

# FAAC



## INSTRUCTIONS FOR USE

## THANK YOU!! To have chosen a **SAFE ZONE**

**Safe Zone** is a tool for measuring the impact forces of automatic doors, gates, barriers, tilting doors etc. It is intended for use by qualified personnel; it is also mandatory to follow the rules of use and maintenance indicated below.

### BEFORE STARTING...

**NOTE:** For older instruments (with a serial number lower than 05112), some features are not available, it is recommended to update the firmware of the force tester, as shown on page **13**. For technical support email at: [blueforce@microtronics.it](mailto:blueforce@microtronics.it).

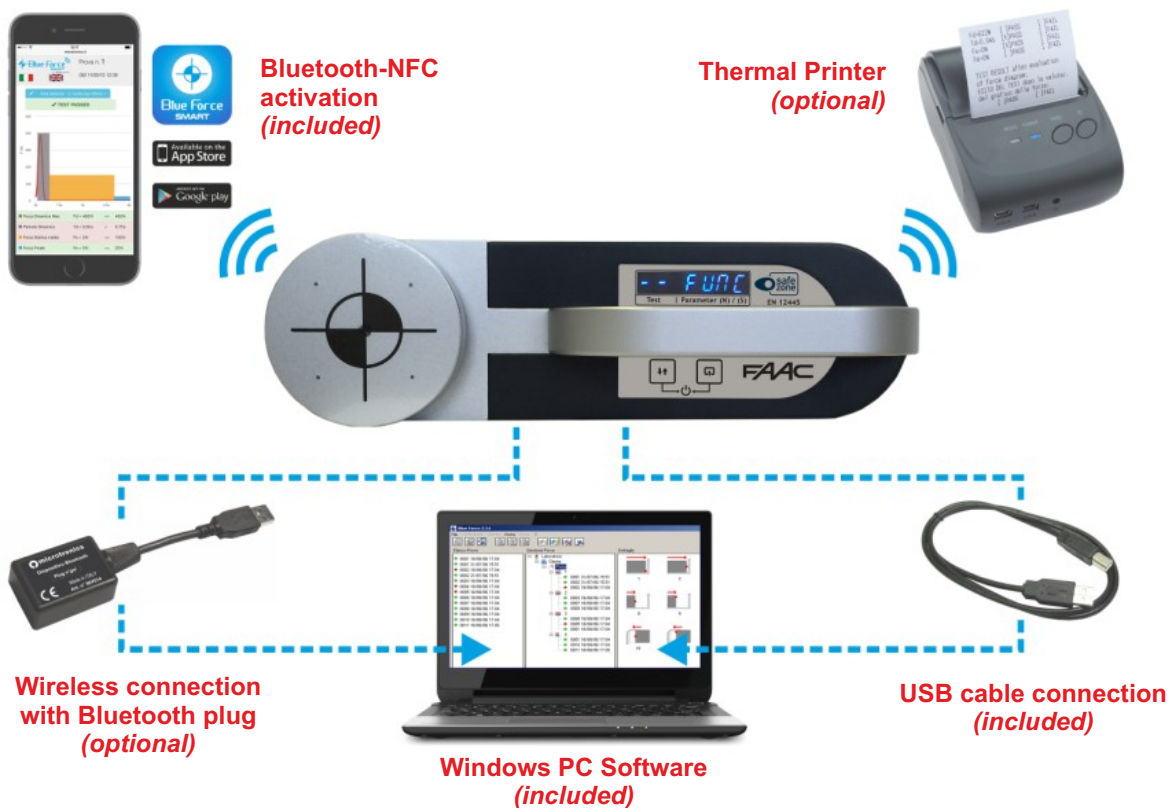
### INDEX

■ Safe Zone specifications	Page 1
■ Initial Use - Instrument Functions	Page 2-3
■ Instrument Functions - Detail	Page 4-5
■ Using the FTP Thermal Printer	Page 6
■ Smart App Installation - Sending tests	Page 7
■ Smart App functions - App Use	Page 8
■ Installation - BlueForce Software for Windows PC	Page 9
■ Setting up the Driver and starting the Blueforce Software	Page 10
■ Manual setting of the serial port	Page 11
■ BlueForce Software - main functions	Page 12-16
■ BlueForce Software - Detail	Page 17
■ Using the Safe Zone Instrument	Page 18
■ Fitting Accessories	Page 19
■ Information Annex - EN12453	Page 20
■ General Provisions	Page 21
■ Technical data - CE certification	Page 22

### SAFE ZONE SPECIFICATIONS

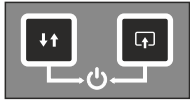
Force measurements taken using **Safe Zone** are stored and displayed on screen, after which the user can transfer stored measurements to the BlueForce software using the **USB cable supplied**, or in wireless mode (using the accessory plug'n Go!). The **BlueForce software** enables management of tests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

The **NFC** and **Bluetooth** hardware features allow the force tester to directly send the tests data to a smartphone or tablet. Through the specific **Blueforce App** you can view the graphs and set the measurement parameters.



**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.



- **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



- Left button
  - press (**short**) = scroll forward/back through stored tests
  - press (**long**) = change direction of scrolling forward/back through tests



- Right button
  - press (**short**) = scroll through the options of individual tests
  - press (**long**) = select and confirm the current action

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



- **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!



- **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.



- **TEST:** With the device resting on a surface, apply a FORCE with your hand for about one seconds, then release.



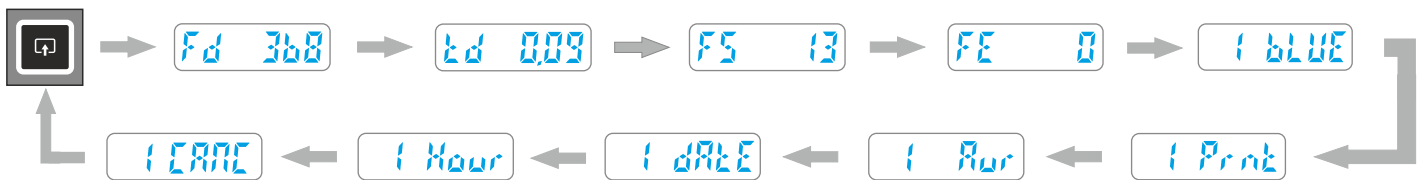
- **TEST ACQUISITION:** when the instrument tip detects a force exceeding the minimum threshold, the test acquisition process is started (6 sec.). The display shows the test number and the letter "A" followed by 3 dashes.



- **SEND TEST:** After acquisition, dots will appear at the bottom of the display (scrolling towards the right) to indicate that the test is being sent to the mobile device (if there is one). For use with mobile devices see on page 7.



- **READING TEST IN MEMORY:** the occupied memory slots are indicated with the relative number, without any dashes to the right. Press the right button briefly in quick succession to scroll through the parameters and other functions on a rotational basis: **Fd** -> **td** -> **FS** -> **FE** -> **bLUE** -> **Prnt** -> **Aur** -> **dAtE** -> **Hour** -> **CANC**, see example below.



**Fd** : Maximum peak value of force (N)



**td** : Duration of force peak (s)



**FS** : It is the average value of static force



**FE** : It is the value of final force, measured after 5 seconds from the first contact

1 BLUE

**bLUE:** Give a **long** press on the **right** button to send the test parameters to the mobile device with iOS or NFC. See also Sending Memorised Tests on page 7.  
**(NOTE:** this function is not active if the device is connected to the PC via the USB cable).

1 Prnt

**Prnt:** (only for the FTP thermal printer) give a **long** press on the **right** button to send the test parameters directly to the dedicated wireless printer. See also Using the FTP Thermal Printer on page 6. **(NOTE:** this function is not active if the device is connected to the PC via the USB cable)

1 Aur

**Aur:** This function allows the user to select the current test for calculation of the mathematical average of three tests. Give a **long** press on the **right** button to memorise the selection; see also Arithmetical Average of Test Values on page 5.

