



Be ahead



## Use Manual

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**THANK YOU!! To have chosen a Microtronics product.**

Leonardo Kit is an instrument used to measure impact forces. Although its use is simple and intuitive, it is recommended for use exclusively by qualified personnel.

### BEFORE STARTING...

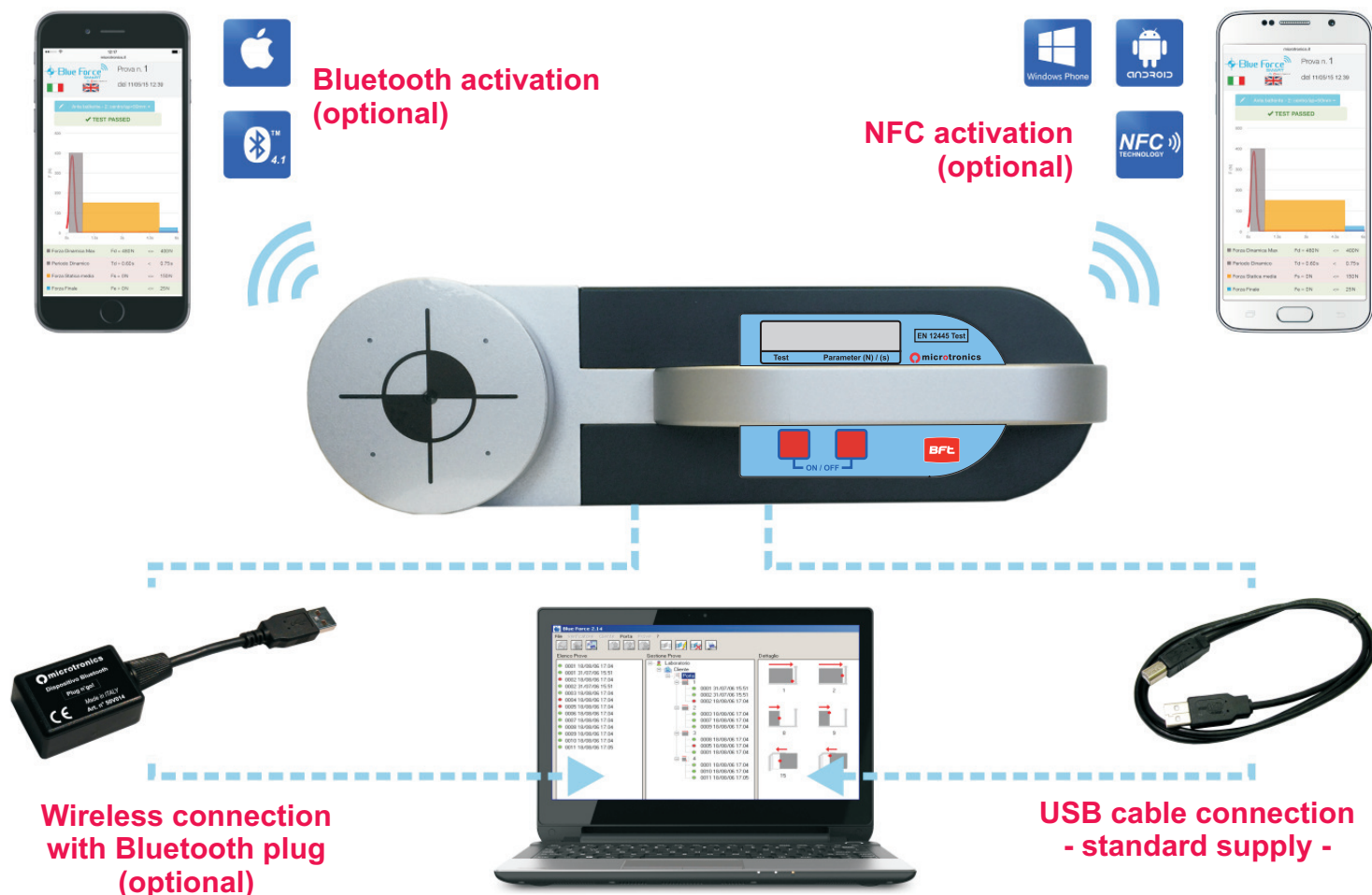
Even if the instrument has a robuste construction, designed for heavy duty (chruishing generated by motors), Leonardo Kit is always a measuring instrument. Therefore, we reccomend to follow all the use and maintenance rules written below.

### LEONARDO KIT / BLUETOOTH SPECIFICATIONS

Force measurements taken using **Leonardo Kit** are stored and displayed on screen, after which the user can transfer stored measurements to the BlueForce software using the **USB cable supplied**, or in wireless mode (using the accessory plug'n Go!). The **BlueForce software** enables management of tests performed within a client database, with the option of printing out reports with relative graphs.

To exploit the **SMART** characteristics of Leonardo Kit, **NFC** or **Bluetooth** functions can be activated (on request) to enable measurements to be taken and then sent directly to devices equipped with these systems. With a standard smartphone, the user can thus view measurements, graphs and all references of the tests to be performed.

► For accessories and **SMART** activation, contact Microtronics or send an e-mail to: [blueforce@microtronics.it](mailto:blueforce@microtronics.it)



## INSTRUMENT FUNCTIONS

■ The buttons are associated with various functions according to how long they are pressed:

■ Short **press** <0.5 sec.

■ Long **press** >2.0 sec.

Test ↑↓



■ Left button

press (**short**) = scroll forward/back through stored tests

Set / Enter



■ Right button

press (**long**) = change direction of scrolling forward/back through tests

press (**short**) = scroll through the options of individual tests

press (**long**) = select and confirm the current action

Test ↑↓



Set / Enter



■ **ON/OFF:** Right button + Left button pressed at the same time for more than **3 sec.**, turns the instrument **ON** and **OFF**.

■ **AUTOMATIC POWER OFF:** The battery saving function automatically turns off the instrument after approx. **4 minutes** of inactivity

## DISPLAY MESSAGES



■ **"...." POWER UP:** On power-up, the instrument runs an auto-test and auto-reset (scrolling dots). NEVER turn on the instrument with the measurement tip charging!



■ **"1 ----" AWAITING NEW TEST:** after power-up and the autotest, if no other information is displayed, the instrument sets to the first memory slot available. The display shows the slot number followed by 4 dashes.



■ **"1 A---" TEST ACQUISITION:** when the instrument tip detects a force exceeding the minimum threshold, the test acquisition process is started (6 sec.). The display shows the test number and the letter "A" followed by 3 dashes.



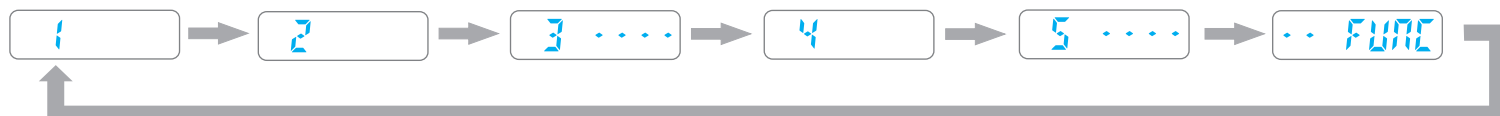
■ **"1 " READING TEST IN MEMORY:** the occupied memory slots are indicated with the relative number, without any dashes to the right. To scroll through stored tests, use the left button: After the first free memory slot, the display shows the special menu **"FUNC"**, positioned before test no.1 and after the last memory slot.

**N.B.** If other messages appear on the display, refer to the paragraph: **ADDITIONAL DISPLAY MESSAGES** on page 5

■ **READ OF TESTS, PRACTICAL EXAMPLE:** Let's imagine the follow situation:

- test 01 "saved»
- test 02 "saved»
- test 03 "empty or erased»
- test 04 "saved»
- test 05 "first test free»

■ Executing the "Tests read" by means of **left button**, it shows:



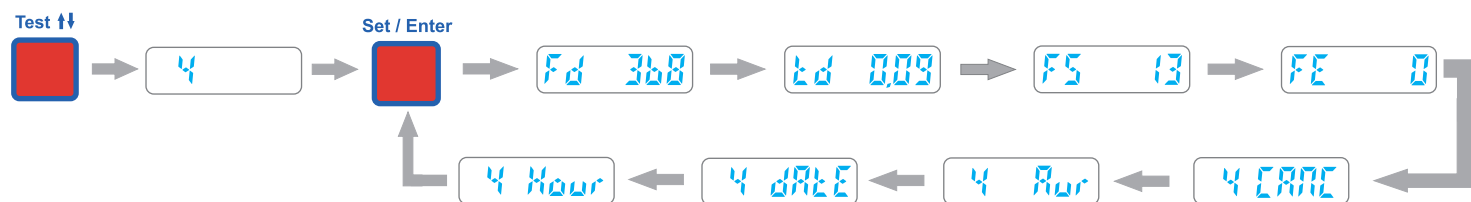
■ In the example, the instrument contains **three** tests saved, **one** erased, and **one** new. By means of **short** consecutive press on **left button**, you can scroll the test list, like you can see, after the last test (5), display shows the special function **FUNC**, then the test (1) and so on.

■ The tests saved are indicated only with a progressive number **1, 2, 4** whereas the tests erased or empty, are shown with the number and four dashes (**3 ----**) to indicate that the test is erased or empty.

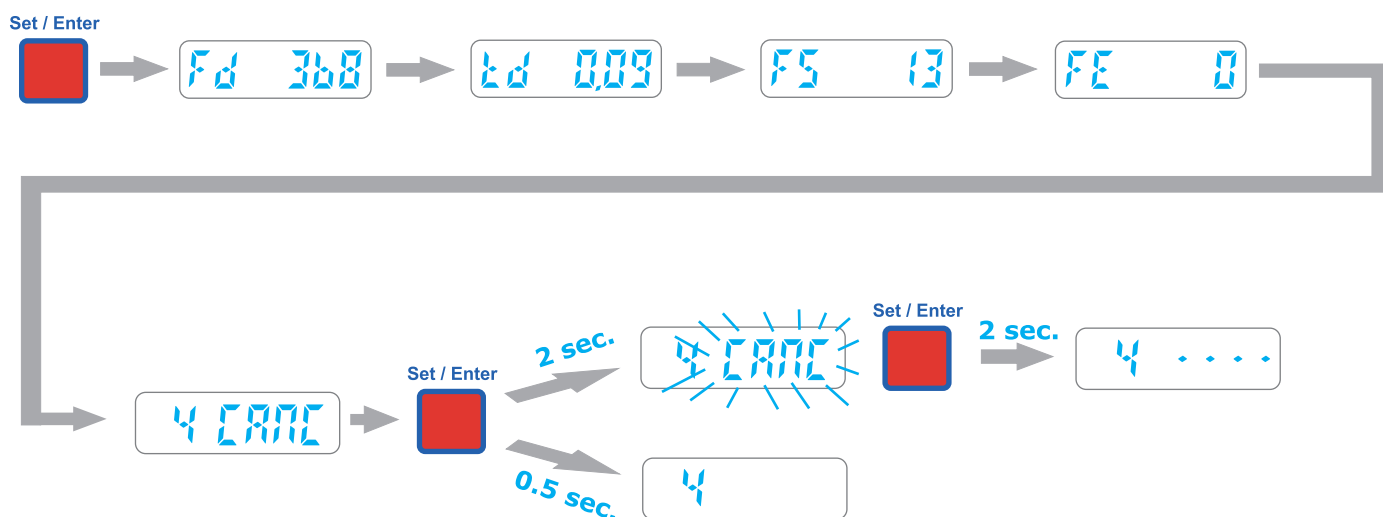
■ **Very important:** following the previous example, the next time that the instrument will be turned on, the display will show the first free position (**5 ----**), to make possible the storage of a new test.

