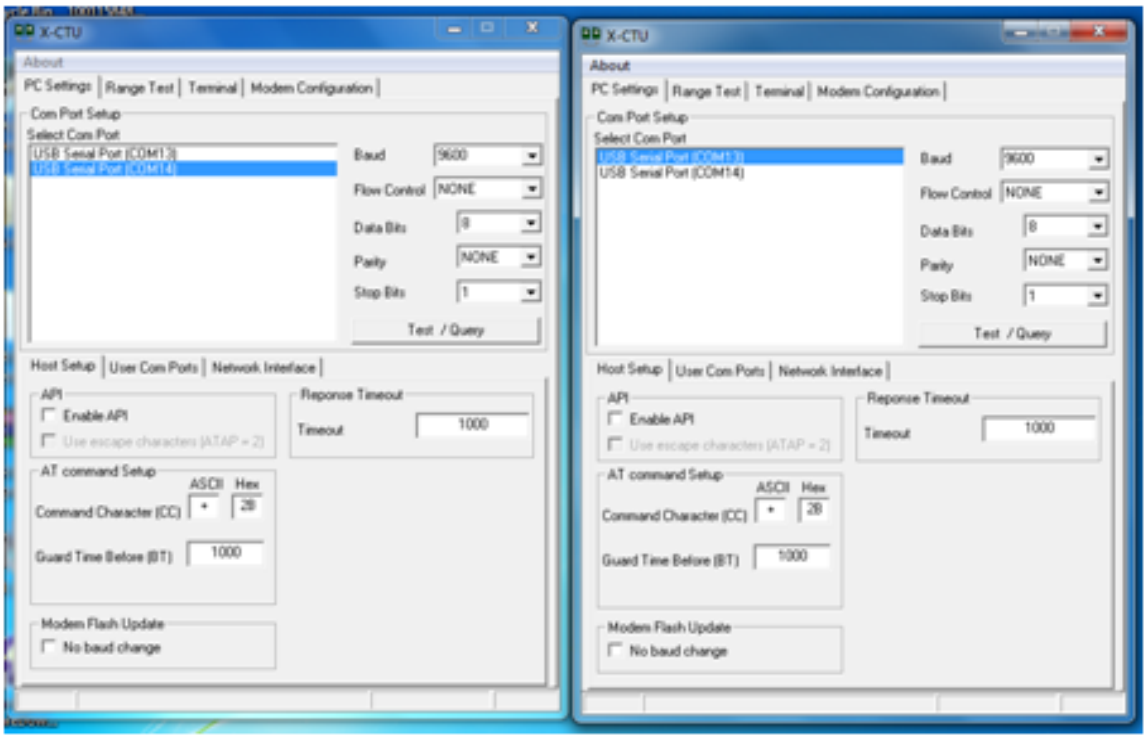
CS684
Team 2 : Kinect based remote control of harvesting bot (Autumn 2012)
Hardware Manual

Client : System at remote location
Server : System in greenhouse

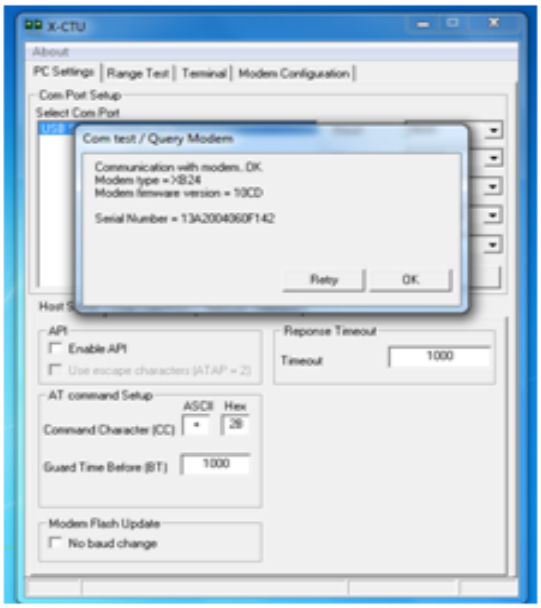
1. Configuration of X-bee module :

