Panlab
An Affiliate of Harvard Bioscience, Inc.

USER MANUAL

PPCWIN 2.0.05

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1. INTRODUCTION

This manual contains material for the experimenter who wishes to use **PPCWIN** to simultaneously monitor up to 8 Conditioned Place Preference (CPP) or Black and White (B&W) boxes.

It is divided into two parts: installation procedure and experiment execution.

We suggest the user to conscientiously read the overall manual before beginning an experiment to avoid any hardware damage and software malfunctioning due to any possible misuse of the system.

Thoughout the manual, the following signal will indicate the points that require a special attention from the user.

2. INSTALLATION OVERVIEW

The installation procedure is completely described for reading during the installation procedure. Therefore, they are stand-alone and can be executed separately as per your needs: acquisition (USB Key must be connected), analysis, reporting (printer must be installed), etc.

First of all, please check that your user has administrative rights on the PC or laptop in which the software or device is to be installed. Please contact your IT staff in order to clarify this issue before the installation procedure is done.

Additionally, you will find details about how to configure some requirements which should be fulfilled to be able to install this system.

2.1. Requirements

PPCWIN needs the following equipment:

- A fully compatible computer with at least:
- 2 GHz Pentium® (Celeron processor excluded).
- 2 Gb of RAM.
- 150 MB of free hard disk space.
- Graphics: 1024x768 pixels and 32-bit true color.
- 1 free USB port for the protection key.
- Connection interface:
- 1 free RS-232 serial port for the boxes connection.

A USB-Serial adapter included in the software pack can be used when a RS-232 serial port is not available.

- Operating system supported:
  - Microsoft® Windows® 11 64bits
  - Microsoft® Windows® 10 32bits and 64bits
- External software needed:
- Microsoft Excel ®.
- Microsoft Word ® (only for reports in Word format).

If external software is not available, some analysis reports cannot be generated. Please contact your IT staff in order to install the external software before analyzing sessions.

- Printer (recommended):

At least one "virtual printer" must be correctly installed. Please refer to section 2.5 for more details.

2.2. Installing Software

PPCWIN software is delivered within a single USB flash drive. The USB flash drive contains the software installation tool, this User's Manual in PDF format and other components required to work in specific conditions.

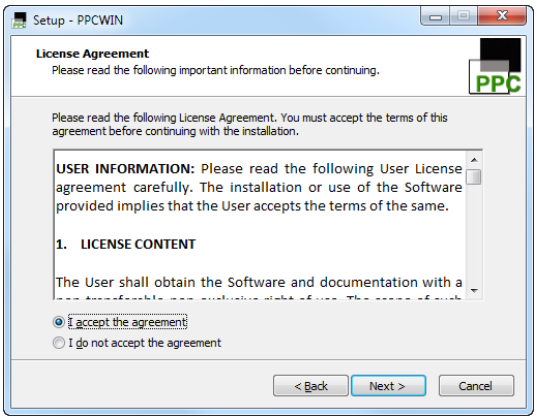
Due to security reasons of the Windows® operating system, a user with administrative rights is required to install the software and other components. Please contact your IT staff before installing the software.

Once you get the administrative rights to install the software, please follow these steps:

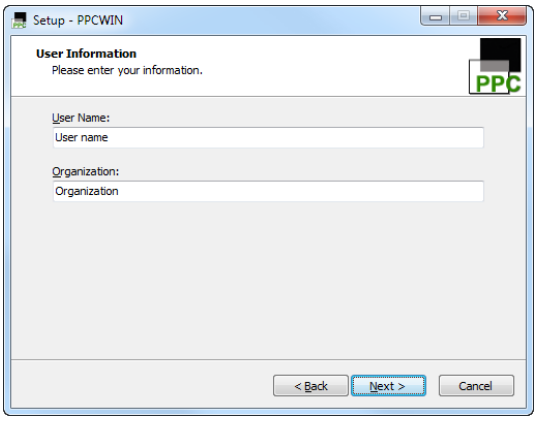
- Plug the USB flash drive in a free USB port of your computer and wait until Windows® installs it as a new removable drive.
- Access the new removable drive detected and execute the PANLAB.EXE file. A window will be shown, as below:

- Press the [Install PPCWIN v2.0.05] button to start the software installation.
- An installation wizard will appear. Press the [Next] button to start the software's installation.

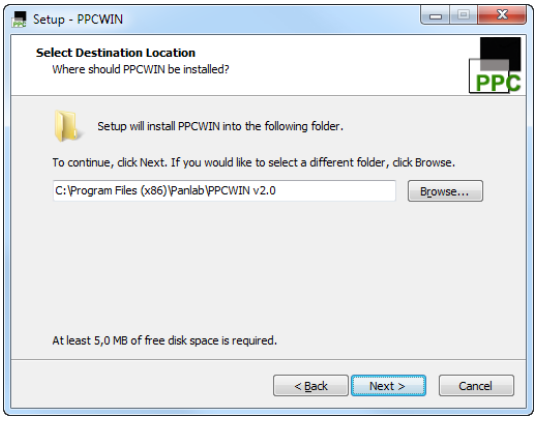
- Read the **License Agreement** and check the **"I accept the terms of the license agreement"** option to continue the installation of PPCWIN. Then press the [Next] button to start the installation.



- In the next windows introduce the name of the user and the company in the correct field. After this, press [Next] button to continue.



- During the installation process, the software is installed in a new folder called [PPCWIN v2.0\] created under the Programs Files folder. If desired, the installation program allows you to choose another folder to locate the software. The location of the software is independent of the data folder, which is defined by the user using the corresponding options of the program.



- Press the buttons [Next] and [Install] following the Install Shield Wizard until reaching the [Finish] button.
- A new shortcut will appear on your desktop. Use it for executing the program later.

2.3. Installing software protection key

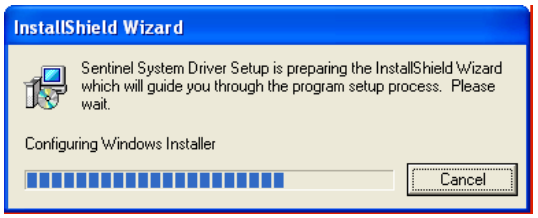
PPCWIN software is delivered with a USB protection key that avoids fraudulent use of the application in a computer which does not have it installed.

Before installing the drivers, all applications must be closed and all USB SuperPro keys must be removed.

