# ECM python script usage

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## Installation

The python scripts demonstrate the use of the WiRE JSON-API. If python is not already available, then it is recommended to install python and the necessary python packages using [Chocolatey](http://chocolatey.org/). The following commands install all the required python packages:

choco install python --confirm

choco install pillow --source python --confirm

choco install requests --source python --confirm

Alternatively, some other python installer can be used and the pip package management tool can be used to install pillow (for image manipulation) and requests (for http support).

Note that the proxy needs to be set using SET HTTPS\_PROXY=<proxyHost>:<proxyPort> otherwise the install will timeout trying to contact the package servers.

## Run a simple single scan measurement template

Use WiRE to setup a simple single scan measurement and save it to a measurement template file (.wxm) The following command sends this template via the JSON-API and provides the result in the specified file path. Note that the template path is on the local client machine while the data file path will be a location on the remote machine.

python ecm\_custom.py \

--url http://localhost:9880/api/ \

--template simple.wxm \

--filename c:\temp\data.wdf

## Create a series data file

A series of measurements can be requested by configuring a series based upon a single scan measurement template. The series configuration includes a starting value, step size and a number of data acquisitions to perform. This information is included as a data origin list in the final file using the data type and label provided.

python ecm\_custom.py \

--url http://localhost:9880/api/ \

--template simple.wxm \

--filename c:\temp\data.wdf \

--series "{\"count\":5, \"start\":1.0,\"step\":1.0,\"units\":\"s\",\"label\":\"testing\"}"

## Create a custom map data file

This command runs a map. A single scan measurement template is specified along with a whitelight image, a map area, and a flag telling WiRE to use WiRE’s XYZ stage. In this demo the whitelight image already includes EXIF values specifying Objective, XPosition, YPosiion, XFieldOfView, YFieldOfView so it must have been exported from WiRE already; it is advised to use a whitelight image whose area is similar to the area to be mapped (ie if the whitelight is at -5000,-5000 but the map is from 1000, 1000 then the map review software will have large blank areas in between the map and the whitelight image)

python ecm\_custom.py \

--url http://localhost:9880/api/ \

--template simple.wxm \

--filename c:\temp\data.wdf \

--whitelight <<path to whitelight image.jpg>> \

--use-wire-stage \

--map-area "{\"xStart\": 10.0, \"yStart\": 15.0, \"xStep\": 1, \"yStep\": 1, \"xCount\": 3,\"yCount\": 4, \"row\_major\": false, \"snake\": false}" \

--custom "{\"index\":1, \"type\": \"arbitrary\", \"units\": \"Micron\", \"label\": \"Height\"}"

## Options

### --custom

Adds a custom data origin to the map or series.

python ecm\_custom.py \

--url <http://localhost:9880/api/> \

--template <<Path of .wxm>> \

--filename <<Path of .wdf file>> \

--whitelight <<Path of .jpeg image file>> \

--map-area "{\"xStart\": 10.0, \"yStart\": 15.0, \"xStep\": 1, \"yStep\": 1, \"xCount\": 3,\"yCount\": 4, \"row\_major\": false, \"snake\": false}" --custom "{\"index\":1, \"type\": \"arbitrary\", \"units\": \"Micron\", \"label\": \"Height\"}"

### --use-wire-stage

Select the use of the WiRE stage controller. See also --use-client-stage.

python ecm\_custom.py \

--url http://localhost:9880/api/ \

--template <<Path of .wxm>> \

--filename <<Path of .wdf file>> \

--whitelight <<Path of .jpeg image file>> \

--use-wire-stage \

--map-area "{\"xStart\": 10.0, \"yStart\": 15.0, \"xStep\": 1, \"yStep\": 1, \"xCount\": 3,\"yCount\": 4, \"row\_major\": false, \"snake\": false}" \

--custom "{\"index\":1, \"type\": \"arbitrary\", \"units\": \"Micron\", \"label\": \"Height\"}"

### --use-client-stage

Select the use of a client stage controller. With a client stage control the stage position is controlled by client software and a custom map axis should be added.

python ecm\_custom.py \

--url http://localhost:9880/api/ \

--template <<Path of .wxm>> \

--filename <<Path of .wdf file>> \

--whitelight <<Path of .jpeg image file>> \

--use-client-stage \

--map-area "{\"xStart\": 10.0, \"yStart\": 15.0, \"xStep\": 1, \"yStep\": 1, \"xCount\": 3,\"yCount\": 4, \"row\_major\": false, \"snake\": false}" \

--custom "{\"index\":1, \"type\":\"arbitrary\", \"units\": \"Micron\", \"label\": \"Height\"}"

### --map-area

Configures the measurement as a map.

See --custom for an example.

### --url

Specify the API endpoint as an http URL. This allows setting the hostname and port.

e.g. python ecm\_custom.py --url <http://localhost:9880/api/>

### --template

This sets the path of measurement template. These may be generated using WiRE and saved from the Measurements menu. The template selects the instrument configuration (laser, detector and scan style).

### --exposure

This sets the exposure time in milliseconds

e.g. python ecm\_custom.py --url http://localhost:9880/api/ --template <<Path of .wxm>> --exposure 100

### --filename

This sets the filename for the data file on the remote end.

e.g. <<Path of python script>>: python ecm\_custom.py --url http://localhost:9880/api/ --template <<Path of .wxm>> --filename <<Path of .wdf file>>

### --accumulations

This sets number of accumulations for the measurement scan.

e.g. <<Path of python script>>: python ecm\_custom.py --url http://localhost:9880/api/ --template <<Path of .wxm>> --filename <<Path of .wdf file>> --accumulations 2

### --get-laserpowers

This return the list of available laser power settings for the measurement.

e.g. <<Path of python script>>: python ecm\_custom.py --url http://localhost:9880/api/ --template <<Path of .wxm>> --get-laserpowers

### --laser-power

Sets the measurement laser power.

e.g. <<Path of python script>>: python ecm\_custom.py --url http://localhost:9880/api/ --template <<Path of .wxm>> --laser-power 10.0

### --whitelight

This sets the whitelight image from a JPEG file.

e.g. <<Path of python script>>: python ecm\_custom.py --url http://localhost:9880/api/ --template <<Path of .wxm>> --filename <<Path of .wdf file>> --whitelight <<Path of .jpeg image file>>

### --series

Configures the measurement as a series & pass a JSON dictionary

python ecm\_custom.py \

--url http://localhost:9880/api/ \

--template <<Path of .wxm>> \

--filename <<Path of .wdf file>> \

--series "{\"count\": 5, \"start\": 1.0, \"step\": 1.0, \"units\": \"s\", \"label\": \"testing\"}"