

CyberScope - User guide

This guide is a simplified version of CyberScope's comprehensive guide.

Only two parts appear: setting channels, MDA.

A more detailed version will be available soon

1. Operating principle

The basic principle of multidimensional acquisition is to realize, as its name indicates, an acquisition over n dimension (in time, in position x / y, in position z, in lighting mode, ...) while performing operations simple shooting of images (zstacking, autofocus, particular masking, ...).

This first software version sequences all the actions requested by the experimenter thanks to a WEB page and more particularly thanks to a jQuery flexible object (fancy jQuery tree). The experimental protocol is translated into the programming object and sent to a server, which remains autonomous after launching the acquisition even if the settings page browser is closed.

The purpose of this first phase (MDA basic) is to reproduce basic functions and the operation of certain software such as micromanager, IQ or YouScope while controlling the system (time of communications with the equipment, respect of the exposure time of the channels, dynamic settings of the equipment).

2. Independence of the operating system | accessibility

The entire development does not depend on the operating system and is accessible either locally or remotely. This first version does not block remote access. The change will be made in version 2.

3. Advantage of the server Node.js | Node-RED

The real advantage of this type of server is to be able to parallelize a set of user requests (flow technique). Thus, the speed of execution is much faster than usual. Today, many applications use this technology because it allows to link hardware devices, graphical user interfaces and online services in the context of the Internet of Things.

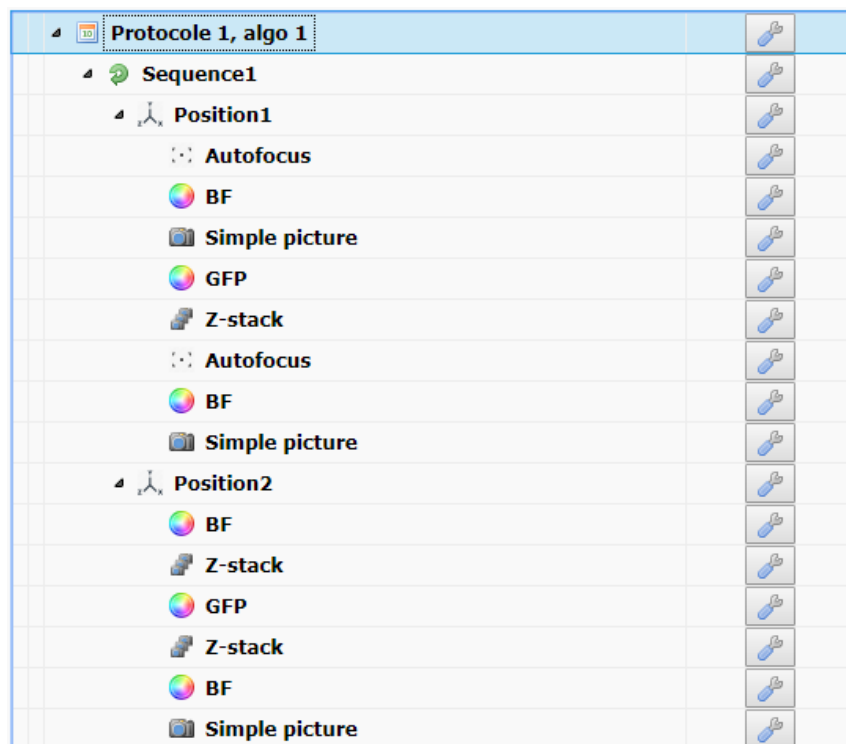
4. Experimental protocols available (CyberSCope-v1-mds1)

Three experimental protocols are available for this version

4.1 First protocol

This protocol makes it possible to go to position 1 then to position 2 and to perform a series of functions in the order of appearance in the tree (to achieve an autofocus, to activate the desired lighting, to take an image or a series of images in z).

- Each function is independent and can take independent setting parameters.
- The number of positions is not restrained.
- All settings are done by clicking the 'wrench' icon of the function concerned.



It is possible to comment the protocol and inform the prefix for saving the images.

Settings: Protocole 1, algo 1

Comment

Simple example:
scan n position during n times every x min, lighting source, autofocus, simple picture or z-stacking

Prefix

test_template1_

VALID

The sequence is repeated for n times every x min.

×

Settings: Sequence1

Time (min)

6

Repeat

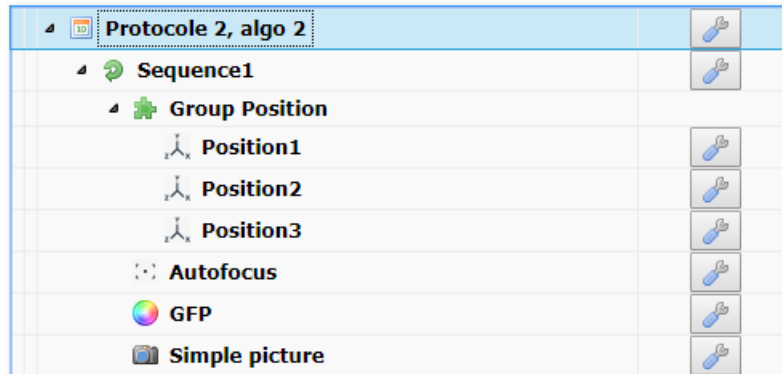
10

VALID

Remarks: No time control is performed in this version. Therefore, make sure that the execution time of the action in the tree does not exceed the repetition time of the loop. In case the time is exceeded, the software will remove the functions too.

