

Instruction for Setting Up SequenceTable

Basic information

The acquisition and analysis pipeline are mostly defined as a *SequenceTable*.

An example of the table:

Order	Camera	Label	Type	Note
1	Zelux	Lattice	Start+Acquire	
2	Zelux	DMD	Start+Acquire	
3	Zelux	Lattice	Analysis	CalibLatR
4	Zelux	DMD	Analysis	FitCenter
5	Andor19330	Image	Start	
6	Andor19331	Image	Start	
7	Andor19330	Image	Acquire	
8	Andor19331	Image	Acquire	
9	Andor19330	Image	Analysis	FitCenter, CalibLatR
10	Andor19331	Image	Analysis	FitCenter, CalibLatO
11	--inactive--		Analysis	
12	--inactive--		Analysis	

Additional to the SequenceTable, there are a few parameters to control the acquisition behaviors.

An example of the parameters:

Acquisition Control

Number of Acq. (raw)

20

Number of Acq. (statistics)

2000

Timeout (s)

Inf

Refresh interval (s)

0.01

Data sampling interval

1

☒ Drop bad frames

☒ Abort acquisition at end

Configure SequenceTable

A *step* is a single row in the SequenceTable. To define a step, one need to specify 4 variables:

- **Camera:** categorical variable, the camera/projector to use for this step, can be selected from cameras {[Andor19330](#), [Andor19331](#), [Zelux](#)} or projectors {[DMD](#)}
- **Label:** text string, the label of the image
 - The purpose is to distinguish two images taken by the same camera
 - Can be set to anything except for blank string ""
- **Type:** categorical variable, type of operations, can be set to {[Start](#), [Start+Acquire](#), [Acquire](#), [Analysis](#), [Project](#)}
- **Note:** text string, optional, additional input parameters for the step, separated by comma, leaving empty means default settings

To define **Type**:

- **"Start"** mode starts the acquisition
 - It either triggers the camera internally, or set the camera to be ready for external trigger
- **"Acquire"** mode consists of two processes: acquisition and preprocess
 - In acquisition, it acquires a raw image from specified camera with specified label
 - Immediately after acquisition it pre-processes the raw image
- **"Start+Acquire"** mode does both **"Start"** and **"Acquire"**
- **"Analysis"** mode performs a series of analysis processes
- **"Project"** mode only works for projectors

Note specifies the parameters for the step, which will be different depending on the **Type**:

- **"Start"**, the note parameters control the behavior of starting acquisition.
 - Available parameters are defined in class [Camera.startAcquisition](#) under `/core/camera/Camera.m`
- **"Acquire"/"Start+Acquire"**, because it consists of more than one process, the parameters require an identifier to specify which process they are controlling
 - For **"Acquire"**, available identifiers are {[Acquire](#), [Preprocess](#)}
 - **"Acquire"**, available parameters are defined in class [Camera.acquire](#) under `/core/camera/Camera.m`
 - **"Preprocess"**, available parameters are defined in class [Preprocessor.process](#) under `/core/preprocess/Preprocessor.m`
 - For **"Start+Acquire"**, available identifiers are {[Start](#), [Acquire](#), [Preprocess](#)}
 - An example note is: "Start, verbose=1, Acquire, min_wait=1, Preprocess, verbose=1"
- **"Analysis"**, the parameters need to specify which analysis process to make as identifier and followed by the parameters
 - The available analysis processes are defined in class [AnalysisRegistry](#) under `/core/analysis/AnalysisRegistry.m`
- **"Project"**, the parameters control the projected pattern

Configure Acquisition Parameters

- **Number of Acq. (images):** control the storage space for raw images, the raw images generated by this number of full sequence run will be kept in memory.
- **Number of Acq. (Statistics):** control the storage space for analysis results, because the analysis usually gives only a few numbers, this number can be much larger than "Number of Acq. (images)" while still taking much smaller storage space.
- **Timeout (seconds):** control the maximum wait time for acquiring a single image from any camera. If wait time exceeds the max but there is still no new image available, the program will throw a warning and return an empty image.
- **Refresh interval (seconds):** control the refresh interval for acquiring a single image from any camera. The camera will check if a new image is available every this interval and return the acquired image when it sees the new data.
- **Data sampling interval:** integer, control the saving interval of data acquisition. The app will save the data every this interval. When set to 1, it saves all the data.