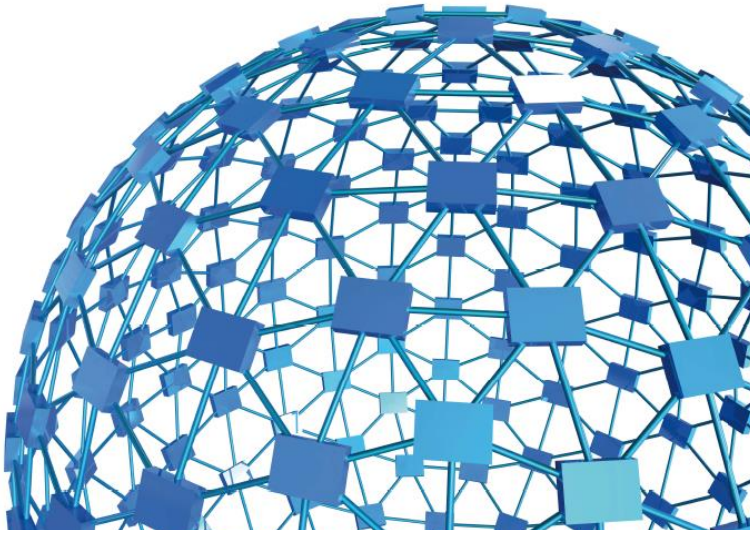
ugo basile®

TRANSFORMING IDEAS INTO INSTRUMENTS

instruction manual

Analgesy-Meter DAQ
Cat. No. 37215-100



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instruction manual

Analgesy-Meter DAQ
Cat. No. 37215-100

Serial No.

SAFETY CONSIDERATIONS

ALTHOUGH THIS INSTRUMENT HAS BEEN DESIGNED WITH INTERNATIONAL SAFETY STANDARD, THIS MANUAL CONTAINS INFORMATION, CAUTIONS AND WARNINGS WHICH MUST BE FOLLOWED TO ENSURE SAFE OPERATION AND TO RETAIN THE INSTRUMENT IN SAFE CONDITIONS.

SERVICE AND ADJUSTMENTS SHOULD BE CARRIED OUT BY QUALIFIED PERSONNEL, AUTHORIZED BY UGO BASILE ORGANIZATION.

ANY ADJUSTMENT, MAINTENANCE AND REPAIR OF THE OPENED INSTRUMENT UNDER VOLTAGE SHOULD BE AVOIDED AS MUCH AS POSSIBLE AND, WHEN INEVITABLE, SHOULD BE CARRIED OUT BY A SKILLED PERSON WHO IS AWARE OF THE HAZARD INVOLVED.

CAPACITORS INSIDE THE INSTRUMENT MAY STILL BE CHARGED EVEN IF THE INSTRUMENT HAS BEEN DISCONNECTED FROM ITS SOURCE OF SUPPLY.

Instruction Manual dated May 2017
Revision 0

CE

www.ugobasile.com

Analgesy-Meter

Randall-Selitto Paw Pressure Test

Cat. No. 37215

General

The 37215 is the up to date version of the classical 7200 paw pressure test which, **since 1965**, is helping to perform a rapid precise screening of analgesic drugs in a number of academic and industrial laboratories.

The force is applied to the animal's paw, which is placed on a small plinth under a cone-shaped pusher with a rounded tip.

The operator depresses a pedal switch to start the mechanism which exerts the force.

When the rat struggles, the operator releases the pedal and reads off the scale the force at which the animal felt pain.

NEW : we are now introducing a **specific pressure sensor and the related controller, available as optional, to transform the Analgesy-Meter in a fully digital device**.

As the basic design is unchanged, results with the digital model are **consistent with published data.**

The upgrade kit has been designed to be fitted on existing Ugo Basile Analgesy-Meters as well. Ask for details!

now available with
optional upgrade to
digital reading

Main Features

- Same instrument, three force ranges (from 0 to 250, 500, 750 g)
- Simple and reliable: no calibration needed!
- **NEW model with digital reading**
- Specific version for Mouse available, with lower (50% pressure range)
- Classic method since the 1960s: hundreds of papers published!
- **Upgrade kit for old Analgesy-Meters available**

Ugo Basile: more than 10,000 citations

CHECK-LIST
Cat. No. 37215-100

CLIENTE / CUSTOMER_____

Ordine No. / Order No. _____ **Data / Date**____/_____/_____

UB code	*CAT.No.*		√	*DESCRIPTION*	*DESCRIZIONE*
	37215-001	**1**		ELECTRONIC UNIT	UNITÀ ELETTRONICA
	37215-002			PAW TRANSDUCER	TRASDUTTORE
52010-325		**1**		USB LEAD	CAVO USB
37215-335		**1**		START/STOP SIGNAL CONNECTOR	CONNETTORE START/STOP SIGNAL
E-AU 059		**1**		UNIVERSAL POWER SUPPLY	ALIMENTATORE UNIVERSALE
E-AU 041 USB pen-drive	**DCA**	**1**		SOFTWARE	SOFTWARE
	37215-100-302			INSTRUCTION MANUAL	MANUALE D'ISTRUZIONE

DATE / /	**Serial No.**	**IMBALLATO DA / PACKED BY**
Universal Input 85-264 VAC, 50-60Hz		

IMPORTANT/IMPORTANTE:

Check the shipment for completeness immediately after receipt: should you find any discrepancy, please fill in the following part and transmit it to our fax no. **+39 0332 745488**

Al ricevimento della merce controllate che la spedizione sia completa: in caso di discrepanza, completate il formulario di seguito riportato ed **in-viatelo** al nostro fax no. **0332 745488**

FROM: Name	Company/Institution
DATE	REF.

NOTE

CONTENTS

FIGURE INDEX

Analgesy-Meter DAQ

Cat. 37215-100

1 GENERAL

The **Ugo Basile Analgesy-Meter**, was designed in the 60's based on the technique for the measurement of the pain response in the animal paw, described by Randall-Selitto in their paper dated 1957. The instrument soon became one of the first Ugo Basile best sellers!

After more than 50 years, this method is still viable, but the question which often arises is: "can I collect and save my experimental data in digital form?" The answer is now YES!

The **37215-100** Analgesy-Meter Data Acquisition System is a new useful tool which makes it possible to upgrade UB Analgesy-Meters to digital.

Figure 1: "Analgesy-Meter 37215 with DAQ 37215-100"

A specific pressure sensor and the related controller, transform **ANY** UB Analgesy-Meter into a fully digital device.

…and last, but not least, the upgrade kit is designed to fit all existing Ugo Basile Analgesy-Meters (provided with photoelectric switch), for retrofitting of old models as well!

1.1 Principle of Operation

The Analgesy-Meter applies a quantifiable force for **direct stimulation** and the Analgesy-Meter DAQ provides **automatic readout** of the animal response.

The special force sensor, which integrates the mechanical pusher in the standard Analgesy-meter, is specially designed to apply force to **rat and mouse paw**, and measures the force which elicits the animal response (normally, limb withdrawal, struggling, or vocalization).

All data saved on the Analgesy-Meter DAQ are easily exported to the PC via USB cable, for further processing and analysis. The basic Analgesy-Meter design is unchanged, hence results collected with the digital model are consistent and comparable with published data.

The completion of each test may be indicated by the paw withdrawal, or by the pressure of the pedal switch.

The display on the electronic unit then gives the operator a summary of the test results test (*i.e.* force and time corresponding to the animal response) and the operator may choose to reject the results or to accept them, in which case they are recorded in the device's internal memory.

The results of, typically, several thousand tests may be stored in the electronic unit for transfer to a PC when convenient.

2 INSTRUMENT DESCRIPTION

The **37215-100 Analgesy-Meter DAQ** device comes as a complete package including:

- an Electronic Unit **37215-001**
- a Paw Transducer **37215-002**

a USB flash-drive with drivers, DCA software and the instrument's Operating Manual 37215-100-302. The instrument is delivered in a convenient plastic case which should be retained for the safe storage of the device and its accessories.

Beside the above listed items, the case also contains

- USB Cable **52010-325**
- an External trigger foot pedal **38500-303**
- Power adapter **E-AU 059**

See also paragraph 9-ORDERING INFORMATION.

2.1 Electronic Unit

The electronic unit is lodged in a compact box. The device is switched **ON** by pressing the **ON/OFF** button.

The three buttons below the display are **soft buttons** whose function changes at different stages of the program. The lower line of the display, 4 by 20 character, is normally used to indicate the current function of each button.

