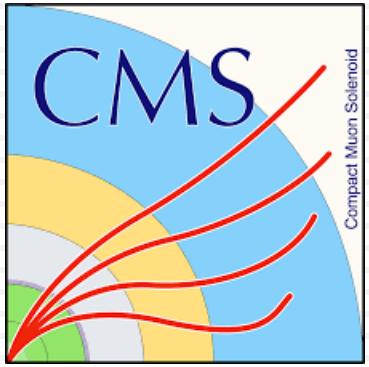
HGCAL Database – Module Production GUI



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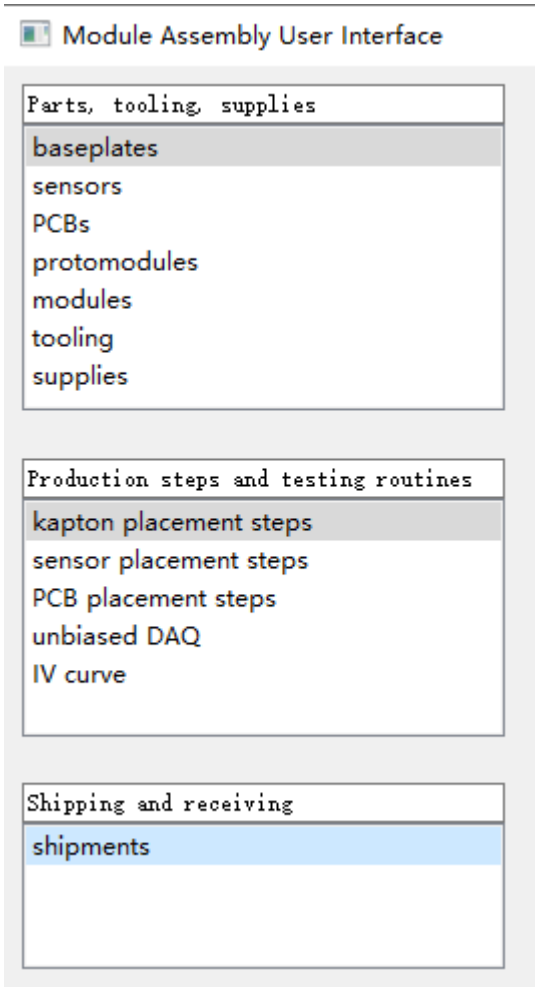
Introduction

- HGCAL Database - an essential part of HGCAL construction
  - record data of all steps in module production
    - parts, module assembly, testing, connections
    - XML files to be provided to HGCAL Database

- Module production GUI is developed to facilitate the information transformation from module production to HGCAL Database
  - graphic interface to record the data for different parts/steps
  - produce XML inputs to be uploaded to HGCAL Database
    - each XML session has corresponding fields in GUI
  - link between different components
  - check errors and consistency
  - download necessary information from HGCAL Database
  - user-friendly in different system
    - Windows, Linux, MAC OS

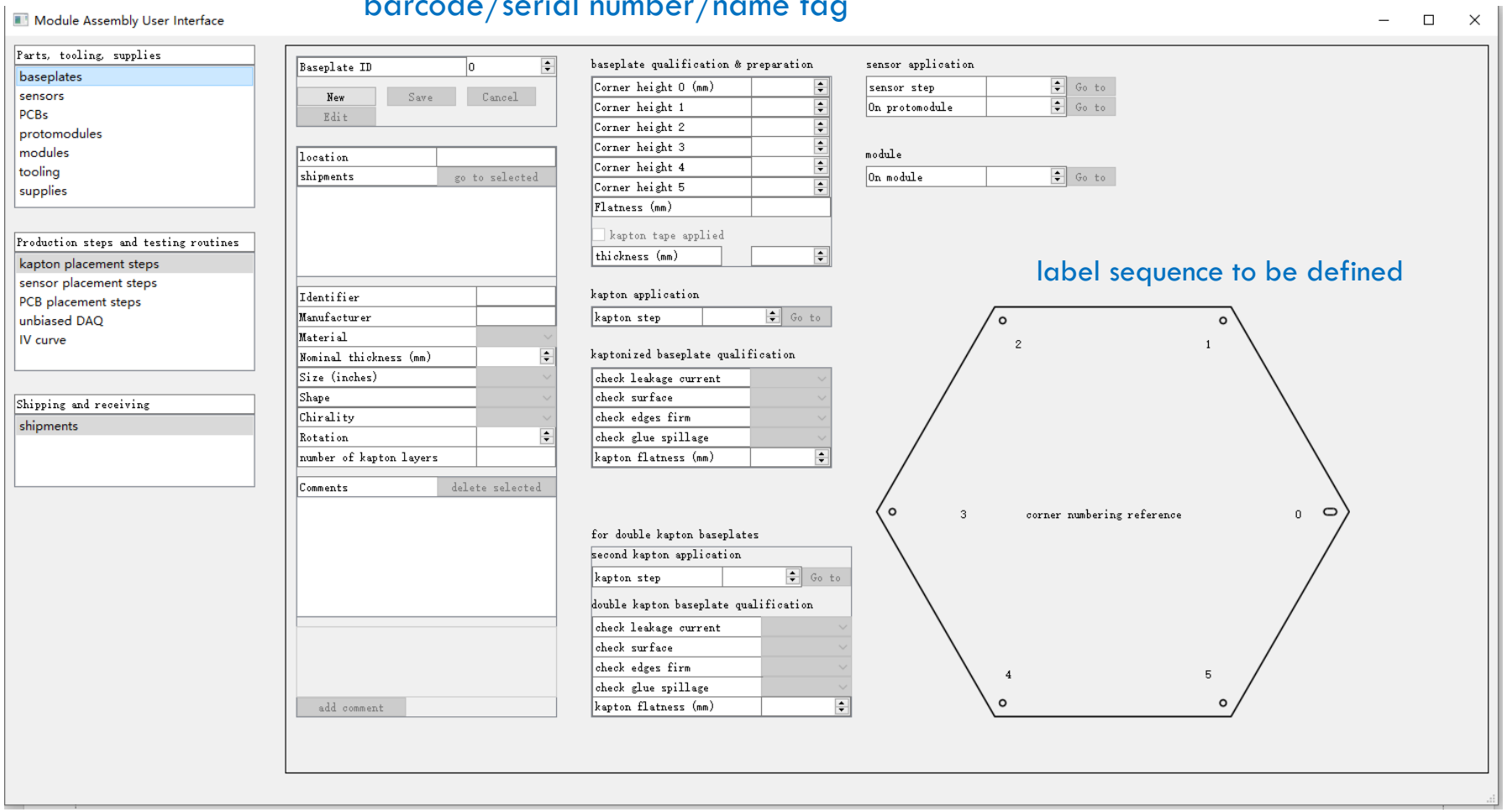
GUI overview

- The GUI consists of 3 sessions
  - Parts, tooling, supplies
    - 7 pages, baseplates, sensors, PCBs etc.
  - Production steps and testing routines
    - 5 pages, placement and tests
  - Shipping and receiving
    - 1 page, keep tract of the shipment