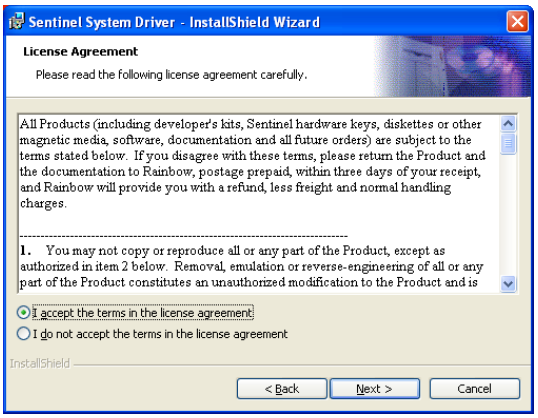
In order to do a correct USB key protection installation, please follow the steps below:

- Press the [Install Software Key Drivers] button to start the driver's installation.

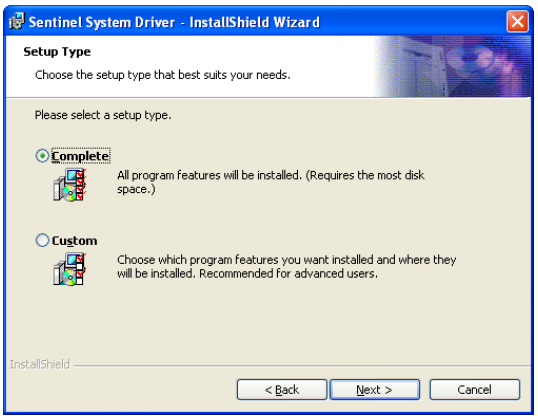
- Automatically a USB key wizard installation will be shown. When the Welcome screen appears, click [Next] to continue.



- Choose [I accept the terms in the license agreement] and click [Next] button to continue.



- On the incoming window select the [Complete] option of setup type and click [Next] and [Install] buttons to continue.

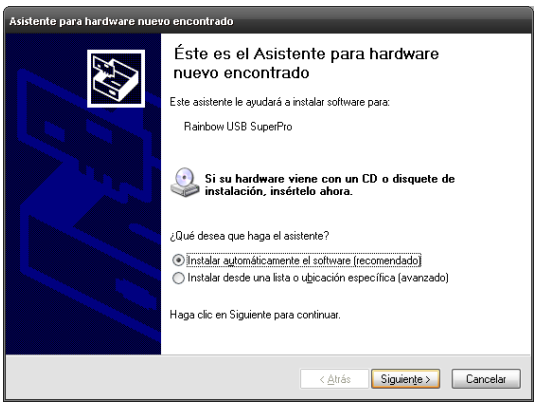


- After pressing the [FINISH] button, you must reboot the system. Thus, your computer will recognize the USB security key.

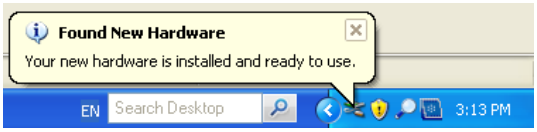
- Did you reboot the computer? If you answer yes, please connect the USB key. In the lower right corner of the screen will appear the next message.

- The wizard for installing the drivers will run when your computer detected correctly the USB key. This process will need some minutes depending on your PC.

- Choose [Automatic Installation] and press the [NEXT] button.



- Wait while the wizard looks for the drivers until it asks you to press the [FINISH] button.
- Finally, a new message will appear in the lower right corner of your screen. The USB key was installed correctly...



Important remark: This step has to be repeated for each USB port of your computer.

2.4. CONRS232USB-HS converter (high speed mode)

PPCWIN requires the use of the high-speed converter from RS232 port to USB port. A USB – Serial adapter will allow you to set 2 serial ports in your PC or laptop.

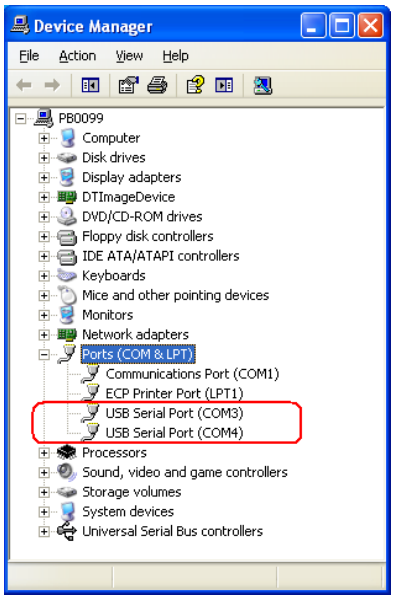
WARNING: do not use direct connection between the device and the computer RS232 serial port (if any).

We recommend the use of a specific model of converter. We cannot guarantee the correct functioning of the system with any other USB-serial converter. The converter includes an extension cable just in case.

To Install the converter:

- Connect the converter to the computer.
- Windows 8, 10 and 11 will automatically install the drivers.
- If working with a Windows 7 or previous, please refer to the notice provided in the box of the converter.

- Once connected and installed, two serial ports will appear in the [Device Manager] window on the Windows Operative System. Usually, the numbers assigned by Windows are sequential.



2.5. CONRS232USB (blue) converter (Legacy mode)

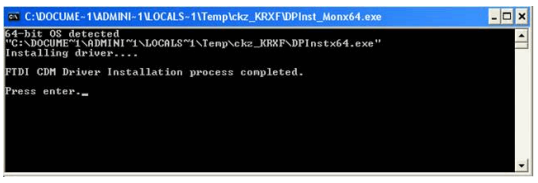
The blue RS232/converter was included in older PPCWIN software packages.

PPCWIN is still compatible with the use of the system in a Legacy mode (not high-speed). In case you need to re-install this device, please follow the below procedure:

- You need to have administrator privileges to install any new drivers under Windows 10/8/7/Vista/2003/XP/2000. To install the driver or update the configuration please log onto Windows as "Administrator" or ask your system administrator to install the USB to serial driver. Please contact your IT staff in order to clarify this issue before continuing installing the device.

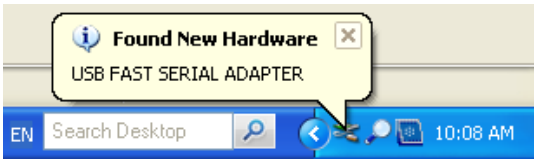
- The drivers should be installed prior to hardware installation. Do not connect the USB to serial I/O Adapters to the USB port of your computer, before you finish driver installation.
- Insert the PPCWIN software USB flash key into a free USB port of your computer and access its content.
    - If your PC is running Windows XP, a manual installation is required: go to folder Files\USBCom and execute file USBCom-CDM_20824.exe
    - Otherwise, for the rest of Windows versions, execute the installation assistant (Panlab.exe). The following installation window will be shown. Press the [Install Drivers USB-RS232] option to start the software installation process.

- The USB COM install program will auto-detect the OS type and install the driver automatically. In some operating systems, it might appear a dialog box asking to press [ENTER] at the end of the installation.