When the device is switched **ON**, the initial menu choice is between making measurements and configuring the instrument to suit the user's specific requirements.

The electronic unit is battery operated: its internal rechargeable battery is charged automatically when external power is supplied to its miniature USB 'B' socket, either from a PC or from a suitable USB power adapter.

A fully charged battery will operate the Analgesy-Meter DAQ continually with its display at maximum brightness for approximately 16 hours.

When the device is switched **OFF**, it goes into a standby mode in which it takes almost no current from the battery although it still updates its internal calendar clock.

Figure 2 "Electronic Unit"

The electronics stores results of several hundreds tests, which can be transfered to a PC when convenient. The detailed menu options will be described later, see paragraph 5.4, 5.5 and 5.6.

2.2 Paw Transducers

The pressure transducers is designed specifically to apply force to the paw of mice and rats. The force sensor is mounted directly on the Analgesy-Meter pusher, as shown is Figure 3 (see also paragraph 4.4).

Each transducer has a built-in identification chip, which identifies its type and its specific characteristics including all relevant factory calibration information, thus facilitating the Analgesy-Meter DAQ adjustment to match that of the transducer.

This feature allows the device to adjust automatically to each transducer and ensures that transducers and electronics are interchanged without the need for routine re-calibration.

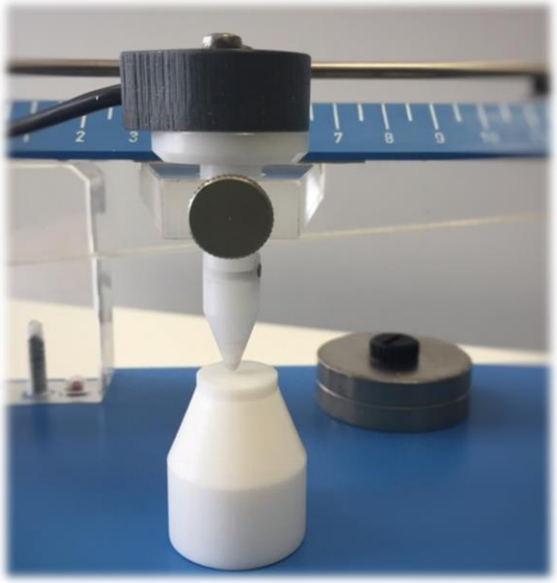


Figure 3: "Pressure transducer"

3 DATA ACQUISITION

Prior to any measurements, the device automatically balances out any offsets using the described autozero function. The DCA **software** provided with the instrument (on the USB pen-drive) ensures automatic recording and storing of the animal response.

The results of several hundred tests may be stored in the Analgesy-Meter DAQ for transfer to a PC when convenient, see paragraph 7.5-Downloading Data from Analgesy-Meter DAQ to PC.

4 INSTALLATION

4.1 Unpacking & Preliminary Check

Check the contents of the shipment for completeness, packing list to hand, and visually inspect the instrument as soon you take it out of the packaging. Use the supplied ***Check List***.

If the instrument is damaged, inform the carrier immediately, notifying our company. If after having tested it, the instrument fails to meet rated performances, please contact our after sales service, see paragraph 8.2-Customer Support.

Protect the environment!

Dispose of packaging properly, according to existing and applicable waste management rules and regulations.

4.2 Notes on the Instruction Manual

The Instruction Manual included in the package (on the USB drive) is necessary for the correct installation and operation of the instrument.

We recommend reading the manual with attention, as it is essential for the correct installation and operation of the instrument.

Please save the manual, ready to be consulted by the qualified personnel who use the instrument. Print it, only if necessary.

Our Instruction Manuals are available as free download on our web page. For any additional information and/or assistance, you are welcome to contact our Service Department (see paragraph 8.2-Customer Support), specifying the serial number of your device.

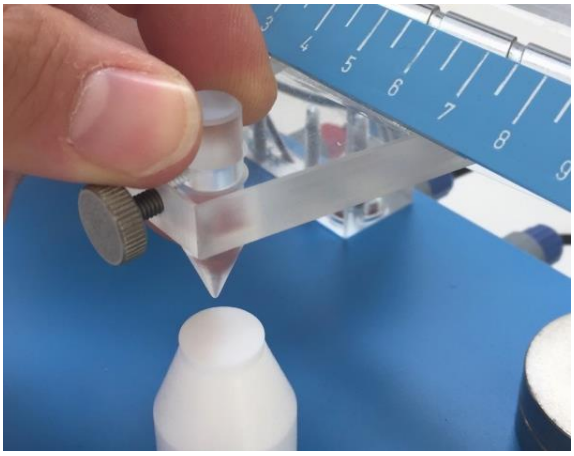
4.3 Charging the Internal Battery

The instrument is dispatched from the factory with a fully charged battery. However, it is recommended that the battery is charged before initial use by connecting it to a USB

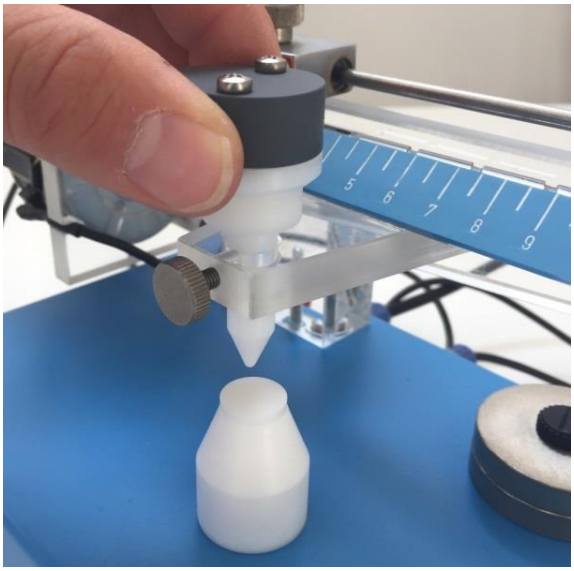
socket on a functioning PC or to a suitable power adapter, using the USB cable provided, for at least 3 hours.

4.4 Assembling the Upgrade Kit on the Analgesy-Meter

A. First of all, slacken the knurled knob which holds the standard mechanical pusher on your Analgesy-Meter, and remove it.

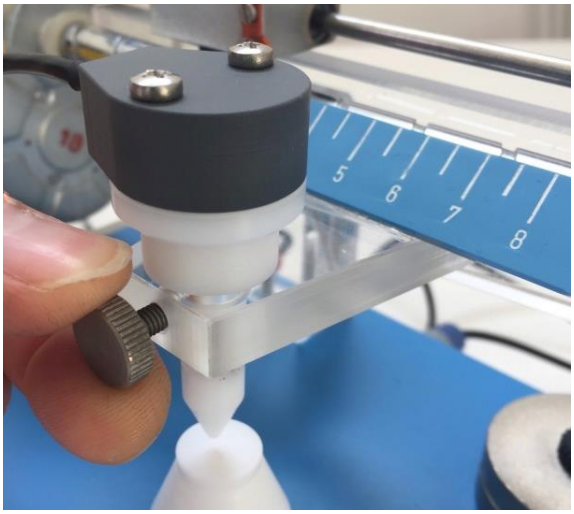


B. Remove the guard from the Transducer 37215-002 and position it in place as indicated in the figure >>>



C. Fix the transducer in place, by acting on the knurled knob.

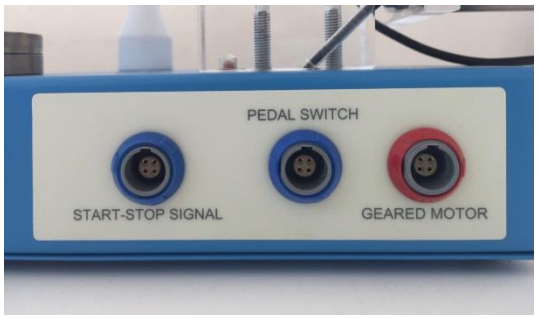
D. Connect the transducer to the “Start-Stop Signal” socket on the Analgesy-Meter connection panel, positioned on the back of the unit, see paragraph 4.5-Connections.