■ **Remark:** position is (**5 ----**) and not the (**3 ----**) previously erased. This mechanism permits to the operator *to add new tests, without modify the sorting of the preexistent tests saved or erased.*

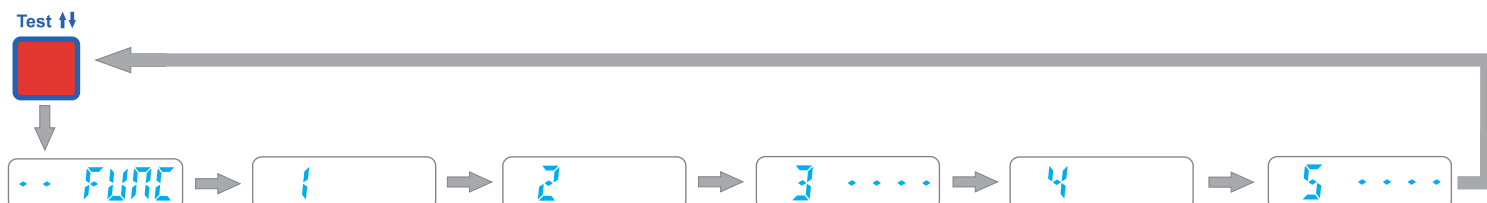
- **READING TEST PARAMETERS:** after moving to a stored test, e.g. 4, the user can then read the sub-menu of the test parameters by briefly pressing the right button and then: **Fd** -> **td** -> **FS** -> **FE** -> **CANC** -> **Aur** -> **dAtE** -> **Hour**. Also in this case the user can display the menu items in rotation by briefly pressing the right button repeatedly as required.
- To exit this mode, briefly press the left button or after 5-6 seconds the integrated time-out system automatically returns to the original location; (test 4).



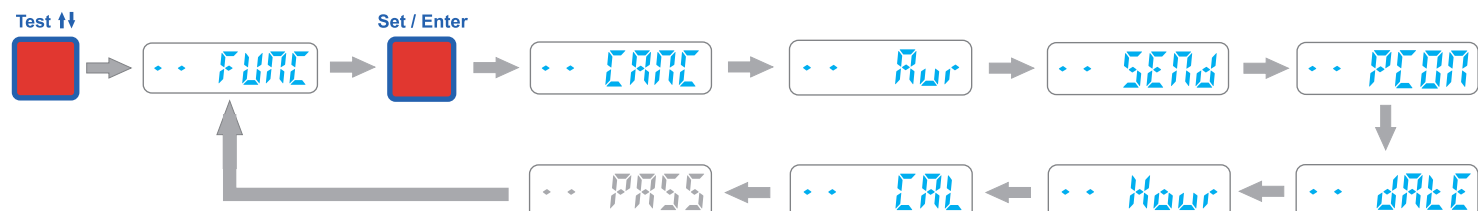
- **DELETING A SINGLE TEST:** in the test memory menu, there is a **DEL** delete function in addition to the option for reading parameters. To delete the current test (in the example no. 4) press the **right button** for approx. **2 seconds**, when the text **4 DEL** flashes on display to indicate "awaiting confirmation"; press the **right button** again for **2 sec.** to permanently delete the selected memory slot. To exit this mode, briefly press the **right button** or after 5-6 seconds the integrated time-out system automatically returns to the original location.



- **SPECIAL FUNCTION MENU:** The user can scroll through the stored tests (see initial example) to select the special **FUNC** menu present between the first and last test. This menu contains various functions: **CANC**, **Aur**, **SEND**, **PCON**, **dAtE**, **Hour**, **CAL**, **PASS** (the latter is only present if the wireless functions are disabled).



- Per accedere alle "sottofunzioni" bisogna posizionarsi su **FUNC**, e poi con brevi pressioni del tasto **destra** è possibile "ruotare" le "sottofunzioni".



## DETAILS ON INSTRUMENT FUNCTIONS

.. CANCEL

■ **CANC:** this function enables the user to simultaneously delete ALL tests stored in the internal instrument memory. To activate, press the **right** button for 2 seconds; the text flashes on display to indicate that the unit is awaiting confirmation; to confirm deletion, press the **right** button again for 2 seconds

.. Aur

■ **Aur: (Average)** is the function that enables a calculation of the mathematical average of the four parameters memorised on any three tests.

.. SEND

■ **SEND:** this function enables the user to send all memorised tests directly from the instrument to the computer, via a USB cable or Bluetooth with the special adaptor for PC, simultaneously clearing the internal memory. To send tests to the PC, first connect the instrument to the computer using the USB cable (or connect the special Bluetooth adaptor), start the BlueForce program, and press the **right** button for 2 seconds. The message "SEND" flashes on display for the entire duration of the test transfer phase.

■ **REMARK:** In the case of transmission error (**Err 2**), the saved tests will not be lost, and so it will be possible to retry to send the tests, by press again the **right** button for 2 seconds.

.. PC ON

■ **PC ON:** this function enables the user to switch from the "display off" phase and activate direct delivery of data to the computer (via USB cable or via Bluetooth with the special adaptor for PC). To enter the PC ON mode, press the **right** button for 2 seconds.; the text **PC ON** flashes on display; press the **right** button again for 2 seconds (see paragraph below: PC ON mode - Details).

.. dAtE

■ **dAtE:** current date, in the format DD/MM/YY. To see the current date, press the **right** button for 2 seconds and then to change the date, press the **right** button again for 2 seconds and **briefly press the right button** to change the day/month/year as required. To change the number, briefly press the **left** button or press and hold the latter to change the direction of modification (increase/decrease); after this, press and hold the **right** button to save the changes and exit.

.. Hour

■ **Hour:** current hour/minutes, in the format HH.MM. To see the current time, press the **right** button for 2 seconds and then to change the hour, press the **right** button again for 2 seconds and **briefly press the right button** to change the day/month/year as required. To change the number, briefly press the **left** button or press and hold the latter to change the direction of modification (increase/decrease); after this, press and hold the **right** button to save the changes and exit.

.. CAL

■ **CAL:** date of last calibration, in the format DD/MM/YY. Press the **right** button for 2 seconds to display.

.. PASS

■ **PASS:** entry of the password to permanently unblock the NFC and Bluetooth interfaces (if disabled). Press the **right** button for 2 seconds to enter the password. Briefly press the **left** button to increase the number flashing on display. Briefly press the **right** button to change number. Press the **right** button for 2 seconds to confirm the changes and exit. If the password is correct, the display shows the message "YES».

## PC ON MODE - DETAILS

■ The **PC ON** mode has been designed to use the instrument in conjunction with the BlueForce program on PC and enables the direct display of the test graph on the PC screen for an evaluation of the results in real time, depending on the type of port selected on the software. In this case the instrument must first be connected to the PC via the USB cable or special Bluetooth adaptor (follow the instructions for installation of the software and drivers on pages 8 and 9).

■ This function, signalled by a small box at the top left of the instrument display, disables memorisation of the tests in the internal memory, as all data are transferred directly to the PC. **In PC-ON mode, the SMART interfaces are not enabled**

■ The previous paragraph describes the method for setting **PC ON**, while to restore the instrument to normal mode (with test storage and display) press the **right** button for 2 seconds, after which the message **PC OFF** flashes on display awaiting confirmation, then press the **right** button again for 2 seconds; at this point, the instrument will be reset to the default operating mode.

■ **BEHAVIOR IN DISPLAY-OFF MODE (PC ON):** In display-off mode, it is always present the red square on the left, together with the advices : Acquiring, Sending, etc.

▣ A...

■ **TESTS ACQUISITION:** During tests acquisition (6 seconds), the display shows (**A---**), (Acquiring) together with three dashes.

▣ SEND

■ **DATA SENDING:** During data sending to pocket-PC, the display shows (**SEND**).

▣ YES

■ **POSITIVE RESPONSE:** In the case of positive response to the test carried out, the display shows (**YES**).

▣ NO

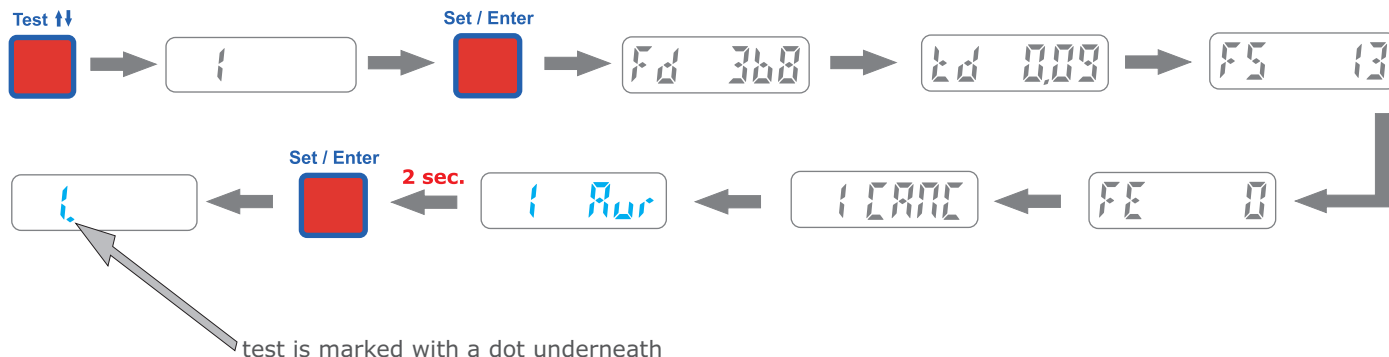
■ **NEGATIVE RESPONSE:** In the case of negative response to the test carried out, the display shows (**NO**).