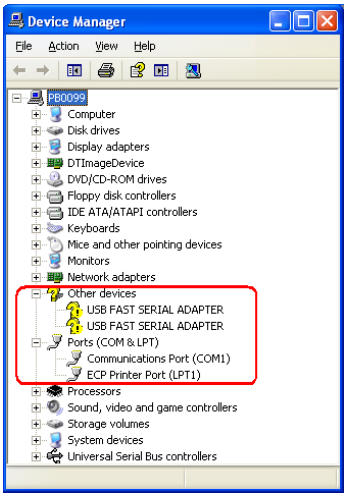


- After the message "FTDI CDM Driver installation process completed" appears, press "Enter" to complete the driver installation.
- Plug in the USB PRO Series Adapter to the USB port of your computer. Windows will finish installing the driver files.

- In the lower right corner of the screen the next message will be automatically shown:

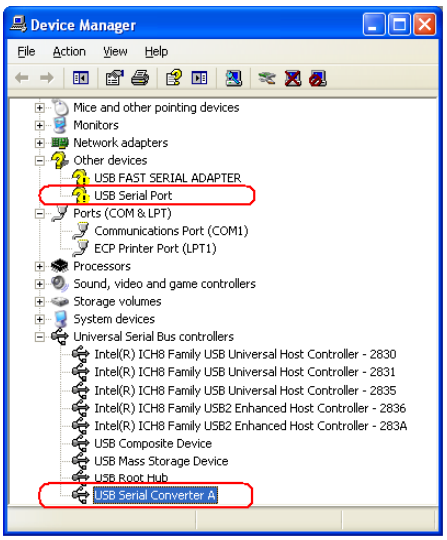


- At the same time, two devices will appear in the [Device Manager] window. The ports provided by the new [USB FAST SERIAL ADAPTER] will be shown under [Other devices] with a warning sign attached.

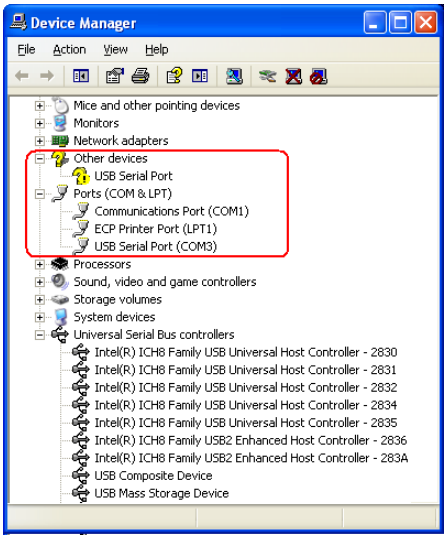


- Please, wait while the wizard locates the drivers installed previously. This process may require some minutes depending on your PC.

- The process of the correct activation of the device (that is, when the PC or laptop recognizes the new serial port), is done one by one.



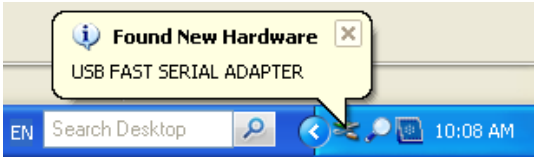
- The next picture shows how the number of the port is finally assigned by the system.



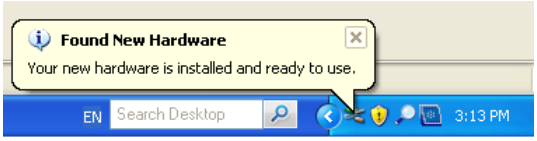
- When the wizard finishes will ask you to press the [FINISH] button.

Important remark:

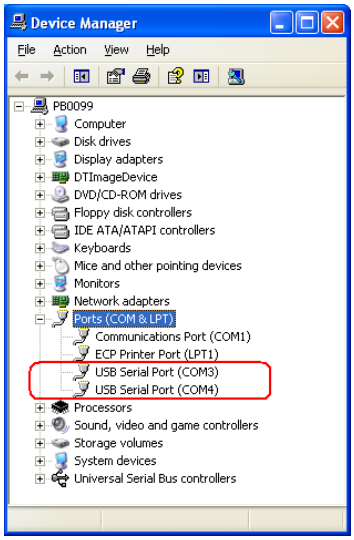
Until now, only one serial port has been correctly installed. The process must be repeated for the second port. Please, wait while your PC or laptop finds another COM port. Once again, the next message will appear in the lower corner of the screen:



- The adapter will be correctly installed when all previous steps have been repeated. Finally, the message will appear in the lower right corner of.



- At the same time, the two serial ports will appear in the [Device Manager] window. Usually, the numbers assigned by the system are sequential.

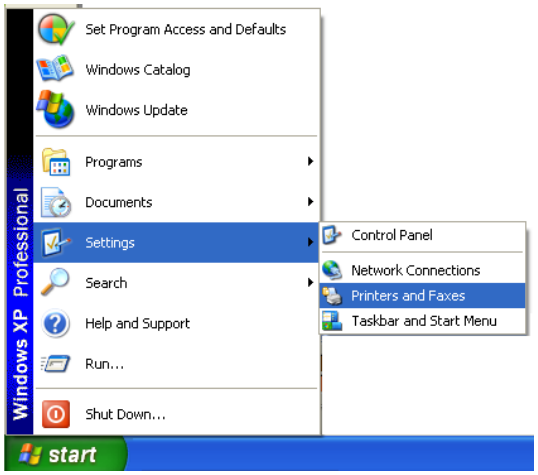


A yellow label with the text [Port 1] is attached to the adapter device to identify the first port recognized for the computer system. That means that if [Device Manager] shows two ports (COM3/COM4 or higher numbers), then that label [Port 1] corresponds to COM3 or the lower number of the new created COMs.

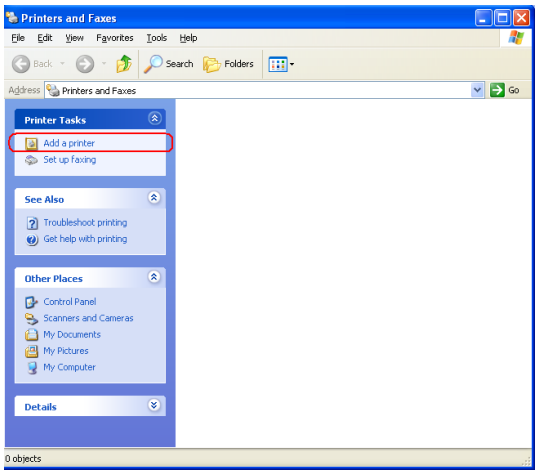
2.6. Installing a Printer by default

If there is not a printer installed in your PC, one virtual printer must be installed by default. If your PC is running Windows 10, there are two virtual printers installed by default (Microsoft XPS Document Writer and Microsoft Print to PDF) and no additional action is required; but for earlier Windows versions, the next steps must be followed to fulfil the system requirements.

