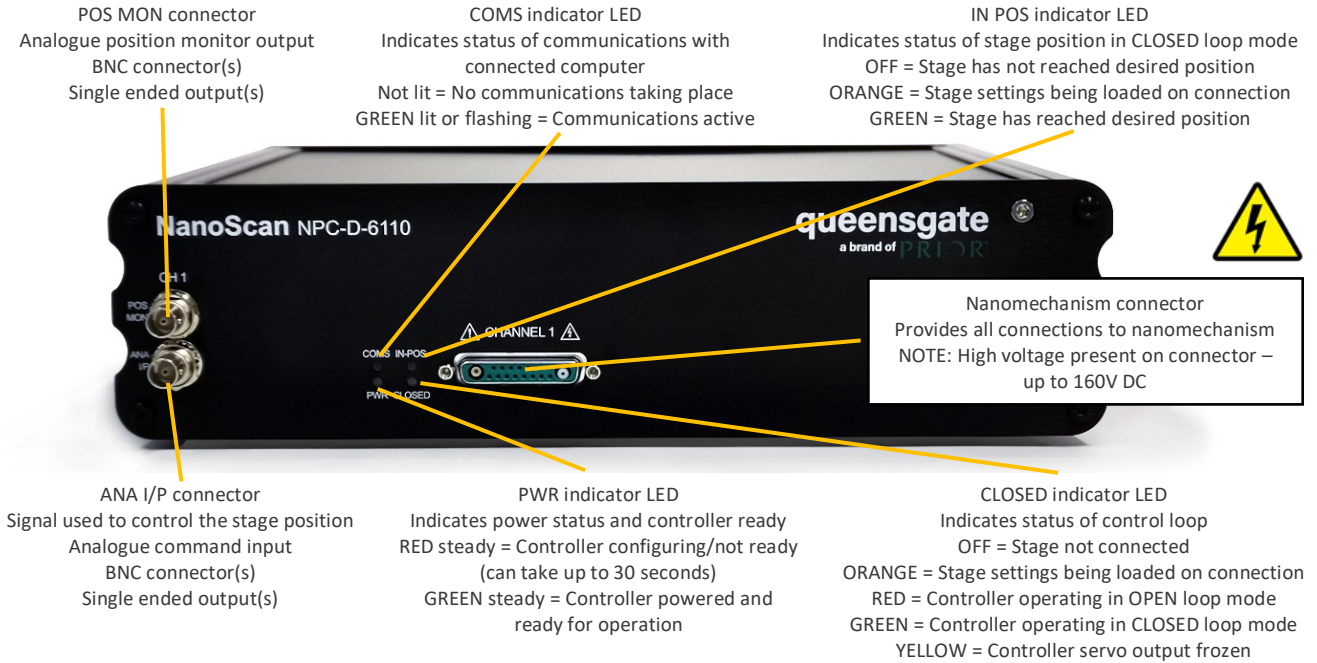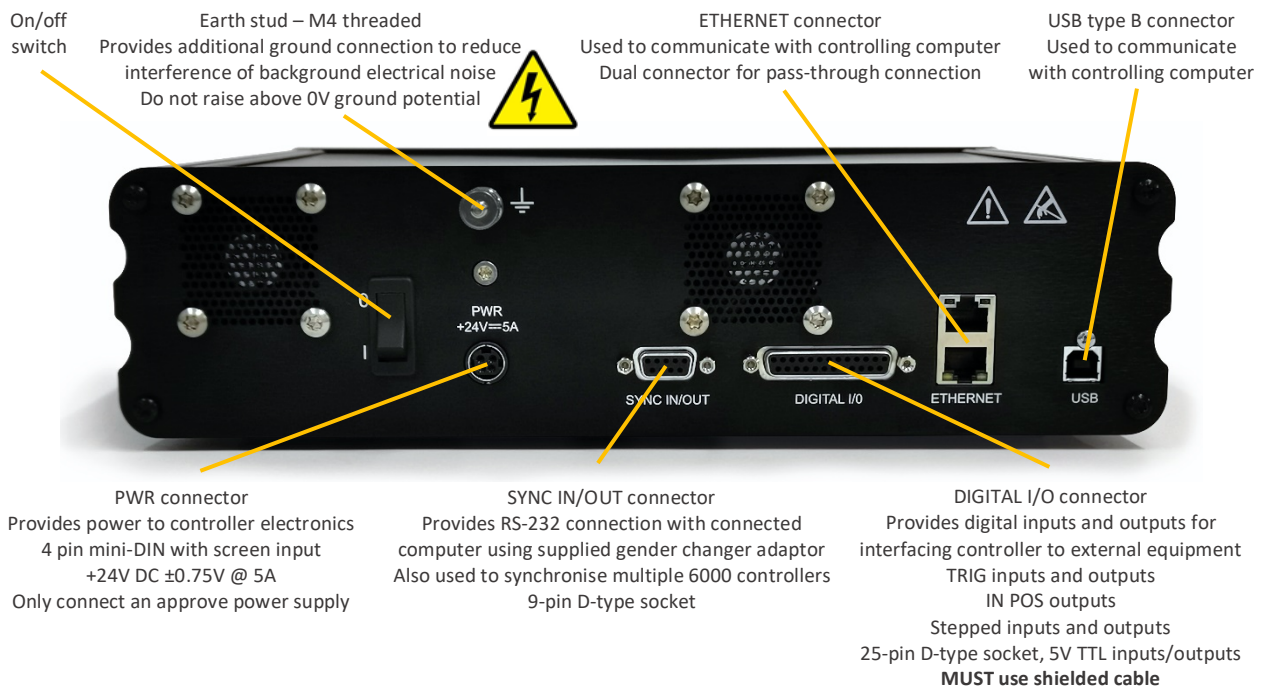# Simple connection options for the NPC-D-6110 Controller when using the NanoScan OP-400 and the NanoScan SP-X00 products