1 dAtE

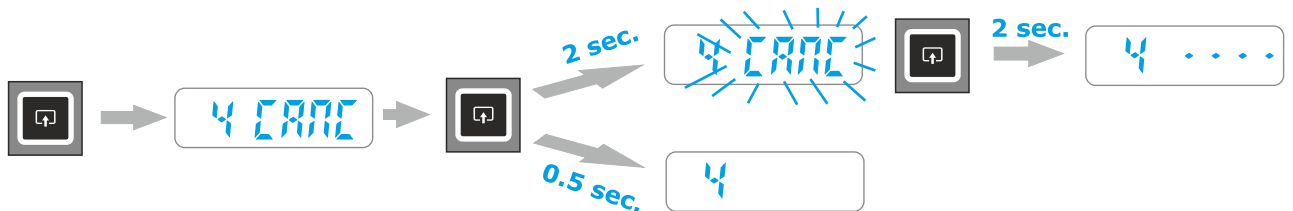
**dAtE:** Test DATE function Give a **long** press on the **right** button to view the DATE.

1 Hour

**Hour:** Test TIME function Give a **long** press on the **right** button to view the TIME.

1 CAnC

**CANC:** **DELETING A SINGLE TEST:** 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.



■ **NOTE:** To quit the **Fd** -> **td** -> **FS** -> **FE** -> **bLUE** -> **Prnt** -> **Aur** -> **dAtE** -> **Hour** -> **CANC** functions, press the **left** button briefly; otherwise, the integrated time-out system will return to its original position after 5-6 seconds.

**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.

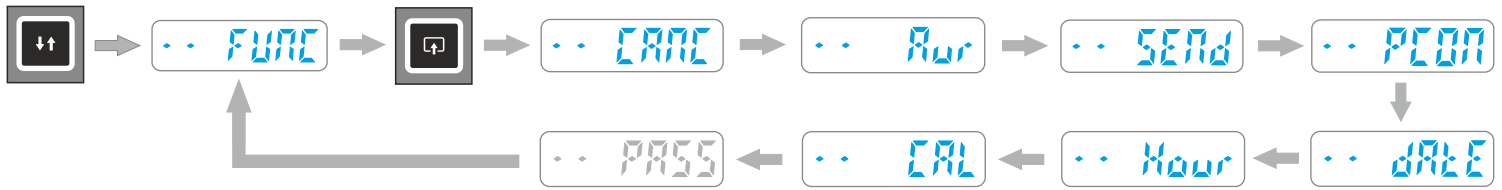
■ The tests saved are indicated only with a progressive number **1, 2, 4** whereas the tests erased or empty, are shown with the number and four dashes (**3 ----**) to indicate that the test is erased or empty.

■ **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.*

■ **FUNC SPECIAL MENU:** When scrolling through the memorised tests, users can select the **FUNC** special menu, present between the first and last tests. This menu contains several functions: **CANC**, **Aur**, **SEND**, **PCON**, **dAtE**, **Hour**, **CAL**, **PASS** (the last one is present only if the bluetooth and NFC functions are disabled, see next section for detail)

■ To access the "sub-functions" move to **FUNC**, then briefly press the **right** button to "rotate" the "sub-functions»



### DETAILS ON INSTRUMENT FUNCTIONS

**· · CANC** ■ **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. (see details on page 5)

**· · 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.

**· · PCON** ■ **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 PCON mode, press the **right** button for 2 seconds.; the text **PC ON** flashes on display; press the **right** button again for 2 seconds (see details on page 5).

**· · 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.

■ **NOTE:** Date and time setting is only available for models with internal clock (not Upgrade).

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

**· · PASS** ■ **PASS:** (Use this function for force testers with serial number lower than 05112). Go to the **PASS** function, then press the **right button for 2 sec.** to entry in the "insert code" mode, the first figure of the code flashes. Briefly press the **left** button to increase the first number 1->2->3 ecc. To go to the next figure briefly press the **right** button then repeat this operation for all the four numbers. At the end, to confirm the code and quit, **press the right button for 2 sec.**, if the code is correct, the display will show the writing "YES"

### MORE DISPLAY MESSAGGES

**· · 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 (see details on page 18).

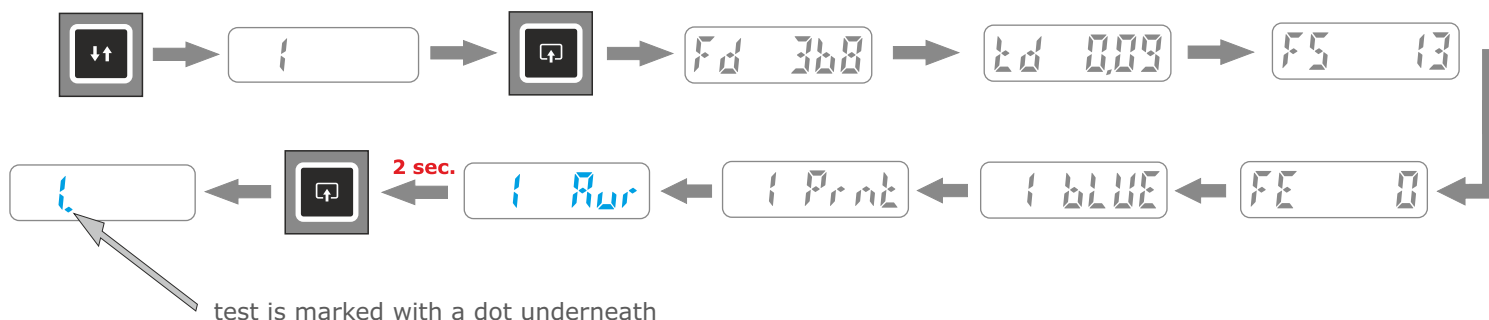
**· · CAL** ■ **CALIBRATION:** This alert appears a month before the calibration due date; if more than one year (Calibration validity period) has passed, it will appear whenever the device is switched on. The alert disappears after a few seconds

**· · FULL** ■ **MEMORY TEST:** If the device has used up all the memory locations available, 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.

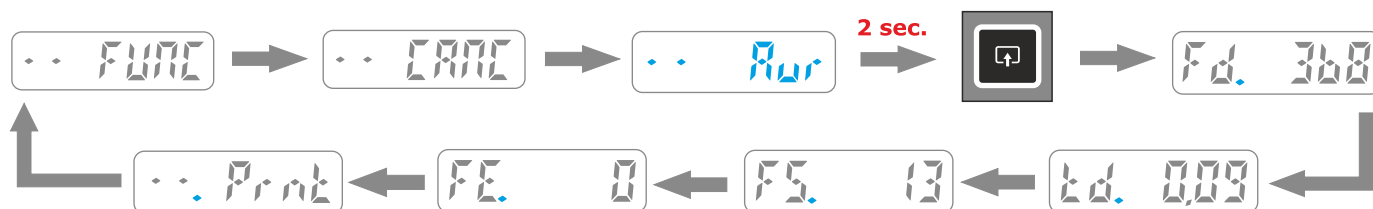
**· · Err2** ■ **ERROR CHECK:** if it occurs any internal errors, the display shows **Err1** or **Err2** etc. until any key is pressed, WITH BLUEFORCE SOFTWARE: verify the setting of the serial port (see page 11) and check that either the USB CABLE, the Bluetooth DEVICE, is inserted in the USB port correctly.

**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.



- The average parameter reading function **Aur** can only be accessed if at least one test has already been selected.
- NOTE: After the average parameters have been read, an additional function (**.Prnt**) allows them to be printed (see detail on page 6)
- 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).

**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 9 and 10).
- 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 little blue square on the left, together with the advices : Acquiring, Sending, etc.



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



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



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



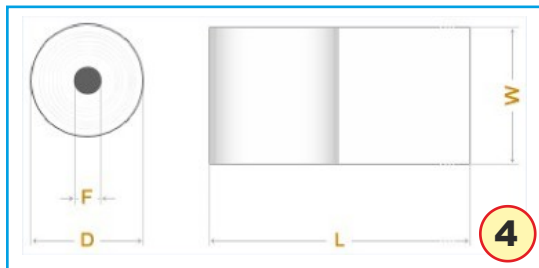
- **NEGATIVE RESPONSE:** In the case of negative response to the test carried out, the display shows (**NO**).



- **DATA TRANSMISSION FAILED:** If the force tester fails to send the test it will indicate **ERR 2-3**; check that the USB cable is connected or see page 11 "Serial port Setup ". N.B. the ERR indication remains continuously until the press of any button.