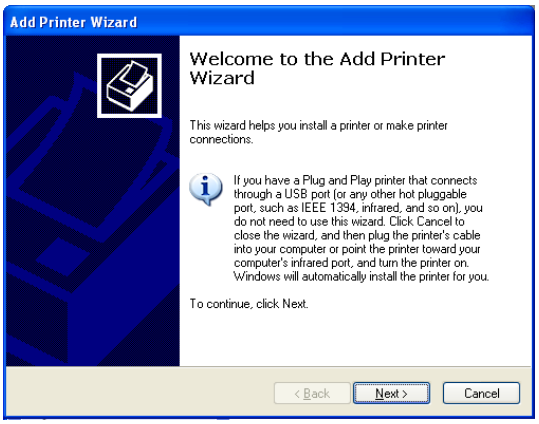
- Go to [Printers and Faxes] option of your system. The access is possible by clicking on [START – Settings]



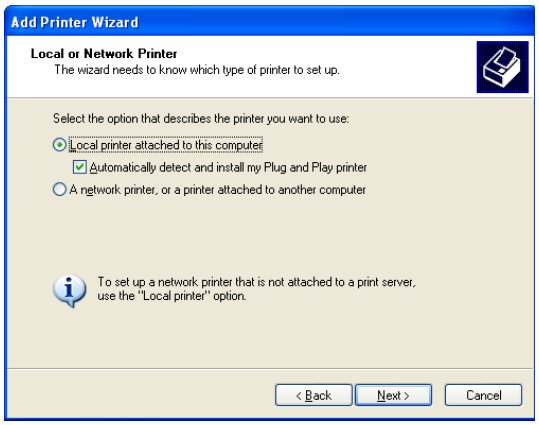
- In the [Printers and Faxes] window press on the [Add printer] button.



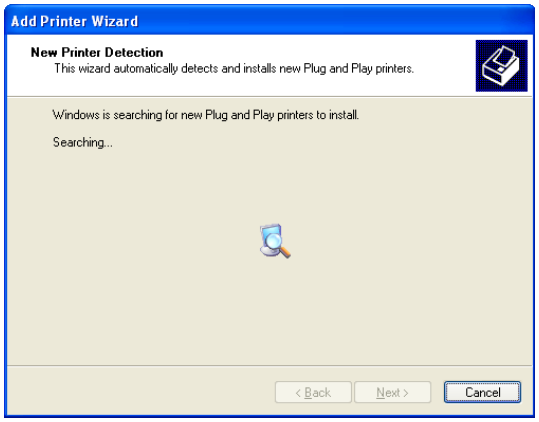
- The Welcome to the add printer wizard appears, click [Next] to continue.



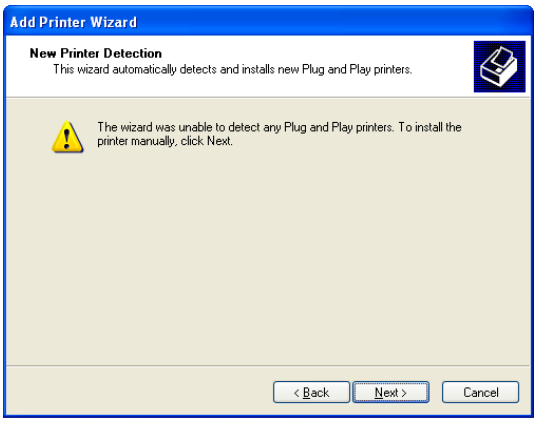
- As this procedure is for installing a virtual printer, the options must be selected as is shown in the next window. Press [Next] button to continue.



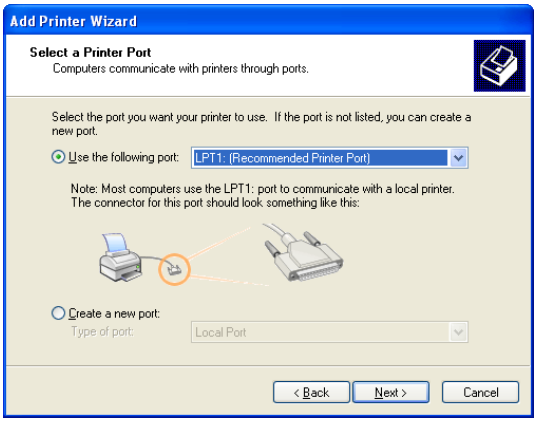
- The wizard will search the drivers for the virtual printer. This process will need some minutes depending on your PC.



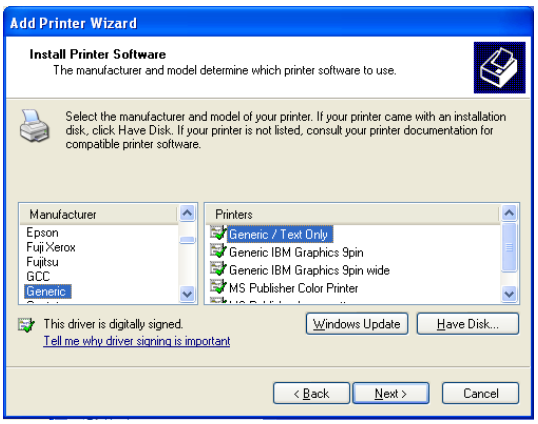
- The wizard notifies that there is not a real printer present. Press [Next] button to continue.



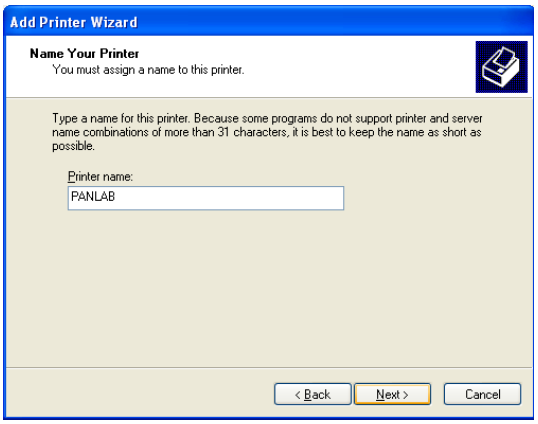
- Obviating the previous message, the options for the next window must be selected as shown in the next picture before pressing the [Next] button.