4.2 Second protocol

In the second protocol, you can create different groups of positions in a sequence. All the functions present in the tree will be executed globally for each position of the group of positions. It is possible to inform a position or a lighting function of a deactivation frequency according to the repetition frequency of the sequence.



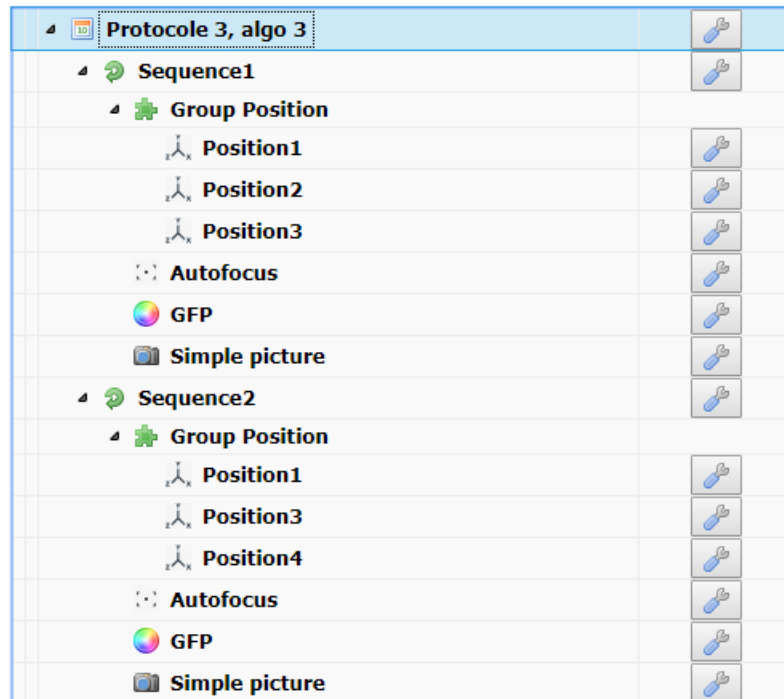
For example, if in position 1 you fill in the skip position at 0, the MDA will always go to position 1 regardless of the iteration. If in the lighting in BF inform you the skip channel to 2, the MDA will not light in BF at the third iteration of the sequence.

- As in the first protocol, the sequence is repeated for n times every x min.
- It is possible to comment the protocol and inform the prefix for saving the images.
- You can set the number of positions you want. In this version, the position number is not limited

Remarks: No time control is performed in this version. Therefore, make sure that the execution time of the action in the tree does not exceed the repetition time of the loop. In case the time is exceeded, the software will remove the functions too.

4.3 Third protocol

The third protocol is similar to the second. It is possible to parallelize two or n sequences. The principle is rigorously the same.



- You can set the number of positions you want.
- In this version, the position number is not limited

Remarks: No time control is performed in this version. Therefore, make sure that the execution time of the action in the tree does not exceed the repetition time of the loop. In case the time is exceeded, the software will remove the functions too.

5. Settings channels

Miss Marple Connected to server

Live mode

Settings Channels

MDA

Settings channels

Configuration loaded: TEST.json
Available configuration channels | click to load a specific configuration channel: TEST.json

+ Add a new setting channel

Name Channel	Light Source	Intensity	Shutter	Color mapping
BF	OLYMPUS-IX-81	21	OFF	
RFP	X-Cite-120PC	30	OFF	
GFP	CoolLed-PE-4000	LambdaA: 100, IntensityA: 84, LambdaB: 200, IntensityB: 100, LambdaC: 300, IntensityC: 80, LambdaD: 400, IntensityD: 29	ShutterA: OFF, ShutterB: OFF, ShutterC: ON, ShutterD: OFF	

Save the current settings

- It's easy to add, edit, or delete channels.
- Do not forget to save your configuration.
- In one version, adding a new configuration was intentionally blocked. It will be available in version 2.

6. Live mode

The live mode is not available in this version. It will be in the version 2

7. Rules to know

Olympus-IX-81, exposure time in bright-field: > 600 ms

Olympus-IX-81, setting ZDC : see Technical-data/Olympus-IX81-ZDC.pdf, page 7

CoolLed, exposure time: > 20 ms

X-Cite, exposure time: > 300 ms