4.5 Connections

The connection Panel, positioned on the back of the Analgesy-Meter, encompasses the following socket connectors, from left to right:

- START-STOP SIGNAL
- PEDAL SWITCH
- GEARED MOTOR



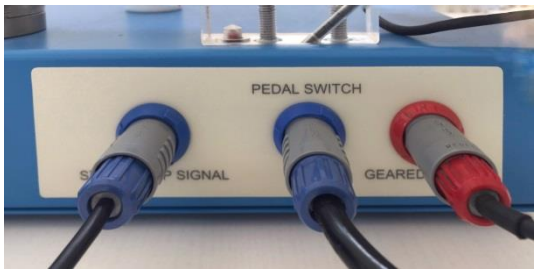
The following picture illustrates the back panel of the DAQ Control Unit 37215-001, where, from left to right you will find:

- the TRANSDUCER connector (**grey**)
- the USB connector
- the SIGNAL connector (**blue**)

Connect the transducer 37215-002 to the grey socket.

Plug the control unit 37215-001 via the USB cable provided to the PC USB or to the power supply.

Plug the red connector coming from the motor on the Analgesy-Meter red socket .



Use the cable 37215-335 provided to connect the Analgesy-Meter (START-STOP SIGNAL) to the control unit (blue socket).

Finally plug the pedal switch (provided with the Analgesy-Meter) on the related socket positioned on the Analgesy-Meter back panel.

Please refer to paragraph 7 when the device is to be connected to the PC.

4.6 Installing the DCA Software

ATTENTION:

Before installing the software, please read the INSTALLATION NOTES at the beginning of the manual.

The software provided with the Analgesy-Meter DAQ (on the USB pen drive) should be installed on a suitable Windows PC, running Windows Vista, 7, 8 or XP.

First, install the software, by double-clicking on the Start Ugo Basile.exe file; follow the instructions until installation is complete.

Then, connect the Analgesy-Meter DAQ via a USB port. The device will be automatically recognized and the drivers will install automatically, by simply following the instructions on the screen.

The Ugo Basile DCA Software can now be launched from the desktop icon or from the Program Files folder.

See section 7, for instructions on how to use the Ugo Basile DCA Software.

4.7 Intended Use

The Analgesy-Meter and Analgesy-Meter DAQ is intended for investigation use on laboratory animals only.

4.8 General Safety Instructions

The following guidelines must be followed to ensure safe operation.

- ! **DO NOT** attempt to open or perform any service work
- ! **DO NOT** connect up human subjects

4.9 Additional Safety Consideration

a. Use original accessories and spare parts only, see also paragraph 9-ORDERING INFORMATION.

b. Do not operate the instrument in hazardous environments or outside prescribed environmental limitations (i.e. +18C°/+24C°, 60% relative humidity, non-condensing);

c. Do not spray any liquid on the connectors;

d. Keep inflammables far from the instruments.

UGO BASILE DOES NOT ACCEPT ANY RESPONSIBILITY FOR PROBLEMS OR HARM CAUSED TO THINGS OR PERSONS, ARISING FROM:

- incorrect electrical supply;
- incorrect installation procedure;

- incorrect or improper use or, in any case, not in accordance with the purpose for which the instrument has been designed and the warnings stated in the instruction manual supplied with the instrument;
- replacement of original components, accessories or parts with others not approved by the manufacturer;
- servicing carried out by unauthorized personnel, see also paragraph 8-MAINTENANCE.

5 OPERATION

5.1 Consideration on the Animal Behavior

As with any behavioral measurement, care must be taken by the operator to guarantee a consistent performance of the test.

As the pressure is precisely regulated by the Analgesy-Meter motor, when using the device, we can envisage only one potential sources of experimental variability: the animal emotional state, which can be overcome by preliminary habituation procedures.

5.2 First Time Operation

After charging the device for at least 3 hours, plug in the touch-stimulation transducer and turn the instrument **ON** by pressing the **ON/OFF** button.

Once the introduction screen is completed, the initial menu will appear as below:

```
        Main Menu
-----------------------------------
Measure              Configure
```

The lower line of the display indicates the current functions of the three **soft buttons** labelled F1, F2 and F3.

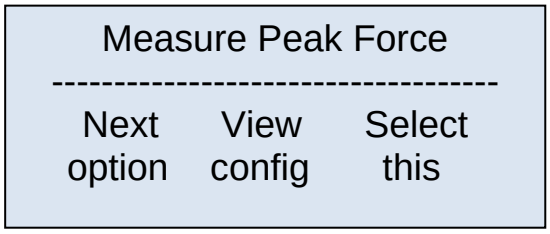
In this case, F1 is **Measure**, F2 is not being used and F3 is **Configure**.

Press **Measure**. A screen similar to the following will appear:

```
Transducer
37215-002 0->1500gf
Serial Number 012317
```

After a few seconds, the instrument completes an **Autozero** operation and then the display shows:

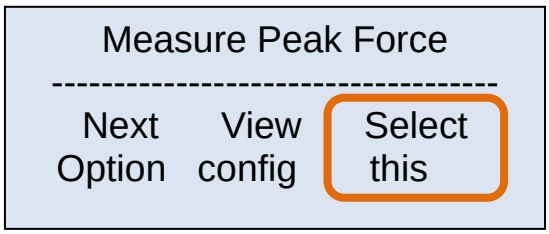
Note that, in this case, all three **soft buttons** are in use.



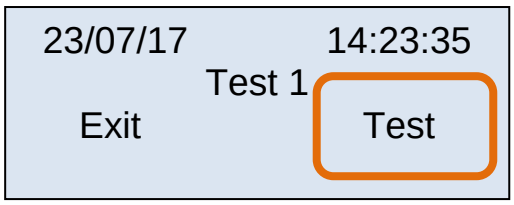
IMPORTANT NOTE:

Do not apply force while the instrument is carrying out the autozero procedure.

Press **Select this**.

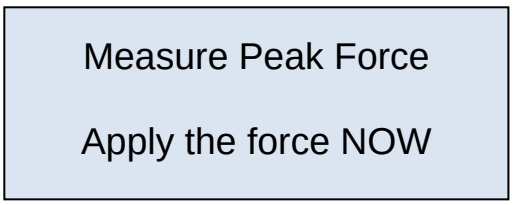


The following display will appear:



Check that no force is being applied to the connected transducer and then press **Test.**

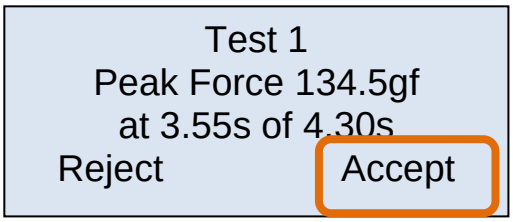
The device checks the transducer zero (DO NOT APPLY FORCE) and then displays:



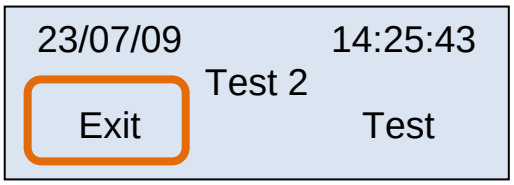
Position the animal with its foot between plinth and pusher (please refer to the Analgesy-Meter instruction manual as well), then **press the pedal switch**, to start the mechanism which exerts the force.

Keep the pedal switch pressed for the duration of the test: for as long as the pedal is depressed, hence the force is applied, the **Force** value will indicate the applied force in gf and the **Time remaining** will indicate the seconds left to complete the test.

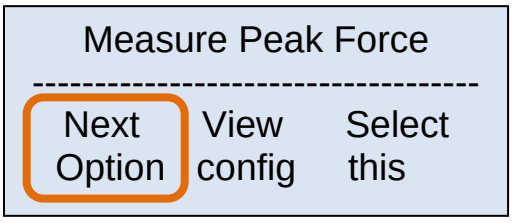
When the pedal is released, the screen changes, showing the peak force and the reaction time in seconds (over a total measurement time, in seconds).



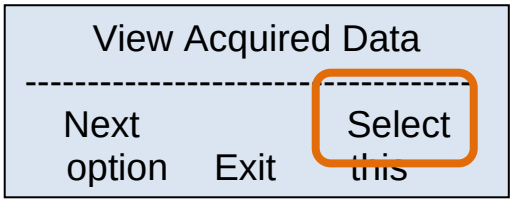
If the test is acceptable, press **Accept** and the screen changes to:



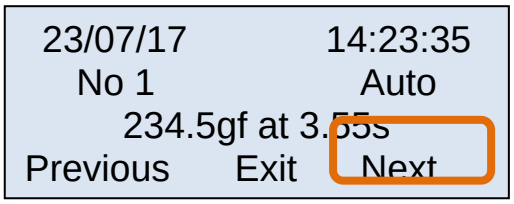
While pressing **Exit** the display returns to:



Press **Next option**, then press **Select this.**

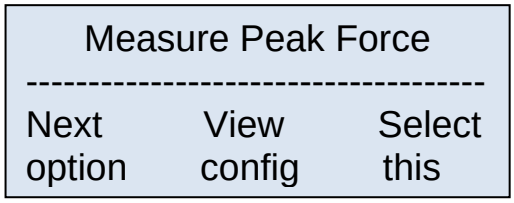


The stored data will be loaded and after 1-2 seconds the display shows:



The most relevant information of each measurement (Date, Time, Progressive number of the measurement, Automatic or Foot Pedal measurement mode, Peak Force, Peak Time) are shown and the measurements can be browsed by simply pressing **Next**.