**TEST VALUE PRINTOUT**

- Test printout is possible for every **single test** memorised, after reading of the parameters: **Fd -> td -> FS -> FE -> bLUE -> Prnt -> Aur -> dAtE -> Hour -> CANC.** Or from the **FUNC** menu after calculation of the mathematical average (if set): **CANC, Aur, SEND, PCON, dAtE, Hour.**
- **FUNCTIONS:** The print function offers two layouts: Short - **Shor** and Long - **LONG**, (see example below)
- **PRINT:** To perform the printout, switch on the printer by holding down the on/off button for at least 2 seconds (the blue power light comes on).
- After this, select the **Prnt** function on the Device by holding down the **right** button and then choose the type of printout: Short (**Shor**) or Long (**LONG**) by giving a short press on the right button.
- Now give a **long** press on the **right** button on Shor or LONG to start the printout.
- **NOTE:** Printing is disabled if the Device is connected to the PC via the USB cable



- (1) FTP thermal printer with internal Li-ion battery.
- (a) ON/OFF button  
 (b) Paper FEED button  
 (c) POWER light:  
 - Steady blue = on  
 - Flashing blue = stand-by  
 - Flashing red = no paper
- (2) Power supply, battery charger  
 (3) Thermal printing paper (load with the edge face-up, as shown in the picture)
- (4) Paper type: NOTE: order original paper or rolls of thermal printing paper in the following size:  
 - **W** = 58 mm.  
 - **D** = max. 40 mm.  
**NOTE:** If printed characters are faint, the battery should be recharged.

Long - LONG

Short - Shor

```

*****
FORCE TEST REPORT
BlueForce s.n.:4000
Calibration exp./scad.: 01/01/15

.....
COMPANY NAME/DITTA ESECUTRICE
.....

.....
CUSTOMER/CLIENTE
.....

.....
DOOR IDENTIFIC./DESCRIZ. PORTA
.....

.....
REMARKS/NOTE
.....

.....
N.TESTS ATTACHED/N.PROVE ALLEG.
.....

NORM.: [ ]EN12445 [ ].....

OVERALL TEST RESULT:
ESITO GLOBALE DELLA PROVA:
[ ]PASS [ ]FAIL

01/03/16 15:45
.....
DATE(d/m/y)TIME/DATA ORA
.....

.....
OPERATOR SIGN/FIRMA OPERATORE
.....

*****
BlueForce by Microtronics Srl
REPORT OF FORCE TEST N.1

01/01/15 00:02
.....
DATE(d/m/y)TIME/DATA ORA
.....

.....
VERT.DISTANCE/DISTANZA VERTIC.
.....

.....
HORIZ.DISTANCE/DISTANZA ORIZZ.
.....

Reminder/promemoria EN12445:
Fd: <400N <0.5m; <1400N >0.5m
Td<0.75s; Fs<150N; Fe<25N

Fd=937N [ ]PASS [ ]FAIL
Td=0.10s [X]PASS [ ]FAIL
Fs=0N [X]PASS [ ]FAIL
Fe=0N [ ]PASS [ ]FAIL

TEST RESULT after evaluation
of force diagram:
ESITO DEL TEST dopo la valutaz.
del grafico della forza:
[ ]PASS [ ]FAIL
    
```

Device serial number and calibration date.

Enter Company Details, Customer, Type of door.

Enter number of tests in printed annex.

Selection of standard applied, EN12445 or other standard.

Enter outcome (x)

Current date and time.  
(entered automatically only in SMART devices)

Enter signature.

Date and time of memorised test.  
(entered automatically only in SMART devices)

Enter measuring point height.

Enter measuring point length.

Reminder of measuring limits in relation to distance.

Entry (x)  
 - PASS (reading correct)  
 - FAIL (reading incorrect)  
**NOTE:** enter the (X) with reference to the limits and distance relating to the closure being tested.


Entry (x) of final outcome of the individual test.

**INSTALLING THE BLUEFORCE SMART APP**



- Install the **BlueForce Smart App** in your device (search in the Apple Store/Google Play -> BlueForce Smart).
- **Minimum requirements of your mobile device:** iOS Apple from ver. 9.0, Android Software from ver. 5.0, Bluetooth, active connection to Internet.
- For technical support email at: blueforce@microtronics.it.

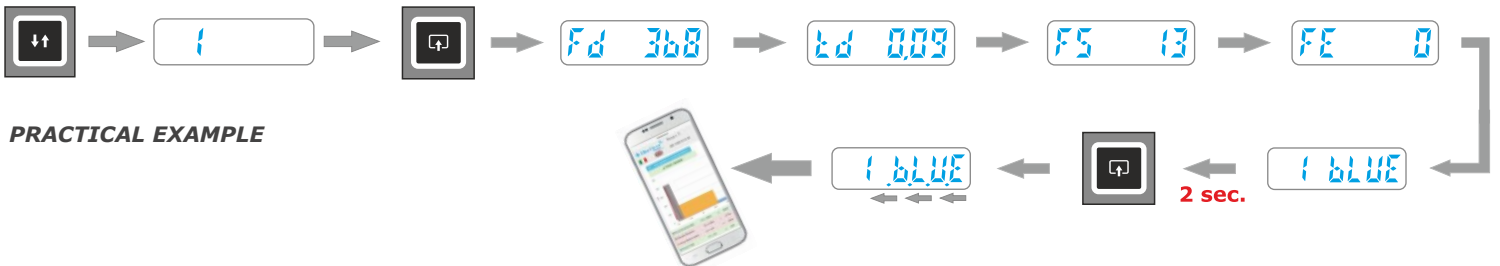
**SENDING TESTS- (BlueForce Smart APP Bluetooth)**

- Activate the **Bluetooth interface** via the relative drop-down menu or in the settings menu of your mobile device.
- Start the BlueForce Smart **App**.
- Do a test with the force tester 
- After 6 seconds' acquisition, the test is sent to the mobile device (scrolling dots will appear on the display to indicate that the test is being sent to the device).
- To use the APP read the paragraph "BlueForce App Smart functions".



**SENDING SAVED TESTS - (BlueForce Smart APP Bluetooth)**

- Activate the **Bluetooth** interface via the relative drop-down menu or in the settings menu of your mobile device and start the BlueForce Smart **App**.
- In the force tester, select the memory location that you would like to send (for example, no. **1**) by briefly pressing the **left** button.
- Premere brevemente il tasto **destra** per accedere alla lettura dei parametri, continuare con il tasto **destra** fino alla funzione **BLUE**
- **Briefly** press the **right button** to access the parameter reading function and continue pressing the **right** button until selecting the **BLUE** function.



**PRACTICAL EXAMPLE**

**SENDING TESTS - (with NFC SYSTEM, without App)**

- Every test performed with the force tester is automatically sent to the **NFC system**, meaning that the latest test acquired is always available.
- Activate the **NFC interface** in your mobile device.
- Perform a test with the force tester; after 6 seconds' acquisition, the test is sent (scrolling dots will appear on the display to indicate that the test is being sent).
- Place the **back of the smartphone** on the **back of the force tester**, on the area marked with the **NFC symbol**; after a few seconds the test will be displayed on the mobile device.
- To use the APP, read the paragraph "BlueForce Smart App functions".



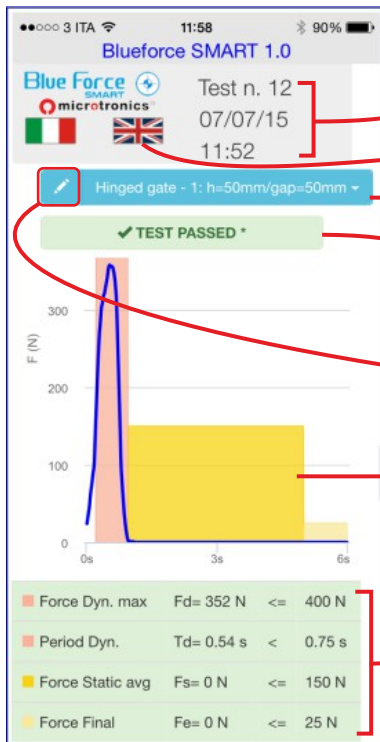
**SENDING SAVED TESTS - (with NFC SYSTEM, without App)**

- Activate the **NFC interface** in your mobile device, then select in the force tester the test that you would like to send (as indicated in the practical example on the top).
- Place the **back of the smartphone** on the **back of the force tester**, on the area marked with the **NFC symbol**; after a few seconds the test will be displayed on the mobile device.

