers on my computer' option.
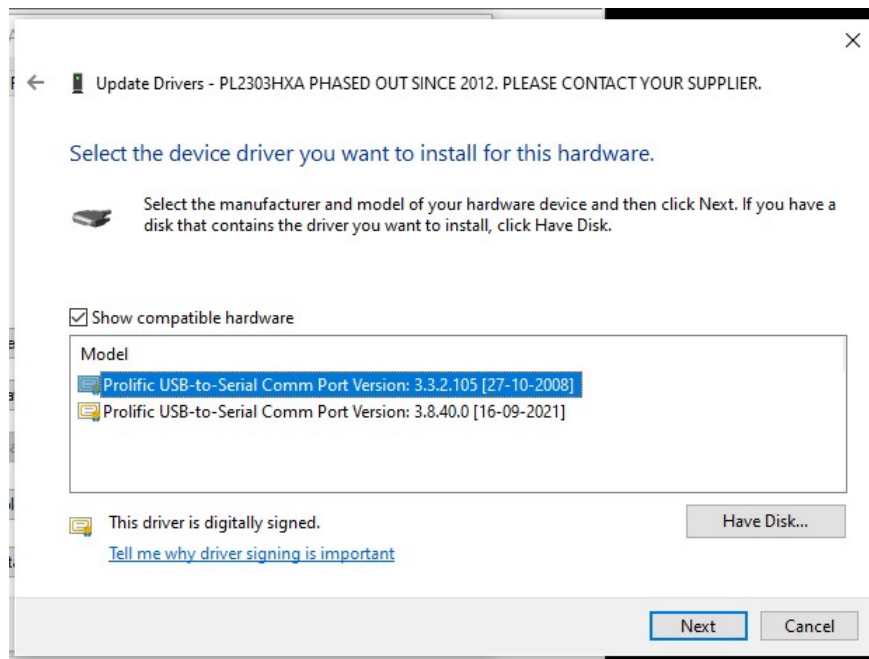
Figure 1.25: Scrennshot of Update Drivers screen with the list of available drivers

7. In the next 'Update Drivers' screen, 'Show compatible hardware' option should be selected. From the drivers list, choose **Prolific USB-to-Serial Comm Port Version: 3.3.x.xxx [xx-xx-xxxx]** and click 'Next'.

If all goes well, the USB driver should be restored to the original 3.3 version and the PicoIRIS device should connect normally.

PicoIRIS-v1.1

2.1 Features

2.2 Specification

2.3 I/O Ports

PicoIRIS-GUI

3.1 Oscilloscope

3.2 Function Generator

3.3 Variable DC

3.4 Digital I/O

— End of Document —