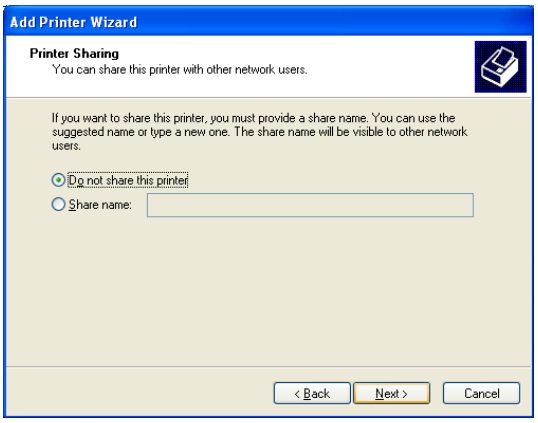
- The virtual printer will be a [Generic / Text Only] thus these options must be selected in the next window before pressing the [Next] button.



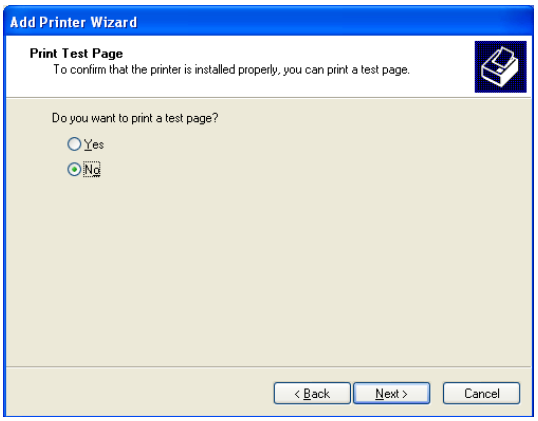
- This virtual printer can be called [PANLAB] so that it can be easily identified when a real printer is connected to the system. The option [No] must be selected before pressing the [Next] button.



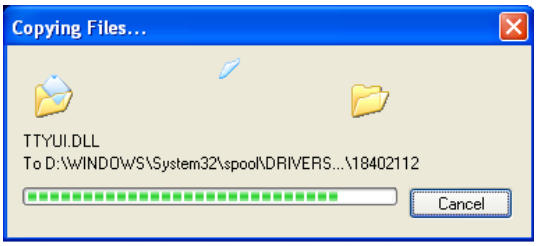
- Of course, it is not necessary to share the PANLAB printer so select the [Do not share this printer] option and press the [Next] button to continue.



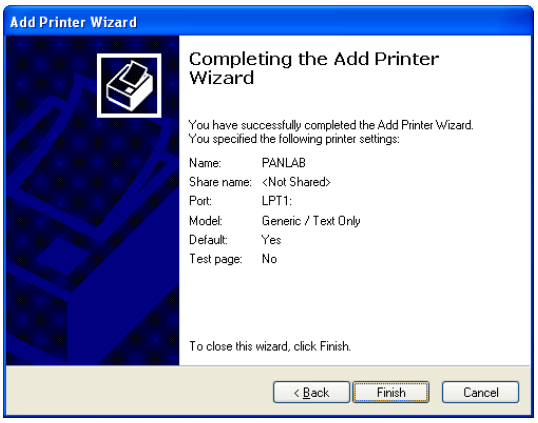
- It is not necessary to print a test page either so select the [No] option for answering to the wizard and press the [Next] button to continue.



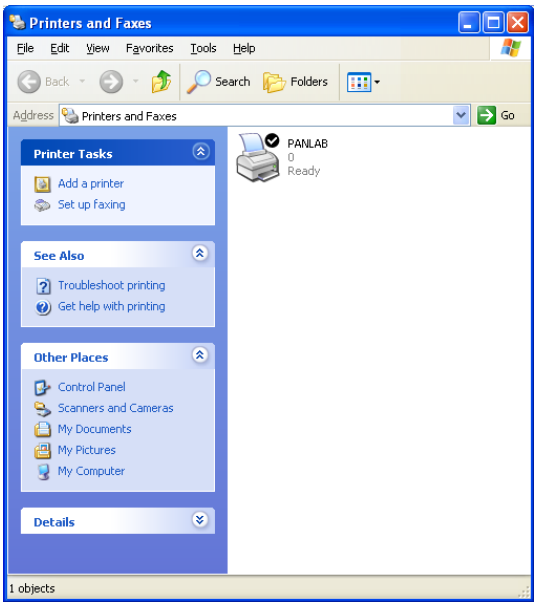
- The wizard will copy the drivers for the virtual printer. This process will need some minutes depending on your PC.



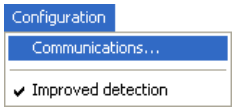
- When the virtual printer is successfully installed the wizard shows you a window as the next picture. Press [Finish] button



- A new icon will appear in [Printers and Faxes] window called [PANLAB]. Close the window and launch the software.



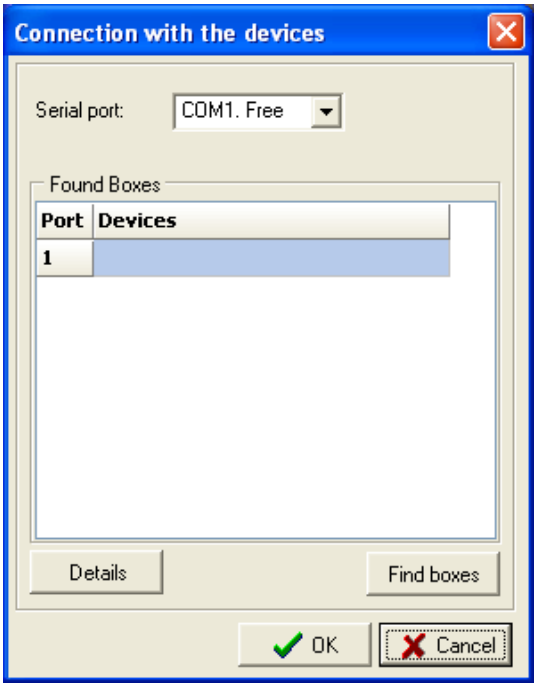
3. BOX DETECTION



This section explains in detail how to detect the boxes connected to the computer and that would be used with the **PPCWIN** software.

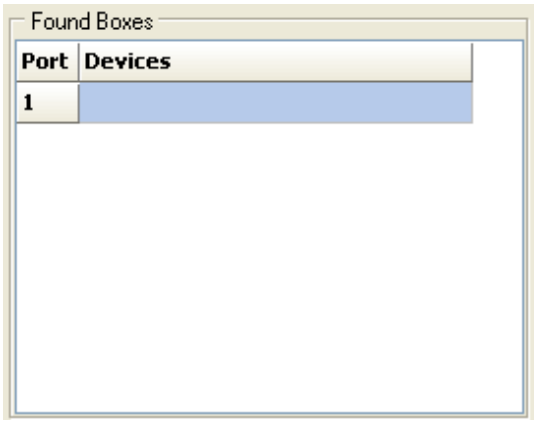
Configuration window can be shown through Configuration > Communications… menu option.