CONNECTING YOUR SYSTEM – FRONT OF UNIT

POS MON connector
Analogue position monitor output
BNC connector(s)
Single ended output(s)

COMS indicator LED
Indicates status of communications with connected computer
Not lit = No communications taking place
GREEN lit or flashing = Communications active

IN POS indicator LED
Indicates status of stage position in CLOSED loop mode
OFF = Stage has not reached desired position
ORANGE = Stage settings being loaded on connection
GREEN = Stage has reached desired position

Nanomechanism connector
Provides all connections to nanomechanism
NOTE: High voltage present on connector – up to 160V DC

ANA I/P connector
Signal used to control the stage position
Analogue command input
BNC connector(s)
Single ended output(s)

PWR indicator LED
Indicates power status and controller ready
RED steady = Controller configuring/not ready (can take up to 30 seconds)
GREEN steady = Controller powered and ready for operation

CLOSED indicator LED
Indicates status of control loop
OFF = Stage not connected
ORANGE = Stage settings being loaded on connection
RED = Controller operating in OPEN loop mode
GREEN = Controller operating in CLOSED loop mode
YELLOW = Controller servo output frozen

CONNECTING YOUR SYSTEM – REAR OF UNIT

On/off switch

Earth stud – M4 threaded
Provides additional ground connection to reduce interference of background electrical noise
Do not raise above 0V ground potential

ETHERNET connector
Used to communicate with controlling computer
Dual connector for pass-through connection

USB type B connector
Used to communicate with controlling computer

PWR connector
Provides power to controller electronics
4 pin mini-DIN with screen input
+24V DC ±0.75V @ 5A
Only connect an approve power supply

SYNC IN/OUT connector
Provides RS-232 connection with connected computer using supplied gender changer adaptor
Also used to synchronise multiple 6000 controllers
9-pin D-type socket

DIGITAL I/O connector
Provides digital inputs and outputs for interfacing controller to external equipment
TRIG inputs and outputs
IN POS outputs
Stepped inputs and outputs
25-pin D-type socket, 5V TTL inputs/outputs
MUST use shielded cable

CONNECTING YOUR SYSTEM – ANALOGUE CONTROL

Connect a coaxial cable with standard BNC connectors from the controlling computer to the ANA I/P connector.

If the controlling computer does not include a DAC card, it is possible to purchase a multifunctional I/O device from a company such as National Instruments: for example the NI card USB-6002 which provides 16-bit analogue I/O. This DAC card uses screw terminals, requiring a cable such as RS Components part number 296-7747. The test connectors on the wire end of the cable must be cut off and the wires stripped back and tinned, to connect reliably to the screw terminals on the NI card.

