X-PAD 3

User Manual

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Software description

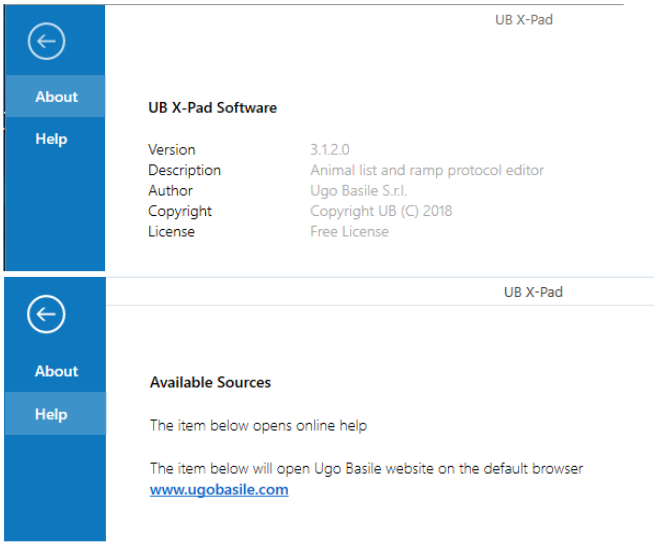
The X-Pad3 software is a software companion for UB instruments. Il lets you to prepare the experiments and the ramps for the devices that support them.

It includes the following pages:

- Info: this block contains the About section with information about the software version
- Experiment design: where the database is managed
- Rota Rod: specific for Rota Rod
- Treadmill: specific for Treadmill
- H/C Plate: specific for Hot/Cold Plate

Info page

The software version and general information about the software appear in the About section.

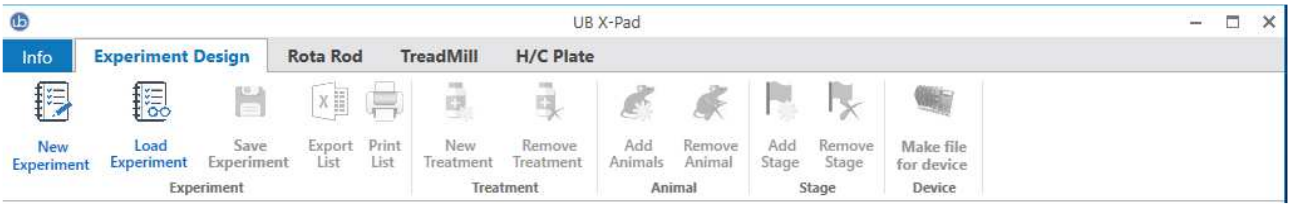


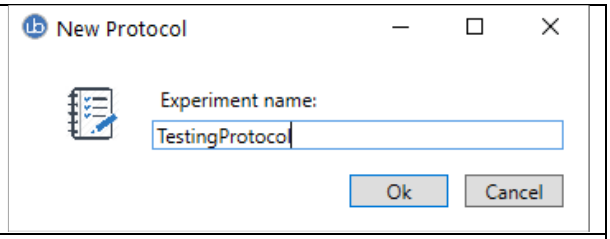
This menu also contains the Help section in which it is possible to open the web link referring to the Ugo Basile website.


Selecting the arrow brings back to the Experiment Design menu.

Experiment design

At this stage, just the first two icons of the Experiment Design page tab list are available.



New Experiment	Selecting the "New Experiment" icon, a window will pop-up. Please enter a name for the experiment and click ok. A new experiment is created and its name is shown under the menu bar.	
Load Experiment	Selecting "Load experiment" icon will allow to open a previously saved Experiment for further editing.	

Once an experiment has been created or loaded, all the menu icons become active.

The other icons have the following meaning:

Save Experiment	Selecting this icon, the current experiment is saved into a folder.
Export List	The selected experiment is exported to Excel
Print List	Prints the selected experiment trial list

 New Treatment	Add a new treatment to current experiment
 Remove Treatment	Remove the selected treatment from current experiment
 Add Animals	Adds a group of animals to the animals list. A window pops up where you can enter the animal's characteristics and directly assign them to an existing treatment.
 Remove Animal	Remove the selected animal from current experiment
 Add Stage	Add a new stage to current experiment
 Remove Stage	Remove the selected stage from current experiment
 Make file for device	Export the current experiment to the device (Rota-Rod, Treadmill or Hot-Cold Plate and so on) via USB flash drive. The output file has a ".db" extension and can be loaded into the device selecting the "LOAD PROTOCOL" function.