1.1 Install X-CTU from:
http://www.digi.com/support/productdetail?pid=3352&osvid=57&type=utilities

1.2 Start 2 windows for X-CTU for setting communication between 2 XBEE modules

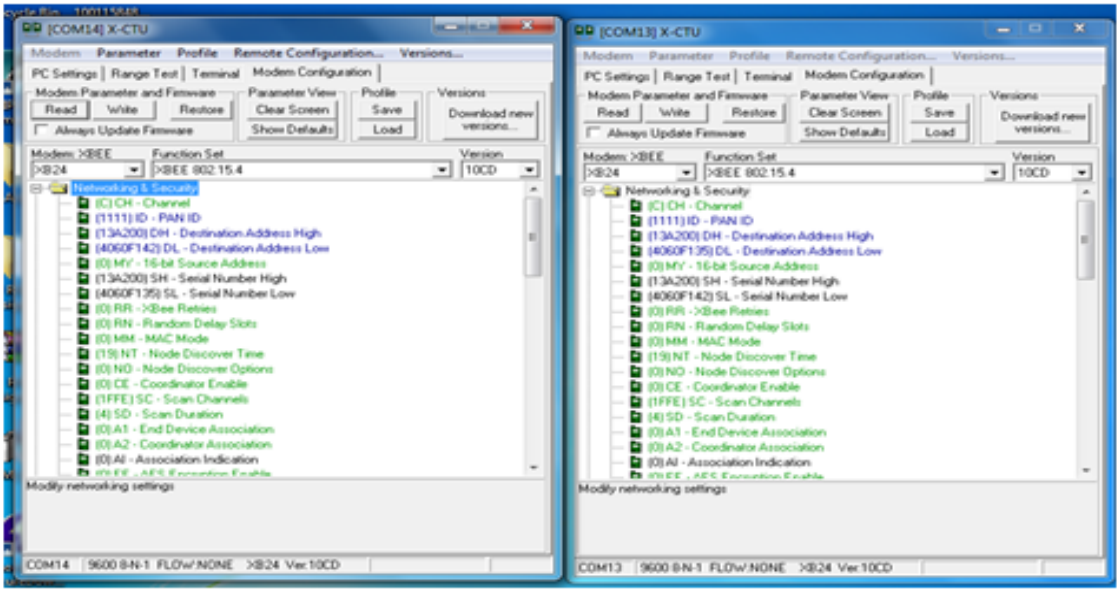


1.3 Go to “PC Settings” - Click on “Test/Query”. This will show the following windows:

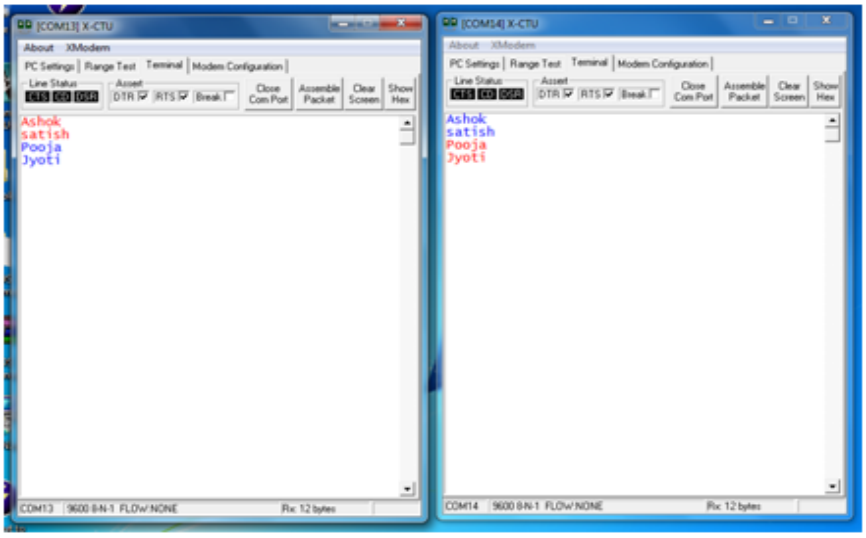


1.4 Go to “Modem Configuration” tab - Click “Read” (for both modules).

1.5 Under “Modem: XBEE” select “XB24”, under “Function Set” select “XBEE 802.15.4” and under “Version” select “10CD”. The PAN ID for both XBEEs must be same and destination address of one XBEE module should be same as the serial number of the other one. Click “Write” button. To check whether settings are done, click on “Read”. This will display the following window:



TESTING: Open “Terminal” tab on both windows. Write in one terminal (appears in blue), the same will appear in the other terminal (in red).



2. IP Camera Setup

IP camera is placed in greenhouse which provides the live video at remote system (client)

Steps for connecting IPCam to LAN:

1. Reset the IPCam, by press the Reset button on its bottom for 5 seconds. It will reset the IP Address of Camera to 192.168.2.3
2. Install the IPCam Admin Utility on your PC from accompanied CD
3. Connect the IPCam to your PC via LAN wire
4. Start the Admin Utility
5. You should find the Camera listed
6. Select your camera and Click on Configure Camera
   It will ask for username and password. (By default they are "admin" , "1234". You may use this interface to change the IP address of IPCam and its authentication details.)
7. Configure the IP settings for IPcam just like how you configure your Laptop IP settings
   ex:
   i. IP adress: 10.129.139.23
   ii. Subnet mask: 255.255.128.0
   iii. Default gateway: 10.129.250.1
   iv. Preferred DNS server: 10.200.1.11

   Note: Remember to set it so that both your PC and IPCam belong to same network (i.e., first 16/24 bits of IP Address)
8. Click Browse Camera via web. You should see IE popping up showing live stream from your camera . It will again ask for authentication, use the same as above (unless previously changed)

9. Now unplug Camera from your PC and connect it to any LAN port using LAN cable

10. Connect your PC to the same LAN and refresh your IE still you should able to see live stream from your Camera

3. Gripper Arm Construction

The gripper is a attachment made of plastic, thermocol and servo motors for gripping the fruits on troughs.

Materials required for making gripper are:

- Two toothed gear wheels
- Plastic strips
- Thermocol
- Metal strips for holding the two wheels together
- Two servo motors

Two arms of the gripper are attached together using a gear arrangement. A servo motor is connected to one of the gear wheel. When this servo motor rotates, both the arms move due to the presence of gear wheels. A thermocol attachment is provided on the gripper for better grip. One servo motor is used to move the arm upwards and downwards. Image of the gripper is shown below.