To start a new test, press **Exit** to return to:



Press the **ON/OFF** button to switch OFF the Analgesy-Meter DAQ.

N O T E : If the device does not behave as described, please repeat all the steps.

If the problem persists, charge the internal battery and reset manually by pressing with a needle into the small reset hole located to the right of the display.

5.2.1 Automatic Dimming of the Display

The display backlight may be configured to dim automatically in most menus, if no soft button is pressed during a period preset between 2s and 29s.

By default this feature, which extends the battery life, is OFF and may be turned ON from the Configuration Menu.

5.3 Routine Operation of the Instrument

5.3.1 Turning ON the Analgesy-Meter DAQ

The device is turned **ON**, by pressing the **ON/OFF** button.

5.3.2 Menu Operation

Analgesy-Meter DAQ is operated via a number of menus by pressing the three **soft buttons**, F1, F2 and F3 under the display.

The current functions of F1, F2, F3 are indicated by the lower line/s on the display.

For example, the following is a typical display in the **Measure** menu:

Measure Peak Force		
Next option	View config	Select this

The user steps through the available option (which appear on the upper line) by pressing "**Next option"** and then selects the desired option by pressing "**Select this"**.

5.3.3 Turning OFF the Analgesy-Meter DAQ

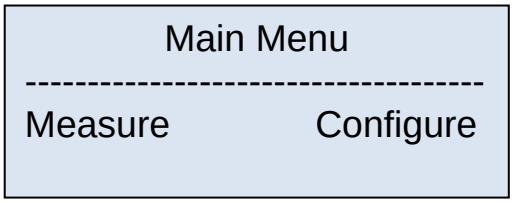
The device may be turned **OFF** from most display screens, by pressing the **ON/OFF** button.

To preserve battery life, Analgesy-Meter DAQ switches **OFF** automatically, after a period of inactivity (if no soft button is pressed), which can be preset from **2 to 29** minutes or **never,** from the **Configure** menu; the factory default setting is **never**.

Analgesy-Meter DAQ also switches **OFF** automatically if the battery voltage is below a critical level.

5.4 Main Menu

The **Main Menu** is the first menu which appears when the device is switched ON.

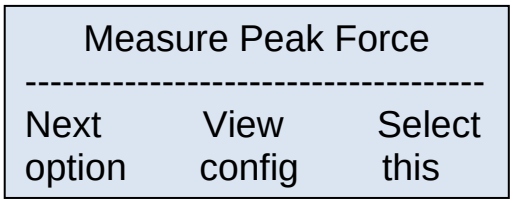


Via the "**Measure**" menu, see paragraph 5.5 it is possible to choose the options relating to measurements and transferring collected data are to the PC.

The "**Configure"** menu allows the user to adjust a number of parameters to suit particular measurement requirements, see paragraph 5.6.

5.5 Measure Menu

A few seconds after selecting the measure menu, the Analgesy-Meter DAQ completes an **Autozero** procedure and the following screen is displayed:



This is the initial screen of the **Measure** menu which consists of the following 6 options, which appear in a loop:

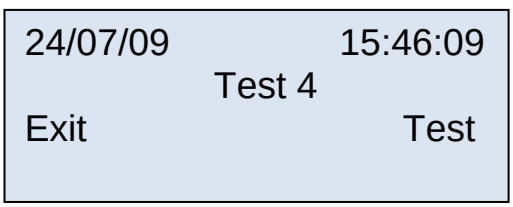
- Measure Peak Force
- View Acquired Data
- Transfer Data to PC
- Memory Status
- Erase Memory

Press **Next option** to go to the following option; press **View config** to view the configuration in use.

These options are discussed in the next sub-headings. The descriptions given refer to factory-set default values for the configuration settings. The effects of altering these settings will be discussed later.

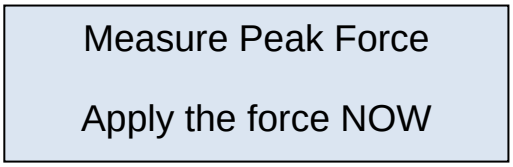
5.5.1 Measure Peak Force

Pressing **Select this** at the **Measure Peak Force** screen gives a display similar to:

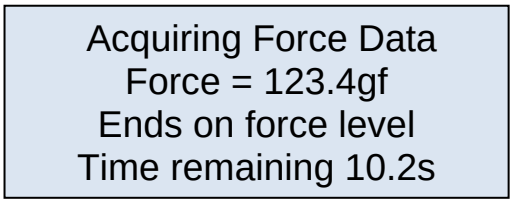


which shows the current date and time, the next test number (in the example the test will be the fourth to be stored since the internal memory was last erased) and the options “Exit” and “Test”.

When **Test** is pressed, a caption will appear, intimating that no force be applied to the transducer during the autozero procedure, after which the following display:



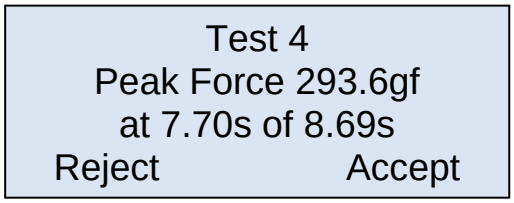
The user should now **perform the measurement,** starting the force application, and the counter, **by depressing the pedal switch**.



Force indicates the currently applied force in gf while **Time remaining** counts down in 0.05s steps from the Maximum measurement time, which may be adjusted up to 30s (default 15s).

The test is terminated by releasing the pedal switch, when the experimenter notices a clear limb withdrawal or the animal struggling, a vocalization or a very small or complex animal movement.

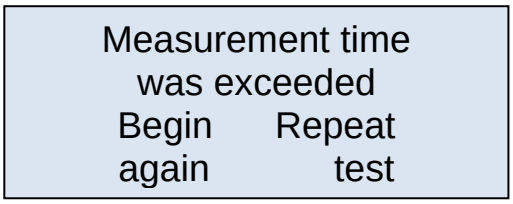
The display shows typically:



The first figure, 7.70s indicates the peak time (*i.e.* the latency time of the animal response), while the second figure, 8.69s, indicates the total duration of the test. The user must choose whether to **Reject** or **Accept** the results of the test, by pressing the corresponding soft-button.

If the result is rejected, it is possible to stop the measurements or repeat the previous test. If the result is accepted, the data are stored in the device memory and the user may stop the measurements or proceed with another test.

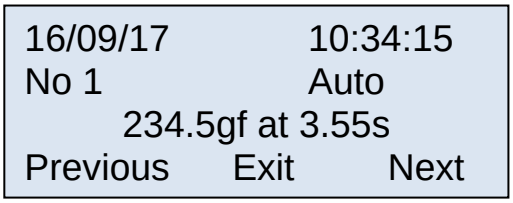
If the **Maximum measurement time** is exceeded during the test, the measurement is terminated automatically and the display shows:



Pressing **Begin again** effectively returns the user to the first Measure Peak Force screen, while pressing **Repeat test** allows the user to repeat the current test.

5.5.2 View Acquired Data

Select **View Acquired Data** from the **Measure** menu, followed by **Select this;** the total number of stored measurements will be displayed, and then the following screen will appear, with data related to the last measurement:



Press **Previous** to view the test before the one being displayed. If the first measurement was displayed, as in this example, pressing **Previous** will display test 70, as the test numbers loop.

Press **Next** to view the next stored measurement, **Exit** to return to option 1 of the Measure menu (i.e. Measure Peak Force).

5.5.3 Transfer Data to PC

Via this option it is possible to transfer the data stored in Analgesy-Meter DAQ's memory to the PC, see paragraph 7.5-Downloading Data from Analgesy-Meter DAQ to PC for instruction.

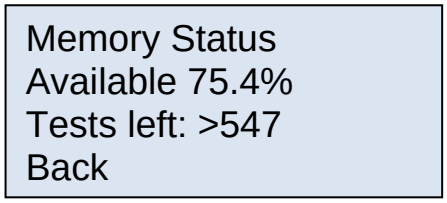
The device must be connected to the PC via the USB cable supplied and that the PC is running the appropriate DCA software provided with the instrument.

