**A black and yellow cover with white text

Description automatically generated**

[Contents: 2](#_Toc144129392)

[Operating Guide 3](#_Toc144129393)

[Arriving to ICF – what to set up: 3](#_Toc144129394)

[Cable setup (bold must be passed through freezer wall) 3](#_Toc144129395)

[Building Guide 3](#_Toc144129396)

[Python Code 3](#_Toc144129397)

[MCC DAQ 3](#_Toc144129398)

[Encoder 3](#_Toc144129399)

[SMU 3](#_Toc144129400)

[LCR 3](#_Toc144129401)

[Gaming Controller 3](#_Toc144129402)

[Zaber Motors 4](#_Toc144129403)

# Operating Guide (Basic)

This section provides the basic information needed to run the ECM system. Note that it does NOT provide the information needed to fix issues that come up along the way – for that, see the “building guide” later on in this document.

## Arriving to ICF – what to set up:

### Cable setup (bold must be passed through freezer wall)

The following items need to be connected to the computer:

* USB cable to LCR
* USB cable to SMU
* USB cable to MCC DAQ
* Wifi antenna (special two screw in points)
* USB keyboard/mouse dongle (for warm area controls)
* DP to VGA cable for warm area monitor
* **USB to Zaber cable**
* **HDMI cable for freezer monitor**
* **USB extenders (x3) for interior keyboard, mouse, gaming controller**

Plug into the MCCDAQ:

* **2-wire bundle for laser control**
* **6-wire bundle for encoder control**
* **3-wire bundle for button reading**

Plug into the SMU:

* **4 measurement Cables**

Plug into the LCR:

* **2 measurement cables**

Plug into power (inside freezer):

* 2x old-school zaber power cables
* 1x new-school zaber power cable
* 1x zaber x-controller power cable

Plug into power (outside freezer):

* Computer
* Monitor
* LCR
* SMU

## Launching the program

To launch the ECM GUI, please follow the following steps:

* Launch Anaconda Powershell
  + (alternatively, you can launch a standard terminal window and type “miniconda/Scripts/activate base” – does the same thing)
* Open the correct Python Environment with “conda activate ecm”
* Use “cd” commands to navigate to folder with files
* To run the GUI, it’s as simple as typing “Python ECMGUI\_vXX.py”
* To edit the GUI, use Spyder. Open by typing “Spyder”.
  + NOTE: I advise against running the gui from within spyder – it seems to glitch more when run this way.

## Using the GUI

# Building Guide (Advanced)

## Python

We are using python 3 for this system. Note that this was installed with miniconda, not anaconda. I forget why, but this simpler install fixed some issue at some point… You’ll have to just take my word for it. All of the system is contained within the “ecm” conda environment.

## ECMGUI

This is our master code that controls the entire system.

## MCC DAQ

### Encoder

## SMU

## LCR

## Gaming Controller

## Zaber Motors