



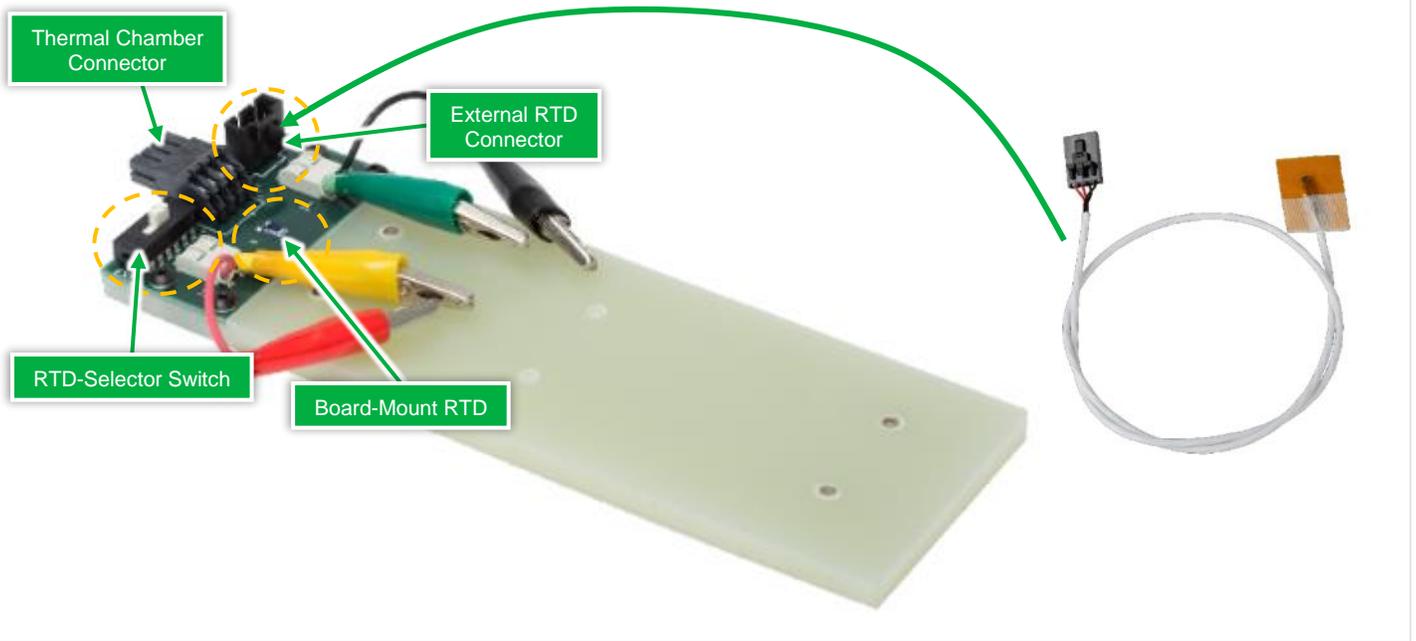
# UHPC System - Troubleshooting

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## 1 Check Cell Holder Health

Before plugging cell holders into a Thermal Chamber, we recommend checking the following to ensure a smooth test.