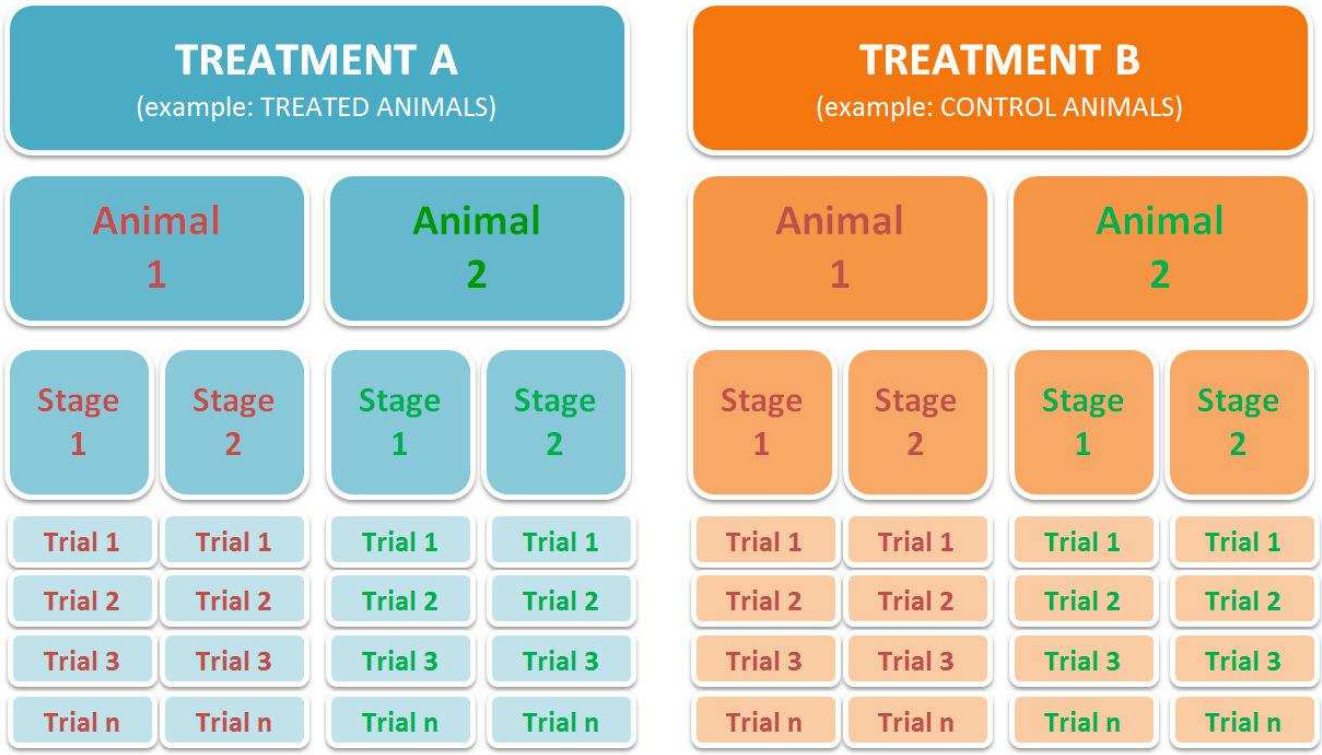
Instrument specific menus for ramp design

For some UB instruments, such as the RotaRod, it is possible to create custom experiment ramps, to be transferred to the instrument itself, via a USB flash drive.

Experiment design intro

This is the core of the X-Pad software, where the experiment is organized and written.

The experiment organization should respect the following scheme:

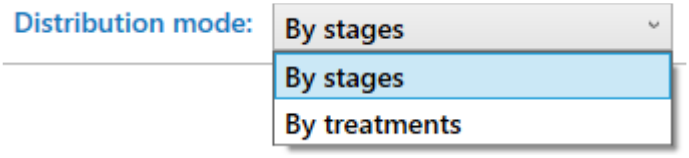


In general, during a common scientific experiment, animals are divided into distinct groups, based on their treatments (typically Treated and Control ones).