The corresponding configuration window is:

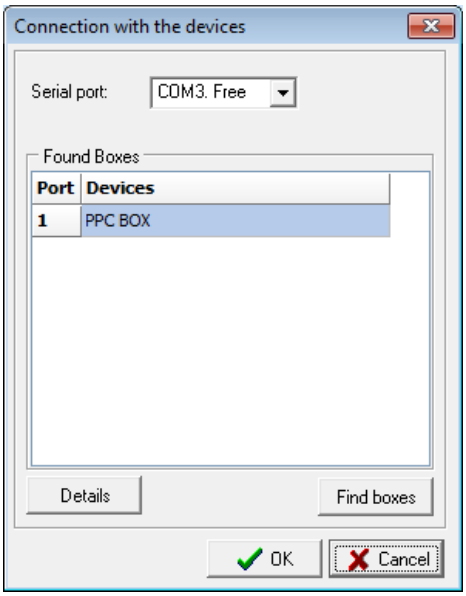


We can see different parts in this window:

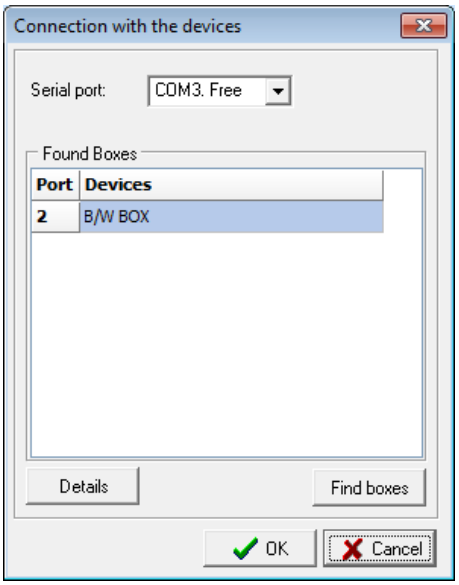
- Serial port: It indicates the port number where is connected the hardware.
- Found boxes: It indicates the list of boxes found in the serial port selected after pressing [Find boxes] button.



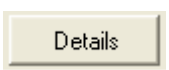
If the computer is connected to a Place Preference box, the PPC BOX name will be displayed in the Devices column.



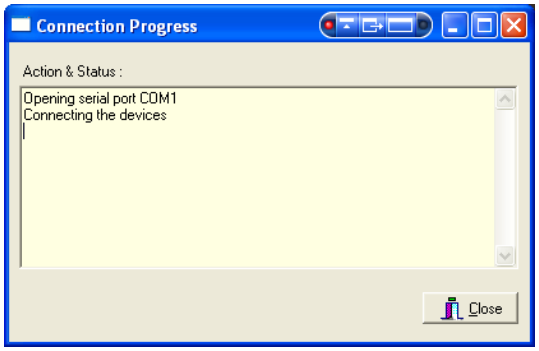
If the computer is connected to a Black and White box, the B&W BOX name will be displayed in the Devices column.



In order to get a correct detection of the boxes, each interface box should be configured with a consecutive Id. Number (back panel of the control unit). From 1 to 8.



- Details button: It shows information of both the connection process with the box and the boxes detection process.



- To configure the communications:

- Select the communications port.
- Press [Find boxes] button.

Depends on the result of connection:

- If connection fails a message like this will be shown:

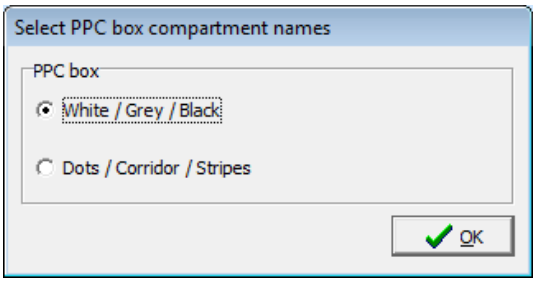
Should this occur, please check the following points:

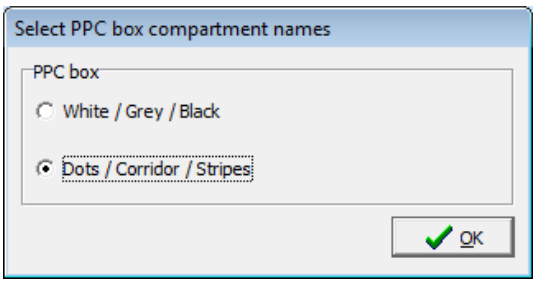
- Boxes connections are established as referred to in the corresponding manual.
- Control unit is connected to the PC with the right cable and in the selected COM port.
- This COM port is not used by another running application.
- If a USB adapter is used, the corresponding drivers are correctly installed.
- If connection doesn't fail, you'll see the list of boxes in the list "*Found Boxes*".
- If the shown list is the correct list, you must press **OK** button and the application will create the corresponding boxes to start, else if the list is incorrect, please repeat the steps from number 2 after changing the serial port selected.

3.1. Compartment name selection in place preference boxes

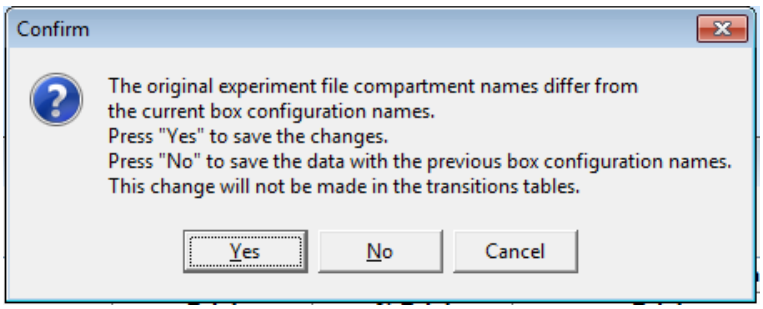
When place preference boxes are used an additional option is proposed after pressing the OK button in the previous step – Box detection (see "Connection with the device" panel described in the previous chapter)

As two kind of place preference boxes can be used (Black & White model or Dots/Stripes model), this additional option allows choosing the name of the compartment that would be display in the data runtime panel and data reports.





Whether you open and save an already existing file with a different name configuration, a message would pop up asking the user to choose between keeping the previous name or changing to the new designation.



Whether the new designation is chosen, the changes would be seen the next time the file is opened in the runtime panel and Zone report.

An important note is that the name of the compartments displayed in the Transition table report for experiments that have been registered with a version previous to V2.0.04 cannot be updated with the new names.