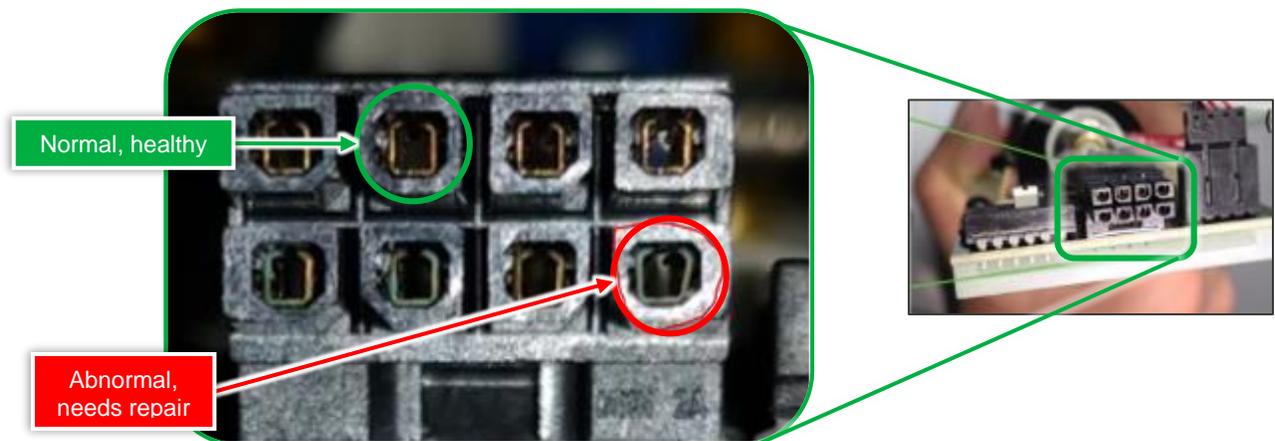


### ✓ Check RTD set up

The white switch on the cell holder should be toggled **right** (near the plug) if no external holder RTD is applied.

### ✓ Check cell holder connection

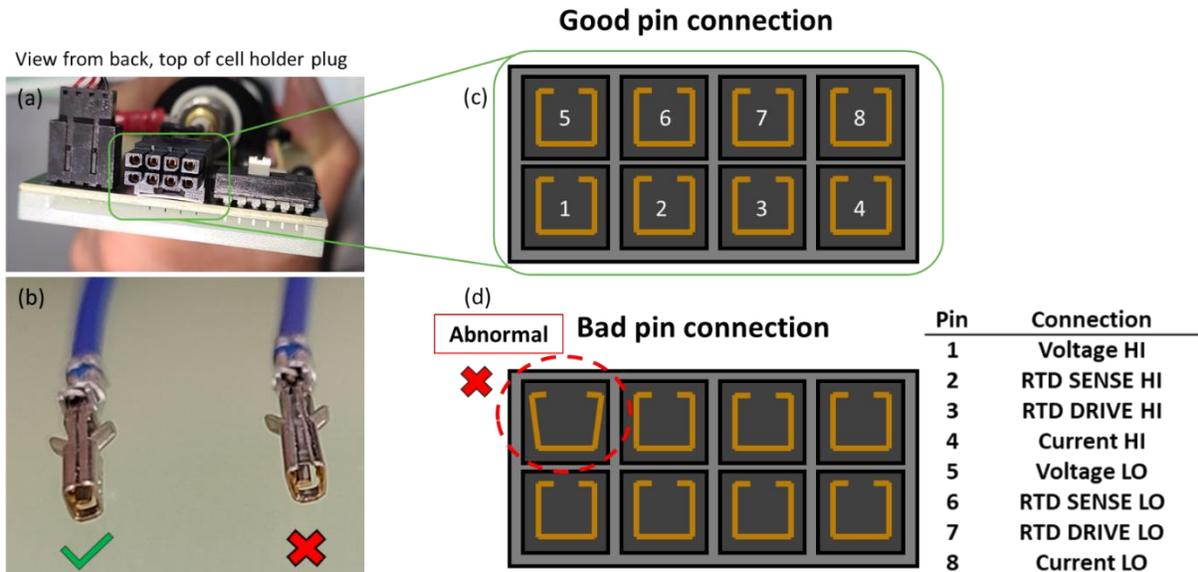
All cell holder pins should be in a normal square shape, as shown above. If any pins appear deformed, skip to [Cell Holder Pin Repair](#).