Software such as MicroManager, MetaMorph and NI Elements have support for controlling the system using analogue signals.

CONNECTING YOUR SYSTEM – DIGITAL CONTROL VIA PROSCAN

The Prior ProScan interface requires an RS-232 connection. The supplied gender changer adaptor must be connected to the controller's SYNC IN/OUT connector to enable RS-232 communications.

If the NanoScan system should be connected directly to the controlling computer, connect the supplied RS-232 cable from the computer's serial port to the SYNC IN/OUT connector (via the gender changer adaptor). Note that MicroManager, MetaMorph and NI Elements require the NanoScan system to be directly connected to the computer.
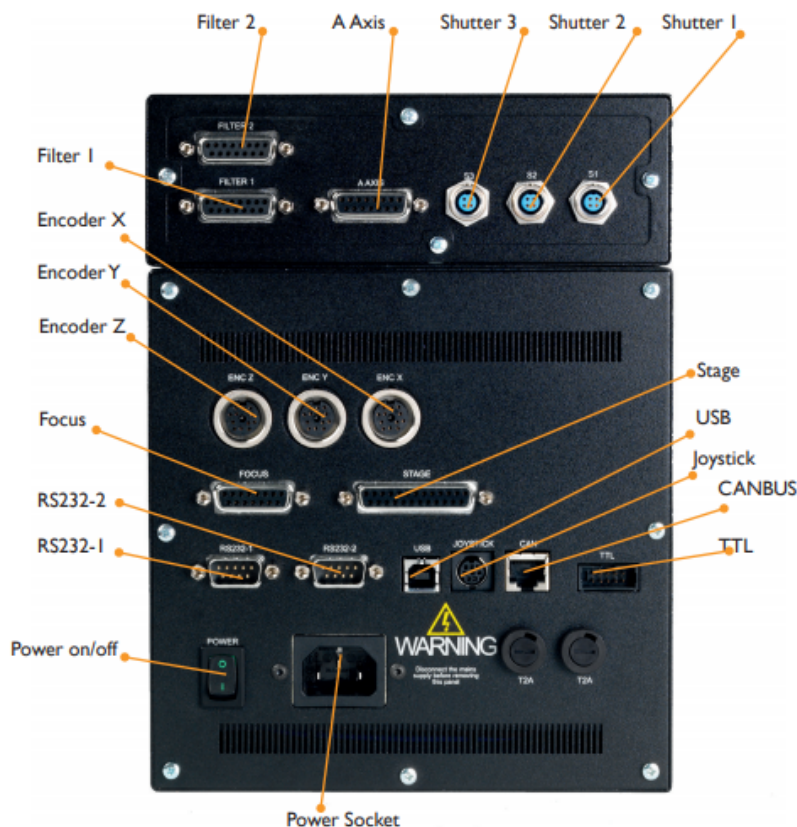
If a ProScan controller exists and the Prior demo software will be used, the controlling computer may connect via the ProScan controller.

Connect the supplied RS-232 cable from ProScan connector RS232-2, pictured left, to the NanoScan controller SYNC IN/OUT connector (via the gender changer adaptor). Note that this must use RS232-2. The ProScan will not communicate with the NanoScan if it is connected to RS232-1.

Connect the ProScan controller to the computer using USB or ProScan connector RS232-1 as normal.