3.2. Detection of the subject's position in the boxes

During the execution of the experimentation trials, PPCWIN software continuously registers the position (box compartment) in which the subject is located.

3.2.1. Detection of the subject's position in The Black and White boxes

In the Black & White box, two compartments are available with 1 sensor below each compartment.

The animal position is then determined depending on the activation of each sensor by the weight of the animal.

3.2.2. Detection of the subject's position in place preference boxes

In the place preference box, three compartments are available: the White/Dots compartment, the Black/Stripes compartment and the corridor. Only 2 compartments have 1 sensor: the Black/Stripes compartment and the corridor.

This means that if the subject is not detected in the Black/Stripes compartment and the corridor, it would be considered as detected in the White compartment by the software.

A special case is the use of the "Improved detection" option (by default option).

In that case, the final position of the subject inside the box is by default determined by means of a filtering process that avoids the generation of inconsistent position sequences (e.g., the subject goes from "White" compartment directly to the "Black" compartment without entering the "Grey" compartment).

This filter can be counterproductive when the subject moves too fast for the box electronics to correctly detect the changes.

The activation or deactivation of this filter can be done through the **Configuration > Improved detection** menu option.

If this option is checked, the filtering process will be enabled so that the position of the subject will be determined not only by the information provided by the boxes interface but also considering the previous position. So, it may happen that the box interface shows the subject detected in the White/Dots compartment when the software still considers it in the Black compartment. In that case, this is the software that would manage to show the correct way to detect the subject using the improved detection option.

If this option is unchecked, the filtering process will be disabled so that the position of the subject will always match with the one provided by the boxes interface, *even when the positions sequence was inconsistent*.

4. PREPARING A SESSION

This section explains in detail how to prepare a session in PPCWIN.

A PPCWIN experiment consists of a set of sessions executed on available boxes (at the same time or not) and with a unique subject on each box.

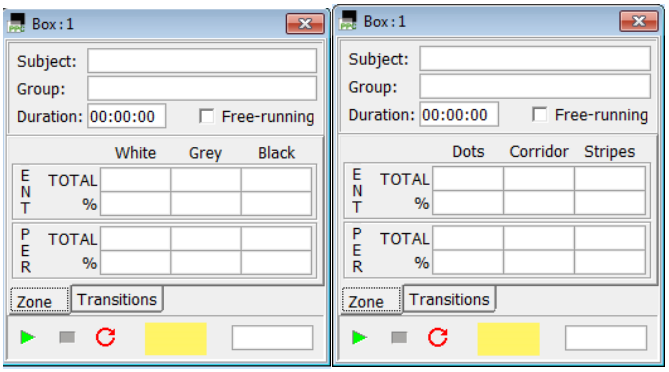
The first time PPCWIN starts probably you will receive a message like this:

This is an information message that advises you about the requirement to configure the RS232 port to establish the communication between the computer and the boxes. Please refer to chapter X to carry out this task.

Once you have done it and every time that you start PPCWIN, Boxes Bar is shown at the bottom of the window.

Boxes Bar includes a button for each available box. Each button has the number of the box and its state (running, stopped or testing) showing as a colored led.

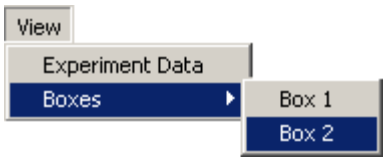
Pressing consecutively a box button will show and hide the corresponding Box Window:



The name of the compartment would depend on the model of box used (CPP or B&W boxes) and on the compartment name selection (only for CPP boxes)

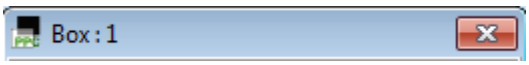
For the B&W boxes a central empty column is shown that would not be filled. This is due to the shared internal structure of these tables with the different models of boxes with 2 or 3 compartments.

Box windows can also be shown or hidden by marking options on View > Boxes > Box menu.



Each box window has four different parts:

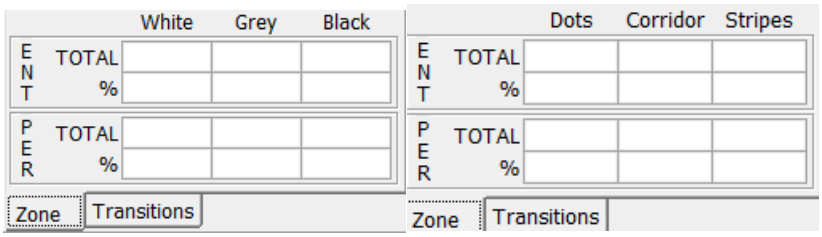
Box identification: shown in the title bar of the window.



Session information: in which Experimenter must enter subject name, subject group (optional) and session duration.

This last value can be indicated on two ways:

- Fixed duration: you should enter a duration in a format hh:mm:ss. Session will then automatically end when execution time reaches specified duration.
- Free-running: checking Free-running box will allow PPCWIN to continuously execute session until User presses Stop button.
- Session data: in which PPCWIN shows zone entrance and permanence statistics as well as transitions list during session execution.



The values of the central column are disabled with B&W boxes (Black and White simulators – only with two compartments).

Transitions list shows and stores all zone changes (time and zone) that have taken place since session start.

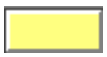
Control panel: which allows Experimenter starting and stopping the session as well as testing box communications.

Control panel also gives information about the current session time and subject position.

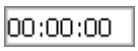
Pressing [Play] button will start the session in the selected box.

Pressing [Stop] button will immediately stop the session and store current session statistics into experiment data table. This button is enabled only when a session has been started.

[Test] button is used to switch box to Test mode. In this mode, only subject position is updated in the Box Window, allowing User to verify communications with the chamber. Test mode will end when User presses [Test] button again.



Subject position is shown as a colored box indicating the zone in which the subject currently is. Colors used are black, white, grey for the B&W boxes and black & white CPP, dots/grey/stripes patterns for the dots/stripes CPP boxes and yellow (indicating that no subjects are in the box).



Current **session time** (chrono) is located on the right side of the control panel. Its format is hh:mm:ss.

In summary, in order to prepare a session, you should:

Configure the communications (as explained in chapter X)

Show desired boxes by pressing corresponding buttons on Boxes Bar.

Test communications with the selected boxes. To do this, enter a subject into the box or manually press chamber floor and check that subject position is correctly shown.

Enter the name of the subject and, optionally, its classification group.

Fix session duration or choose Free-running mode.

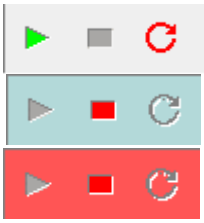
5. SESSIONS EXECUTION: DATA ACQUISITION

Only when preparation process has finished, session data acquisition can start by pressing [Start] button.