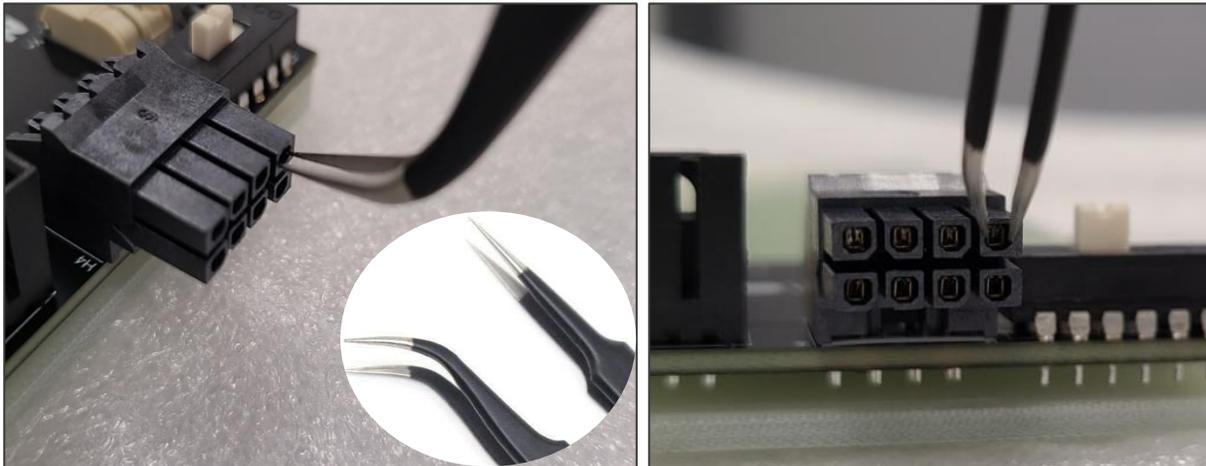
## 2 Cell holder pin repair

All Cell Holder pins should be in a normal square shape. Occasionally, during routine use, some pins may be opened by the mating stresses, causing them to lose continuity.

NOVONIX is aware of this issue and is actively working to improve the connector.



To fix the issue, we use fine, sharp-tipped tweezers. Insert the tips to the connector, between the pin and housing, and gently squeeze to tighten the gap back to a square shape.



Please [contact us](#) about replacement if you are unsure about the pin adjustment.

### 3 Channel cannot maintain current or voltage

This issue might be caused by a bad connection at any of the equipment interfaces, between:

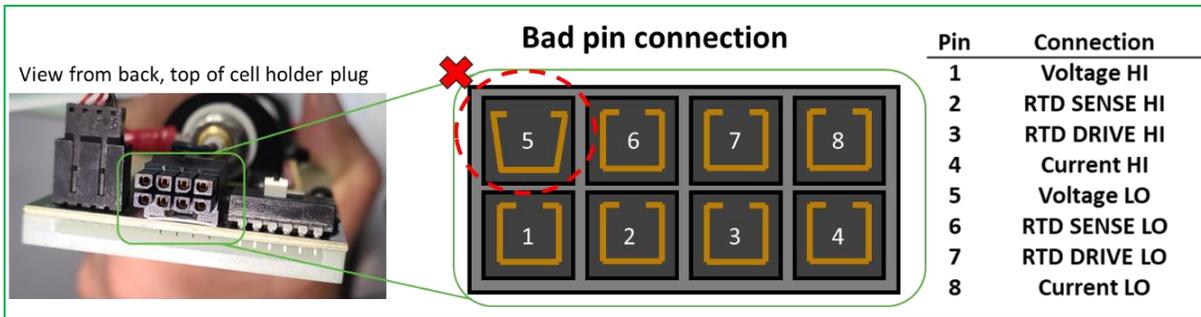
- Cell and Cell Holder
- Cell Holder and Thermal Chamber
- Thermal Chamber with Channel Module
- Channel Module and Control Module

Before connecting or disconnecting ANY cables, verify that no tests are running and power to the system is OFF.

✓ **Check Cell Holder connection**

Check that Cell Holder pins are a normal, square shape.

- Refer to [Cell Holder Pin Repair](#) if any are deformed.



✓ **Methodically investigate each remaining connection**

If the Cell Holder connector appears healthy, investigate each interface to isolate the issue. Reminder: ensure no tests are running and power to the system is OFF

- Verify that the cell is well seated on its Cell Holder. Pogo pins (if applicable) should make a firm contact with the cell terminals.
- Move the Cell Holder to a new position in the Thermal Chamber see if the problem persists.
- Ensure Interconnect Cables connecting the Channel Module to Thermal Chamber are solidly connected.
  - Swap Interconnect Cables or replace the Interconnect Cable with a spare.
- Swap or replace the Ethernet comms cable on the back of the Channel Module. Ensure it is a straight-through Ethernet configuration and not a crossover cable. Try to connect again.
- Move the Channel Module to a new port on the Control Module. Note that the channel number of the channels will change if their Communication Module position is changed.