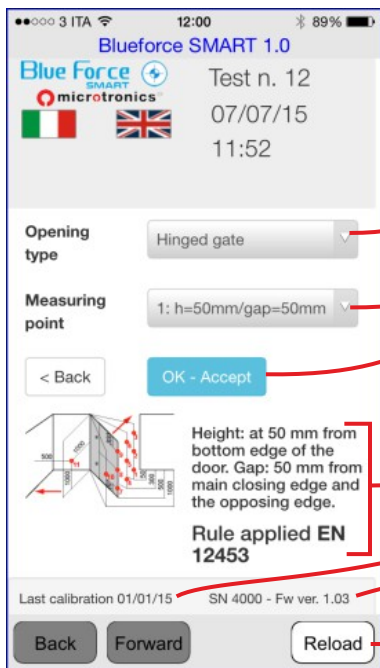


**BLUEFORCE SMART APPLICATION FUNCTIONS**

- After sending the required test with the Safe Zone 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.

**BLUEFORCE SOFTWARE FOR WINDOWS PC - DOWNLOAD**

- Web link to download the **BlueForce software for Windows PC**: [www.microtronics.it/attivazione\\_faac.html](http://www.microtronics.it/attivazione_faac.html)
- To download **updates**, follow the instructions on the page: [www.microtronics.it/lang1/download\\_area.html](http://www.microtronics.it/lang1/download_area.html)

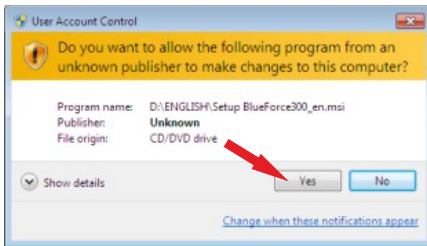
**WARNING !!!**  
 The file is **not harmful** and enables/allows your Browser or Antivirus program to download the file **Setup\_blu\_faac\_en.zip** or **update\_blueforce\_en.zip**

**BLUEFORCE SOFTWARE FOR WINDOWS PC - INSTALLATION**

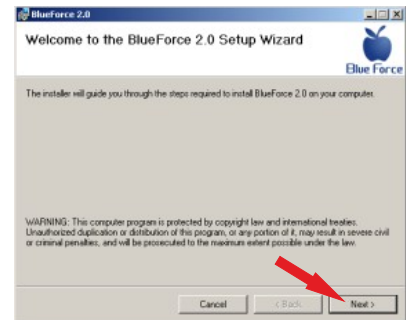
- Download the file **Setup\_blu\_faac\_en.zip**, then extract the two files onto the computer desktop



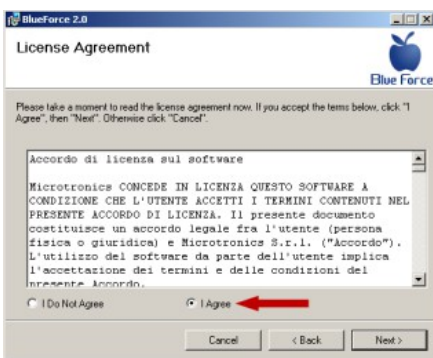
- Run the Setup file and enable installation



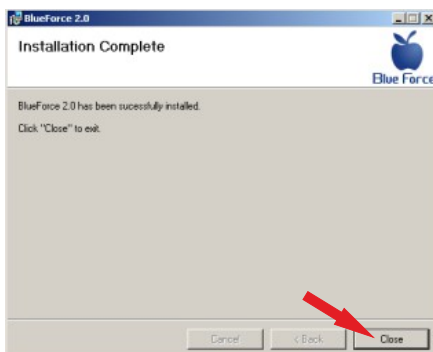
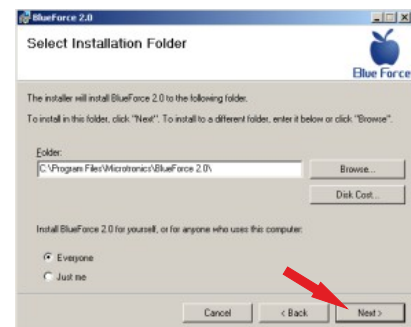
- Proceed with guided **installation of the BlueForce**, click **Continue**



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



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

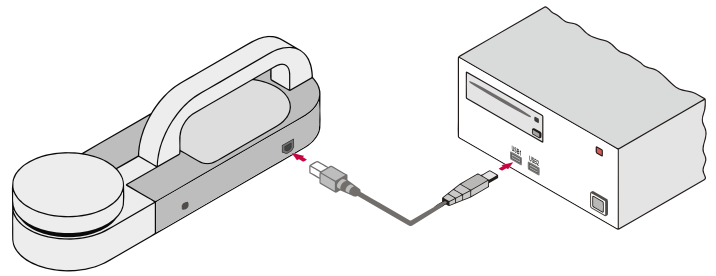


- Click **Close** to end installation of BlueForce

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

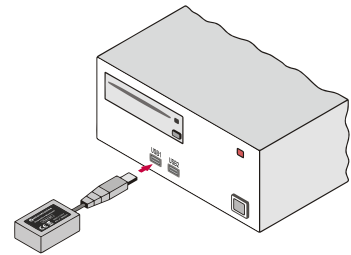
**DRIVER INSTALLATION WITH USB CABLE (supplied)**

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 WITH PC BLUETOOTH DEVICE (optional)**

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



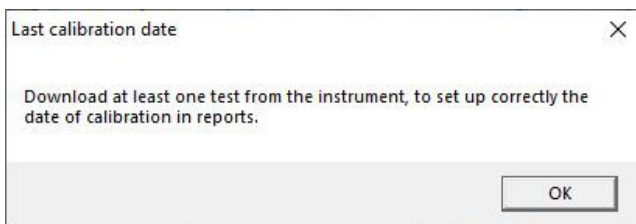
- **Wait a few seconds** for the Drivers of the new Hardware to be installed (see pop-up in the applications bar)



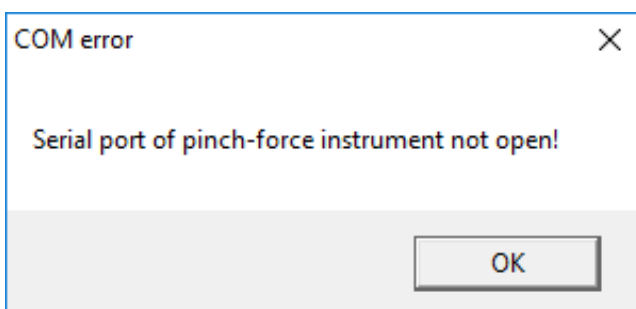
**WARNING !!!**  
If the computer has more than one USB port, always remember to insert the Device, Adapter or USB cable into the **same one**.

**STARTING THE BLUEFORCE SOFTWARE (Windows PC)**

- Connect the instrument with the **USB lead** or connect the Bluetooth device.
- Run the BlueForce software from the desktop icon.



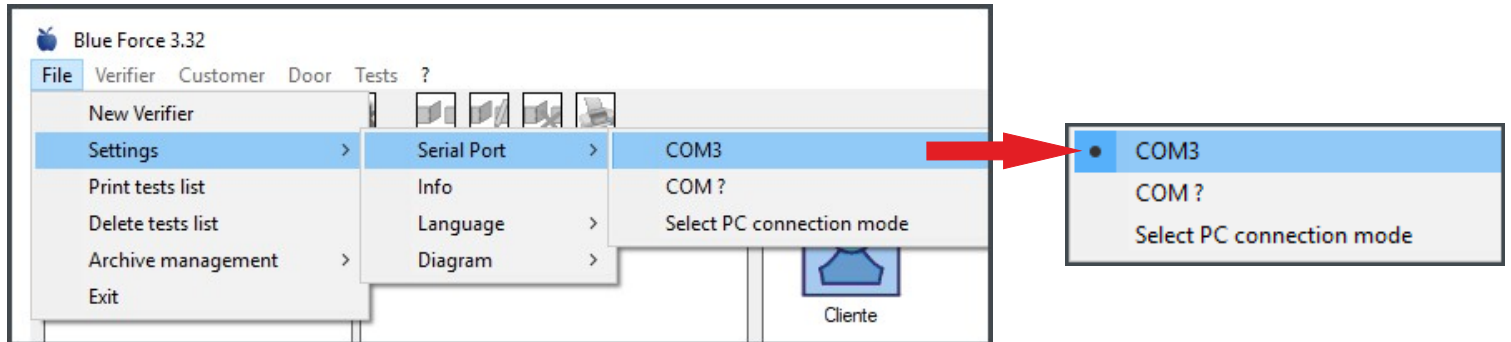
- The following advice, requires that at least one test must be carried out, to correctly set up the calibration date.
- This can be done by following the practical example, see on page 2.