▣ Err

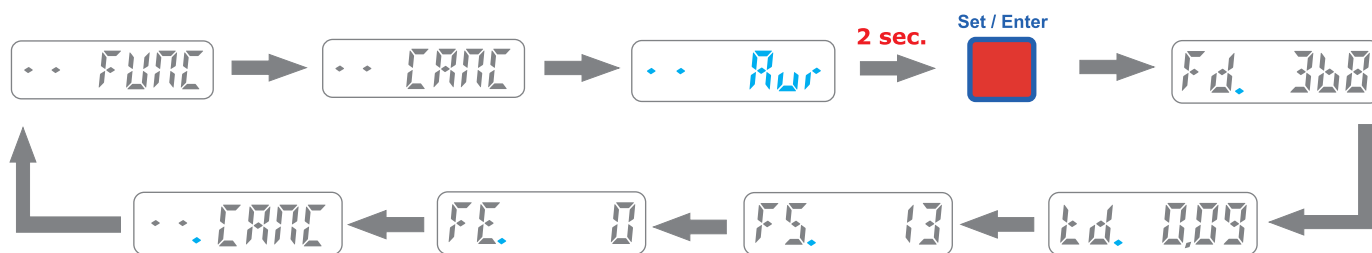
■ **ERROR CHECK:** if it occurs any internal errors, the display shows **Err1** or **Err2** etc. until any key is pressed (See *MORE DISPLAY MESSAGES* page 5).

**ARITHMETICAL AVERAGE OF THE TEST VALUES**

- To calculate the average, proceed as follows: any three of the tests performed can be used to calculate the average, e.g. : Test **01**, Test **02** and Test **04**.
- After reading the Test **01** parameters, the **right** button can be used to make the **CANC** function appear, followed by the **Aur** function. Pressing the **right** down for **2** seconds makes the **Aur** function disappear and the test is **marked** with a dot underneath it; this shows that Test **01** has **been selected** for calculation of the average. Now the two other tests must be selected (Tests 02 and 04) in the same way as described above.



- Once the test **selection** operation is complete, the **FUNC** menu (always available between the first and last test) must be opened; next find the **Aur** function (straight after **CANC**), and press the **right** button for **2** seconds to activate the average calculation function immediately; the parameters are displayed in a cycle in which the user can move from one value to the next by quick-pressing the **right** button.



- During the parameter averages reading (**Aur**), the dot only appears in the bottom right-hand corner if at least one other test has been selected.
- After the parameter averages reading, the function (**.CANC**) is available to allow the user to delete the average and the previous selections.
- When the gauge is switched off, the tests "**selected**" for the average calculation are automatically "**unselected**" (the parameters and the tests stored in the instrument are not erased)

**MORE DISPLAY MESSAGES**

.. bAtt

- **BATTERY CHECK:** If battery charge is low, the display shows **bAtt** until any key is pressed. Anyway it will be possible to carry out at least another complete test, before replacing.

.. FULL

- **MEMORY TEST:** if the instrument has 80 tests saved, the display shows **FULL** until any key is pressed. If you proceed without **erase** or **download** saved tests, the instrument overwrites **always** the test n°1.

.. Err2

- **ERROR CHECK:** if it occurs any internal errors, the display shows **Err1** or **Err2** etc. until any key is pressed

- **N.B. WITH BLUEFORCE SOFTWARE:** verify the setting of the serial port (see page **10**) and check that either the USB CABLE, the Bluetooth DEVICE, is inserted in the USB port correctly.





## ENABLING AND TRANSFERRING TESTS ON SMARTPHONE/TABLET - NFC

- 1) Request the **unlocking password** to enable the SMART function from: Microtronics, email address [blueforce@microtronics.it](mailto:blueforce@microtronics.it), after which you will receive the cost to enable the function (**request not required if the instrument is already enabled in the factory**).
- 2) Enter the unblock code received as described on page 4 (**PASS** function).
- 3) Activate the Internet connection in the settings of the Smartphone or Tablet.
- 4) Activate the **NFC** interface of the smartphone via the relative drop-down menu or settings.



- 5) On the instrument, select the memory location to be displayed by briefly pressing the **left** button (e.g. n° 2). Then briefly press the **right** button to display the parameters of the selected test (dots will scroll to the right briefly before display), after which the test will be ready for display by the **NFC** device.



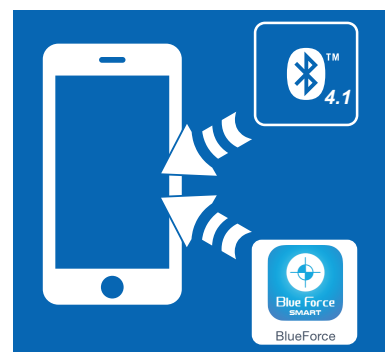
- 6) Place the **rear side of the smartphone** on the **back of the Leonardo Kit** instrument on the area marked with the **symbol NFC**; after a few seconds the selected test will be displayed on the device (see page 7).



## ENABLING AND TRANSFERRING TESTS ON SMARTPHONE/TABLET - BLUETOOTH

- 1) Request the **unlocking password** to enable the **SMART** function from: Microtronics, email address [blueforce@microtronics.it](mailto:blueforce@microtronics.it), after which you will receive the cost to enable the function (**request not required if the instrument is already enabled in the factory**).
- 2) Enter the unblock code received as described on page 4 (**PASS** function)

- 3) Install the BlueForce Smart **App** on the iOS device (as described in the email sent)
- 4) Activate the Internet connection in the settings of the Smartphone or Tablet.
- 5) Activate the **Bluetooth** interface of the smartphone via the relative drop-down menu or settings. N.B. (Bluetooth v.4.0 or later)
- 6) Launch the BlueForce Smart **App** on the iOS device



- 7) On the instrument, select the memory location to be displayed by briefly pressing the **left** button (e.g. n° 2). Then briefly press the **right** button to display the parameters of the selected test (dots will scroll to the right briefly before display), after which the **test will be sent** to the page of the BlueForce Smart application (see page 7).



**N.B.** On devices with NFC, if the SMART function of the Leonardo Kit instrument is **NOT** active, a web page is opened after a few seconds, containing information on the activation procedure (described at the start of the page)

For more information, visit [www.microtronics.it/attivazione\\_bft.html](http://www.microtronics.it/attivazione_bft.html)

## USING THE SMART APPLICATION

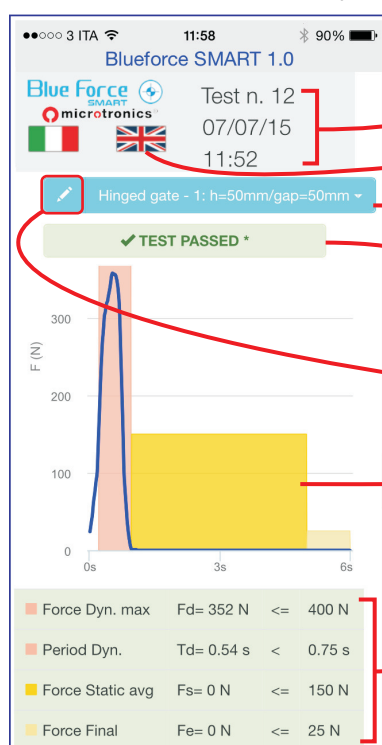
- After activating the **SMART** functions on the **Leonardo Kit** instrument, as described in the previous paragraph, the user can display the tests memorised on the hand-held devices (smartphone, tablet etc.).
- Note that in the case of devices with **NFC**, the smartphone should be positioned in the vicinity of the back of the instrument in the area of the **NFC** symbol, while in the case of devices with **iOS Bluetooth** (4.0 or later) simply activate Bluetooth, then launch the **Leonardo Kit SMART App** and send the test with the **Leonardo Kit** instrument.

**N.B.** The page indicating "awaiting test delivery" is first displayed on the **app** of the Bluetooth / iOS devices



## BLUEFORCE SMART APPLICATION FUNCTIONS

- After sending the required test with the Leonardo Kit instrument, the device (smartphone, tablet etc.) will show this page, containing all information on the measurements taken (see details below).
- To display to correct **graph** according to the **effective port and measurement point**, the correct selection must be made via the relative icon: **setting of the measurement type and points**, then confirming by pressing **OK-Confirm** to re-process the parameters and display the results on the basis of the selected port and measurement point.



■ Number of test send and relative date/time

■ App language change

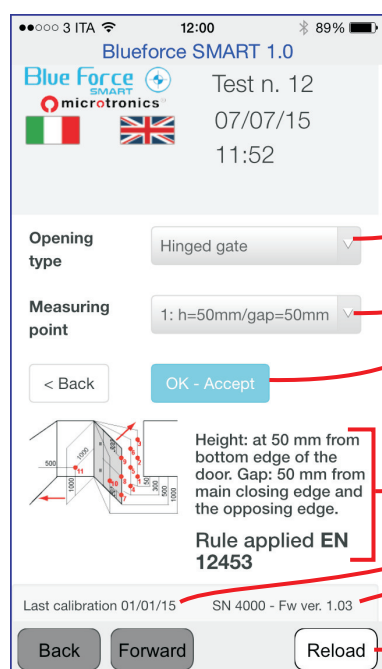
■ Type of port measured and relative data on measurement points

■ TEST results

■ Modification to measurement type and points

■ Impact curve graph

■ Impact curve parameters



■ Selection of port type

■ Selection of measurement points

■ Confirm button for type of port and measurement points

■ Graphic display of measurement according to EN 12453

■ Current instrument calibration date

■ Serial number and current instrument firmware version

■ **N.B.** for iOS devices Three buttons are located on the lower section: RELOAD, BACK, FORWARD. These enable **navigation** in "internet browser" mode.