Please [contact us](#) if the step above doesn't fix the issue.

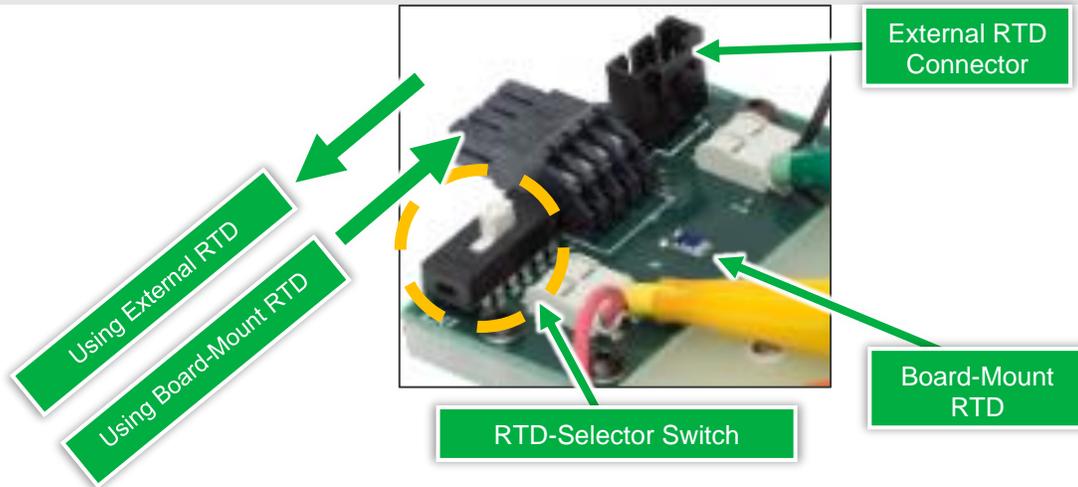
Our service team may ask to connect to your system remotely. Please ensure the newest version of TeamViewer is installed on your UHPC computer here: <https://www.teamviewer.com/en-us/>

### 4 Temperature is out of range

This might be caused by the RTD setup, or a bad connection.

✓ **Check cell holder RTD set up and connection**

The white switch on cell holder should be toggled to RIGHT side (near the plug) if no external holder RTD is applied:



✓ **Check that Cell Holder pins are a normal, square shape.**

- Refer to [Cell Holder Pin Repair](#) if any are deformed.

View from back, top of cell holder plug

**Bad pin connection**

Pin	Connection
1	Voltage HI
2	RTD SENSE HI
3	RTD DRIVE HI
4	Current HI
5	Voltage LO
6	RTD SENSE LO
7	RTD DRIVE LO
8	Current LO

- Try swapping Cells, Thermal Chamber positions and Cell Holders with each channel.

✓ **Methodically investigate each remaining connection**

If the Cell Holder connector appears healthy, investigate each interface to isolate the issue. Reminder: ensure no tests are running and power to the system is OFF

- Verify that the cell is well seated on its Cell Holder. Pogo pins (if applicable) should make a firm contact with the cell terminals.
- Move the Cell Holder to a new position in the Thermal Chamber see if the problem persists.
- Ensure Interconnect Cables connecting the Channel Module to Thermal Chamber are solidly connected.
  - Swap Interconnect Cables or replace the Interconnect Cable with a spare.
- Swap or replace the Ethernet comms cable on the back of the Channel Module. Ensure it is a straight-through Ethernet configuration and not a crossover cable. Try to connect again.

- Move the Channel Module to a new port on the back of Control Modules. Note: The channel number of the channels will change if their Communication Module position is changed.

✓ **Disable Temperature Limits**

If temperature is not critical for your experiment, you can disable temperature limits. In the UHPC Control software:

- Settings >> Features >> Disable Temperature Limits

Please [contact us](#) if any of your issue persists.

## 5 Cell Holder Temperature Measurements

Standard format Cell Holders have an RTD mounted directly to their circuit boards. An external RTD can also be plugged onto it, thus allowing temperature measurement of another desired surface (e.g., cell surface).