- Normally the software **automatically sets** an available serial port.
- In case an error is reported to **the Serial Port**, it is necessary to manually set the serial port for the correct connection of the instrument with the PC, see page 11.

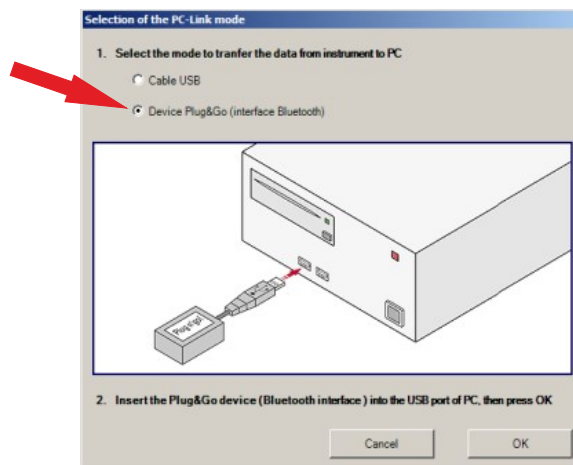
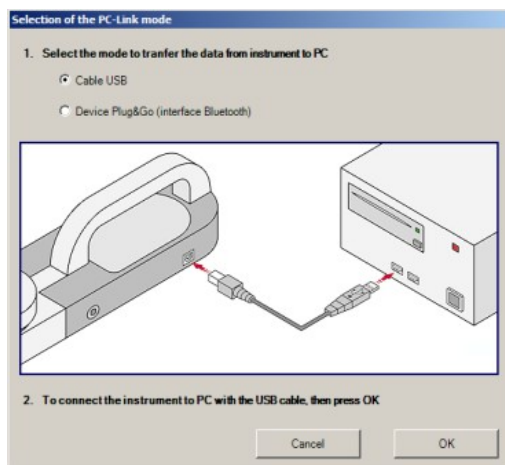
### MANUAL SETUP OF THE SERIAL PORT

- After connecting the force tester with the USB cable, start the Blueforce software and open the menu **File-> Settings-> Serial Port ->** then click on the free serial port (e.g. COM3), a black dot confirms the serial port set.



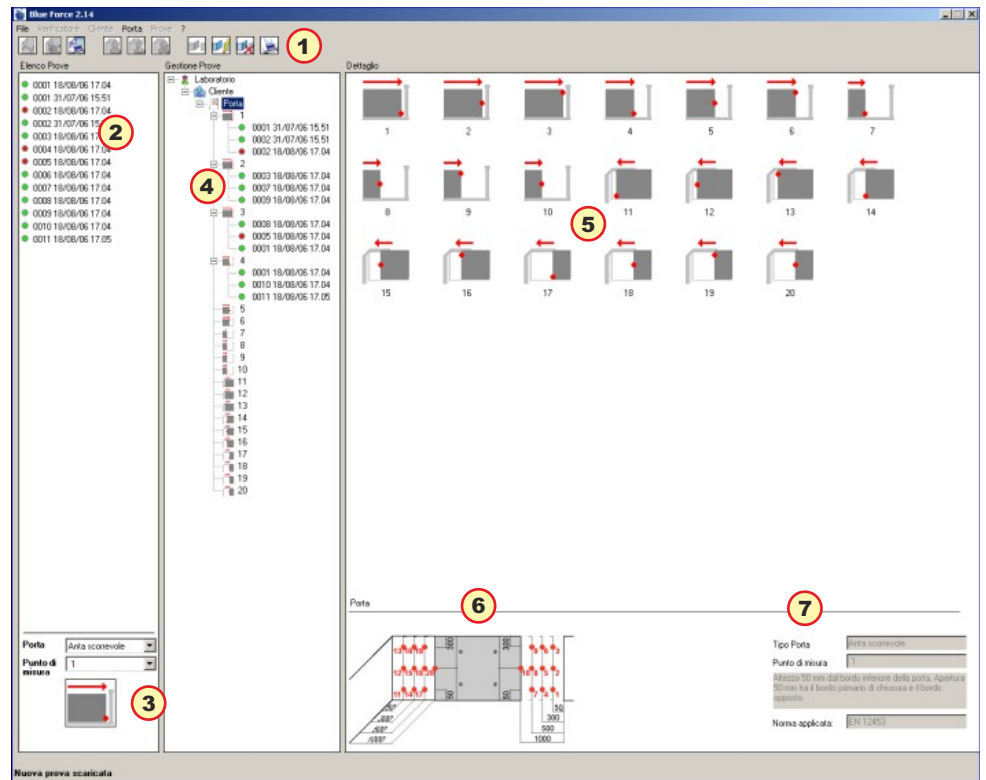
### MANUAL SETUP OF THE SERIAL PORT- (use of the Plug'n Go! Bluetooth optional device)

- If you have the **optional** Plug 'n Go! device, you must manually set the serial port.
- Then connect the optional Plug 'n Go! device, start the Blueforce software and open the menu **File-> Settings-> Serial Port-> Select connection mode to PC->** Set the device and click on Confirm.



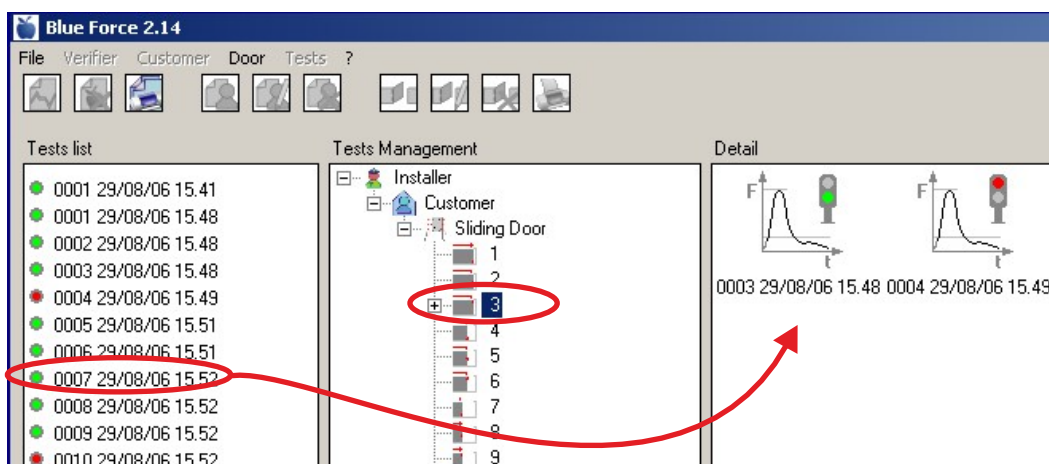
## BLUE FORCE SOFTWARE-MAIN FUNCTIONS

- (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

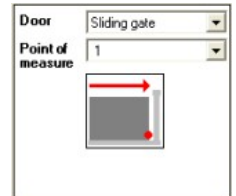
- Prepare the instrument to carry out the test measurement by placing it on a level surface, then switch it on. The instrument is ready to measure after 2 seconds; press down on the head and wait for data acquisition.
- After the first test, press "Test", then carry out the next test.
- After carrying 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 sent 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 **transfer** the tests, the user must have 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

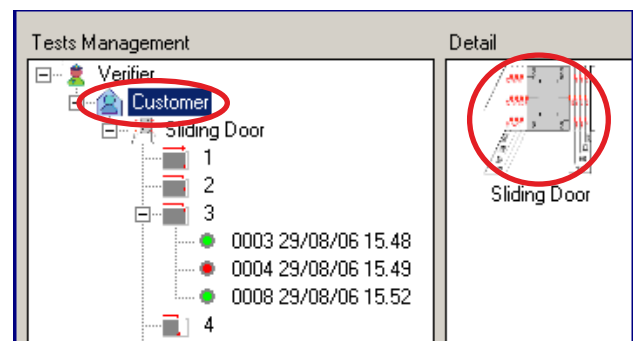


N.B. The result of the measurements is reprocessed automatically by the software when the tests are copied or moved from the **test lists** to a new door created in the **test management** section.