For each animal different stages are planned, which basically identify the different phases which will be performed during the experiment; a protocol must include at least one stage. For example, during a Rota-Rod Test you might have a training phase, and the subsequent test.

Stages might include one or more trials with the same features (in the example of a Rota-Rod test, speed and mode).

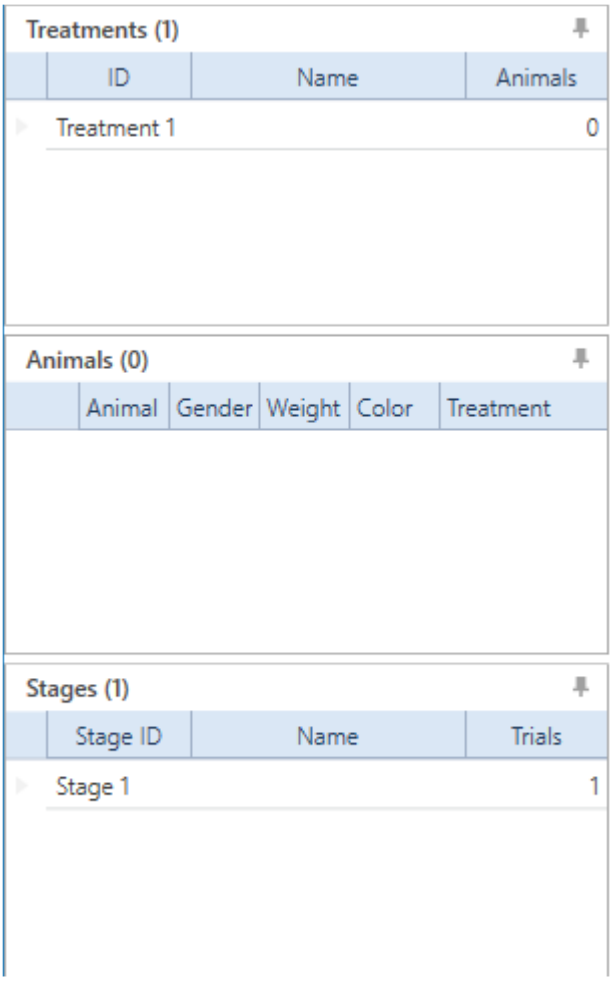
It is possible to execute the experiments by stage or by treatment selecting the desired way:



"By Stage" means: for each stage, for the number of trials, for each treatment, test the animals assigned to the treatment

"By Treatment" means: for each treatment, for each stage, for the number of trials, test the animals assigned to the treatment

First of all, create a new Experiment, enter a name, and confirm by OK; when a new experiment is started, an empty grid is prepared for each of the following elements: Treatments, Animals, Stages & Trials. The tables will auto-fill as soon as treatments, animals and stages will be added:



Treatments

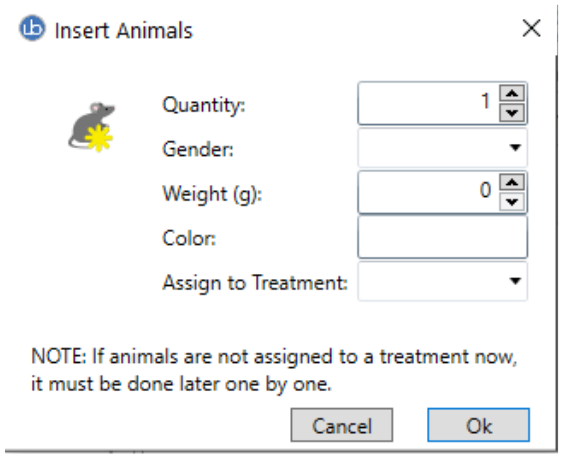
Double click on the Name column to add a name. On the Animal column appears the number of animals assigned to this treatment group and it is not editable. Be aware that to make a change effective it is required to press “Enter” on the keyboard.

Animals

When an experiment is newly created, no animals are present.

Click Add Animals from the top menu. A dialog window opens letting you to enter the animal’s characteristics.

You can insert the number of animals to be added, their gender, weight and color, and you can directly assign then to one of the already created treatments.