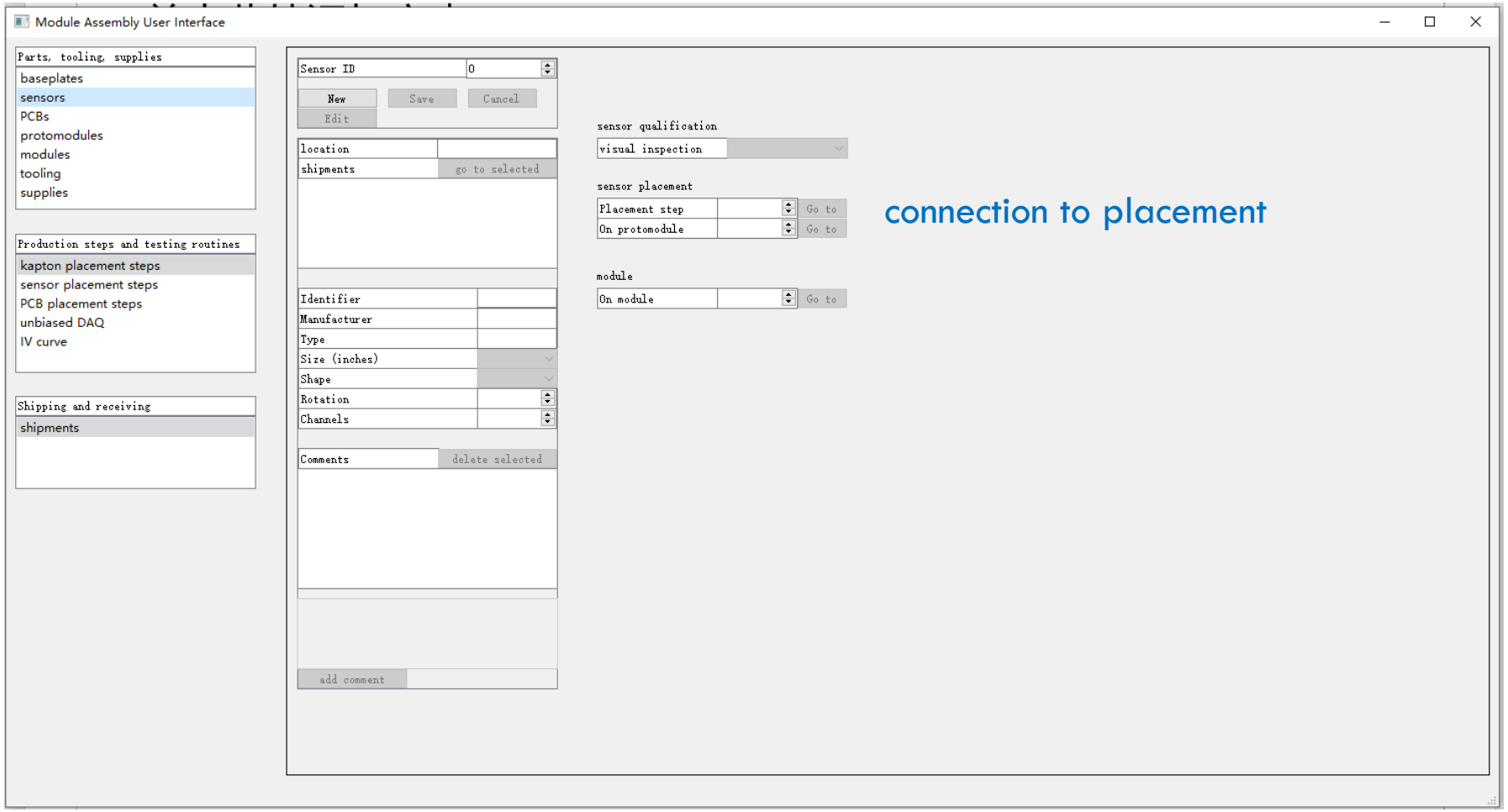


Baseplates

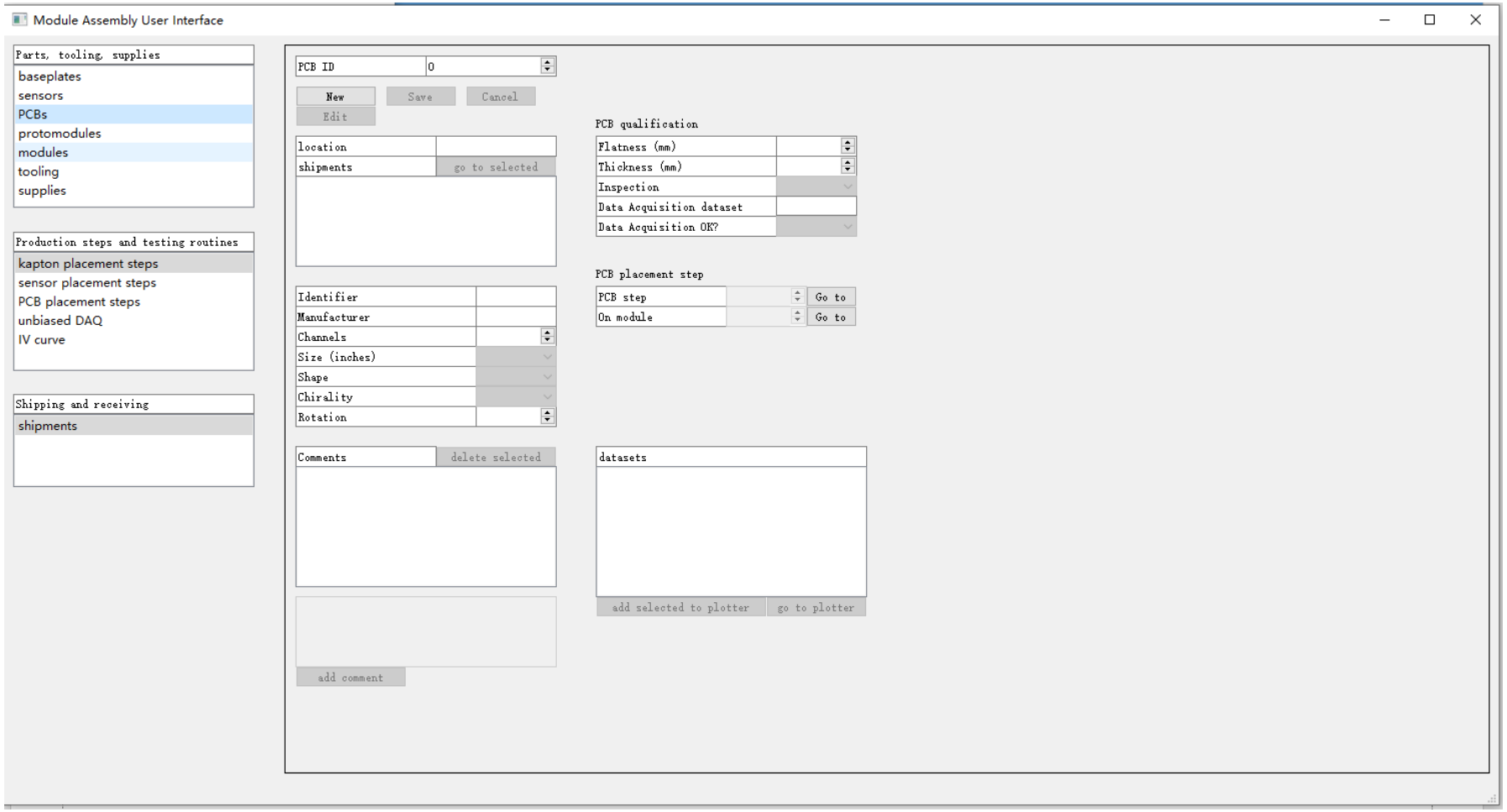
ID format to be updated:
barcode/serial number/name tag



