

Ice Nucleation Controller – Manual

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Abstract

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

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1 Safety Information

1.1 General safety instructions



DANGER

Danger to life or serious injury can occur when live parts are touched. Do not touch or modify electrical installations without proper training or guidance.



WARNING

Danger to life, serious injury, or equipment damage can occur due to incorrect handling of equipment. Only trained personnel may service and modify system.



CAUTION

Risk of skin irritation or burn when handling gallium. Always handle with care in both solid and liquid form.



CAUTION

Risk of adverse health effects from long-term use and high humidity build-up if not ventilated. Always operate system in properly ventilated room.

NOTICE

Risk of damage to sensitive equipment and/or loss of calibration due to incorrect handling. Always handle equipment marked SENSITIVE with care.

NOTICE

CAMERA lens...

2 Overview

2.1 Components

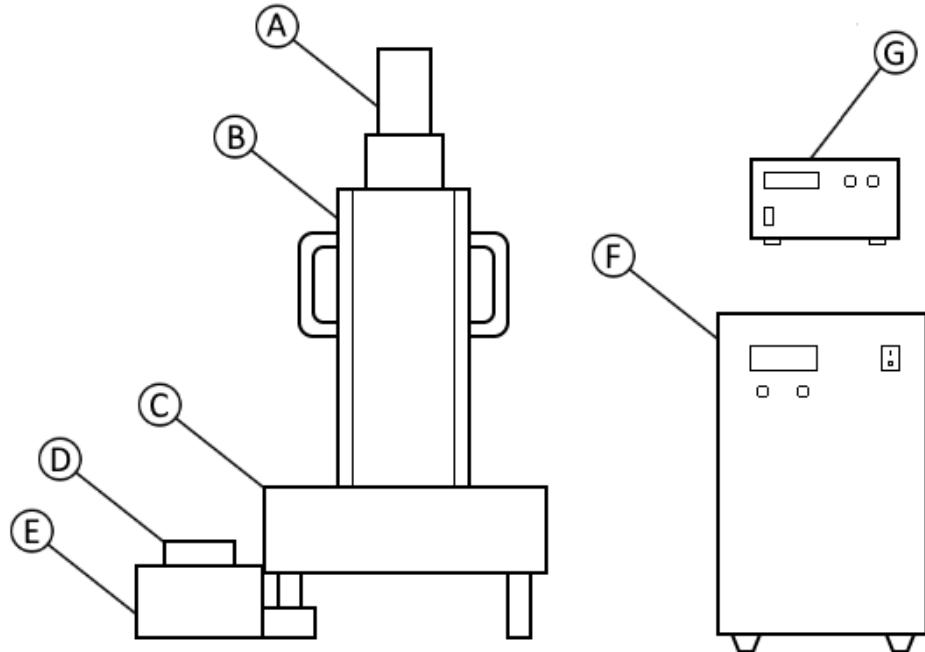


Figure 1: System Components.

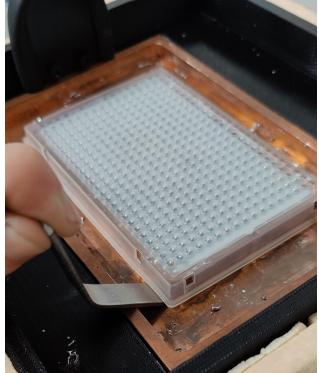
2.2 Component Description

Component	Description	Notes
A	Thermal Camera	FLIR A655sc (SENTIVE) [1]
B	Camera Tower	-
C	Cooling Base	Protruding Sensor Cables (SENTIVE)
D	cDAQ Module	NI 9219 and cDAQ-9171 [2] [3]
E	Sensor PCB Housing	Protruding Sensor Cables (SENTIVE)
F	Water Cooler	Alphacool Eiszeit 2000 Chiller [4]
G	Peltier Power Supply	PeakTech (P1580) [5]