The white RTD-Selector switch on the board selects whether the Board-Mount RTD or an External RTD Connector is to be used, as shown in picture below:

### ✓ Board-Mounted Temperature Measurement

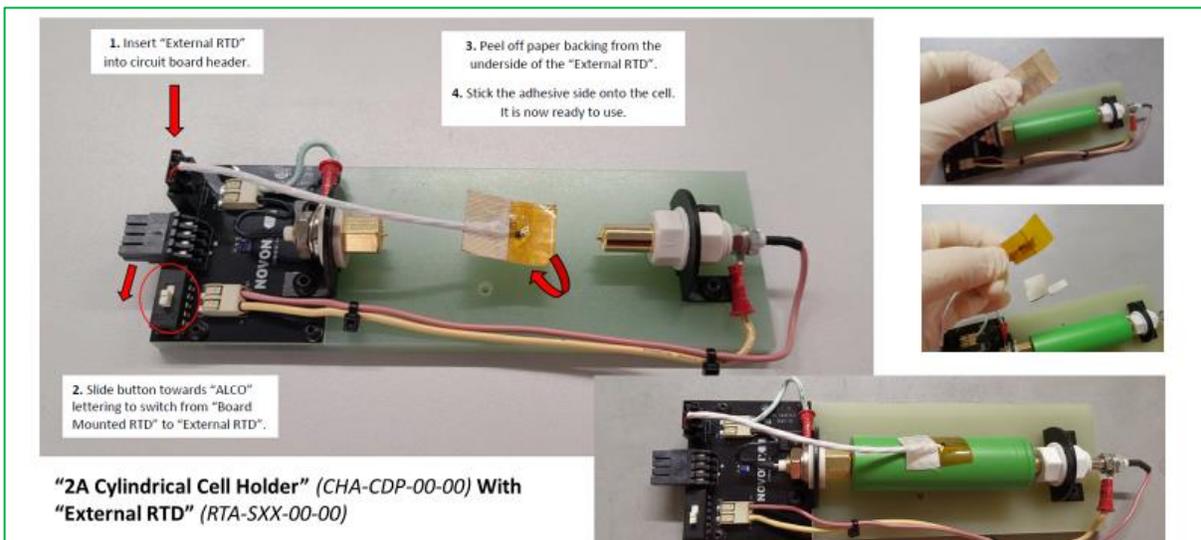
Toggle the RTD-Selector Switch RIGHT, as shown above. That's all! Temperatures will automatically be measured and logged from the board mounted RTD.

### ✓ External RTD Measurements

To use an External RTD, toggle the switch to the LEFT (see image above). Plug in your external 4-wire RTD allow temperature test with an external RTD.

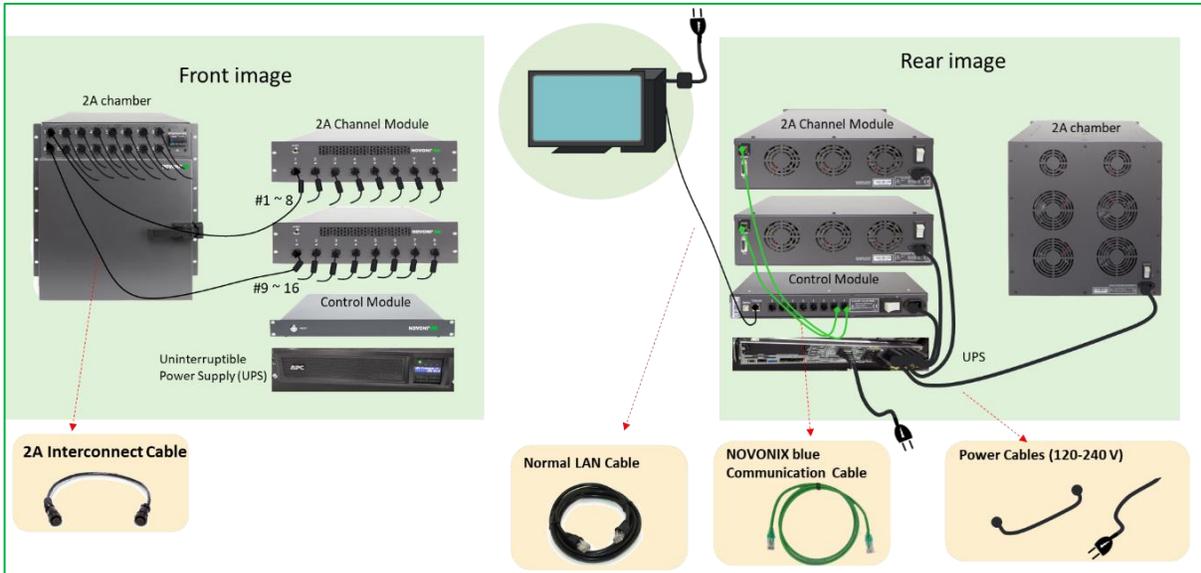
- Plug your 4-wire “external RTD” into circuit board header.
- Toggle the RTD Selector Switch LEFT to switch from “Board-Mount RTD” to “External RTD”.
- Peel off the paper backing from the underside of the “External RTD”
- Stick the adhesive side onto the cell. It is now ready to use.