**Leonardo Kit SOFTWARE FOR WINDOWS PC - DOWNLOAD**

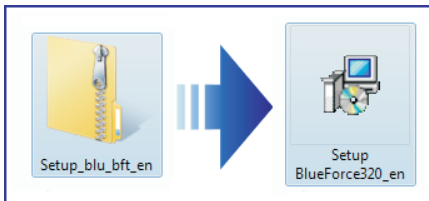
- Web link to download the **Leonardo Kit software for Windows PC**: [www.microtronics.it/attivazione\\_bft.html](http://www.microtronics.it/attivazione_bft.html)
- To download **updates**, follow the instructions on the page: [www.microtronics.it/download\\_bft.html](http://www.microtronics.it/download_bft.html)

**WARNING !!!**

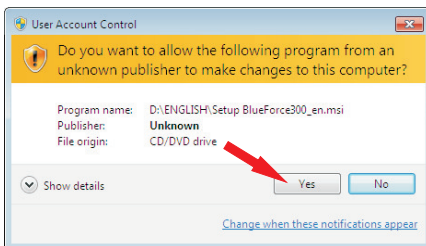
The file is **not harmful** and enables/allows your Browser or Antivirus program to download the file **Setup\_blu\_bft\_en.zip** or **update\_blueforce\_en.zip**

**Leonardo Kit SOFTWARE FOR WINDOWS PC - INSTALLATION**

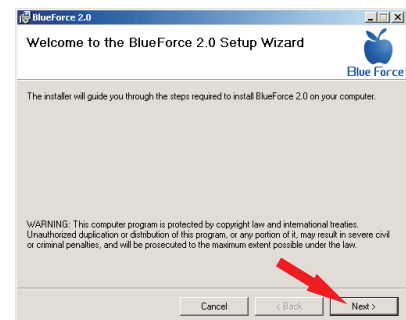
- Download the file **Setup\_blu\_bft\_en.zip**, then extract the two files onto the computer desktop



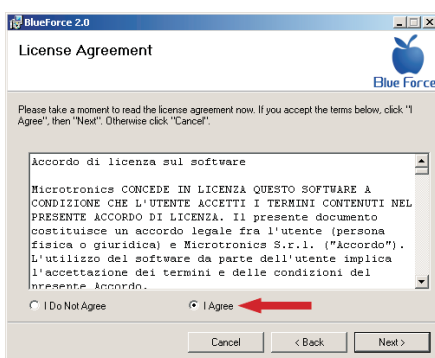
- Run the Setup file and enable installation



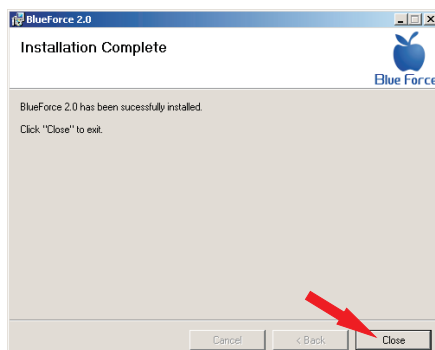
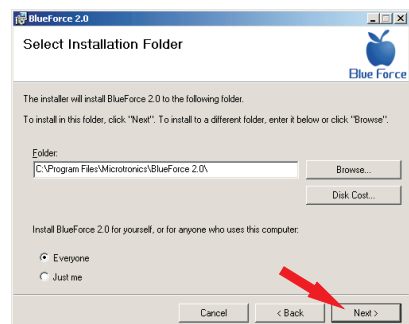
- Proceed with guided **installation of the Leonardo Kit**, click **Continue**



- After the licence contract, select "I Agree" and click **Continue**



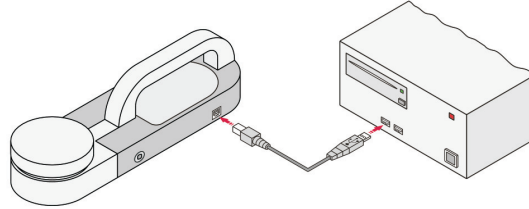
- Confirm selection of the installation directory, click **Continue**



- Click **Close** to end installation of Leonardo Kit

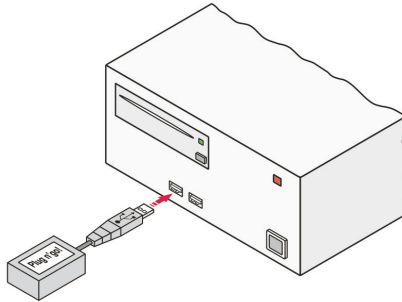
- **IMPORTANT !** Before starting installation of the Leonardo Kit software, the **Drivers** have to be installed as described below.

## DRIVER INSTALLATION USB CABLE - SUPPLIED



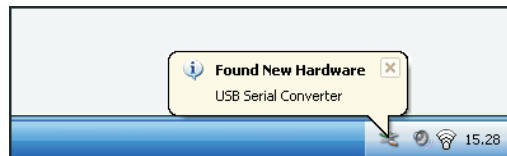
- For instruments with **USB** interface, the instrument must be connected to the PC using the **USB cable** provided as shown (there is no need to switch the instrument on).

## DRIVER INSTALLATION BLUETOOTH DEVICE (optional)



- For instruments with **Bluetooth** interface, connect the **Plug'n Go!** device to the PC's USB socket as shown.

- **Wait a few seconds** for the Drivers of the new Hardware to be installed (see pop-up in the applications bar)



### WARNING !!!

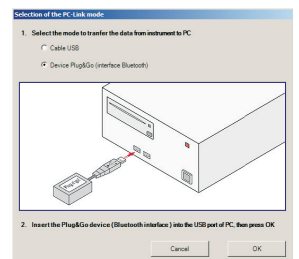
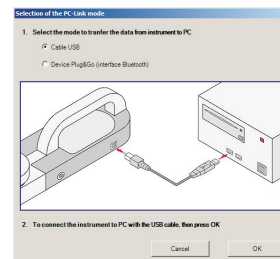
If the computer has more than one USB port, always remember to insert the Device, Adapter or USB cable into the **same one**.

## STARTING THE SOFTWARE

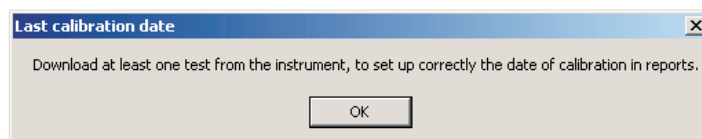
- Run the Leonardo Kit software from the desktop icon.
- When it is started the first time, the user has to select the type of device used (USB cable or Bluetooth device).



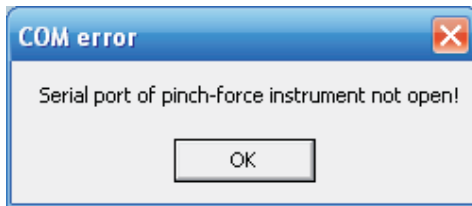
- Select the PC connection mode.
- Connect the instrument with the **USB lead** or connect the Bluetooth device.
- Click Confirm.



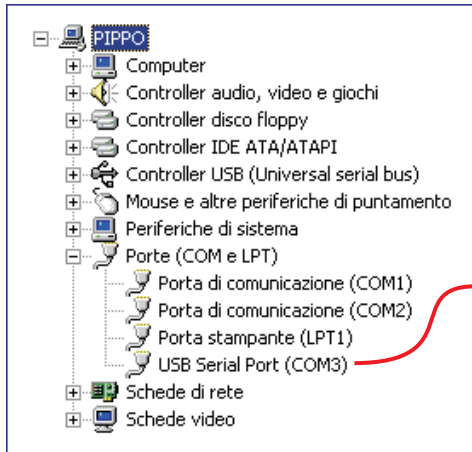
- The following advice, requires that at least one test must be carried out, to correctly set up the calibration date.



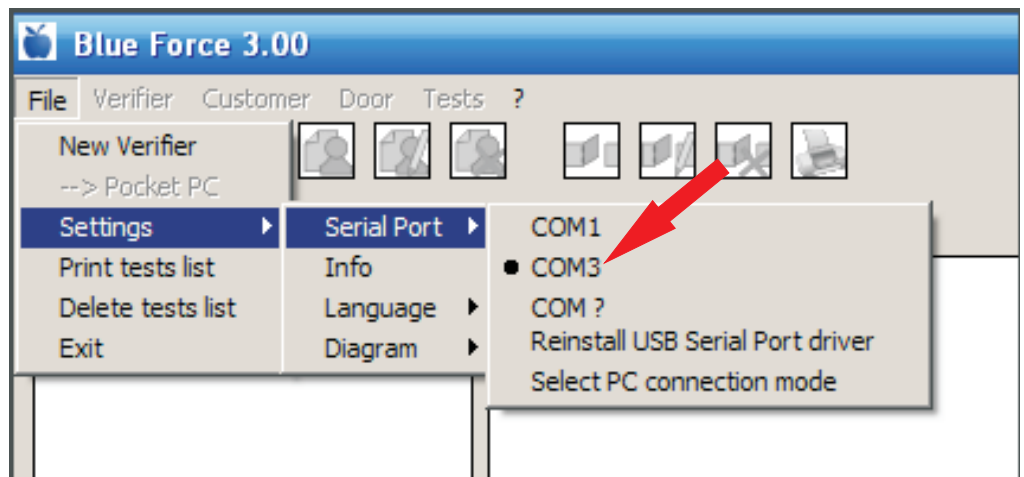
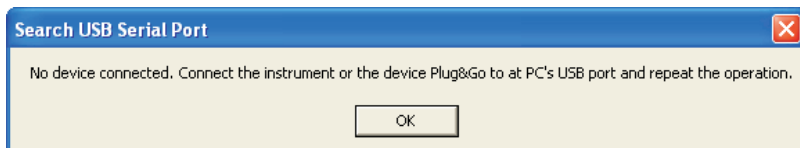
- **If no other messages appear, the instrument or adapter is connected correctly and the software has configured the serial port automatically and is ready for tests to be transferred.**

**RECOGNITION FAILURE – SERIAL PORT ERROR**

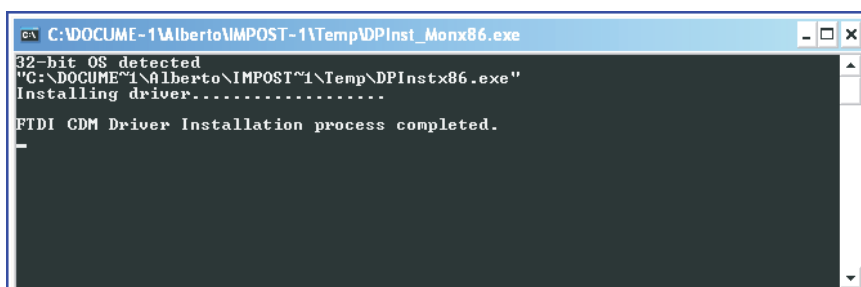
- If the message "**serial port of pinch-force not open!**" appears, the installation procedure described above has not been followed correctly.
- Use the **manual** serial port **configuration** procedure as described below:

**SERIAL PORT RECOGNITION**

- The following procedure can be followed to ensure correct **Serial Port** recognition:
- Open the **Control Panel**
- Select **Device Management**
- Then select Device Manager, It will show the Device Manager tree
- **Connect instrument** or Plug&Go device.
- The **USB Serial Port** will be shown with the relative serial number in the **COM and LPT Ports** hardware group.
- Start the Leonardo Kit software and open the menu File -> Settings-> Serial Port.
- Select the exact **COM** port (a black dot appears on the left)