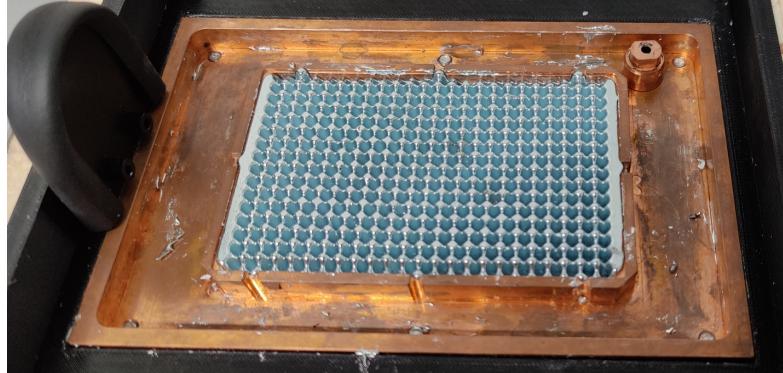
3 Procedure

3.1 Preparing Sample

1. Remove Old PCR Plate use crowbar tool to remove previous PCR plate if present.

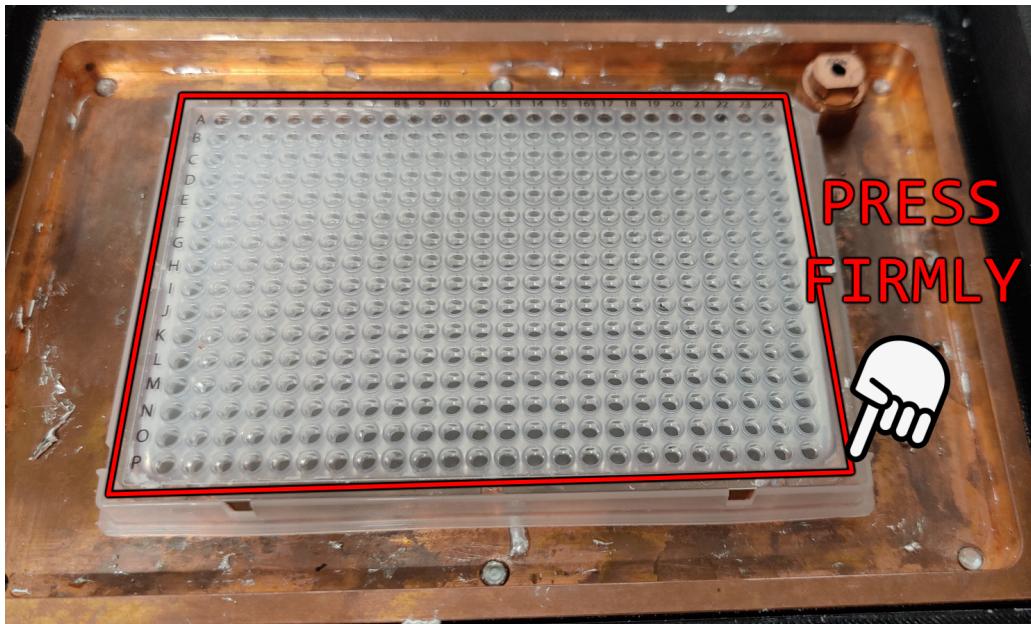


(a) Crowbar Tool

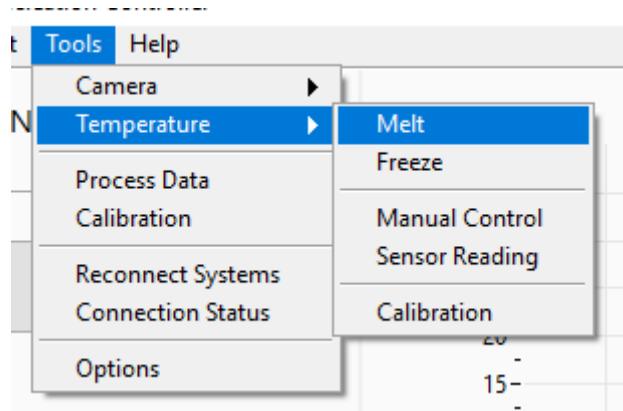


(b) PCR plate removed

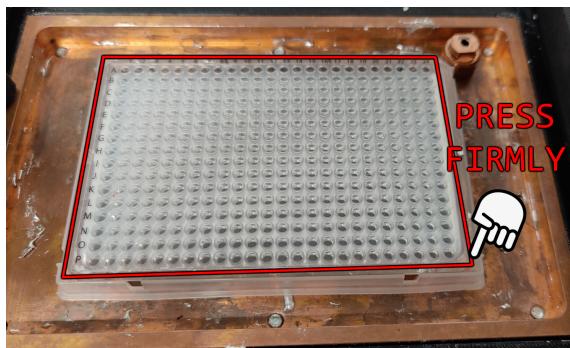
2. Insert New PCR Plate STERILE, make sure to press firmly on every corner and sides.