If this option is selected in the absence of a PC, correctly connected and running appropriate software, the display shows "**PC not available"** for a few seconds and then returns to the first option on the Measure menu.

For detailed software details and instruction, see paragraph 7.

5.5.4 Memory Status

Select the **Memory Status** option from the Measure menu to check the data memory available to store further measurements; in the following example: 75.4%.



The estimated value of **>547** for **Tests left** is based on the assumption that future measurements will be similar in length to those already stored.

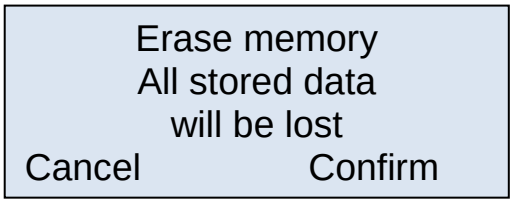
The number of tests that can be stored, is strongly dependent on the duration of each test.

Press **Back** to return to the first option of the **Measure** menu.

5.5.5 Erase Memory

When selecting **Erase Memory** from the **Measure** menu, you will be given the option to cancel all the data stored in the memory, by pressing **Confirm**.

The configuration settings will not be changed.



If you don't wish to cancel the data, press **Cancel** to return to the start of the **Measure** menu.

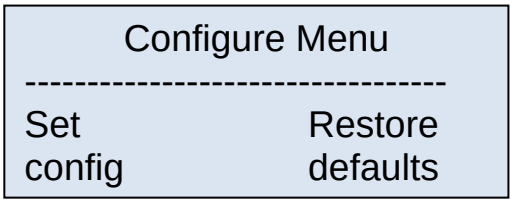
The **Erase Memory** option is offered automatically after transferring the data to the PC, see paragraph 7.5.

5.5.6 Back to Main Menu

To go back to the main menu, press **Exit.** When the Exit choice is not available, press Next Option, until Exit appears over the F2 soft-button.

5.6 Configure Menu

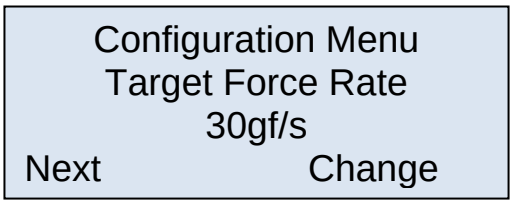
When **Configure** is selected from the **Main Menu**, the following screen appears, which allows the user, by pressing **Set config,** to adjust a **number of configuration settings.**



These include **options related to the measurement process**, but also covers **general settings**, such as the brightness of the display and the period of inactivity before the device will switches off.

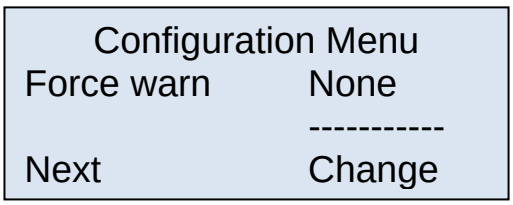
An example:

by pressing **Set Config**, the first configuration option appears, enables the user to set (change) the force application rate.



When two options are available, as in this case, the underscoring indicates the **selected option**.

In the example, pressing **Change** moves the selection from “None” to “Force Warn”. There is no need to confirm the choice; press **Next** to see the next configuration option.



5.6.1 Configuration Options

The **Configure** menu shows 15 screens in a loop, by which the user may adjust the following features of Analgesy-Meter DAQ in order to:

1) Adjust the target force rate **(120gf/s),** see also paragraph 6.4

2) Set a warning sound to inform if a preset force is exceeded (**none**)

3) Adjust the warning sound threshold value (**300gf**)

4) Adjust the force value which triggers the start of the measurement (**2% of full scale**)

5) Adjust the maximum time allowed for a measurement (**15s**)

6) Set if the operator should be asked Left or Right paw at each test (**Do not**)

7) Use Subject Numbers or only Test numbers (**only Test**)

8) Store every measurement regardless or only the good measurements, *i.e.* accepted by the user (**only good**)

9) Store the force waveform or only the peak value (**waveform**)

10) Show abbreviated configuration settings on the Measure menu (**Do not**)

11) Show the offset value before each measurement (**Do not**)

12) Adjust the period of inactivity after which device switches OFF, from 2 to 29 minutes, or never (**never**), see also paragraph 5.3.3

13) Adjust the normal (undimmed) display brightness (**10**)

14) Adjust the period of inactivity after which the display dims, from 2s to 29s, or never (**never**) see also paragraph5.2.1

15) Adjust clock: this can be set by the control unit or by the PC, see also paragraph 6.3.

The values in the brackets are the factory default settings. See also 6.4-Available Configuration Settings.

Press **Exit** to return to the Main Menu**: you will be asked to save Changes to Configuration**.

5.6.2 Restoring Default Values

From the Configure Menu, it is possible to restore the factory default values; press **Restore defaults** and the following screen will be displayed:

Reset memory All stored data will be lost
Cancel Confirm

Pressing **Cancel** returns to the **Main Menu** without altering the configuration settings nor the data memory.

Press **Confirm** to restore the factory-set configuration values as indicated in paragraph 5.6.1.

Remember that this action will also clear the data memory!

6 OTHER IMPORTANT FEATURES OF THE 37215-100

6.1 Battery Voltage Warning

The voltage of the internal rechargeable battery used in the Analgesy-Meter DAQ is monitored continuously during routine operation. Two warning levels are provided.

If the battery is low but still usable, the dashed line of most menus will include **Battery Low**. For example, the first **Measure** screen will become:

Measure Peak Force ----Battery Low----- Next option View config Select this

The device may still be used, but the USB lead should be connected to an active PC or a USB power adapter to charge the battery as soon as possible.

If the battery is so low that Analgesy-Meter DAQ cannot operate, then the instrument will switch OFF immediately. The data which have been stored will be retained but the device cannot be used until it is connected to an active PC or a USB power adapter using the USB lead provided.

Clearly, it is not advisable to allow the battery to drop to this critical level.

6.2 Memory Limit Warning

Each time the user decides to make a new measurement, the Analgesy-Meter DAQ checks that sufficient data memory is available.

If the available memory is too low, the request is refused and the user is advised to transfer the stored data to a PC and/or to erase the existing data; in practice, this critical situation should never arise as **the user is given a clear warning each time a measurement is made** if the available space is not sufficient for 10 more measurements.

6.3 Calendar Clock

The internal calendar clock maintains real time even while the device is switched off. To set the clock, go to the Configure menu, see prg. 5.6.1, item 15).

When the supplied PC software is used to transfer data or to monitor the force applied to the transducer, the internal clock is synchronised automatically to the PC clock, see also paragraph 7-USING THE PC SOFTWARE .

6.4 Available Configuration Settings

A complete list of configuration options is shown below including the adjustment ranges and default values, see also paragraph 5.6.1-Configuration Options.

Configuration flags which may be set or cleared.

- Whether **every measurement** is stored regardless (sometimes required by GLP) or the user may **choose which measurements** to store (default).
- Whether **the transducer offset value is shown** before each measurement or **not** (default).
- Whether **a warning sounds** if a preset **force is exceeded during** a measurement or **not** (default).
- Whether **abbreviated configuration settings** are shown on the Measure menu or **not** (default).
- Whether the stored data includes the **force waveform** (default) or **not**.
- Whether the operator should be asked to **indicate Left or Right limb** or **not** (default).
- Whether Analgesy-Meter DAQ should use **Subject Numbers** or **not** (default).

Configuration values which may be adjusted:

- The **force value** (as a percentage of the full scale range) **which triggers the start** of the measurement. It may be adjusted from **0.4% to 5.0% in 0.1% steps** with a default value of 2%.
- The **threshold force** value in gf **which triggers the warning,** if enabled. It may be adjusted from **100gf to 1000gf in 10gf steps** with **a default value of 300gf.**
- The **maximum time** allowed for a measurement. It may be adjusted from **10s to 30s in 1s steps** with **a default value of 15s.**
- The **period of inactivity** after which **Analgesy-Meter DAQ switches OFF**. It may be adjusted from **1min to 29min in 1min steps** or **never** with a default value of never.
- The normal (undimmed) **display brightness**. May be adjusted from **1 to 10** with a default value of 10.
- The **period of inactivity** after which the **display dims**. May be adjusted from **1s to 29s in steps of 1s** or **never** with a default value of never.
- The **target force rate** which is the ideal rate at which the stimulus force should be applied, see also paragraph 5.6.1-Configuration Options
- The **date and time settings** of the internal clock may be adjusted manually. The internal clock is normally set by synchronising it with the PC to which it is attached. Synchronising occurs when data is downloaded from the device to the PC and when force measurements are monitored live on the PC.
- **Return to main menu**. This **menu** option acquires the latest configuration information and returns to the initial menu.