Sensors


Module Assembly User Interface
Parts, tooling, supplies
baseplates
sensors
PCBs
protomodules
modules
tooling
supplies
Production steps and testing routines
kapton placement steps
sensor placement steps
PCB placement steps
unbiased DAQ
IV curve
Shipping and receiving
shipments
Sensor ID
0
New
Save
Cancel
Edit
location
shipments
go to selected
Identifier
Manufacturer
Type
Size (inches)
Shape
Rotation
Channels
Comments
delete selected
add comment
sensor qualification
visual inspection
sensor placement
Placement step
Go to
On protomodule
Go to
module
On module
Go to
connection to placement

PCBs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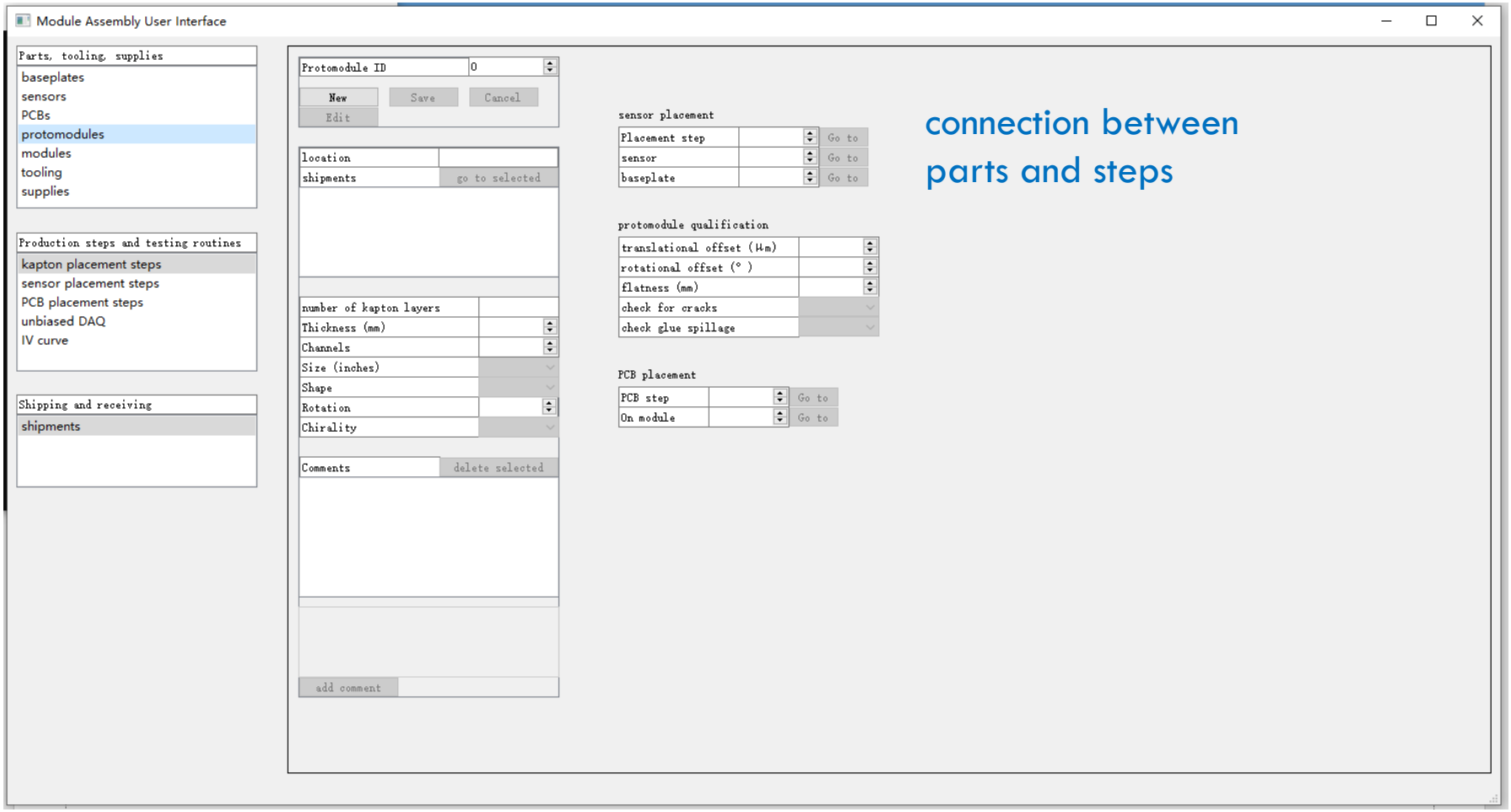
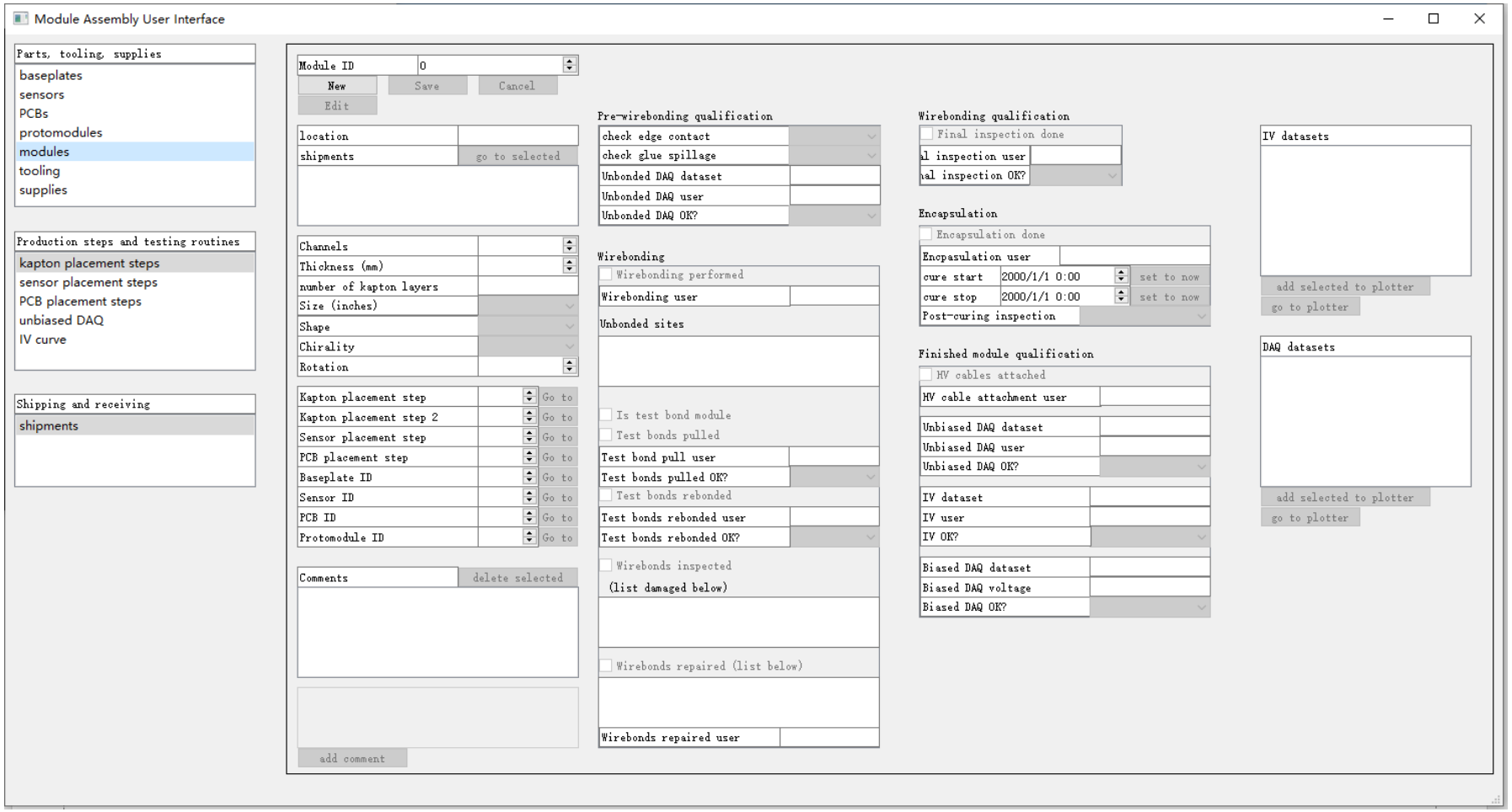
go to selected
Identifier
Manufacturer
Channels
Size (inches)
Shape
Chirality
Rotation
Comments
delete selected
add comment
PCB qualification
Flatness (mm)
Thickness (mm)
Inspection
Data Acquisition dataset
Data Acquisition OK?
PCB placement step
PCB step
On module
Go to
Go to
datasets
add selected to plotter
go to plotter