Note: Other heat tape like Kapton could be used if the original stick tape fades after repeatable usage.



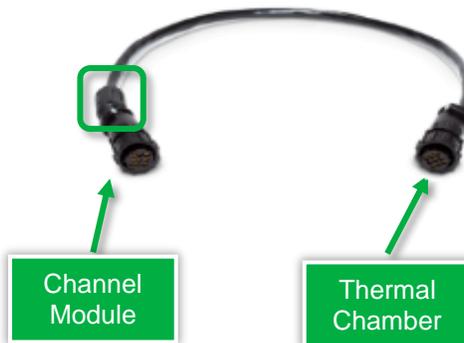
## 6 Cable connections of a UHPC system

The cable connection of an example 2A UHPC system is shown below.



### ✓ To set up or check cable connection

- Make sure **interconnect cables** are correctly installed between the Channel Module and the Thermal Chamber. Identify the Channel Module end by looking for additional RF shielding on the cable (see image below).



- Make sure a **standard, straight-through Ethernet cable** connects Control Module “computer” port to your PC. Additionally, **standard, straight-through Ethernet cables** should connect Control Module to Channel Modules. Verify that crossover style cables are not being used.
- **Power cables** of all modules should be connected via a UPS. Please refer to the specific device’s [specification sheet](#) for power draw information if using a 3<sup>rd</sup> party UPS or have another power solution.
- Make sure that all cables are connected and seated securely.

✓ **Plug type**

The plug requirements by region and by product can be found in the table below.

<i>Thermal Chamber Voltage</i>	<i>Plug</i>
100-120V	NEMA 5-15p
220-240V	IEC 320 C14

<i>UPS Model #</i>	<i>UK</i>	<i>Rest of Europe</i>	<i>North America (Low Voltage)</i>	<i>North America (High Voltage)</i>
<u>SMT3000RM2UC</u>			NEMA L5-30P	
<u>SMX3000RMHV2U</u>	BS 1363A	CEE 7/7		IEC 60320 C20
<u>SRT5KRMXLT-IEC</u>				NEMA L6-30

## 7 Channels cannot be recognized / connected

This may be caused by cable connection, software version or IP address. To detect its possible cause, follow the steps below.

### ✓ Check cable connections

- Make sure that all power and communication cables are connected and seated fully.
- Make sure a standard, straight-through Ethernet cable connects Control Module “computer” port to your PC. Additionally, standard, straight-through Ethernet cables should connect Control Module to Channel Modules. Verify that crossover style cables are not being used.
- Control Modules can only connect to a single Channel Module type at a time – one Control Module cannot connect simultaneously to 2A and 20A (for e.g.) Channel Modules.

### ✓ Update Control software

Make sure you have the most up to date version of our UHPC Control installed. You can access this from the [NOVONIX Customer Area](#).

### ✓ Check the list of applications running

Make sure that only 1 instance of HPC Control is running on the computer. Restart Control software and try to connect again.