6.5 Updating the firmware

The hardware used in Analgesy-Meter DAQ is very flexible and many of its features are determined by its internal software program or firmware. When improvements and additions are made to the firmware, existing users may update easily to the new version. The associated PC software includes an option to update the firmware.

6.6 Skipping the introduction

The routine introduction shown when Analgesy-Meter DAQ is turned ON may be skipped by holding down the left soft button.

7 USING THE PC SOFTWARE DCA

This section assumes that the **DCA PC** software has been installed successfully as described in paragraph 4.6. Beside the Analgesy-Meter DAQ, the DCA software manages the GSM, the PAM and eVF instruments by Ugo Basile.

7.1 Note on the DCA PC Software

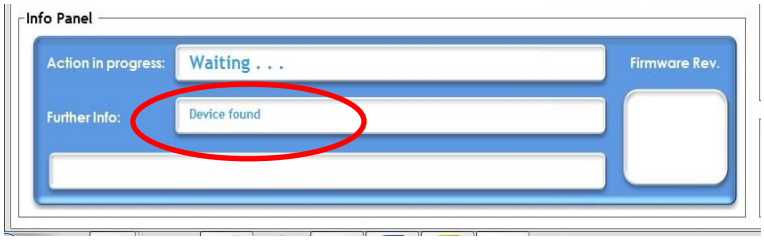
The DCA software is a guide: specifically, this software is a **monitoring tool** and it is not intended to drive the device (the software does not substitute for the controller); all operations must therefore be driven from the Analgesy-Meter DAQ control unit.

This includes changing the slope of the target rate displayed on the PC monitor, which is in fact done from control unit. In fact the slope function on the PC reflects the Target force rate set in the configuration menu, see paragraph 5.6.1-Configuration Options.

7.2 Starting the DCA Software

First connect the device to the PC using the supplied USB cord, then run the **Ugo Basile DCA (Data Collection Application) Software** program from the Windows Start Menu or from the DCA icon on the desktop.

In the screen which appears, the Info Panel informs "**Device found**":



To proceed with the experiment press the "**Use Device**" button.

Figure 4 "DCA Software"

Wait until the info Panel confirms "**device connected**".

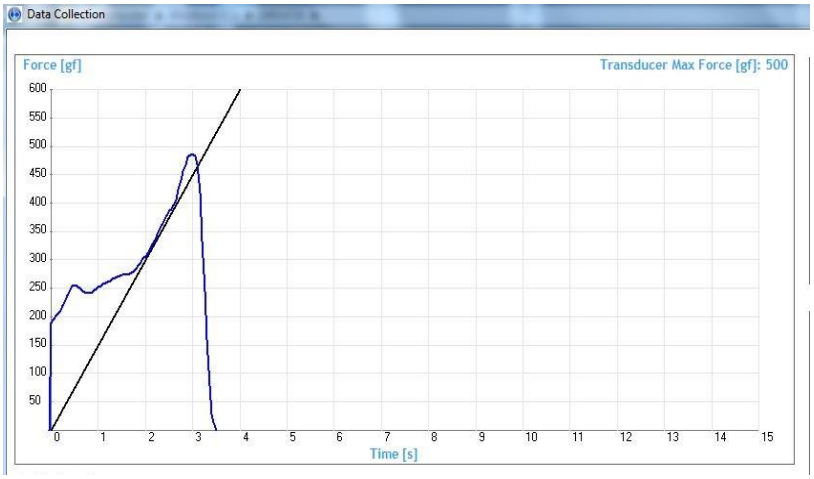
7.3 Starting the Experiment

Now that the software is ready to work, the test-monitoring window will appear:

Figure 5 "Test Monitoring"'

The test-monitoring window includes the following sections:

7.3.1 Main Box



As soon as the experiment is started from the device, the main box on the left will continuously plot the applied force intensity along time.

Note that the applied force appears as a **blue line**, overlapping a straight black line: this is particularly meaningful when the DCA is used to manage a PAM, GSM or eFV test, when it is important to control target force rate.

In fact, this function helps the experiment to apply the force consistently, by simply making sure that the blue trace lays on the black line. With Analgesy-meter, which controls the pressure application rate, this function is useless.

At the beginning of each new trial, the plot window refreshes so that just the current and latest one is visualized. A caption on the top right of the window reminds the Transducer Max Force, as set in the instrument configuration menu.

7.3.2 Info Panel

The Info Panel indicates the action in progress (in these examples TEST MONITORING, and WAITING) and additional information regarding the action

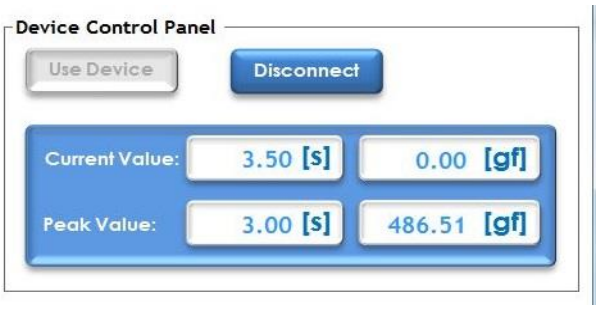
In addition, the panel shows the current Firmware revision.

During the data Analysis, the panel shows specific data related to the selected file

7.3.3 Device Control Panel

From the Control Panel it is possible to start the software (USE DEVICE) or to disconnect it (DISCONNECT).

The current value and the overall peak are displayed in the related boxes, together with the time.



7.3.4 Analysis Control Panel and Notes Tool

All data files are stored in the folder **C:\UB Data** in sub-folders which are named according to the date of data transfer, in the format **YYMMDD**; for example, data transferred on July 23rd, 2013 will be found in the folder **C:\UB Data\130723**. All the trials conducted in the same experiment are saved in the same file.

Individual files, containing the downloaded data, are named automatically according to the date, followed by two letters which progress from **AA, AB, AC**… through to **ZZ**.

For example, the third set of data downloaded on July 23rd, 2013 would be stored in file:

C:\UB Data13\090723AC.PAM

where “PAM” is the extension of this proprietary software (originally designed for PAM).

During the test, the Analysis panel is not active

Once the experiment is over and the data transmitted from the device to the computer, push the button "**Analyze**" to open the folder where the .PAM files are saved and stored during the test.

Select the file from the window which automatically appears:

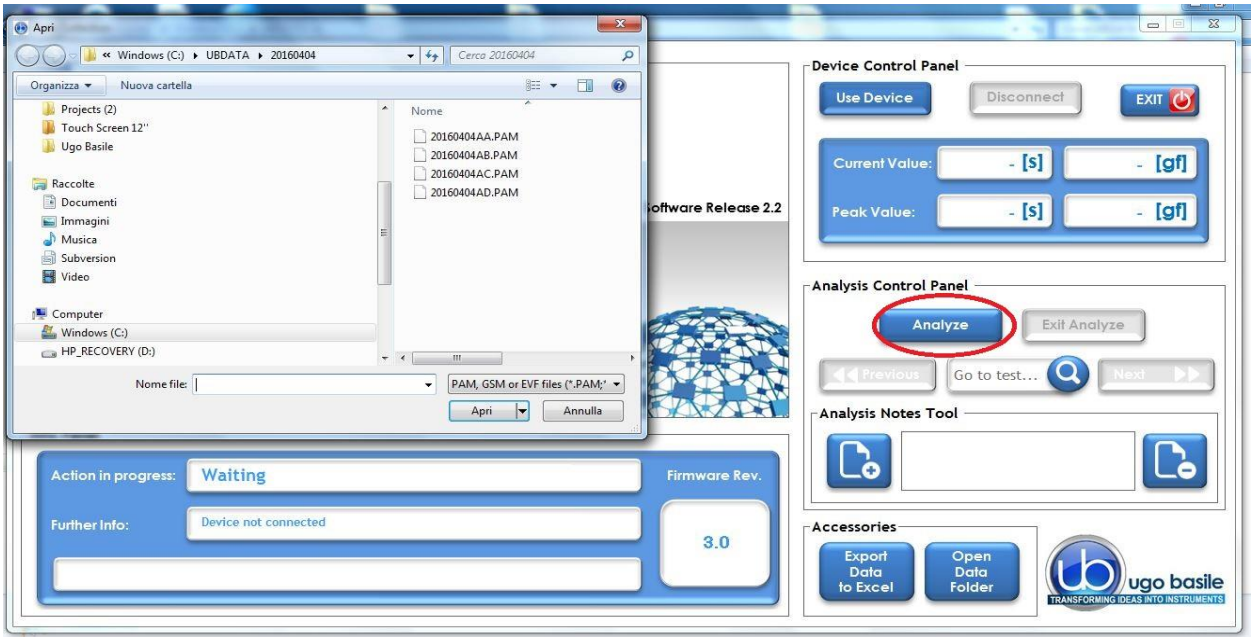


Figure 6 "Analyze Window"