3. Melt Gallium with new PCR plate inserted [Tools] > [Temperature] > [Melt].



4. Firmly Press on each corner of PCR plate make sure PCR plate is firmly secured, pressing on each corner and side.



(a) Press Edge



(b) Do Not Press Center

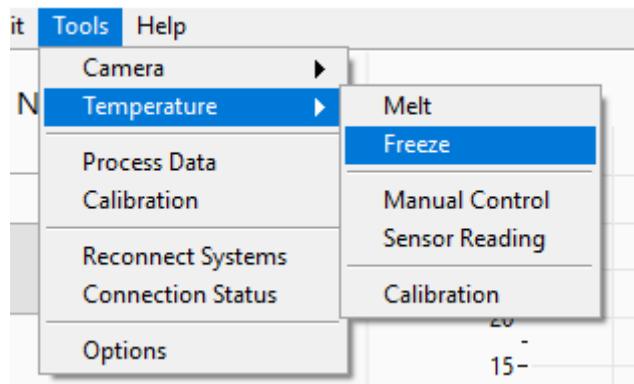


DO NOT PRESS CENTER

5. Place Lid, Plate and Weight place STERILE on top of PCR plate to weigh down.

6. Start Water Pump if not already started do so now.

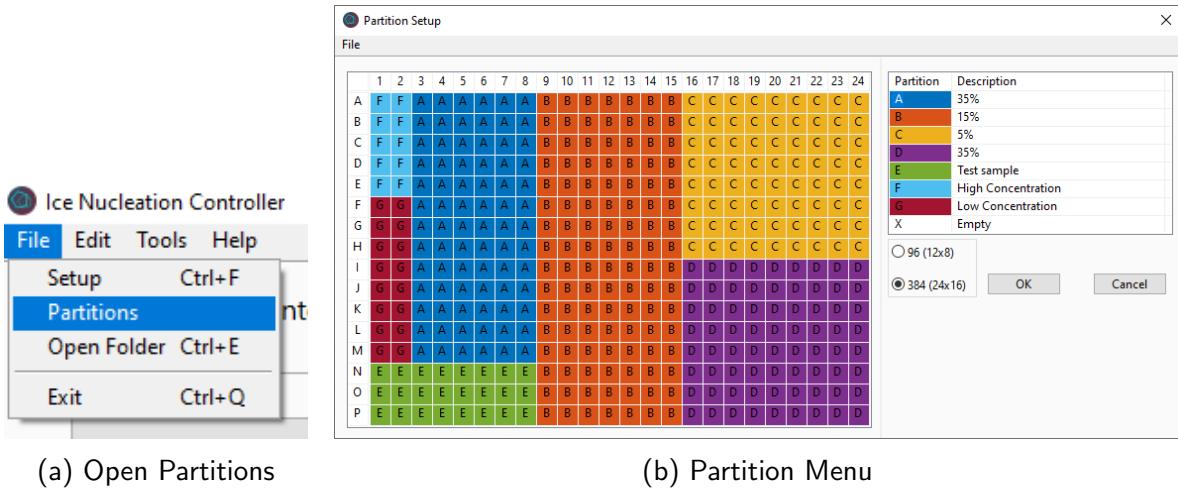
7. Freeze Gallium with [Tool] > [Temperature] > [Freeze] to ensure ideal thermal contact.



3.2 Configure Partitions

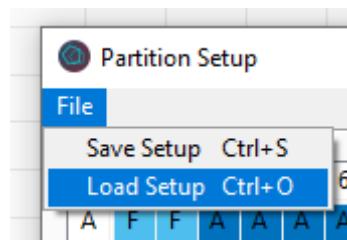
3.2.1 Partitions settings

Open partition settings **Files > Partitions**.



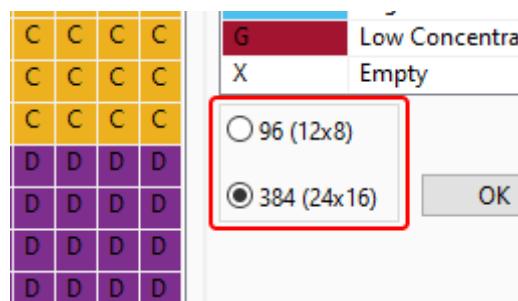
3.2.2 Load Partition (Optional)

Load a previously created partition setup. If none are available, create a new Partition Setup.