Clicking OK all the Animals are added to the animal's grid. They are automatically named "Animal 1", "Animal 2" and so on, but you can change their ID from here.

In this grid, clicking on the animal row fields you can: edit the Animal ID, select the gender, enter the weight, edit the color and assign the animal to one of the available treatments.

As soon an animal is assigned to a treatment, the Trials grid is automatically populated.

Trials (3)

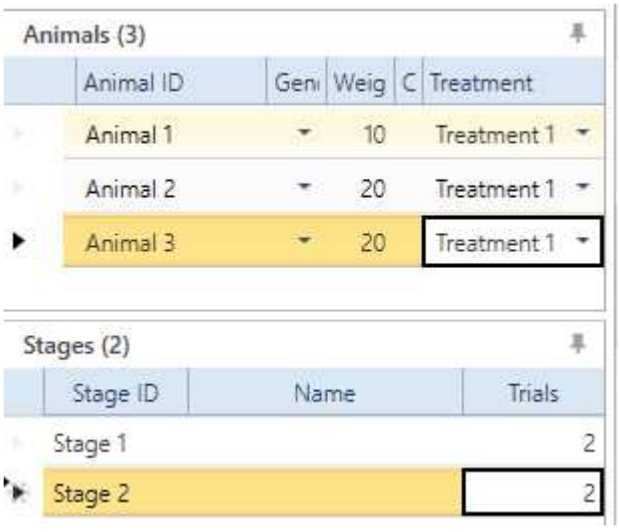
	Run	Animal ID	Color	Gender	Weight (g	Treatment ID	Stage ID	Trial
1	1	Animal 1		Male	10	Treatment 1	Stage 1	1
2	1	Animal 2			20	Treatment 1	Stage 1	1
3	1	Animal 3			20	Treatment 1	Stage 1	1

Stages

For the list of created treatments, it is possible to add one or more stages. A stage is added using the "Add Stage" menu function. Stages can be removed through the key "Remove Stage".

Adding a Stage will create another set of rows for each treatment, for each animal and for the number of trials entered for each stage.

For example, if I have 3 animals and 2 stages with 2 trials each as in this example:



I'll come up with this list:

Trials (12)

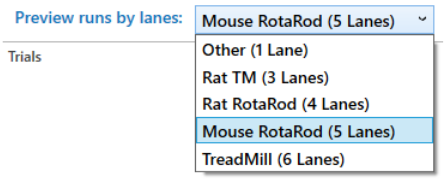
	Run	Animal ID	Color	Gender	Weight (g	Treatment ID	Stage ID	Trial
1	1	Animal 1		Male	10	Treatment 1	Stage 1	1
2	1	Animal 2			20	Treatment 1	Stage 1	1
3	1	Animal 3			20	Treatment 1	Stage 1	1
4	2	Animal 1		Male	10	Treatment 1	Stage 1	2
5	2	Animal 2			20	Treatment 1	Stage 1	2
6	2	Animal 3			20	Treatment 1	Stage 1	2
7	3	Animal 1		Male	10	Treatment 1	Stage 2	1
8	3	Animal 2			20	Treatment 1	Stage 2	1
9	3	Animal 3			20	Treatment 1	Stage 2	1
10	4	Animal 1		Male	10	Treatment 1	Stage 2	2
11	4	Animal 2			20	Treatment 1	Stage 2	2
12	4	Animal 3			20	Treatment 1	Stage 2	2

As you can see, each animal will be assigned to each stage for each trial of each stage.

Animals can be assigned to only one treatment.

The grayed lines indicate groups of animals that will be tested at the same time, or in the same “run” (see the “Run” column).

