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

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:

* **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.
* **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>
* **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
  + 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
  + 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
* **Configure the COM ports:**
  + In the command prompt, open communication with the MOXA board by entering: telnet <IP address>
  + Check that all the ports of the MOXA board are on “Real COM mode”, meaning that they act as virtual COM ports:
    - 4) Operating Mode -> Choose Port -> 1) Operating mode, change to Real COM mode if not currently set
  + 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.
    - These settings are used by LabView to communicate with the devices, and can be found in various parts of the LabView program
    - 3) Serial Settings -> Choose Port -> Set correct values (see table below)
  + 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.

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| **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 |