3.2.3 Creating a new Partition Setup

1. Select PCR size – Select between 96 and 384.

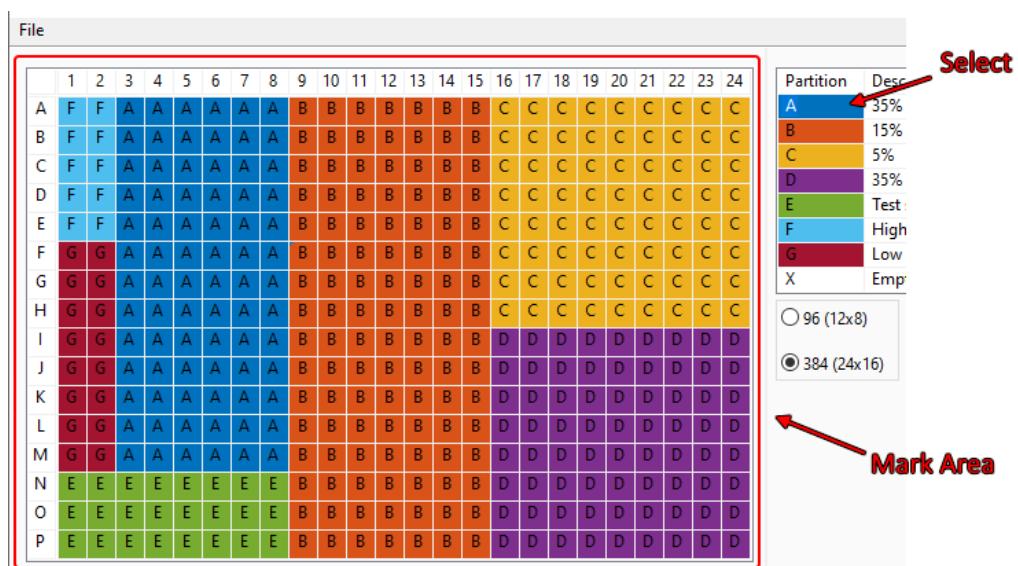


2. Configure Partitions – Select partition and left click a description to edit contents. Fill out as required.

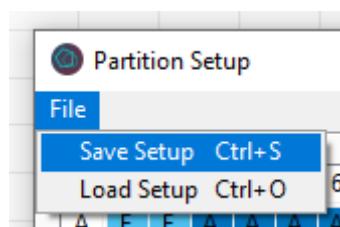
24	Partition	Description
C	A	35%
C	B	15%
C	C	5%
C	D	35%
C	E	Test sample
C	F	High Concentration
C	G	Low Concentration
X		Empty

○ 96 (12x8)

3. Mark Partitions – Select a partition (A, B, C, etc.). Mark an area of the PCR plate containing contents by left click and dragging. Fill out as required.



4. Save Partition (optional) – Save created partition setup for future uses.



3.3 Configure Setup

3.3.1 Setup settings

Open Setup settings [Files > Setup].

3.3.2 Fill out configuration

Settings...

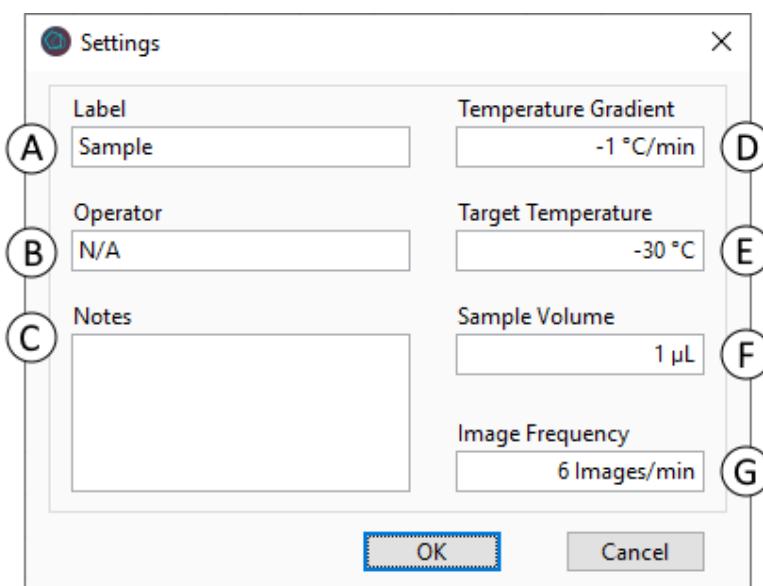


Figure 5: Sample Setup.

Description	
A	Title of Experiment
B	Initials of operator
C	Any additional information
D	Target gradient of experiment
E	Ending temperature of experiment
F	Volume present in each PCR well
H	Camera and data output rate

References

- [1] <https://www.flir.eu/products/a655sc/>
- [2] <https://www.ni.com/da-dk/support/model.ni-9219.html>
- [3] <https://www.ni.com/da-dk/support/model.cdaq-9171.html>
- [4] <https://www.alphacool.com/shop/durchlaufkuehler/geraete/21410/alphacool-eiszeit-2000-chiller-black>
- [5] <https://www.elfadistrelec.dk/da/laboratoriestromforsyning-32v-30a-960w-justerbar-p/11095172>
- [6] <https://www.impactsubsea.co.uk/seaview/>
- [7] <https://www.impactsubsea.co.uk/isd4000/>