How the animals are divided into runs depend also on the capacity of the device, and you can choose it from the top bar:

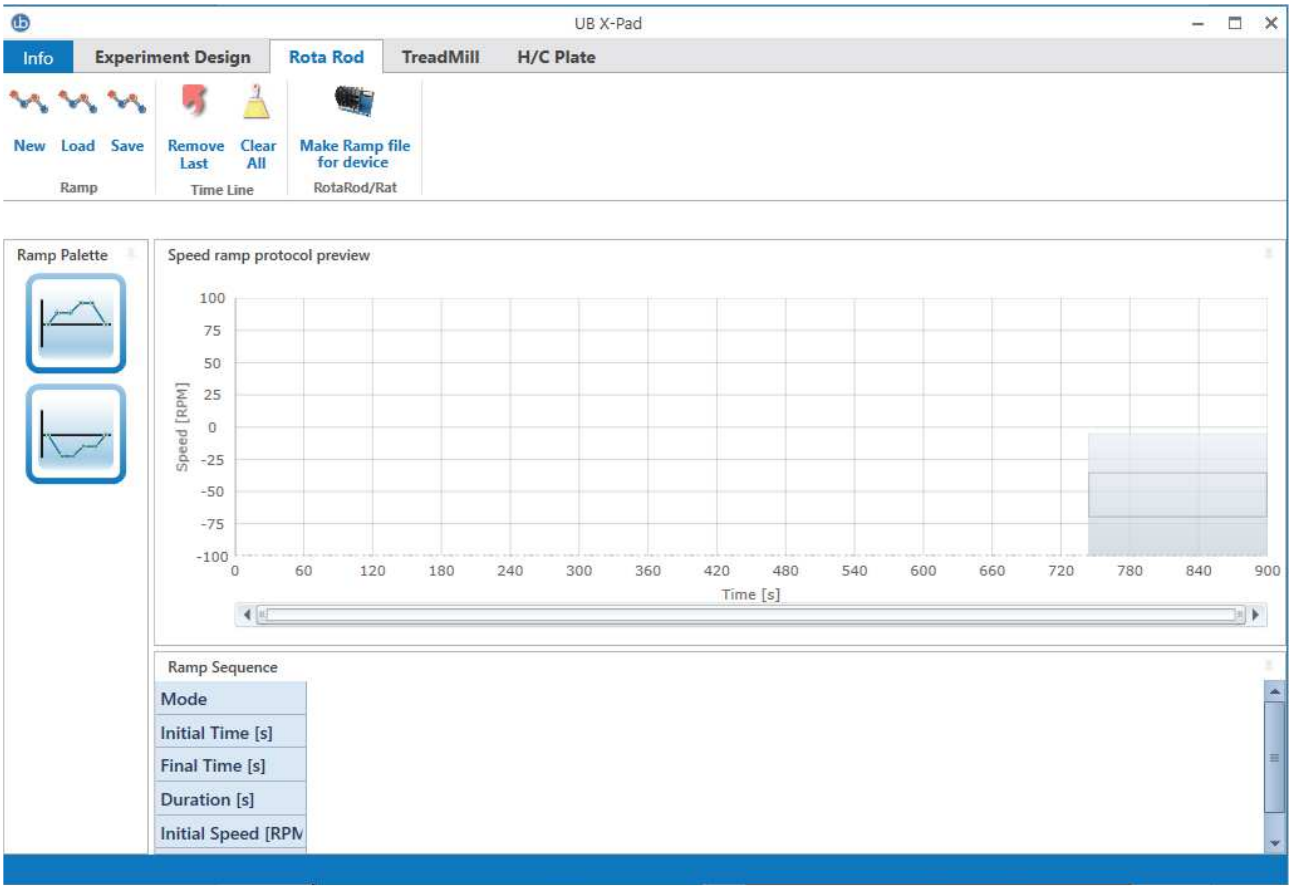


This allows you to figure out how many runs are needed to test all the protocol on the selected device.

As you can see our devices have currently the following capacity to test animals o n the same run:

Device	Capacity
Mouse Rotarod	5 wheels
Rat Rotarod	4 wheels
Mouse Treadmill	6 lanes
Rat Treadmill	3 lanes
Hot Cold Plate	1 place
Incapacitance Tester	1 place
Dynamic Plantar	1 place
Plantar Test	1 place
Tail Flick	1 place
Others	1 place

Ramps (Rotarod, Treadmill, Hot Cold Plate)



These pages, specifically related to the three devices, enable the user to write a custom ramp; a custom ramp is a sequence of custom defined speed or temperature elements.