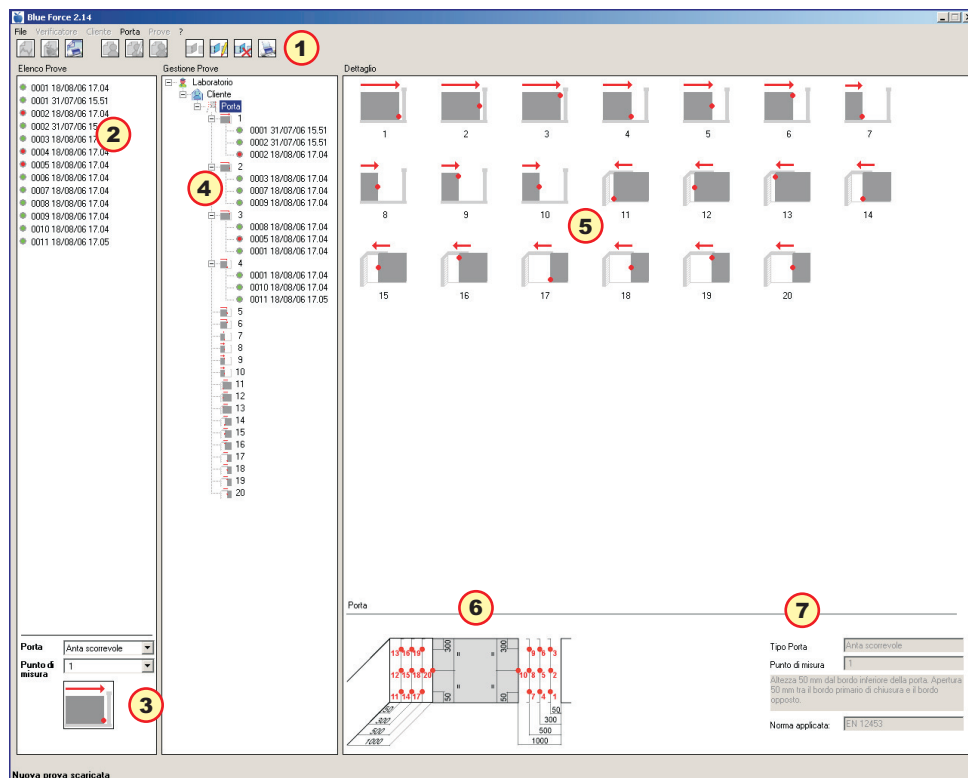
**REINSTALLING THE DRIVERS**

- If the DRIVERS cannot be found, repeat installation from the Leonardo Kit software.
- Start driver installation by giving the "**Reinstall USB Serial Port Drivers**" command from File menu -> Settings -> Serial Port.
- After the driver installation, you must repeat the operations indicated recognition in the previous paragraph.



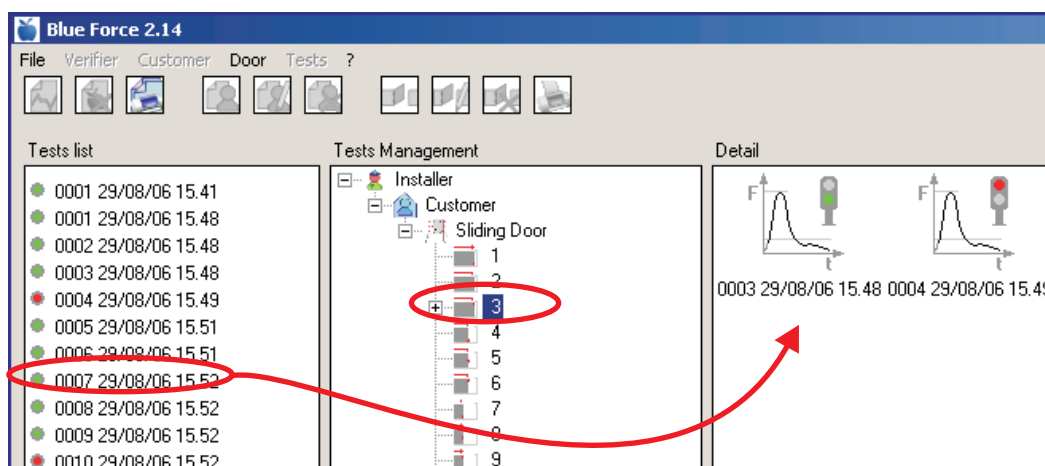
## BLUE FORCE SOFTWARE-MAIN FUNCTIONS

- (1) Main menu and commands: Print, new door, client, etc.
- (2) List of tests transferred from the gauge
- (3) Door typology (to perform the tests on the list straight away)
- (4) Tests moved/copied on point of measurement
- (5) Details of the measuring points and relative heights
- (6) Details of the type of door and the relative measuring distances
- (7) Detailed look at the reference standards



## TEST MEASURE

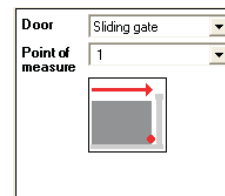
- Prepare the instrument to carry out the test measurement by placing it on a level surface, then switch it on. The instrument is ready to measure after 2 seconds; press down on the head and wait for data acquisition.
- After the first test, press "**Test**", then carry out the next test.
- After carrying out a few tests, connect the **device**, **adapter** or **USB cable**, launch the Blue Force software, then activate the "**SEND**" function on the instrument to send the tests to the software.
- Tests sended to the program, are placed on the top at the left, if there are more than one test, the list increases to the bottom.
- Each test can be identified by the progressive number and the date. A dot will appear beside each test: **green** indicates a positive result, **red** a negative result. The assessment based on the port type (see section on "Door typology selection" on page 9)
- In order to **transfert** the tests, the user must has created at least one **Verifier**, one **Client**, one **Port** and selected a **measurement position**.
- Remark: The creation of a new Client profile, and association of the relative door with it, allows the software to **automatically** establish all the measuring positions and then set the relevant legally-required limits.
- After having dragged the test with mouse, software will ask you to **copy** it or to **move** it in the position of measure.
- Remark: Standard EN 12445 requires at least **three tests** to be carried out per measuring point. The software then calculates the test averages **automatically** (see "print report" on page 12)



## ■ Selection of the type of gate.

- The evaluation of test result, is carried out based on current selection of type of gate (sliding door, hinged door, tilting door, barrier, etc.) and on current measuring point.
- Therefore, this selection determines the validity (or not) of the result shown by Gauge.
- By means of the corresponding curtain-menu, it is possible to select the kind of gate more suitable for the gate to verify.
- To every kind of gate, there are pre-defined all the measuring position, indicated by norms, plus a generic point at limit 400N and another point at limit 1400N.
- Based on the selected gate and the positions, the program shows a picture that indicates the point of measure. The following kinds of gate are available:

- 1-Folding door, 2-Hinged door, 3-Sliding door, 4-Lifting door, 5-Barrier, 6-Tilting door, 7-Single household tilting door, 8-Pedestrian folding door, 9-Pedestrian hinged door, 10-Pedestrian rotating door, 11-Pedestrian sliding door, 12-Single household lifting door

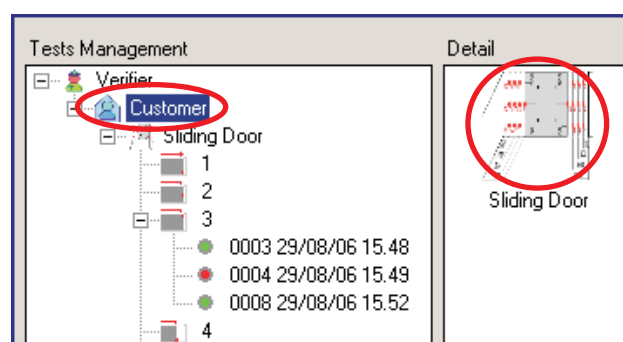


N.B. The result of the measurements is reprocessed automatically by the software when the tests are copied or moved from the **test lists** to a new door created in the **test management** section.

## ■ PRINT REPORT

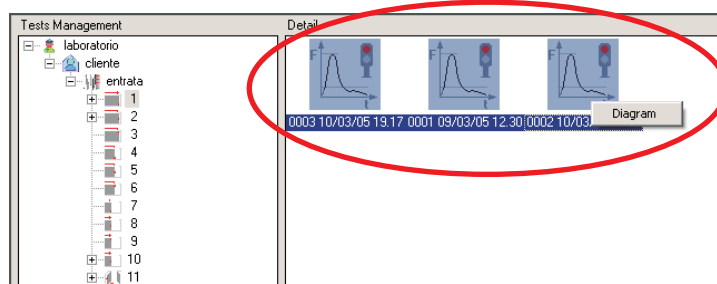
- To print out the report of the tests associated with a **door** (as required by EN 12445), proceed as follows: create the **door** type, enter all the door's characteristics, transfer the tests carried out (at the points listed by the software), and then, finally, **select the door**. You can now view a print preview (to check that all the data entered is correct), then proceed with the printout.

- Remark: The report can be printed in the PDF format in which it is drawn up.



## VIEWING AND PRINTING OVERLAID GRAPHS

- To print out several overlaid graphs (from 2 to a maximum of 5), proceed as follows:
- **Left-click** the mouse to select the desired graphs
- **Right-click** once to view the whole graph and then **again** to enable the print function.

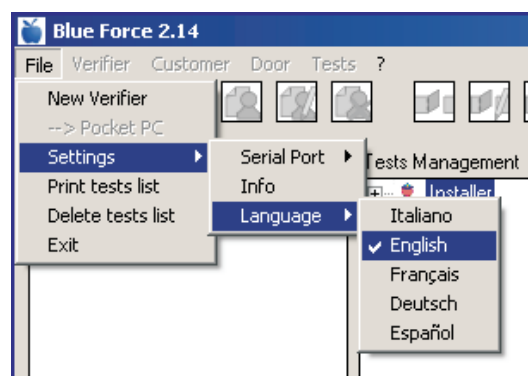


## PRINT TEST LIST

- It is possible to generate a print report of all tests present in section "tests list".
- In the report section "Tests data", are reported only measures Dynamic Force, dynamic Time, Static Force, Final (End) Force, of all tests saved.
- The report sections Verifier Data, Customer Data and gate Identification, are left empty to permit to technician to write them, after printing report.

## INSTRUMENT / LANGUAGE SETTING

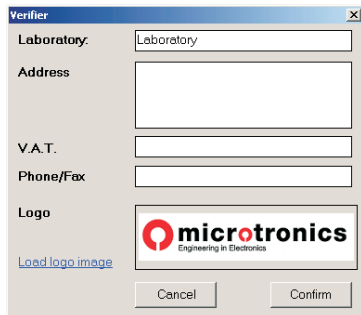
- The language setting can be accessed from the **File, Settings** menu.
- In the menu **File, Settings, Info**: the main specifications of the instrument are displayed: Model, Serial number, Calibration date, firmware version, (Date and Time settings are only found on models equipped with internal clock).