### ✓ Check IP addresses of the PC’s Ethernet port

Click “change adapter options” from “Network & Internet settings”. Manually change the IP address in the IPV4 adaptor settings and try to connect with each of the following IP addresses

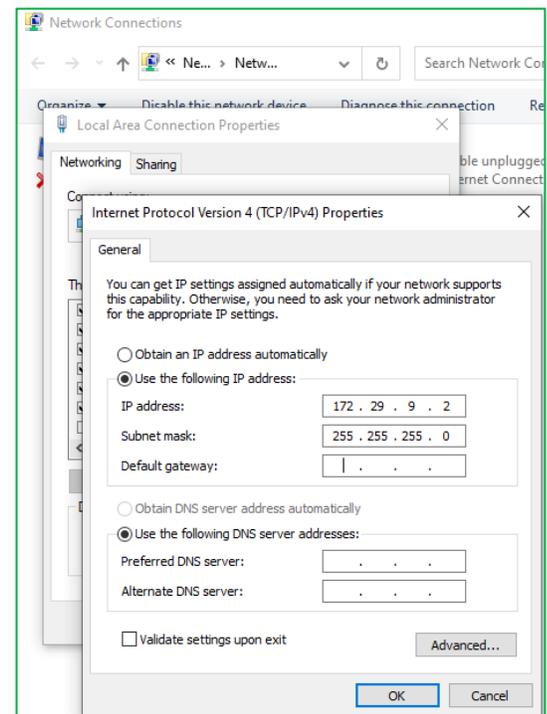
- 172.29.9.2 and 192.168.1.2.
- After switching the IP address wait for 1 minute for the connection to establish. If still not successful, carry on to next step.

### ✓ Reset Control module

- Hit the reset button of the Control module and wait for 30 seconds. If still not successful, carry on to next step.

### ✓ Reset Channel modules

- Right click on the channel and select Reset Selected Rows from the dropdown.
- If still not successful, restart the power of Channel modules (make sure to stop any tests first). Try to connect again.



If you need assistance, please [contact us](#).

## 8 Test Stopped – Ping not received

Ping not received is likely a communication problem. Check cable connections, software settings and module functions separately to detect the root cause.

### ✓ Check cable connections

- Make sure that all power and communication cables are connected and seated fully.
- Make sure a standard, straight-through Ethernet cable connects Control Module “computer” port to your PC. Additionally, standard, straight-through Ethernet cables should connect Control Module to Channel Modules.
- Control Modules can only connect to a single Channel Module type at a time – one Control Module cannot connect simultaneously to different types of Channel Modules.
- Move the Cell Holder to a new position in the Thermal Chamber see if the problem persists.
- Ensure Interconnect Cables connecting the Channel Module to Thermal Chamber are solidly connected.
  - Swap Interconnect Cables or replace the Interconnect Cable with a spare.
- Swap or replace the green Communication Cable on the back of the Channel Module. Try to connect again.
- Move the Channel Module to a new port on the back of Control Modules.

Note: The channel number of the channels will change if their Communication Module position is changed. Update Control software

### ✓ Update Control software:

- Make sure you have the most up to date version of our UHPC Control installed. You can access this from the [NOVONIX Customer Area](#).
- Check the list of applications running to make sure that only 1 instance of HPC Control is running on the computer. Restart Control software and try to connect again.

### ✓ Check IP addresses of the PC’s Ethernet port

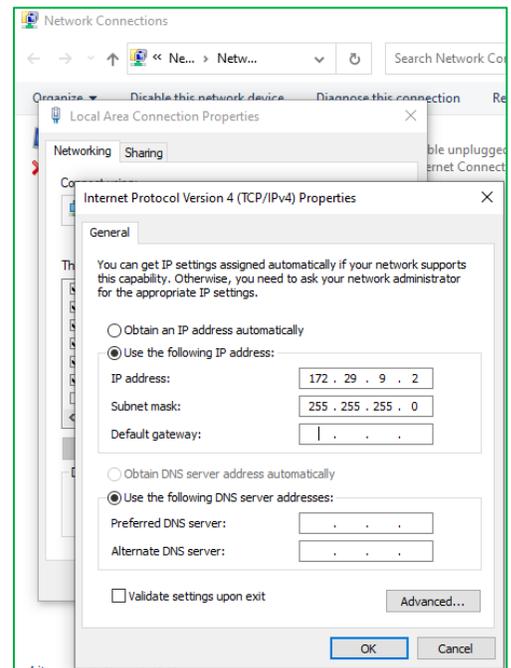
Click “change adapter options” from “Network & Internet settings”. Manually change the IP address in the IPV4 adapter settings and try to connect with each of the following IP addresses

- 172.29.9.2, 192.168.1.2.
- After switching the IP address wait for 1 minute for the connection to establish.