Protomodules



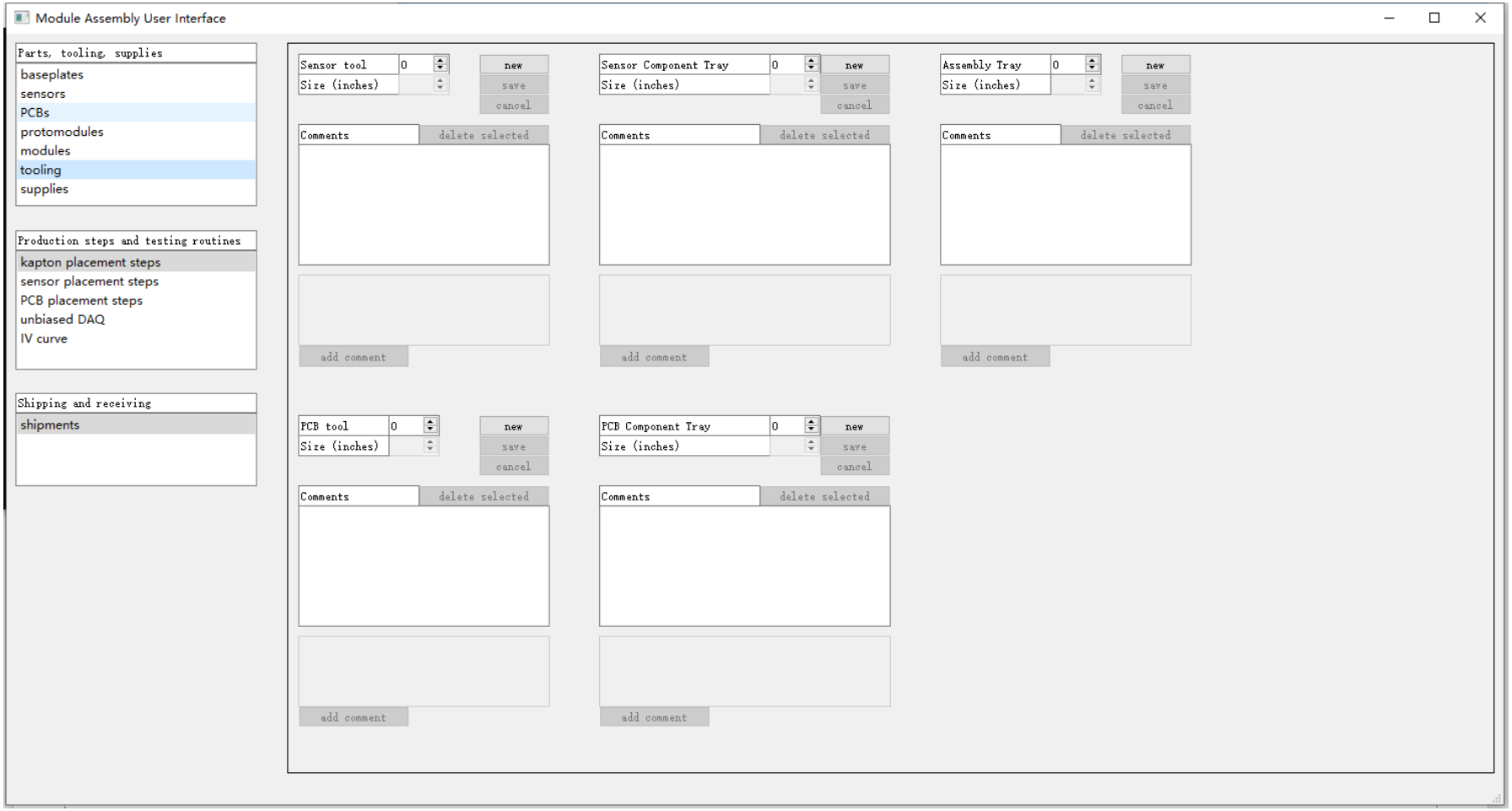
Modules

associated with tests:
unbiased DAQ and IV curve



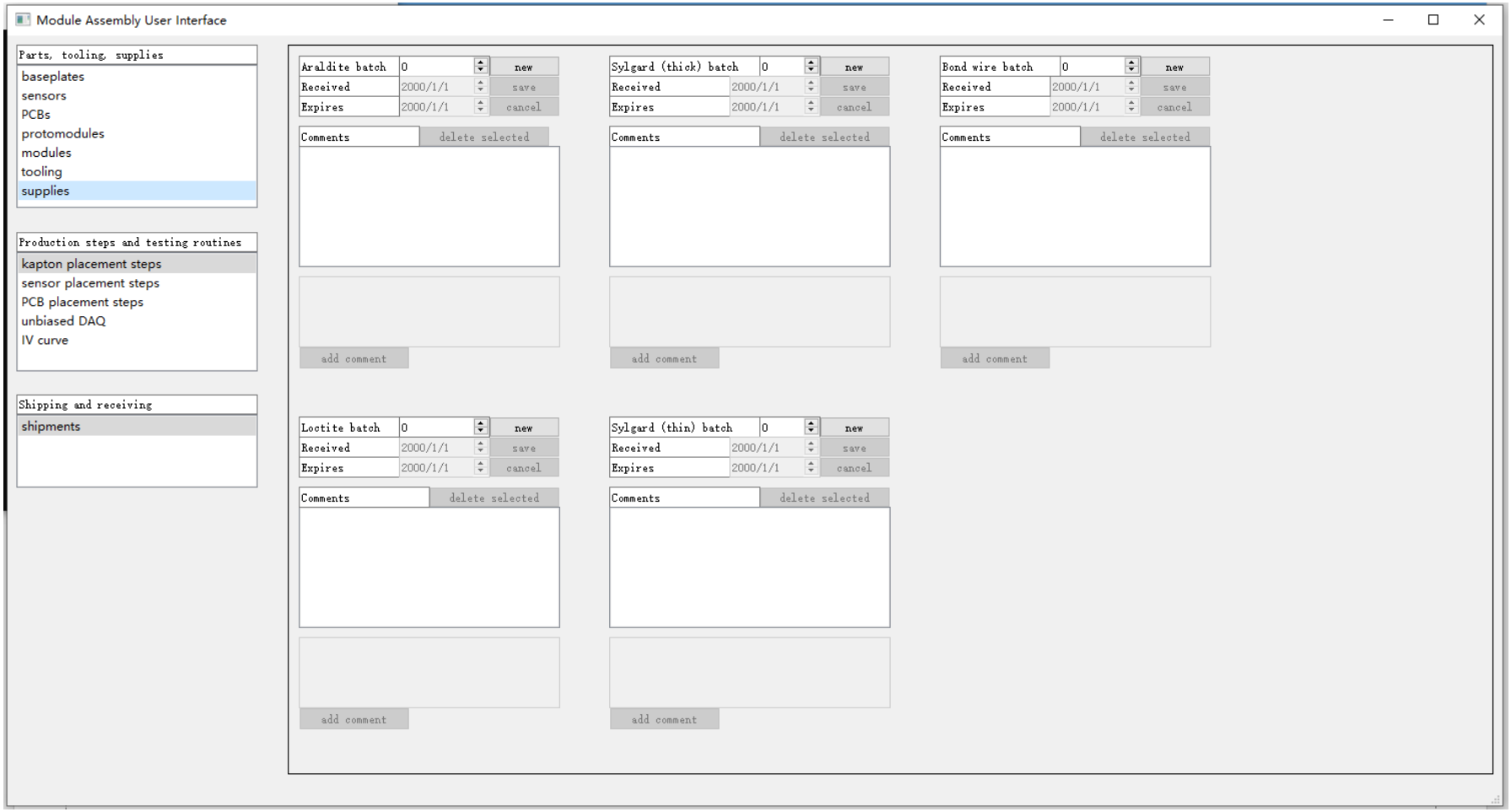
Toollings

different tool IDs and locations



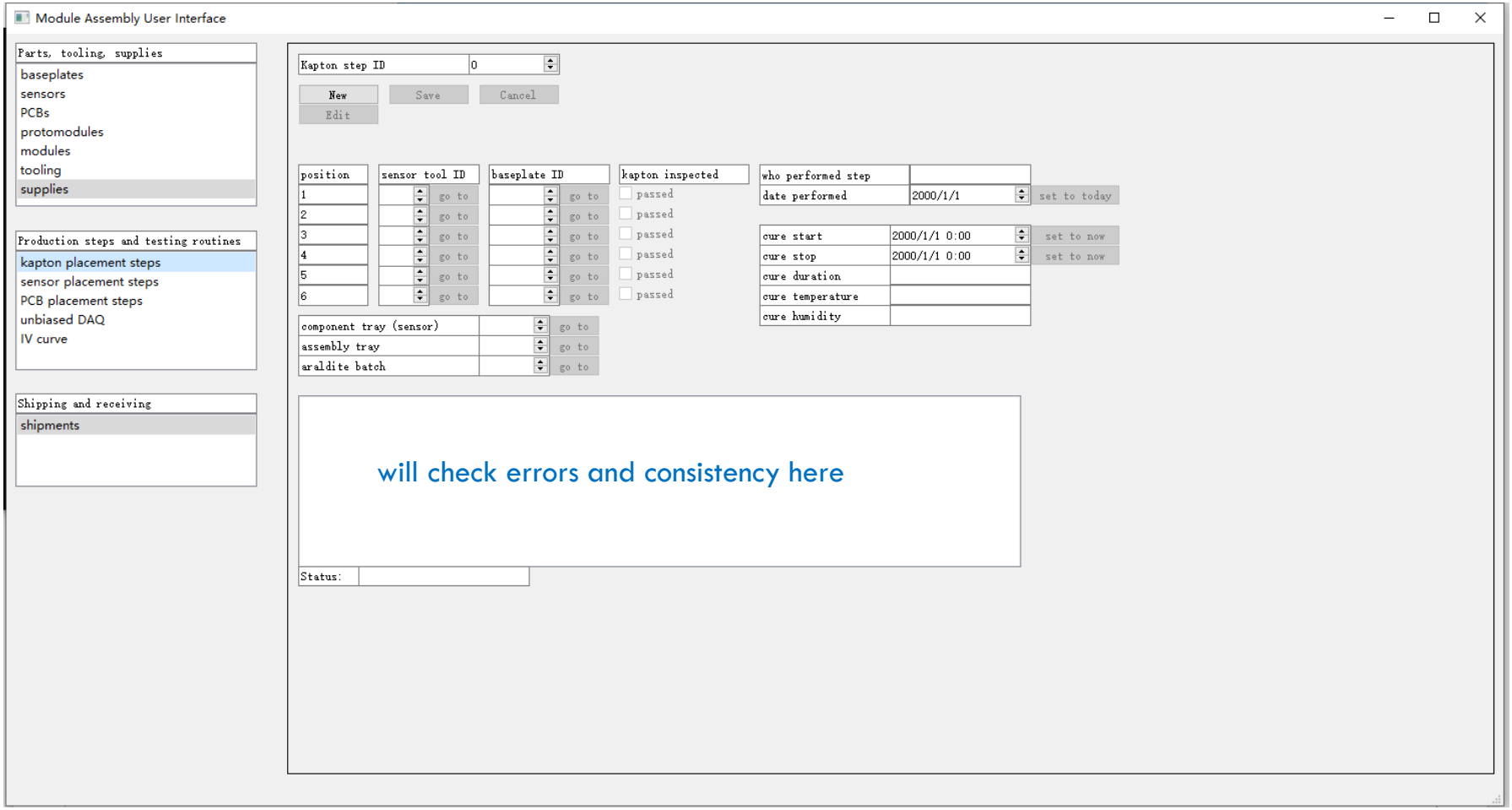
Supplies

different supply IDs and locations



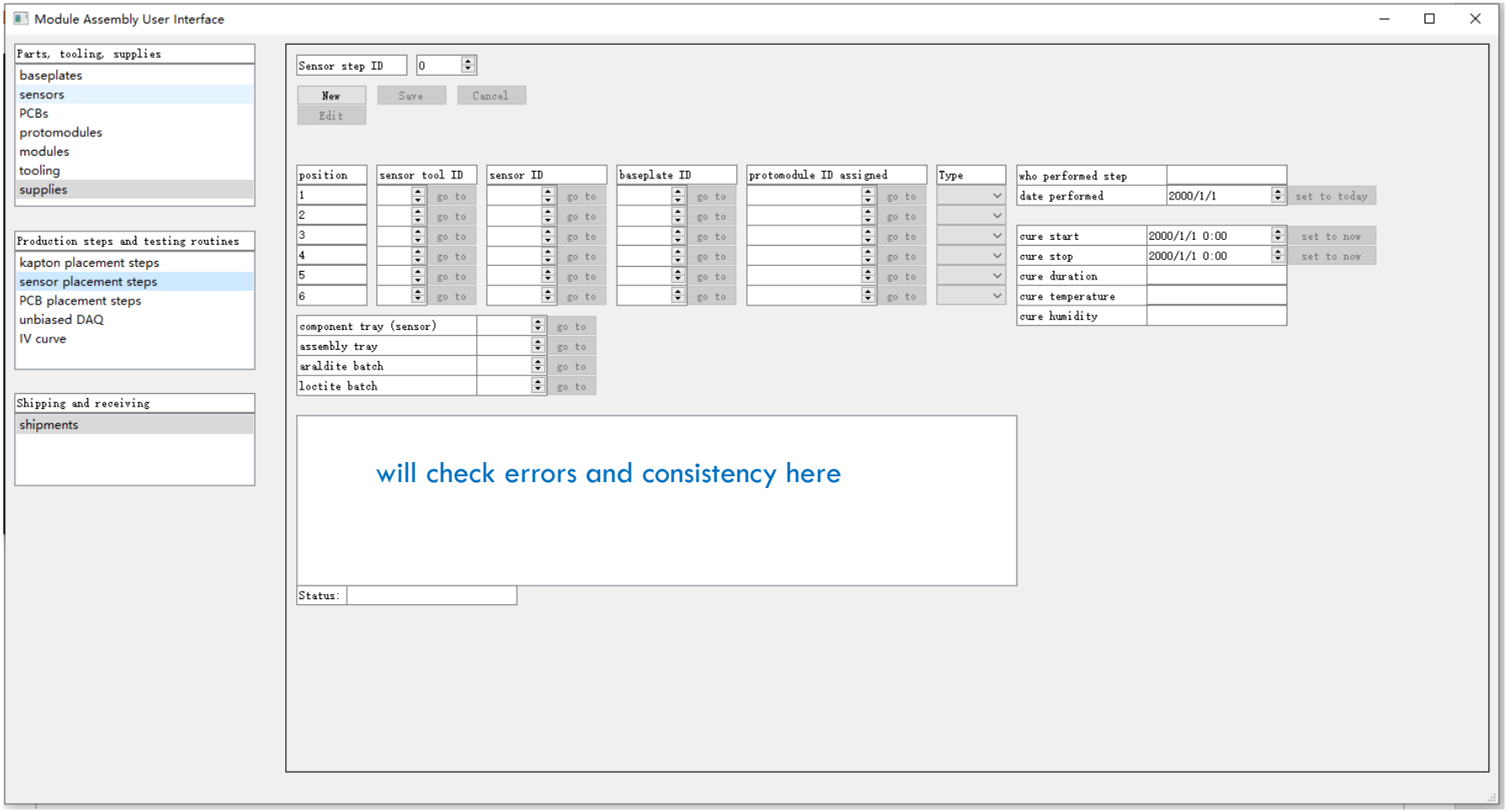
Kapton placement

associated sensor and baseplates



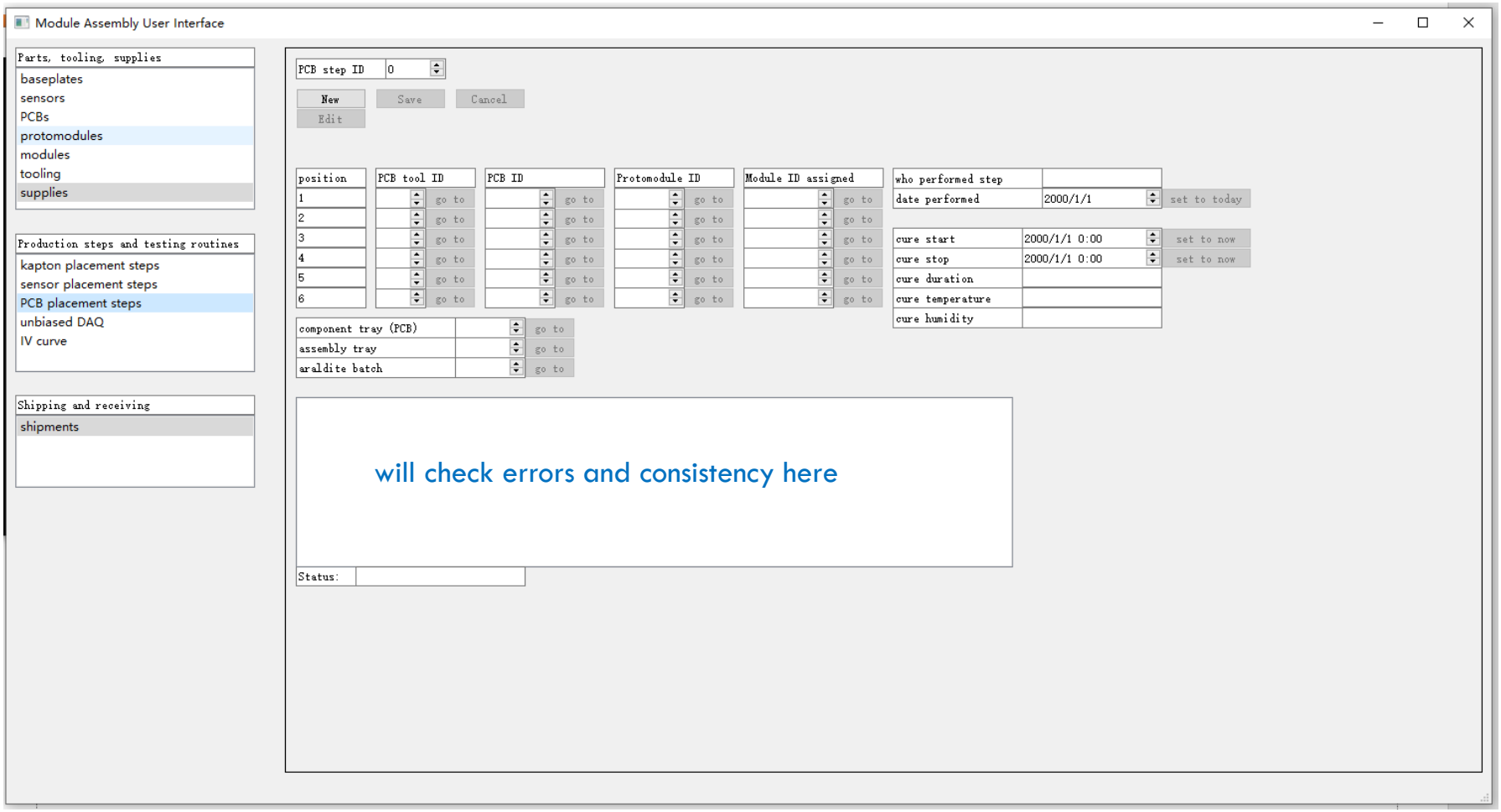
Sensor placement

associated sensor, baseplates and protomodules



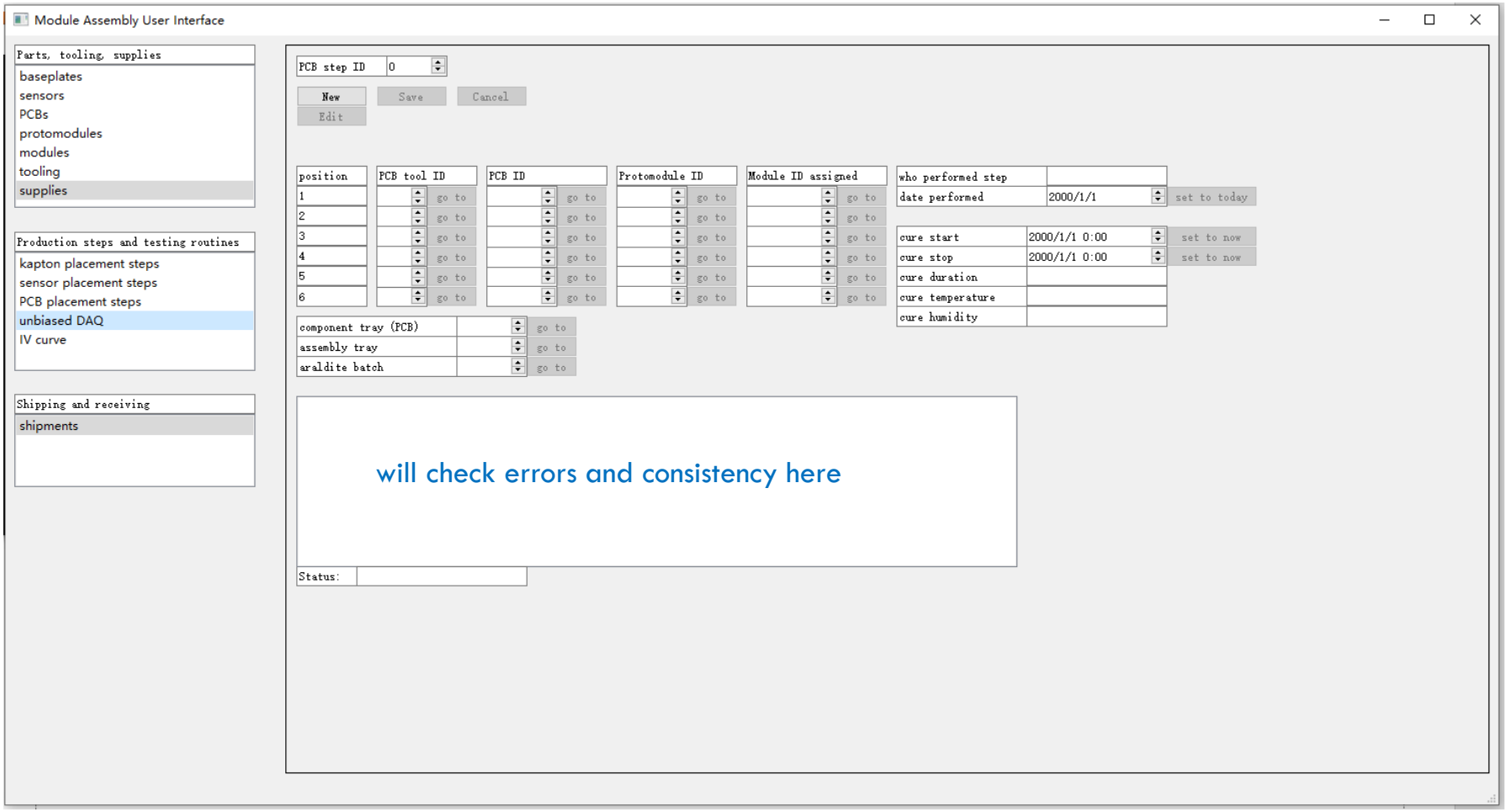
PCB placement

associated PCBs with protomodules and modules



