**Setting up communication with the Moxa NPORT board**

**PART 1**

As explained in the TREX manual, all components of the TREX are connected with the LabView laptop via the Moxa NPORT board. In order to set up the communication, several steps are required:

* 1. **IP Address:** The MOXA board and the TREX laptop must be on the same subnet.
  + If there are no other constraints, the MOXA board has a default IP of 192.168.127.254. Set the IP of the TREX computer to 192.168.127.254 (subnet = 255.255.255.0, default gateway = 192.168.127.27, DNS = 192.168.127.28 preferred and 192.168.127.27 alternative).
  + If the TREX is on the ETH network, it has an IP address of 172.31.57.192, and the MOXA board needs to have the IP set to the ETH ID of 172.31.57.193. Other settings (DNS, etc.) should be set to the same as the TREX computer.
    - *Note*: The QCLAS IP in the ETHZ network is 172.31.57.188
  + In any other network configurations, set the MOXA board IP to be on the same subnet as the TREX.
* *Setting the IP address on the TREX / QCLAS:*
  + Go to Windows -> Settings -> Network -> Ethernet -> Change adapter options
  + Right click on the Ethernet connection and choose Properties and then double click on Internet Protocol version 4
  + Set the IP manually or to automatic as needed
* *Setting the IP address of the MOXA board:*
  + Open the software NPort Administrator on the TREX
  + Search for the board and connect to it
  + “Unlock” from the communications menu with u: **admin** and pw: **moxa**
  + Choose Configure and the Network tab to edit the network and IP settings
  + If you do not know the password of the moxa or if the IP is not valid (not default and incorrect for the network) you must reset the moxa by pressing the reset button on the front for 3 seconds until the screen flashes green. This resets the username, password and IP address to the default.
  1. **Check the communication with the MOXA board:**

To test that the communication with the MOXA board is correct:

* In an internet browser, type the MOXA board IP address in the url bar and you should come to the login page.
* Do not modify the password here! Modified passwords seem to no longer work.
* Open a command prompt window (search cmd in the Windows menu) and type: ping <IP address>. You should get quick communication on all packets; if packets are lost, check the IP settings again.
* Communicate through telnet with the MOXA board: telnet <IP address>
  1. **Set up the COM port assignments:**
  + Open the software NPort Driver Manager, and search for the MOXA board
  + Delete all of the existing COM port assignments
  + Select Add and add the new ports
  + Select Search, highlight the Nport model, click ok
  + This will give a list of all the COM ports
  + Change the COM port assignments of each port on the MOXA board to the desired COM port (see table below for usual values) by highlighting the port and choosing Settings, Go to serial parameters.
  + Click apply – now the 8 ports on the MOXA board are “mapped” as virtual COM ports on the TREX computer
  + Through the Windows Device Manager you should see the COM ports as available
    - Nb: If you don’t get the interface, reset the MOXA by pressing the reset button for 10 sec. Then repeat the whole IP address configuration process.
  1. **Configure the COM ports:**
  2. In the command prompt, open communication with the MOXA board by entering: telnet <IP address>
  3. Check that all the ports of the MOXA board are on “Real COM mode”, meaning that they act as virtual COM ports:
     1. 4) Operating Mode -> Choose Port -> 1) Operating mode, change to Real COM mode if not currently set
  4. Check the settings of all ports are correct. The settings need to correctly correspond to the serial communication port type (eg. RS 232 or RS 485), baud rate, stop bits, etc. of the instrument.
     1. These settings are used by LabView to communicate with the devices, and can be found in various parts of the LabView program
     2. 3) Serial Settings -> Choose Port -> Set correct values (see table below)
  5. In the main menu, save settings and reset.

After these steps are completed, the communication with LabView should work. If the MOXA board is reset, all values are returned to defaults.

PART 2:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MOXA board port** | **COM port** | **Device** | **Baud rate** | **Data bits** | **Stop bits** | **Parity** | **Flow control** | **FIFO** | **Interface** |
| Default |  |  | 115200 | 8 | 1 | None | RTS/CTS | Enable | RS-232 |
| 1 | 1 | Vici | 115200 | 8 | 1 | None | RTS/CTS | Enable | RS-232 |
| 2 | 2 | MFCs | 9600 | 8 | 1 | None | RTS/CTS | Enable | RS-485 4Wire |
| 3 | 7 | Vacuum pressure | 9600 | 8 | 1 | None | RTS/CTS | Enable | RS-485 2Wire |
| 4 | 8 | Stirling | 115200 | 8 | 1 | None | RTS/CTS | Enable | RS-232 |
| 5 | 9 | Parker | 9600 | 8 | 1 | None | RTS/CTS | Enable | RS-485 2Wire |
| 6 | 10 | Actuator | 115200 | 8 | 1 | None | RTS/CTS | Enable | RS-232 |
| 7 | 11 | JUMO | 9600 | 8 | 1 | None | RTS/CTS | Enable | RS-485 2Wire |
| 8 | 12 | HayeSepD pressure | 115200 | 8 | 1 | None | RTS/CTS | Enable | RS-232 |

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1. *Setting the IP address on the TREX / QCLAS:*
   1. Go to Windows -> Settings -> Network -> Ethernet -> Change adapter options
   2. Right click on the Ethernet connection and choose Properties and then double click on Internet Protocol version 4
   3. Set the IP manually or to automatic as needed:
   4. Use the following IP address-enter Safaricom router IP address
   5. Wait for the subnet mask to automatically fill-click ok
2. *Setting the IP address of the MOXA board:*
   1. Open the software NPort Administrator on the TREX
   2. Configuration-broadcast search
   3. ~~Search for the board and connect to it~~
   4. Right click on status and “Unlock” from the communications menu with u: **admin** and pw: **moxa**
   5. Highlight the network, right click, then choose Configure. To edit the network, check the modify box and type the IP address then click ok.
   6. Automatically the moxa board resets.
   7. ~~If you do not know the password of the moxa or if the IP is not valid (not default and incorrect for the network) you must reset the moxa by pressing the reset button on the front for 3 seconds until the screen flashes green. This resets the username, password and IP address to the default.~~

**Setting up communication on the web. 15.02.2024**

**PART 2**

* 1. Open the software NPort Administrator on the TREX.
  2. If you already entered the IP address, select it otherwise follow procedure in the steps in part 1 of this protocol.
  3. On the top menu bar, click on configuration, and select web in the options

Enter the username and password listed in PART 1. u: **admin** and pw: **moxa**

* 1. Press continue, below the login summary.
  2. Click skip on the change password step. This will take you to the Nport console.
  3. On the menu bar on the left, click on **Quick setup**, check that that the ip address is right. The Netmask should be 255.255.255.0
  4. Click on **Back** if all is right then click on **Network** settings>Serial settings. This will give a list of all the COM ports, then check under the Ports one by one,

changing the COM port assignments of each port on the MOXA board to the desired COM port (see table in PART 2 for usual values).

* 1. Click submit when you are done. You should hear a click on the Moxa board each time you edit the COM port.
  2. When done click Save/Restart. This will reboot the server. Your changes will take effect when the server restarts.
  3. To confirm, follow **PART 1.4** a) & b)

When all else fails:

Get to the web app, ensure everything works

Follow the telnet procedure

Save and restart