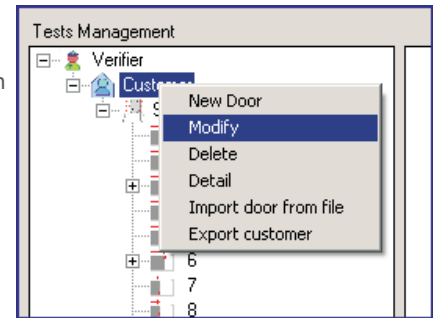
**FURTHER DETAILS (RIGHT-CLICK)**

■ **WARNING!!** The **right** hand button of the mouse can be used at several stages. Use of this button activates short cuts for carrying out important functions such as Print, Delete, Copy, etc.

- Print PDF file / Edit / Erase
- Export / Import Client, Door, File
- Grid, Zoom (on graph only)

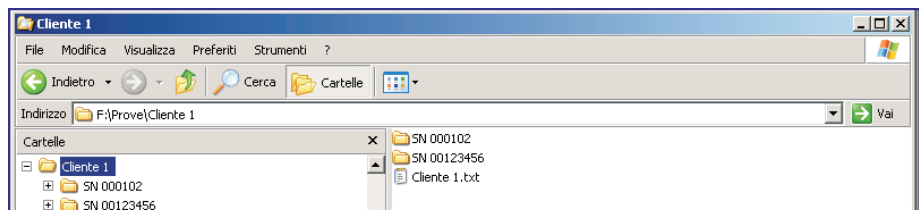
**LOGO SETTING**

- The Modify function allows the Laboratory's name and address etc. to be changed.
- The **Load logo Image** function allows selection of a new image (Logo) for inclusion in the heading of the printed report. This allows printouts to be customised with the user's own corporate / personal logo.

**USE OF IMPORT/EXPORT COMMANDS**

■ The Import/Export commands are helpful for routine "maintenance" of the Blue Force Software; quite simply, they allow data to be exported, filed or entered in a database and then deleted. This way, clients or tests that are no longer used can be removed to "lighten up" the software.

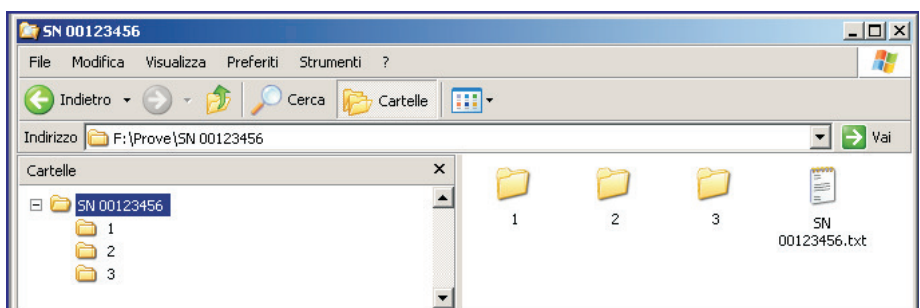
■ **Export client:** this allows all the client-related data to be saved (including the closure types and relative associated tests) in a series of **.txt** files and directories, depending on the number of doors and the measuring points associated with them (with the relative impact test files). Exported client files are organized as follows: one directory [client name] contains one file named **clientname.txt** and as many directories [door name] as there are closure types associated with the client. For a description of the contents of the directories [door name], see the section on the "Export door to file" command.



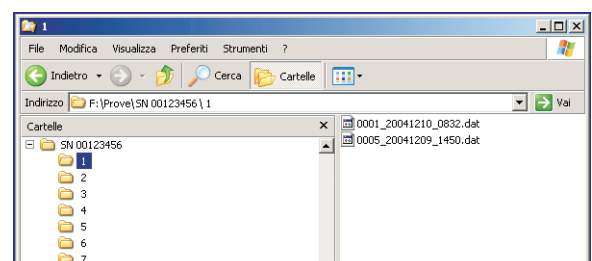
■ **Import client:** this allows a client previously exported using the "Export client" command to be associated with a laboratory/tester (and entered in the database). To import the client, simply open the **clientname.txt** file found in the directory [client name] created with the "Export client" command.

■ **Export door to file:** this allows all the door-related data to be saved (including the relative associated tests) in a series of **.txt** files and directories, depending on the number measuring points associated with the door type (with the relative impact test files).

■ Exported closure type files are organized as follows: one directory [door name] contains one file named **doorname.txt** and as many directories [measuring points] as there are measuring points associated with that closure type.

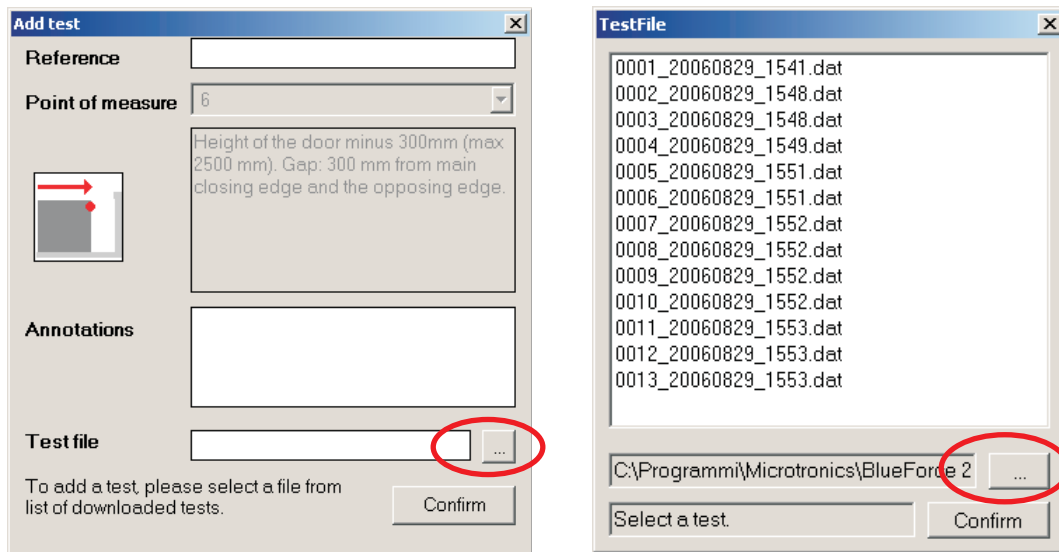


■ The directories [measuring points] contain the **testname.dat** files relating to the associated impact tests.



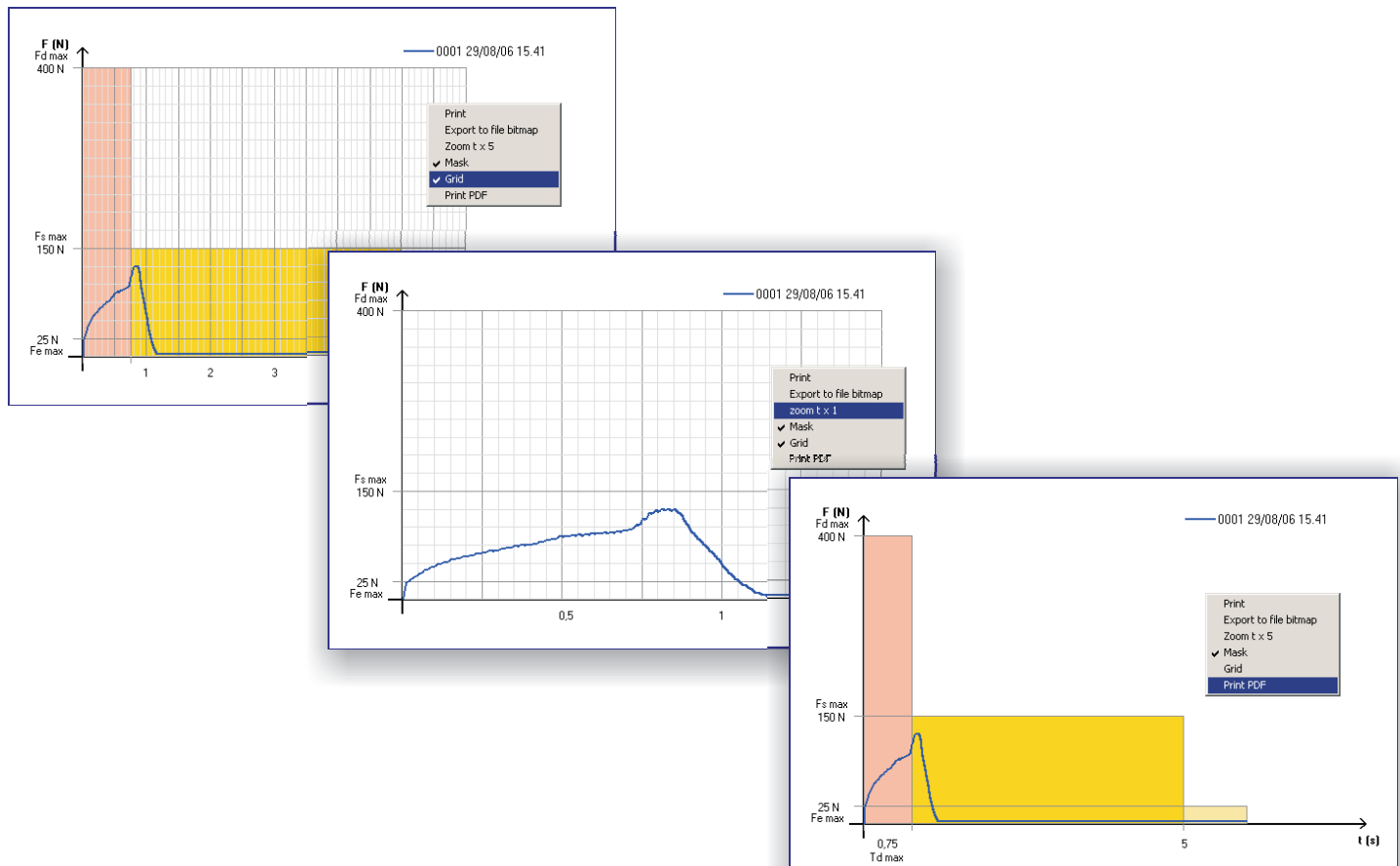


- **Import door from file:** this allows a door exported previously to be associated with a client (and entered in the database). To import the door, simply open the **doorname.txt** file found in the directory [door name] created with the "Export door to file" command.
- **Associate test:** by entering an impact test taken in a certain measurement position using the 'Associate test' menu, you can select the directory containing the file you wish to load. This also gives you the opportunity to select other files, including any that have been wrongly associated with other measuring points or exported using the 'Export client' and 'Export door to file' commands.