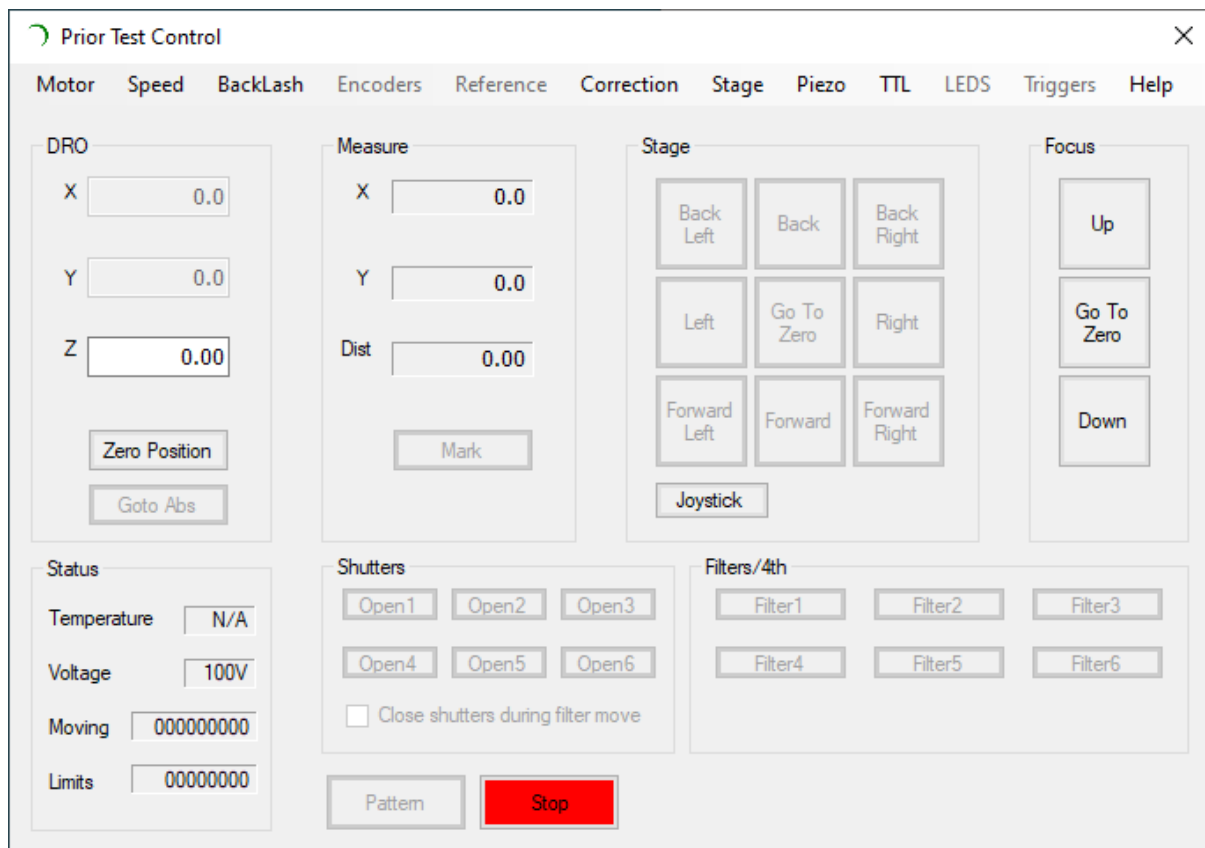# CONTROLLING THE SYSTEM USING PRIOR PROSCAN DEMO SOFTWARE

Download and install the "Prior Scientific DLL SDK" software from the Prior website.
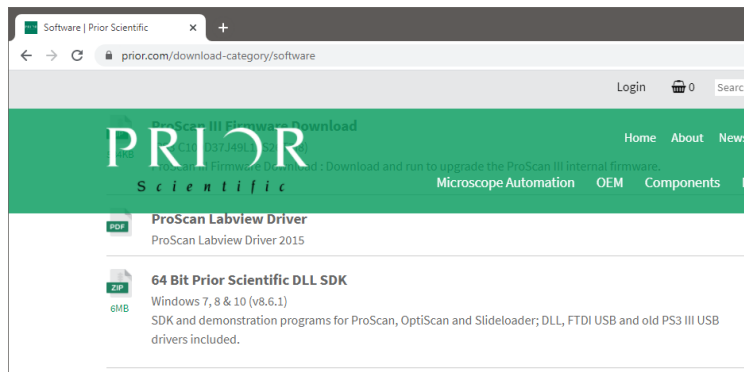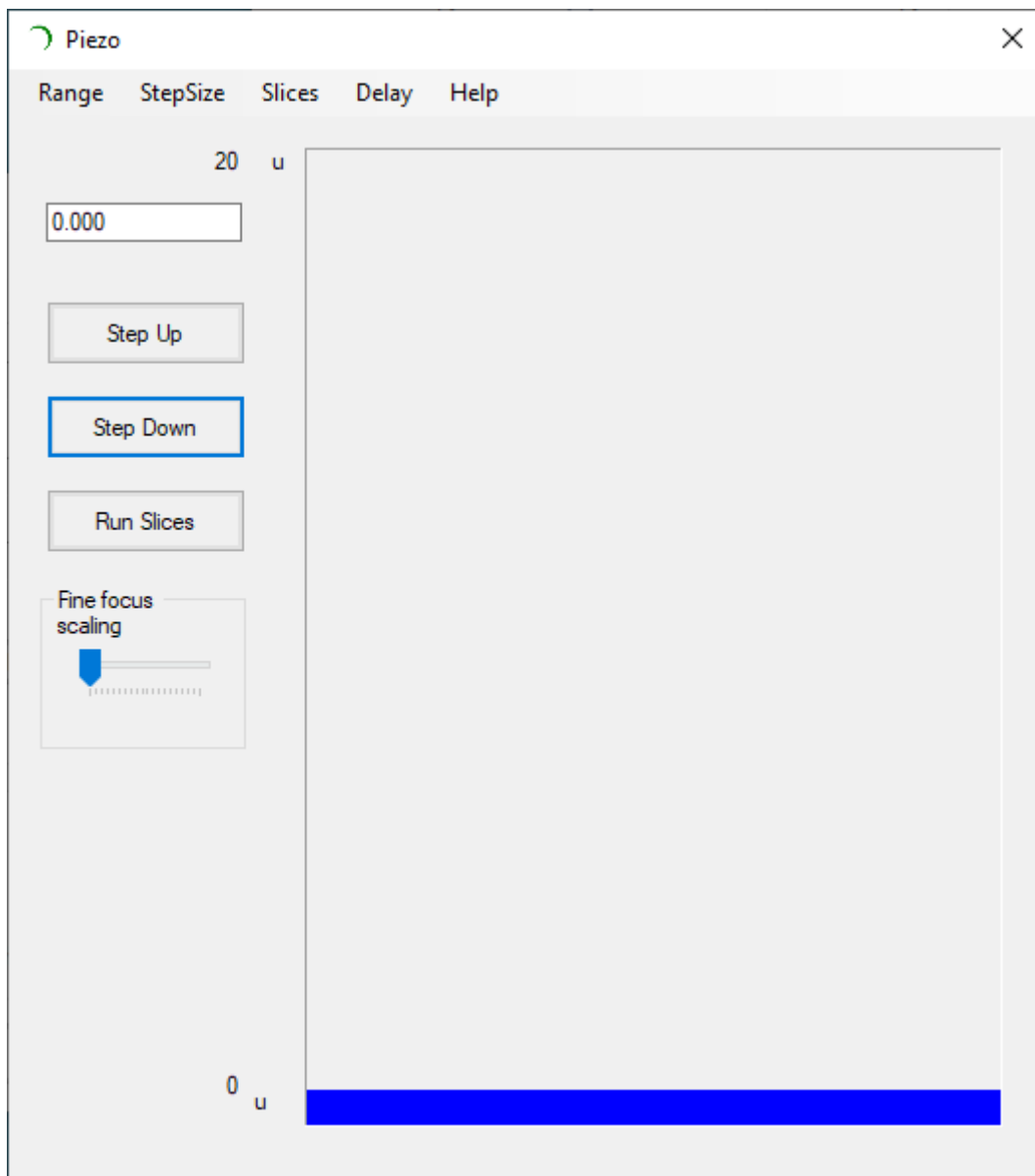

Running the "Prior Demo" software, the serial port number used to connect to the NanoScan or ProScan controller must be entered.
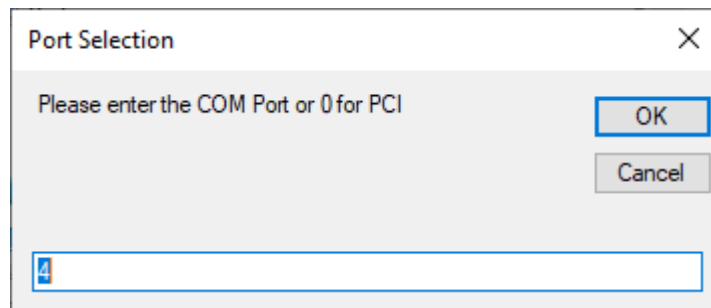
If the system is connected correctly, the user is presented with the main control screen.

Select "Piezo" from the menu, and another window appears which allows the NanoScan controller to be driven.

The nanomechanism position may be set directly, or stepped up and down.

The user may also move the nanomechanism by clicking and dragging in the right-hand pane.

Finally the user can run a step-scan over multiple slices, setting the number of slices and distance between slices.