## ■ PRINT REPORT

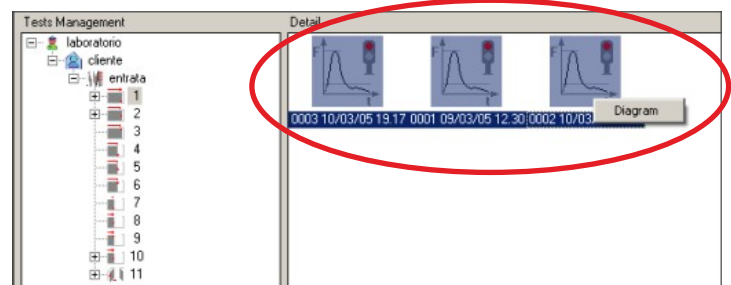
- To print out the report of the tests associated with a **door** (as required by EN 12445), proceed as follows: create the **door** type, enter all the door's characteristics, transfer the tests carried out (at the points listed by the software), and then, finally, **select the door**. You can now view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

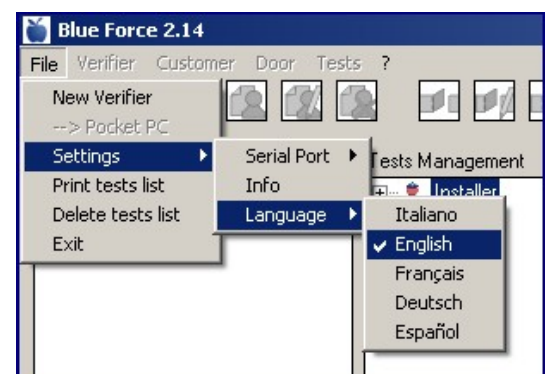


## PRINT TEST LIST

- 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.

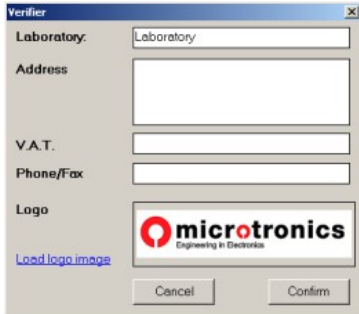
## INSTRUMENT SETTING - Serial Port, Firmware Version, Language

- From the menu **File-> Settings-> Serial Port** you can check the serial port paired with your force tester; a black dot marks the COM serial port set.
- 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 ( only models equipped with internal clock).
- **N.B.** to update the **firmware** of the force tester download and read the instructions on the download page of the website [www.microtronics.it](http://www.microtronics.it).
- From the menu **File-> Settings-> Language** you can change the language setting.

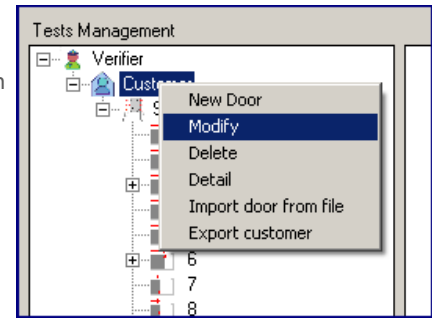


**FURTHER DETAILS (RIGHT-CLICK)**

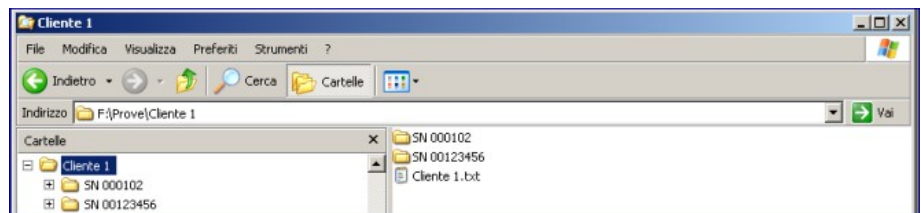
- **WARNING!!** The **right** hand button of the mouse can be used at several stages. Use of this button activates short cuts for carrying out important functions such as Print, Delete, Copy, etc.
- Print PDF file / Edit / Erase
- Export / Import Client, Door, File
- Grid, Zoom (on graph only)

**LOGO SETTING**

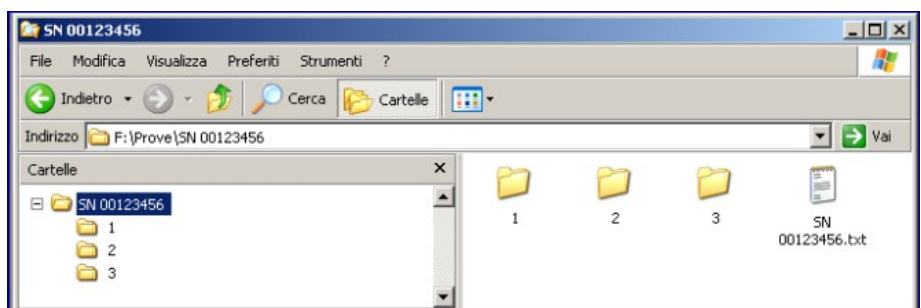
- The Modify function allows the Laboratory's name and address etc. to be changed.
- The **Load logo Image** function allows selection of a new image (Logo) for inclusion in the heading of the printed report. This allows printouts to be customised with the user's own corporate / personal logo.

**USE OF IMPORT/EXPORT COMMANDS**

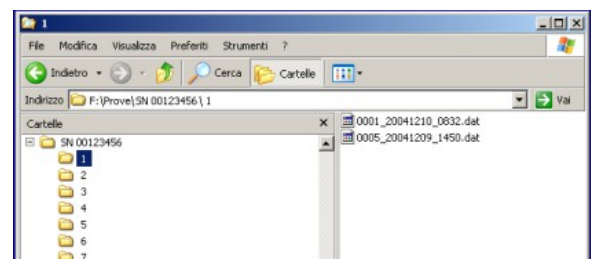
- The Import/Export commands are helpful for routine "maintenance" of the Blue Force Software; quite simply, they allow data to be exported, filed or entered in a database and then deleted. This way, clients or tests that are no longer used can be removed to "lighten up" the software.
- **Export client:**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



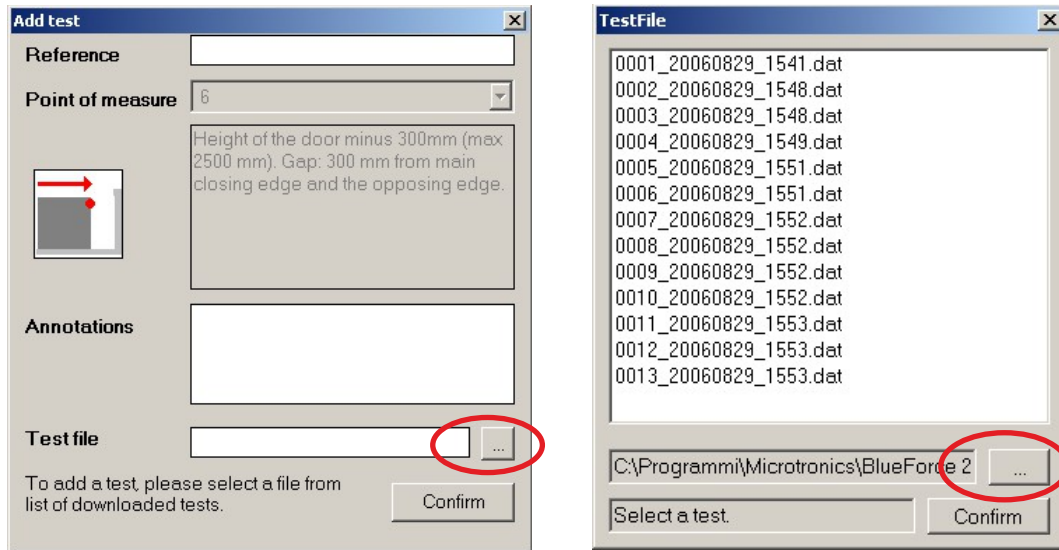
- **Import client:** this allows a client previously exported using the "Export client" command to be associated with a laboratory/tester (and entered in the database). To import the client, simply open the **clientname.txt** file found in the directory [client name] created with the "Export client"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