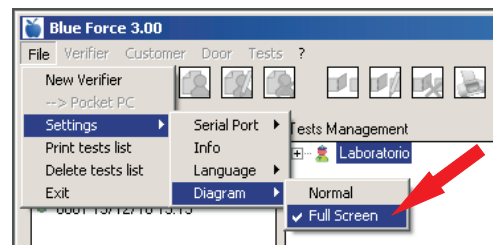
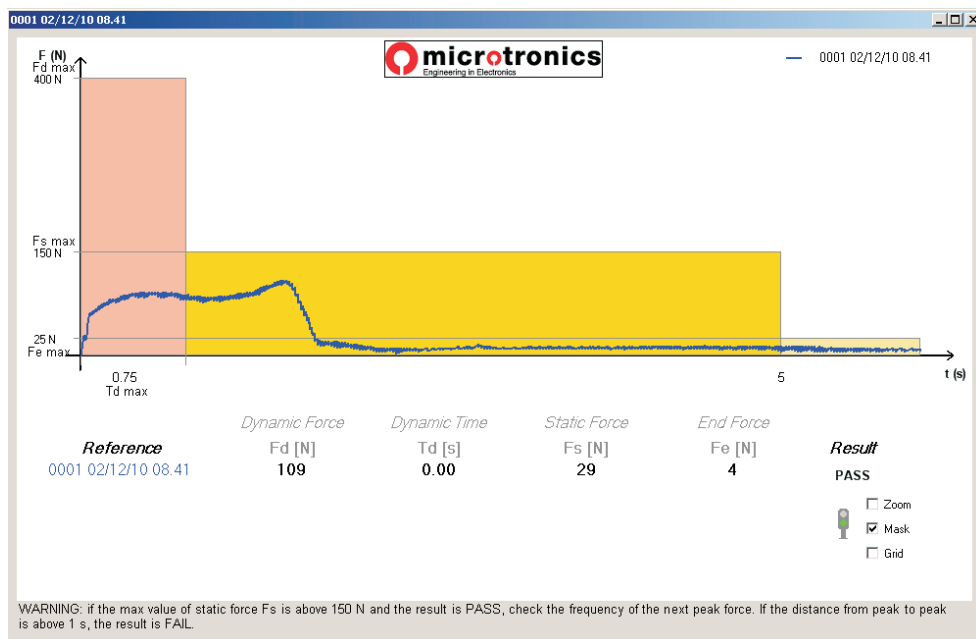
### UTILITIES AND GRAPH DISPLAY

- The graph utilities function allows the user to perform a more in-depth analysis of the impact curve.
- **Export to file:** exports impact test file to **txt file** in a format importable by **Excel** (force – time table).
- **Export to bitmap file:** exports impact force graph to an image file in **bitmap** format.
- **Grid / Template:** the impact force graph can be viewed with an overlaid scaled grid for easier reading.
- **Zoom t x 5:** expansion of the time scale for a better view of the dynamic phase.
- **Print PDF file:** to print out the file in **PDF** format.

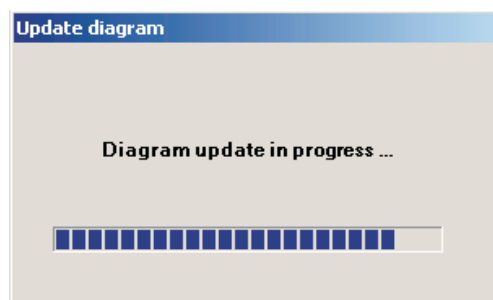


### FULL SCREEN GRAPH MODE

- The File -> Settings -> Graph menu offers a choice of two graph display functions: **Normal and Full Screen**.
- The default setting is Normal, while the Full Screen function allows the graph to be enlarged to occupy the whole of the screen.



- The Full Screen allows even tests **downloaded directly from the instrument** one after the other to be viewed in this mode.
- To activate this function, select the Full Screen option then open the graph of any test and finally start testing with the instrument.



- N.B. this function can also be used with the instrument set in PC ON mode, connected with the USB lead or the Bluetooth adapter.

### Leonardo Kit SOFTWARE (commands)

- **GRAPH:** It shows the course force-time of the selected test, it visualizes also values of: Dynamic Force, Dynamic Time, Static Force, Final Force.
- **ERASE TEST:** Erase definitively the test selected into the section "Tests List" or in the section "Tests Management".
- **NEW CUSTOMER:** This option is active only when a verifier is selected. It permits the creation of a new customer to couple with the verifier. It will open an input form, where it is possible to insert: Name, Address, V.A.T., Phone/Fax.
- **MODIFY CUSTOMER:** This option is active only when a verifier is selected. It opens an input form, where it is possible to insert or modify customer data.
- **ERASE CUSTOMER:** If customer has no gates associated, it shows a confirmation form: if you click on OK, the customer selected will be cancelled. It is not allowed to cancel a customer that has one or more gates associated, proceed first with the cancellation of gates
- **NEW GATE:** This option is active only when a customer is selected. It permits the creation of a new gate associated with the customer. In the input form (reference, address, location, installation date, etc.) it is also possible to select the kind of gate (sliding, hinged, tilting, lifting, barriers, generic). The program generates automatically all measuring points related to the kind of gate chosen for the tests based on european norms.
- **MODIFY GATE:** This option is active only when a gate is selected. It permits to modify the data of the gate (reference, address, location, installation date, etc.).
- **CANCEL GATE:** If the selected gate has no tests associated, it shows a confirmation window: if you press OK the gate will be erased. It is not allowed to erase gates with associated tests.
- **PRINT OF REPORT:** It shows a print-preview of the report with all data of selected gate (verifier data, customer data, instrument data, gate data, tests data). In section "Tests Data" there are written the values measured by instrument (Dynamic Force, Dynamic Time, Static Force, Final (End) Force), limits imposed by norm, and results of all tests associated to the gate.

**Leonardo Kit SOFTWARE (Main menu)**

- **File:**
  - New verifier:** It permits to create a new verifier.
  - Pocket PC:** It establishes the connection to pocket-PC (if presents), showing an additional window on the left, that represents the list of tests saved.
  - Settings:**
    - Serial Port:** It permits to select the serial port, associated with the instrument
    - Info:** It shows instrument data (serial number, calibration date)
    - Language:** to change the software language.
  - Print tests list:** It prints a generic report (without reference to any customer or gate) with all tests present in section "Tests list".
  - Delete tests list :** it erases all tests in "Tests list".
  - Exit:** Close the Leonardo Kit program.
- **Verifier**
  - New Verifier:** It permits to create a new verifier.
  - Modify:** It permits to modify verifier data (name, address, v.a.t.,...)
  - Delete:** It eliminates the verifier selected. It is possible to eliminate a verifier, only if he has no customers associated (first eliminate customers).
  - Detail:** it shows data of selected verifier (name, address, v.a.t.,...)
  - New Customer:** create new customer to associate with the selected verifier.
- **Customer**
  - New:** It creates a new customer, to associate to selected verifier.
  - Modify:** It permits to modify customer's data (name, address, v.a.t....)
  - Delete:** It eliminates the selected customer. It is possible to eliminate a customer, only if he has no gates associated (first eliminate gates).
  - Detail:** It shows data of selected customer (name, address, v.a.t.,...)
  - New gate:** It permits the creation of a new gate associated to the selected customer.
- **Gate:**
  - Modify:** It permits to modify gate data (reference, type, location,...)
  - Delete:** It eliminates the gate selected. It is possible to eliminate a gate, only if it has no tests associated (first eliminate tests)
  - Detail:** it shows data of selected gate (reference, type, location,...)
  - Point of measure: Load Test file:** it permits to associate a test present in section "tests list", to the point of measure on the selected gate. Insert file name in the field "Test file" or select file from the list.
    - Detail:** It shows a description of the point of measure, related to the position selected.
  - Print:** It print a complete report of all tests associated to test selected, with all gate data, customer data and verifier data.
- **Tests:**
  - Graph:** It shows the force-time graph, with limits and measures associated to selected test.
  - Detail:** It shows data related to the selected test (reference, point of measure, test file,...).
  - Modify:** It permits to modify the reference or file associated..
  - Delete:** Cancellation of selected test.

■ **ATTENTION !!!** The software will be periodically updated and improved, anyway the basic functions described into "Panoramic of Leonardo Kit software" will be always the same.

**CARES FOR PROPER USE OF THE INSTRUMENT**

ATTENTION ! Follow the rules of "proper use and safety on work»



ATTENTION ! Don't expose the instrument to high temperature ( $>80^{\circ}\text{C}$ )



ATTENTION ! Don't dip the instrument in any liquid.

**USE OF THE INSTRUMENT**

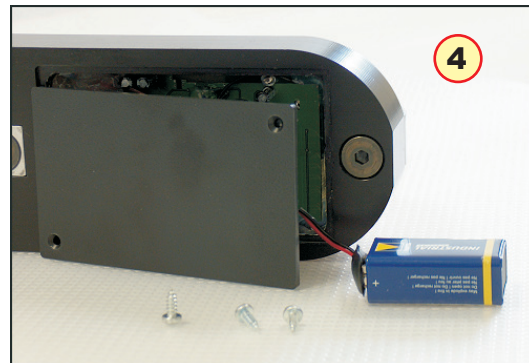
■ The Instrument is composed by:

- (1) Head
- (2) body with electronics and buttons
- (3) wing

■ To replace the battery, remove the cover, by unscrew the two screw (4)

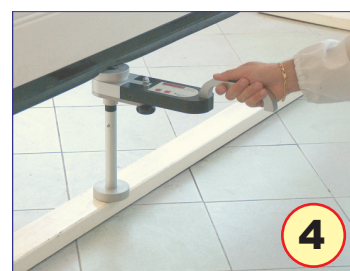
■ It is possible to dismount and to turn upside down the handle, by means of the hexagonal spanner.

■ In place of the handle, you can apply the accessories (optionals)

**ON-SITE MEASUREMENT POSITIONS**

- (1) Position on sliding leaf, instrument with straight accessory (total 30 cm)
- (2) Position on sliding leaf, instrument with straight accessory plus additional element (total 50 cm)
- (3) Position on vertical leaf, instrument with angular accessory plus additional element (total 150 cm)
- (4) Position on vertical leaf with straight accessory (total 30 cm)

■ N.B. Additional guides can be found on the Microtronics web site.





## ACCESSORY ASSEMBLY

### LINEAR ACCESSORY 30-50 cm. (Picture 1)

- Tests based on EN 12445 norm, impose points of measure and distances well defined.
- For 30 cm and 50 cm it is necessary the linear accessory 30-50cm.