When opening the selected file, all the plots referring to the trials contained in the related experiment will be shown:

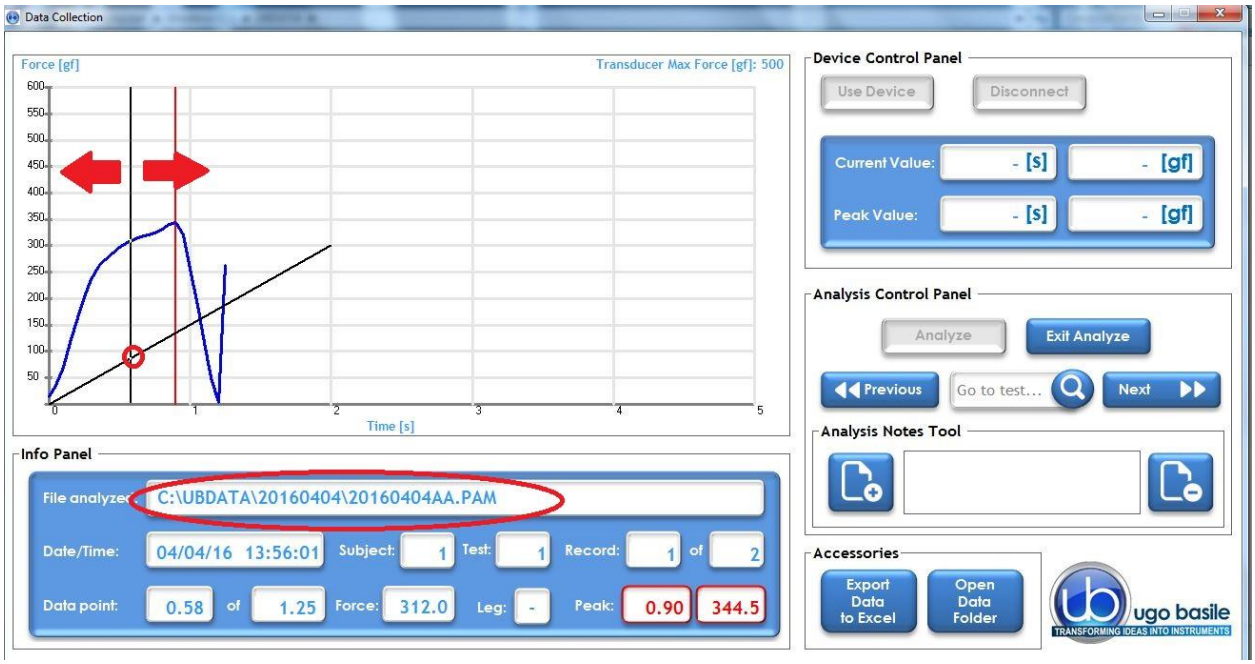
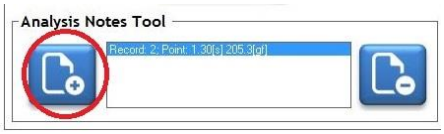


Figure 7 "Test Monitoring"

By moving the **black vertical line** (indicated by the arrows in the above screenshot) left or right along the slope, the user will be able to select a specific moment in the test.

To save it, select the "**Add Note**" button, left on the "Analysis Notes Tool".



The note is remove by the button on the right.

Note that the Info Panel now shows the data relating to the point currently selected.

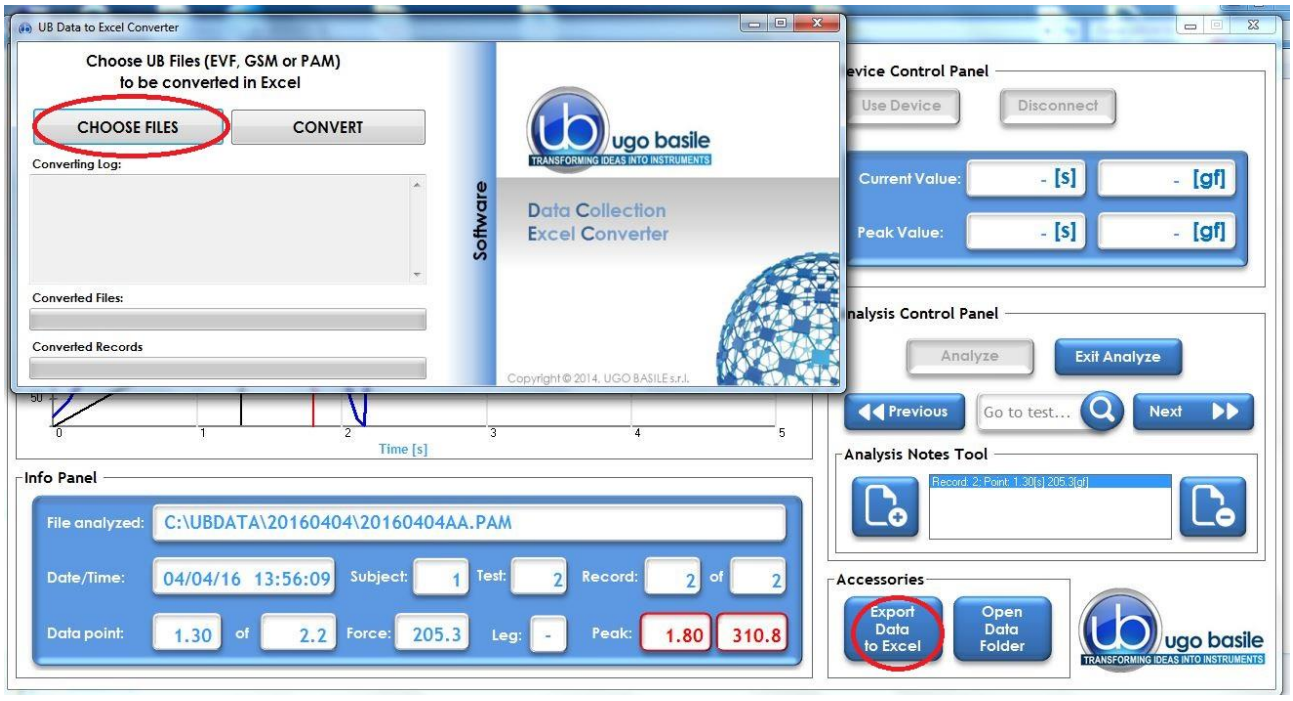
Moreover, the recorded peak measure is pointed out, associated with time.

7.3.5 Accessories

In this section you will find the Export Data to Excel and the Open Data Folder buttons.

7.4 Exporting and saving data

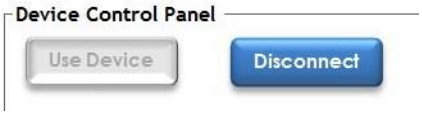
Once the analysis of the experiment is accomplished, it is possible to export the data to Excel or to open a data folder.



While the DCA PC software is not designed for statistical analysis, exporting the data using the DCA PC software creates a user friendly file compatible with Excel. One will find this automatically generated file to be most useful, because Excel seems to be the most common spreadsheet program which allows a researcher to perform whatever analytical statistics are preferred.

The data in the Excel file consists of columns for measurement number, peak force and peak position, filled with the values for each of the test downloaded.

When all the operations and experiments are completed, it is recommended to click “Disconnect” from the “**Device Control Panel**”, in order to close the connection between the device and the software.