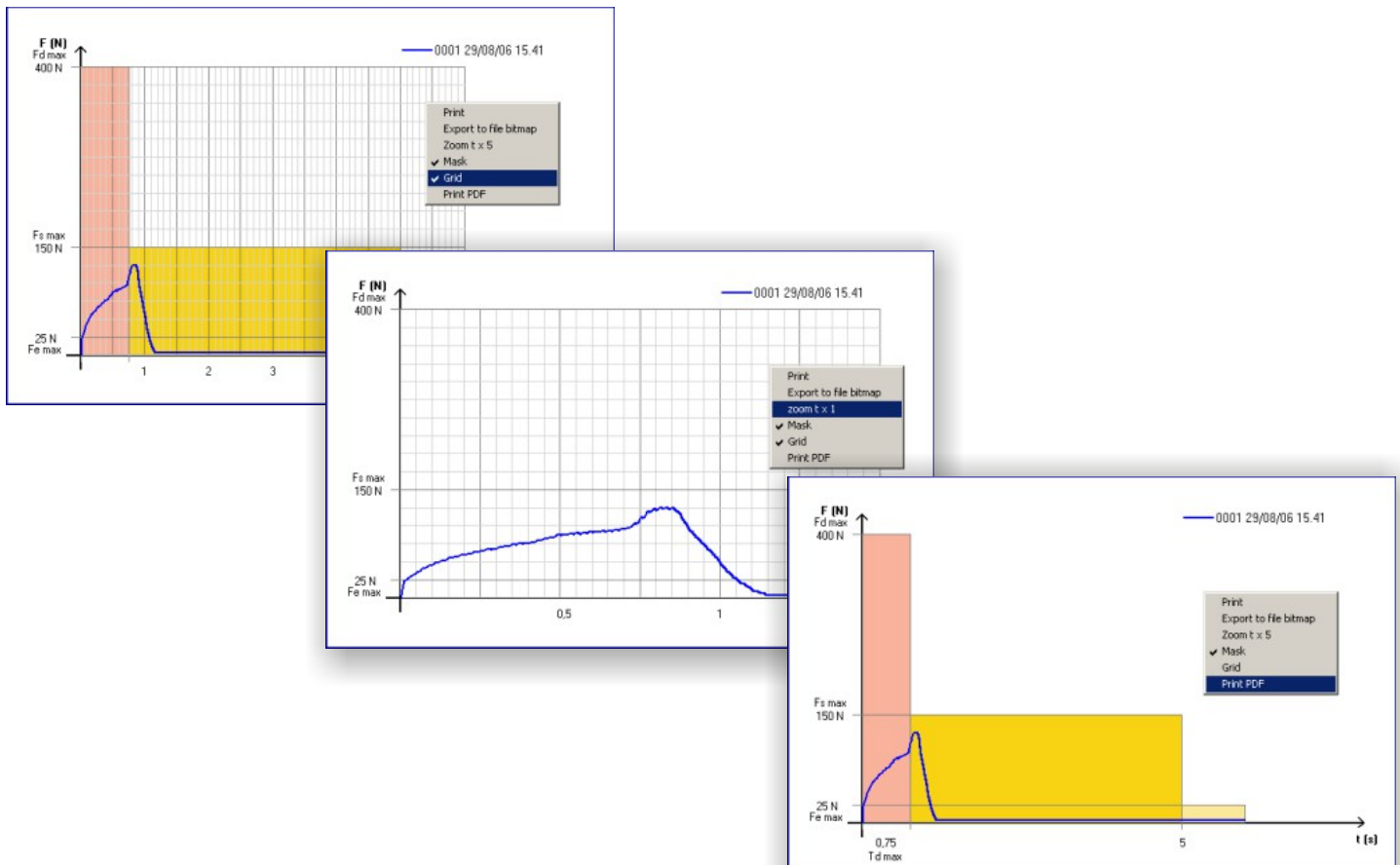


- **Import door from file:** this allows a door exported previously to be associated with a client (and entered in the database). To import the door, simply open the **doorname.txt** file found in the directory [door name] created with the "Export door to file" command.
- **Associate test:** by entering 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

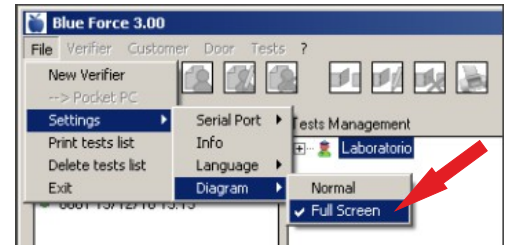
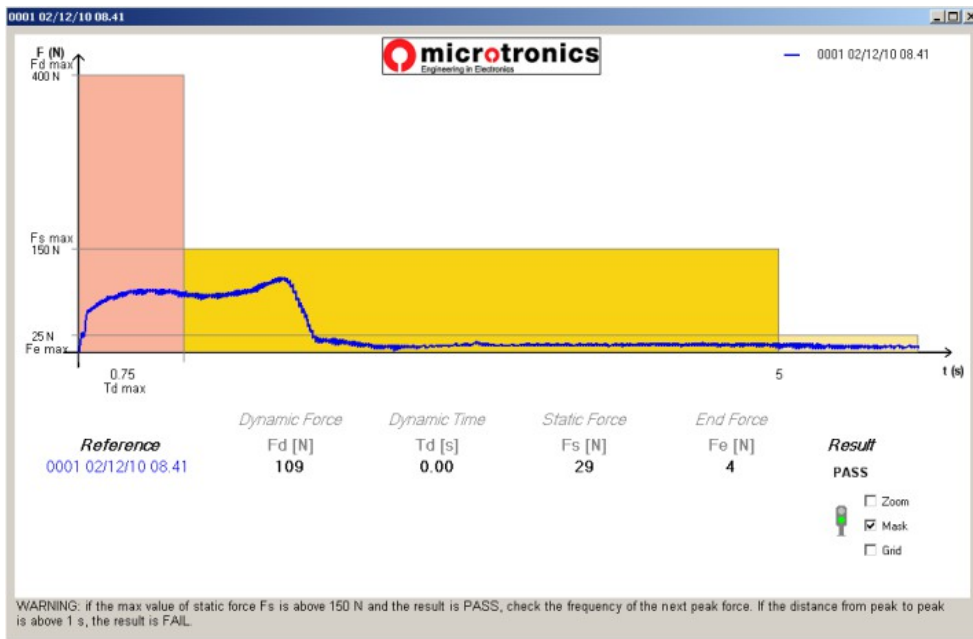
- The graph utilities function allows the user to perform a more in-depth analysis of the impact curve.
- **Export to file:** exports impact test file to **txt file** in a format importable by **Excel** (force – time table).
- **Export to bitmap file:** exports impact force graph to an image file in **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.



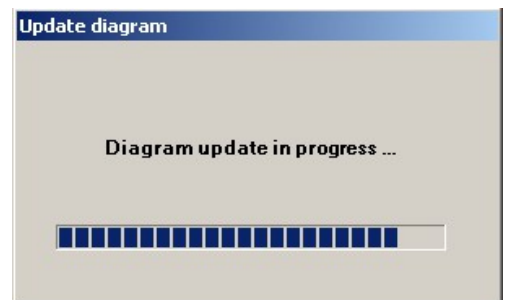


## FULL SCREEN GRAPH MODE

- 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.

## BLUEFORCE 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.

**BLUEFORCE 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 BlueForce 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 BlueForce software" will be always the same.

■ To download **updates**, follow the instructions on the page: [www.microtronics.it/lang1/download\\_area.html](http://www.microtronics.it/lang1/download_area.html)

**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°C)



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



**USE OF THE INSTRUMENT**

■ The Instrument is composed by:

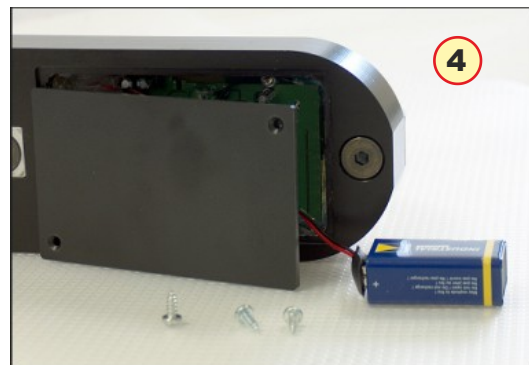
- (1) Head
- (2) body with electronics and buttons
- (3) wing

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

■ **NOTE:** after battery replacement, the DATE and TIME have to be set as described in the DESCRIPTION OF DEVICE FUNCTIONS on page 4.