A functional PPCWIN protection key must be connected in order to start data acquisition.

During the execution of a session, PPCWIN will continuously monitor subject position into the chamber and calculate, visualize and store the following session data:

- Zone entrances (ENT): total (units) and global percent (0% - 100%) by zone.
- Zone permanence time (PER): total (time) and global percent (0% - 100%) by zone.
- Transitions list: detailed time and zone list.
- Current subject position: shown in the subject position box.
- Current session status: as a background color in the control panel:



- Gray: Session is currently stopped.
- Green: Session is currently running.
- Red: Communications have been lost.
- A red colored control panel indicates severe problems with chamber communications. In this case, PPCWIN will consider that the subject is not changing zone so statistics may be affected.

- That is why we suggest you to manually stop session and test communications when this occurs.
- Current session time (chrono): in format hh:mm:ss.

If a fixed duration has been defined, session will automatically end when time arises duration. However, both fixed-duration and free-running sessions can be manually stopped by pressing [Stop] button.

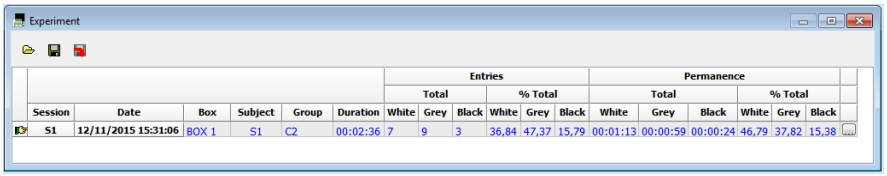
6. EXPERIMENT DATA TABLES

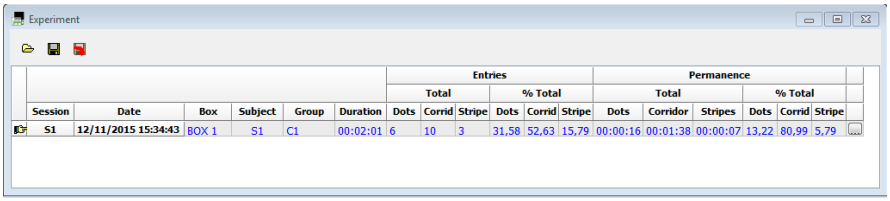
Experiment data tables are a detailed online experiment report which stores the information generated during the execution of several sessions.

Experiment data table can be shown and hidden through **View > Experiment data** menu option.

Two kinds of tables are provided: Experiment Table and Transitions table.

Experiment Table:

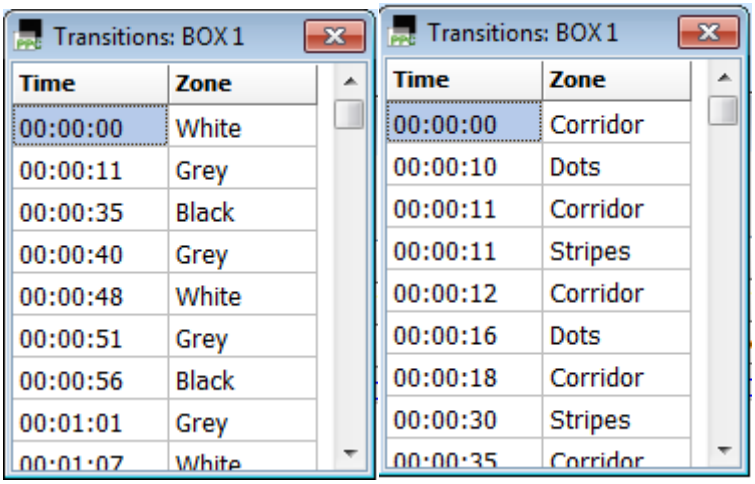




When a sessions is finished (automatically or manually), its detailed information (identifier, starting date and time, entries, permanence and transitions) is entered in a new row of the table.

Transitions Table:

Pressing  button at the end of a row will show a detailed list of transitions of that session.



Both reports will show the name of the compartment accordingly to the selection made after the box detection process (only for CPP boxes).

The only exception is the name of the compartment in the Transition report than cannot be updated with new names when a new name selection is requested on an already registered session.

6.1. Saving experiment data

Experiment data table content can be stored into a report file both in text format and as a Microsoft Excel® document.

Selecting **File > Save** or pressing **Save experiment** button located at the top of the **Experiment data** table will allow User to select destination folder, name and type of the report file.

If **Text file** report type is selected, **PPCWIN** will generate a pair of files with the name of the experiment followed by "_Zones" and "_Transitions". Those files store sessions statistics and transitions lists of each session respectively.

If **Excel file** report type is selected, a Microsoft Excel® workbook is generated including a general sheet named "Zones" and as many "Transitions" sheets as sessions are the experiment have.

Once an experiment is saved, its name is shown in the **Experiment data** window title bar.

File > Save as... menu option and **Save as experiment** button (in the **Experiment data** window) will allow you to save current experiment with a different name or, even, as a different report type.

As an experiment file can be retrieved in the future, you may not modify its content. Whether you want to include additional information such as Excel® calculations or new rows or columns, we strongly recommend you save the original content into a different Excel® document and make changes to this new file.

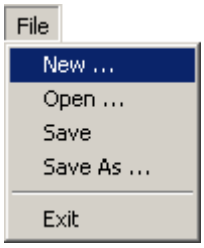
6.2. Retrieving experiment data

Experiment files can be loaded in order to review its content and / or to include additional sessions in the same file.

To do this, you can use **File > Open...** menu option or **Open** button located at the top of the **Experiment data** window. Then, you should locate and select the experiment file (any of the text files or the Excel file).

Once the experiment file is loaded, its content is shown into the **Experiment data** table and you are allowed to start and add new sessions information.

7. STARTING A NEW EXPERIMENT



Selecting [File – New] menu option will start a new blank experiment.

As this option cleans all previous experiment information, PPCWIN asks User for saving changes.

Even so, please make sure that the information of the current experiment is not required before using this option.

8. EXITING PPCWIN APPLICATION

[File - Exit] menu option will exit PPCWIN application. Before that, PPCWIN will ask whether you want to save previous changes into an experiment file.

When exiting PPCWIN application, current desktop arrangement (position and size of the windows) is stored so it can be restored when starting application again.

9. CONTACT INFORMATION

We are available to help you with your questions and concerns. Should you hit a roadblock or need some additional training, please feel free to visit the HBIO Behavioral Support Center at https://support.behavior.hbiosci.com to find articles and helpful information in our knowledge base or submit a ticket. We are happy to help!

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