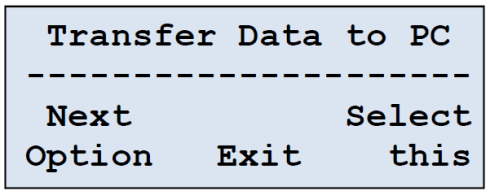


7.5 Downloading Data from Analgesy-Meter DAQ to PC

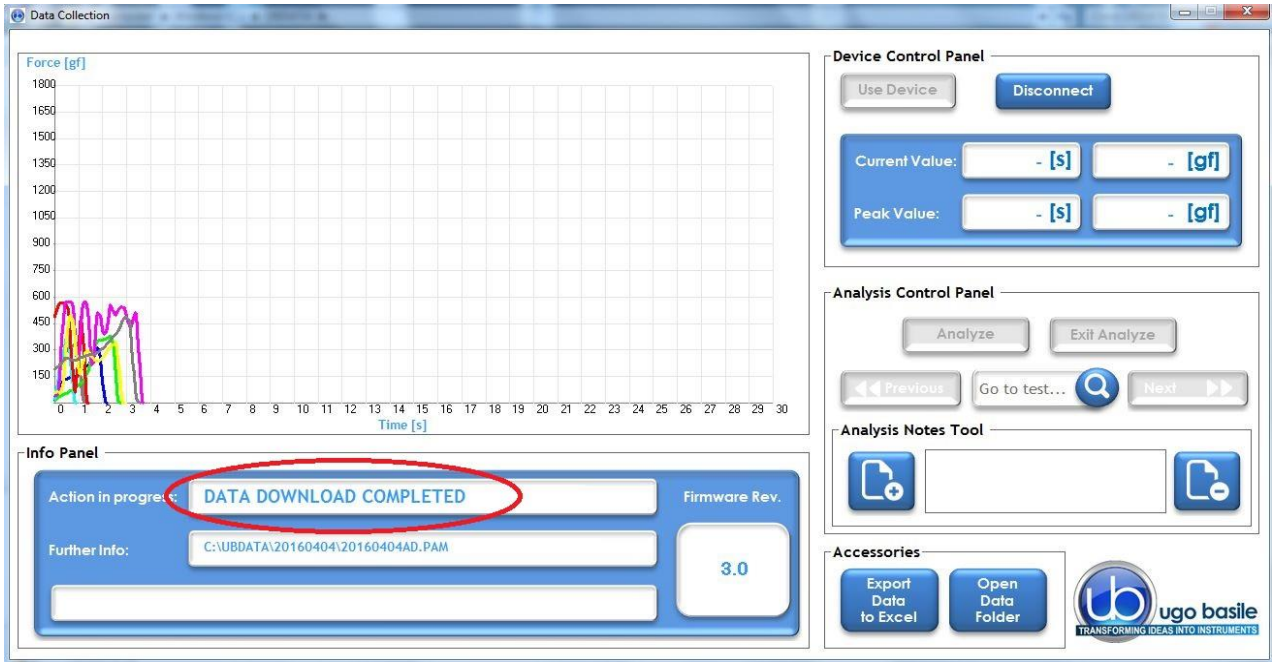
When working with the Analgesy-Meter DAQ not connected to the PC, all the data are stored inside the device memory. Data can be saved on the PC; data download is also controlled by the device.

First, ensure that the controller is properly connected to the PC, and that the software is working properly.

Then, using the menu and buttons on the controller, toggle through selections (**Main Menu > Measure > Next Option**) until the Transfer Data to PC appears on the blue display window of the controller.



A progress bar in the Info Panel of the DCA software monitors the download: the same panel will confirm when the data download is complete.



Data can now be analyzed as described in paragraph 7.3.4

The **Transfer Data to PC** operation, also ensures that the device clock and the PC clock are synchronized.

If this is performed when the Analgesy-Meter DAQ has no stored data, it will only synchronize the device and PC clocks.

8 MAINTENANCE

While any service of the instrument ought to be carried out by Ugo Basile personnel or by qualified personnel authorized by UGO BASILE organization, this section of the instruction manuals describes normal maintenance procedures which can be carried out at your facility.

8.1 Long Inactivity

The instrument does not require any particular maintenance after long inactivity.

8.2 Customer Support

For any further information you may desire concerning the use and/or maintenance of the device, please do not hesitate to contact our **service department** (or our local distributor) either directly of via our contact page:

UGO BASILE s.r.l.
Via G. Di Vittorio 2
21036 GEMONIO – Varese, ITALY

Phone : +39 0332 744574

service@ugobasile.com
logistics@ugobasile.com
sales@ugobasile.com

Before sending any instrument to our factory for repair, please contact our logistics department to obtain a return authorization number (RMA) and shipping/packing instructions.

We may not be held responsible for damages during transport due to poor packing; whenever possible, please use the original packing.

9 ORDERING INFORMATION

37215-100	**Analgesy-Meter DAQ**
37215-001	Electronic Unit
37215-002	Paw-Pressure Transducer
37215-335	START/STOP Signal Connector
52010-325	USB Lead
E-AU 059	Universal Power Supply
E-AU 041	USB pen-drive, including
	37215-100-302 Instruction Manual
	DCA Software

10 Instrument Specifications

Operation	
Commands	via soft-buttons
Read-out	multifunction graphic display
Starting	via pedal switch
Force Range	see Analgesy-Meter manual
Force increasing rate	regulated by the Analgesy-Meter motor
Latency Time	read-out on the graphic display, in 0.1 s steps
Connection to PC	via USB cable (A to mini-B)
Power Requirement	either battery operated, or via USB cable connected to PC or universal converter (85-264 VAC, 50-60Hz)
Operating Temperature	10° to 40° C
Sound Level	negligible
Pollution Degree	≤ 2
Physical	
Total Weight	0.8Kg
Shipping Weight	2.7Kg approx. (in the plastic case)
Packing Dimensions	46x38x27cm
Warranty	

37215-100 is covered by a 24-month warranty

11 BIBLIOGRAPHY for ANALGESY-METER

12 Method Paper

- L.O. Randall and J.J. Selitto: **"A Method for Measurement of Analgesic Activity on Inflamed Tissue**" Arch. Int. Pharmacodyn. CXI, No. 4: 409-419, **1957.**

12.1 Reference to UB Analgesy-Meter (Rat)

- E.K. Joseph et alia: "**Vascular Endothelial Cells Mediate Mechanical Stimulation-Induced Enhancement of Endothelin Hyperalgesia via Activation of $P2X_{2/3}$ Receptors on Nociceptors**" J. Neuroscience 33 (7): 2849-2859, **2013**
- L. Ferrari et alia: "**Role of Nociceptor αCaMKII in Transition from Acute to Chronic Pain (Hyperalgesic Priming) in Male and Female Rats**" J. Neuroscience 33 (27): 11002-11011, **2013**
- H.J. Jeong et alia: "**Role of 5-HT_1 receptor subtypes in the modulation of pain and synaptic transmission in rat spinal superficial dorsal horn**" Br. J. Pharmacol. 165 (6): 1956-1965, **2012**
- D.A. Andersson et alia: "**TRPA1 Has a Key Role in the Somatic Pro-Nociceptive Actions of Hydrogen Sulfide"** PLoS ONE 7(10): e46917, **2012**
- K. Király et alia: "**The Dipeptidyl Peptidase IV (CD26, EC 3.4.14.5) Inhibitor Vildagliptin is a Potent Antihyperalgesic in Rats by Promoting Endomorphin-2 Generation in the Spinal Cord**" Eur. J. Pharmacol. 650: 195-199, **2011**
- Zs. Helyes et alia: "**Involvement of Transient Receptor Potential Vanilloid 1 Receptors in Protease-Activated Receptor-2-induced Joint Inflammation and Nociception**" Eur. J. of Pain 14 (4): 351-358, **2010**
- M. Boettger et alia: "**Differential Effects of Locally and Systemically Administered Soluble Glycoprotein 130 on Pain and Inflammation in Experimental Arthirits** " Arthritis Res&Therap. 12(R140) 1-9, **2010**
- D. Feuerbach et alia: "**The Selective Nicotinic Acetylcholine Receptor α7 Agonist JN403 is active in Animal Models of Cognition, Sensory Gating, Epilepsy and Pain**" Neuropharmacology 56: 254-263, **2009**

12.2 Reference to UB Analgesy-Meter (Mouse)

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Notes

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CE CONFORMITY STATEMENT

Manufacturer	**UGO BASILE srl**
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We hereby declare that

Instrument.	**ANALGESY-METER DAQ**
Catalog number	**37215-100**

It is manufactured in compliance with the following European Union Directives and relevant harmonized standards

- *2004/108/CE relating to electromagnetic compatibility*
- *2011/65/UE on the restriction of the use of certain hazardous substances in electrical and electronic equipment*

Account *Manager* — Adriano Basile

Nome / *Name*

May 2017

Date

Firma / *Signature*