### ✓ Reset Control module

- Hit the reset button of the Control module and wait for 30 seconds. If still not successful, carry on to next step.

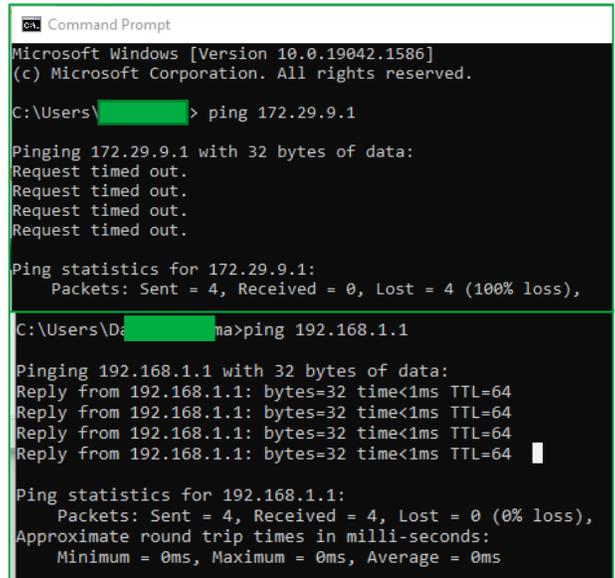
### ✓ Reset Channel modules



- Right click on the channel and select Reset Selected Rows from the dropdown. If still not successful, restart the power of Channel Modules (make sure to stop any tests first). Try to connect again.

✓ **Check the Control module connections**

- Open the command prompt (cmd) and type “ping 172.29.9.1” or “ping 192.168.1.1”. These should be the IPs of the Control Module.
- If the request times out, then it's not communicating with the system and there is a connection issue.
- Recheck the communication cables. Try to connect again. If still not successful, there may be a problem with the Control Module itself. [Contact us](#) for next steps.
- If the ping is sent back, the Control Module and its connections should be healthy.



```
Command Prompt
Microsoft Windows [Version 10.0.19042.1586]
(c) Microsoft Corporation. All rights reserved.

C:\Users\ > ping 172.29.9.1

Pinging 172.29.9.1 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.29.9.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\Da > ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

[Contact us](#) if any issues persist.

- Please send us photos of all your cable connections.
- We may as to check the system connection remotely, via a remote connection tool. Please install the newest version of following software to your UHPC computer from internet.
  - TeamViewer
  - Tera Term
  - WinSCP

## 9 Migrating to a new PC with Windows 10

Migrating NOVONIX UHPC Software to a new PC running Windows 10 is straightforward. We recommend following these steps:

- ✓ Make sure that all tests on all connected UHPC channels are stopped
- ✓ Backup all important files and configurations
- ✓ Get the latest UHPC software
  - You will need UHPC-Control, UHPC-Protocol and UHPC-Plot, which are available in [NOVONIX Customer Area](#).
  - Download the latest available version for each software package and install per the instructions provided.
- ✓ Move the communication cable from your old PC to the new one. Open UHPC-Control and confirm that all channels appear.
- ✓ If channels cannot be identified/do not appear:
  - Check the IP address of the PC's Ethernet port by clicking "change adapter options" from "Network & Internet settings".
  - Manually change the IP address in the IPV4 adapter settings and try to connect with each of the following IP addresses:
    - 172.29.9.2, 192.168.1.2.
    - After switching the IP address, allow up to 1 minute for the adapter to reset the connection.
- ✓ Verify that old data files can be read with the new software
- ✓ In certain cases, protocols written with previous versions of the software may not work with the latest UHPC-Control. In this case, re-write them using the latest version of UHPC-Protocol on the new machine.
- ✓ Disable Sleep on the new PC
  - Go to Windows Start >> Settings >> Power & Sleep >> Sleep >> Never
- ✓ Run a brief test to check that every channel is responding properly