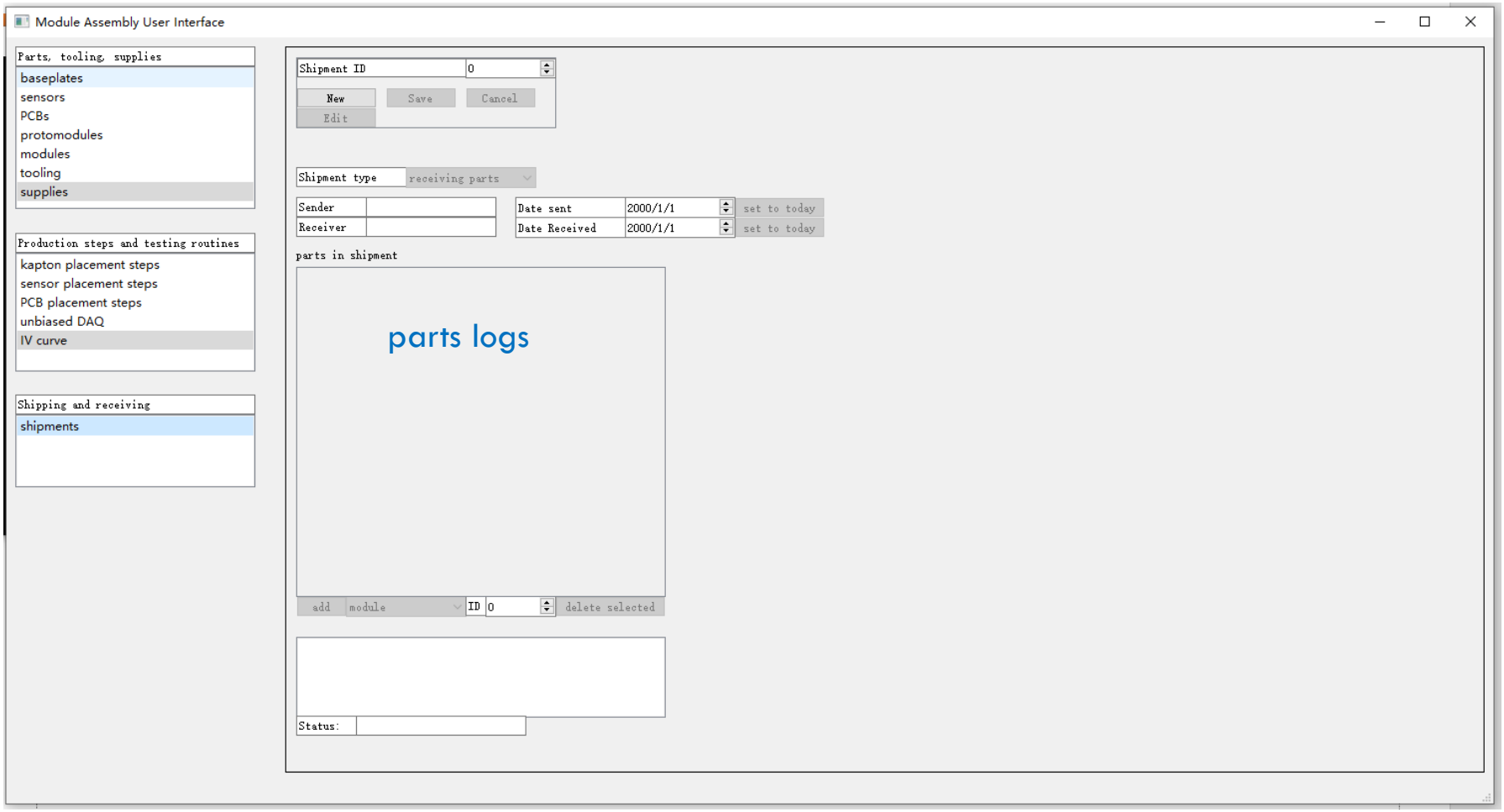
Unfinished pages

Unbiased DAQ and IV curve pages are not implemented yet.



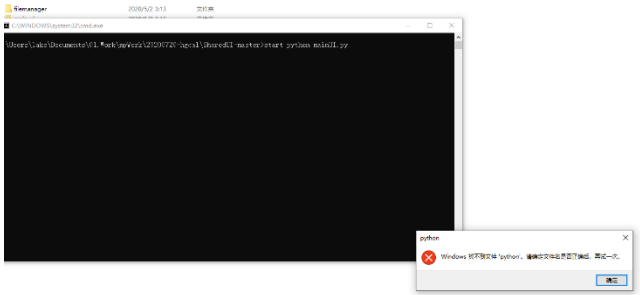
Shipment

Keep track of shipments, identify inconsistency

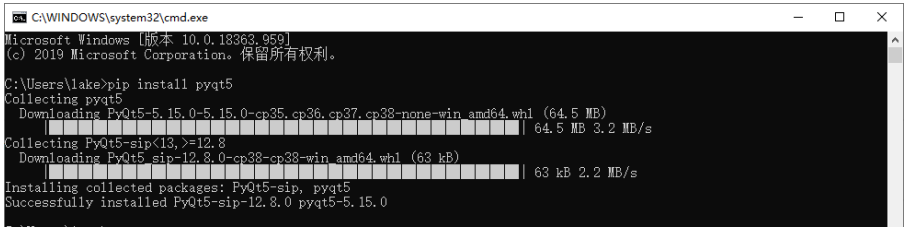


Installation

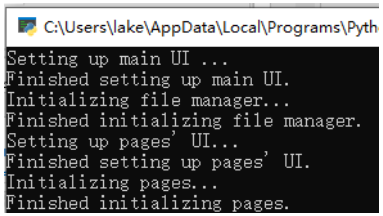
Windows installation instructions



- 1. install python3
  - best version python3.7
    - python version has to be above 3.5, below 3.8
    - https://www.python.org/ftp/python/3.7.8/python-3.7.8.exe
- 2. install PyQt5
  - need to run CMD with administrator rights