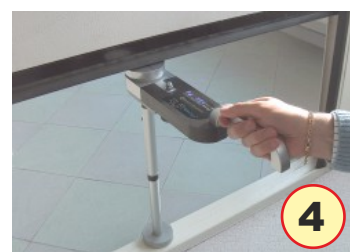
■ It is possible to dismount and to turn upside down the handle, by means of the hexagonal spanner.

■ 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



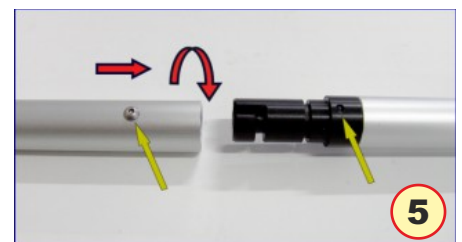
2



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 the norm EN 12453.

■ Briefly, what does the **EN 12453:2017** norm speak about?

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

☞ The EN 12453 norm describes also the tests to be carried out to verify the safety of various kind of automatic gates and doors, from sliding doors to barriers. Besides, it describes the technical data of the force measurement instrument, and underlines the need to have the instrument periodically calibrated at least once a year.

■ What are the **responsibilities** of technician?

☞ From 1st May 2005, it is mandatory to carry out the CE marking on automatic doors and gates. The technician shall : 1) Compile the Technical Dossier, with force measurements reports enclosed; 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 measurements, in which the instrument can be used with the original handle; in other measurements, it is necessary to use 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, rapresents 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 the BlueForce program is easy and immediate: what is more important is that the trend of the diagram must be entirely contained into the coloured mask. However, to be able to make adjustments on the gate installed, it is very important to understand the meaning of parameters measured. Let's look at the force diagram: by convention there are three separated areas:

**A) IMPACT –"Dynamic period"**: it shows the trend of the force during the first instants of 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.

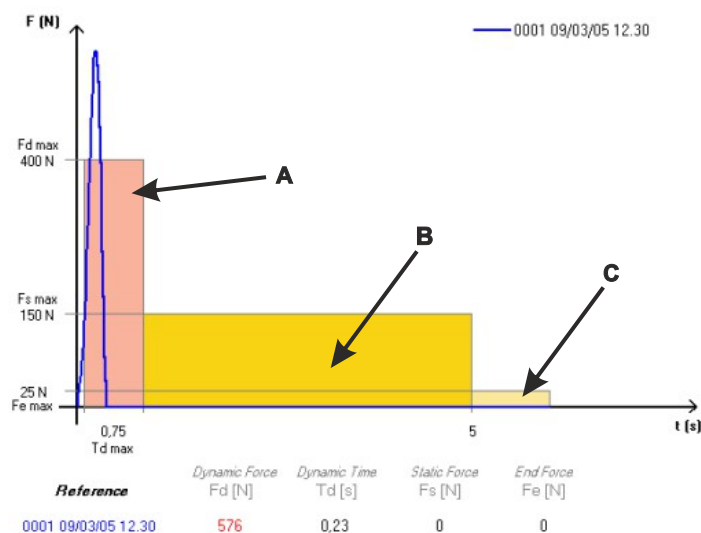
**B) CRUSHING –"Static period"**: it represents the force trend, after the first impact. It represents the crushing force generated by motor, that insists on pushing also after the impact.

The parameters measured are:

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

**Fe** : it is the value of final force, measured after 5 seconds from the first contact. Normally the force should decrease until reaching the maximum level of 25N.

**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 inadeguate 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

**GENERAL INFO**

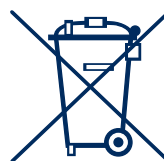
- Information in this document is subject to change without notice. - 2006-2015 Microtronics S.r.l. All rights reserved -
- Reproduction in any manner whatsoever without the written permission of Microtronics is strictly forbidden.
- The Microtronics logo, and Blue Force are trademarks of Microtronics S.r.l. Microsoft and Windows are registered trademarks of Microsoft corporation. Microtronics disclaims any proprietary interest in the marks and names of others.

**IMPROPER USE OF THE INSTRUMENTS**

- MICROTRONICS WILL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), EVEN IF MICROTRONICS, OR ITS RESELLER, HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

**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.



**TECHNICAL DATA**


- Dimensions and Weight: 280x80x50mm - approx. 1.6 Kg
- Power supply: 9V alkaline battery
- Memory capacity: 80 tests
- Force acq. interval: 6 sec, sampling at 1kHz
- Force measurement range: 0-2000N (mechanical stop at approx. 2100N)
- Force measurement resolution: 1N
- Dynamic time measurement resolution: 0.01s
- Maximum force measurement error margin: range from 25N to 400N: ±0,5% F.S.; from 400N to 1000N: ±1% F.S.; from 1000N to 2000N: ±2% F.S.
- CE-EMC conformity at TUV Rheinland on sample BlueForce instrument serial no.: 00981
- Compliant with standards: EN12453, EN12445, EN16005, EN60335-2-95, DHF TS 011-012, ASR A1.7
- NFC interface: standard ISO/IEC 14443 and NFC Forum Type 4
- BLE interface: Bluetooth version 4.1
- USB interface: v.2.0 specification compliant

(\* ) Compatible with Android devices with S.O. from 5.0 and with Apple devices with iOS from 9.0

(\*\* ) Compatible with all smartphones equipped with an active NFC interface.

And active Internet connection is required.

## DECLARATION OF CONFORMITY CE



■ **THE MANUFACTURER**

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

■ **DECLARE THAT THE PRODUCT:**

Type: Electronic measurer of closing force on automatic gates/doors  
Model: BlueForce Smart p.n.50V001B2 and variants (950223, P111386, P111387, 001CAMETEST, R99Z002)

■ **COMPLIES WITH THE PROVISIONS OF THE FOLLOWINGS DIRECTIVES AND REGULATIONS:**

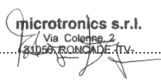
EMC DIRECTIVE: 2004/108/CE  
R&TTE DIRECTIVE: 99/05/CE

■ **MOREOVER, WE DECLARE THAT HAS BEEN APPLIED THE FOLLOWINGS STANDARDS AND SPECIFICATIONS:**

EN 60950-1:2006: Information technology equipment - Safety  
EN 55022:2006: Information technology equipment - Radio disturbance characteristics  
A1:2007: Limits and methods of measurement  
EN 55024:1998: Information technology equipment - Immunity characteristic  
A1:2001, A2:2003: Limits and methods of measurement  
EN 301 489-1-17 V1.9.2 (2011-09) V2.2.1 (2012-09): Electromagnetic compatibility and Radio spectrum Matters (ERM)  
Electromagnetic Compatibility (EMC) standard for radio equipment and services  
EN 300 328 V1.8.1 (2006-06) art.3.2: Electromagnetic Compatibility and Radio spectrum matters (ERM);Wideband transmission systems; Data transmission equipment operating in the 2,4GHz ISM band  
EN 62479:2010: Assessment of the compliance of low power electronic and electrical equipment with the basic restrictionsrelated to human exposure to electromagnetc fields (10MHz to 300GHz)  
EN 61326-1: Electrical equipment for measurement, control and laboratoy use. EMC requirements. General requirements.  
EN 61000-4-2/3/4/6: Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques- Electrostatic discharge immunity test  
EN 61000-6-1/3: Electromagnetic compatibility (EMC) - Generic standards

**PLACE:** Casale sul Sile (TV)                      **DATE:** 27 march 2015

**NAME OF RESPONSIBLE PERSON:**           **Ing. Fabrizio Montagner**

**SIGN:** .....  .....

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

Microtronics S.r.l. Via Schiavonia, n° 93 - 31032 Casale sul Sile - Treviso (Italy) tel. +39.0422.827178 fax. +39.0422.785558 www.microtronics.it

# FAAC



FAAC S.p.A.  
Via Calari, 10  
40069 Zola Predosa (BO)  
tel +39 051 61724  
fax +39 051 758518  
it.info@faacgroup.com  
www.faac.it