#### MOUNT THE INSTRUMENT HOLDER (Picture 2-3)

- Remove the central screw of the handle, by means of enclosed hexagonal key.
- Remove the bolt and insert the holder, making correspond the **spindle** with the **notch hole** in the Instrument body.
- Fix the holder by means of enclosed knob.
- Verify that thread spindle of knob is well screwed to handle.
- REMARK: it is possible to not use the handle, but use the enclosed blind bolt.

#### MOUNT SPACERS (Picture 4)

- For 30cm measures, insert the spacer with head on the Instrument holder.
- Push with strenght, and then turn the spacer following the joint.
- If necessary, add the additional spacer for 50cm measures.

#### JOINT ACCESSORIES (Picture 5)

- To assemble accessories and spacers correctly, it is necessary to insert with strenght the tube with **spindle** aligned to reference **notch**, and then turn of 180° to insert the joint secur-lock.

#### ANGULAR ACCESSORY (Picture 6-7)

- To assemble correctly the angular accessory, it is necessary to insert the element with **ring** terminal into the holder with screw and blind bolt.
- Attention! The four washers must be equally divided, **two** on the **right** and **two** on the **left** of the ring element.
- To use the angular accessory, it is necessary to fix The Instrument with the holder and the enclosed spacers (1,25m. or 0,60m), and then press the stirrup on the floor with a foot, while supporting the tube of spacer with an hand.



1



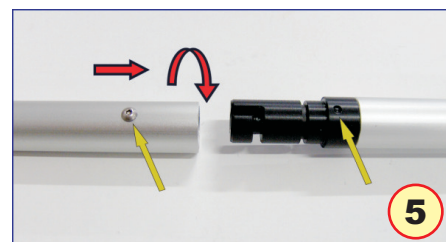
2



3



4



5



6

7

## INFORMATIVE APPENDIX (questions and answers)

■ Below, there are listed the most common questions, asked by technicians. For closer examination, please refer to norms EN 12453 and EN 12445.

■ Briefly, what does the **EN 12453** norm speak about?

☞ The EN 12453 norm "Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Requirements" describes in details the risks related to safety of automatic closures, and fixes the limits of crushing force, both amplitude (Newton) and duration (seconds).

■ Briefly, what does the **EN 12445** norm speak about?

☞ The EN 12445 norm "Industrial, commercial and garage doors and gates - Safety in use of power operated doors - Test methods" describes in detail the tests to be carried out to verify the safety of various kind of automatic closures, from sliding doors, to barriers. Besides, it describes technical data of the force measuring instrument, and underlines that it is necessary to carry out the periodic calibration, at least one time for year.

■ What are the responsibilities of technician?

☞ From 1th May 2005, it will become mandatory to carry out the CE marking on automatic doors and gates. The technician shall : 1) Compile the Technical Dossier, with enclosed force measures reports; 2) Subscribe the CE Declaration to be delivered to customer; 3) Put, in indelible manner, the CE mark on the automatic door.

■ Is it necessary to use **accessories** ?

☞ During the use, instrument has to be holded up, in a way to not alter tests results. There are some easy measures, where you can use the instrument with original handle, in other measure, it is necessary the use of proper extensions. For example, in barriers, the extension must be fixed to ground, and must have the possibility to adjust height and tilt.

■ How the resultant graph is to be interpreted?

☞ The resultant test graph, represents the diagram of Force (amplitude expressed in Newton, on vertical ax) versus Time (duration expressed in seconds, on horizontal ax).

The interpretation of diagram in Blue Force program, is easy and immediate: the main meaning is that the trace must be interely contained into the colored mask. Anyway, to be able to carry out adjustments on the gate installed, it is very important to understand the meaning of parameters measured. Let's look at force diagram: for convention, there are three separated areas:

**A) IMPACT** –"Dynamic period": it shows the force course during the instants of first contact, and represents the energy released in the initial impact, related to speed and mass of gate.

The parameters measured are:

**Fd** : maximum peak value of force (N), based on the kind of gate and position, it shall be less than 400N or 1400N.

**Td** : duration of force peak (s) must be less than 0.75s.

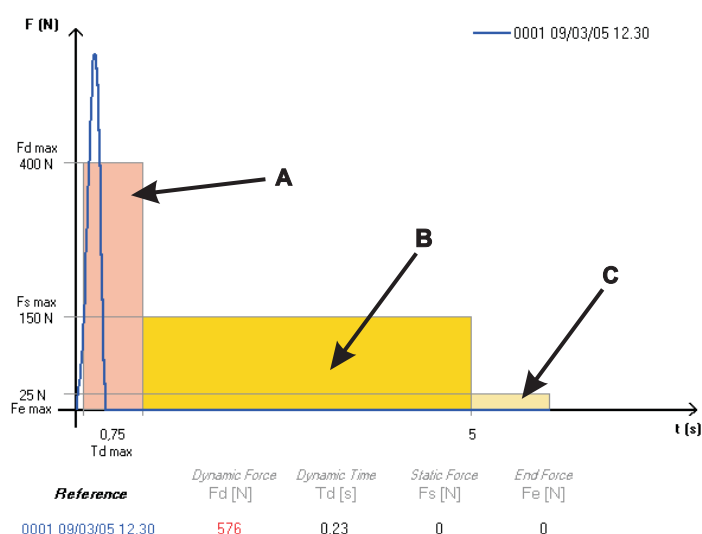
**B) CRUSHING** –"Static period": it represents the force course, after the first impact. It represents the crushing force generated by motor, that insists to push.

The parameters measured are:

**Fs** : it is the average value of static force, normally it must be less that 150N.

**Fe** : it is the value of final force, measured after 5 seconds from the first contact.

**C) END PHASE**: after 5 seconds from the first contact, the residual force must be always less or equal than 25N.





## INSTRUMENT MAINTENANCE

- If possible, always put away the Instrument into its suitcase.
- To replace the 9V battery, you have to proceed in the following manner: unscrew the rear lid, remove the clip-connector from the exhausted battery, replace the battery with an equivalent one (high capacity Alkaline), and close again the lid with screws, paying attention to embed correctly the battery on the lid seat.
- In the case of intensive use, clean the Instrument with a lightly wet cloth.
- Don't try to remove the lateral screws, and the screws on the aluminium head, because they are internally blocked.
- EN 12445 norm, says that instrument must be re-calibrated at least one time for year. Calibration must be carried out only by producer's laboratory. Microtronics suggests to calibrate the instrument every time it had to suffer a fall or a bump, transversal to normal direction of force measuring.

## WARRANTY CONDITIONS

- The hardware of the product is guaranteed 24 months from date of purchase. During this period, we replace or repair the piece found to be defective from the origin, free of charge, only if customer can show the purchase receipt. Products to be repaired, have to be send at charge of customer. Warranty does not cover:
  - Any aesthetical imperfection, dued to normal production process.
  - Normal consumption of the instrument.
  - Damages caused by inadequate or improper repairs, carried out by not authorized people.
  - Damages caused by negligence, accidents, modifications, or other use, different from what is written in this manual.
  - Possible bugs (imperfections) of software, and/or incompatibility with PC or other external peripherals.
  - Damages dued to transport.

## RESPONSIBILITY

- REMARK: The indication of NEGATIVE RESPONSE / POSITIVE RESPONSE returned by instrument and/or by software, must be considered merely a suggestion.
- Microtronics Srl is not responsible in any way, for any possible damage or injury to people/things, that may come from wrong interpretation of tests results, or from improper use of the instrument.

## SOFTWARE USER LICENCE

- It is granted only one user licence for the software "Blue Force", valids for installation on only one PC and one POCKETPC.
- All programs and files enclosed with MICROTRONICS products, belongs to their producers and are copyright protected.
- It is not allowed to copy, modify, disassemble, even partially, software provided with MICROTRONICS products

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## RAEE Refuses Norm about electric and electronic equipments

- In European Community, this label means that this product has not to be disposed together with domestic refuses. It must be put in a suitable plant, which must be capable to carry out recovery and recycling.



# DICHIARAZIONE DI CONFORMITA' CE



## ■ IL PRODUTTORE

Microtronics S.r.l.  
Via Schiavonia, n° 93 - 31032 Casale sul Sile - Treviso (Italy)

## ■ DICHIARA DI SEGUITO CHE IL PRODOTTO:

Tipo: Strumento misuratore di forze d'impatto per chiusure elettriche  
Modello: BlueForce Smart art. 50V001B2 e varianti (950223, P111386, P111387, 001CAMETEST)

## ■ RISULTA IN CONFORMITA' A QUANTO PREVISTO DALLE SEGUENTI DIRETTIVE COMUNITARIE:

(Comprese tutte le modifiche applicabili)

DIRETTIVA EMC: 2004/108/CE  
DIRETTIVA R&TTE: 99/05/CE

## ■ INOLTRE DICHIARA CHE SONO STATE APPLICATE LE SEGUENTI NORME TECNICHE:

(Comprese tutte le modifiche applicabili)

EN 60950-1:2006: Apparecchiature per la tecnologia dell'informazione - Sicurezza  
EN 55022:2006: Apparecchiature per la tecnologia dell'informazione - Caratterizzazione disturbi radio  
A1:2007: Limiti e metodi di misura  
EN 55024:1998: Apparecchiature per la tecnologia dell'informazione - Caratteristiche di immunità  
A1:2001, A2:2003: Limiti e metodi di misura  
EN 301 489-1-17 V1.9.2 (2011-09) V2.2.1 (2012-09): Compatibilità elettromagnetica e spettro delle radiazioni elettromagnetiche (ERM)  
Compatibilità elettromagnetica (EMC) per dispositivi radio e servizi  
EN 300 328 V1.8.1 (2006-06) art.3.2: Compatibilità elettromagnetica e spettro delle radiazioni elettromagnetiche (ERM) per dispositivi di trasmissione dati operanti nella banda ISM 2,4GHz  
EN 62479:2010: Compatibilità di apparati elettrici ed elettronici di bassa potenza con i limiti dell'esposizione umana ai campi elettromagnetici (10MHz-300GHz)  
EN 61326-1: Requisiti EMC per strumentazione elettronica da laboratorio per misure e controlli.  
EN 61000-4-2/3/4/6: EMC immunità ai disturbi: metodi di prova  
EN 61000-6-1/3: EMC emissioni: metodi di misura

LUOGO: Casale sul Sile (TV)

DATA: 27 marzo 2015

NOME DELLA PERSONA INCARICATA: Ing. Fabrizio Montagner

FIRMA:

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 microtronics s.r.l.  
 Via Colonne 2  
 31032 CASALE SUL SILE (TV)



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