  - update “pip” if necessary
    - python -m pip install --upgrade pip
  - pip install PyQt5

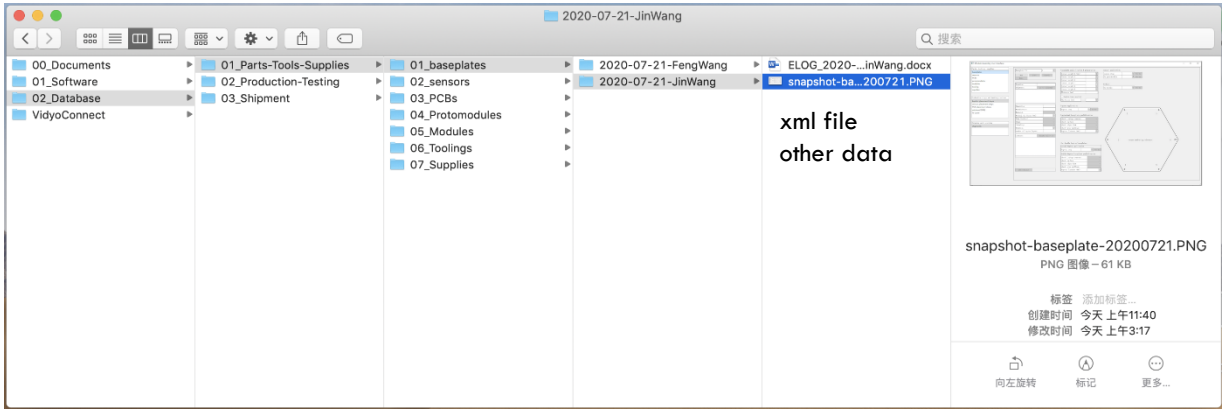


- 3. install numpy
  - need to find the right version corresponding the version of python
    - numpy-1.19.0-cp37-cp37m-win32.whl
  - put it under the “script” directory of python
  - pip install numpy-1.19.0-cp37-cp37m-win32.whl
- 4. install the GUI package
  - run.bat with https://github.com/p-masterson/SharedUI.git



Local database for module production

- Windows: RAID1 cloud e-log storage
  - archive corresponding parts/placement/tests logs
    - dates, responsible person, summary and necessary data
    - updates with module production GUI pages, and the output XML files
  - data stored locally with RAID1 disks
  - cloud storage with automatic backups?
    - can work remotely
    - can work in parallel



- Linux: similar idea with systems like web-based or git-based repository
  - easier to maintain
  - storage limited

Summary and Future work

- Test, maintain, update of the GUI, follow up on the development, connect GUI outputs with HGCAL Database
  - the beta version is not ready yet, to be released to all MACs
  - current outputs of GUI are partial XML, partial json file, to be completed
  - DAQ/IV curve test are not in place, need to interface with testing hardware
  - some ID formats and label definition to be determined
  - some functions are not implemented
- Will install the necessary infrastructure for module production GUI and HGCAL Database in the local laptop/desktop in the lab
  - hardware dedicated to record/archive the module production data
- Instruct individuals to get familiar with and use the module production GUI
- Communicate with developers on potential issues, feedbacks, requirements etc.