The menu includes the following options:

New	Creates a new ramp
Load	Loads a previously created ramp. The file extension is ".ror"

 Save	Saves the ramp to disk (file extension is ".ror")
 Remove Last	Removes the last step of the current ramp
 Clear All	Clears the current ramp
 Make ramp file for device	Creates the file for the device. The file extension for the ramp files is ".rcr" and the file can be loaded into the device selecting the "Custom ramp" function from the settings menu.

Select New to create a new custom ramp, then start with the first element: chose the mode from the Ramp Palette on the left:

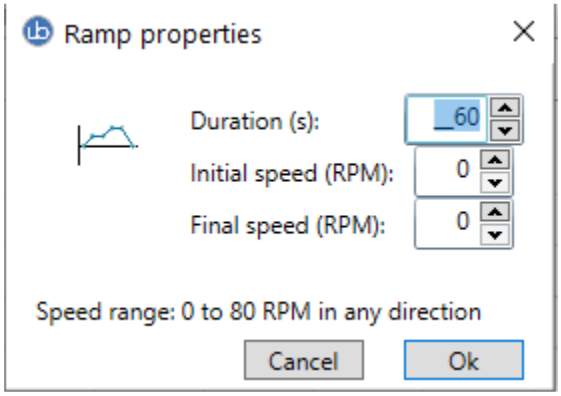
This palette changes depending on the chosen device.

Rotarod has forward and reverse ramps and they are set in RPM (rotations per minute).

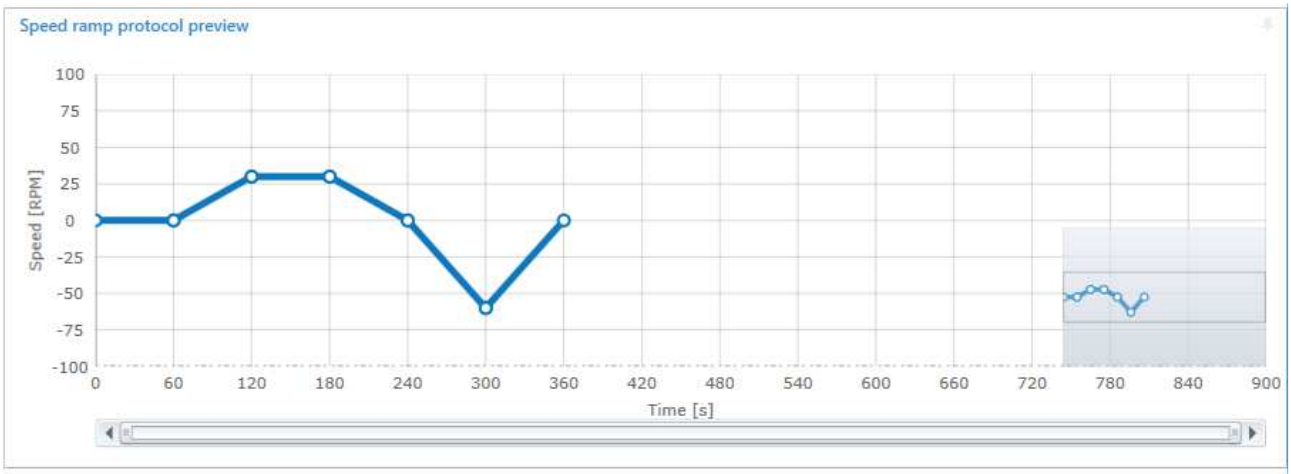
Treadmill has forward only ramps and it is set in m/min (meters per minute).

Hot Cold Plate has temperature ramps and they are set in °C (Celsius degrees).

To add an item to the sequence, double-click (or right click) the desired ramp from the ramp palette, a window will pop-up, in which the user may enter the ramp properties:



Add more elements to obtain the desired speed/temperature curve, which is displayed graphically in the "Speed (or Temp) ramp protocol preview" area:



Ramp Sequence

Mode						
Initial Time [s]	0	60	120	180	240	300
Final Time [s]	60	120	180	240	300	360
Duration [s]	60	60	60	60	60	60
Initial Speed [RPM	0	0	30	30	0	-60

The initial speed/temperature of each ramp step must match the final value of the previous step.

The custom ramp can be saved and exported to the Rota-Rod, Treadmill or H/C Plate: click on the "Make Ramp file for device" icon, and save the configuration on a USB key, ready to be uploaded to the Rota-Rod via the USB port.