Ballistics analysis software X-BAL 11.00

Acquistion
Analysis
Display
Memorization
Share

XBAL11 is an integrated high-performance and easy-to-use Windows © / Linux software for quality control and ballistic research. The XBAL software has been developed since 1985 and since version 5 of 1995 has been completely rewritten natively for Windows ©.XBAL11 has been designed from the outset for intensive use in research and quality control fields. Its field of action is aimed at the industrial, military, and forensic research sectors. The peculiar characteristic of XBAL11 are the integration and interchangeability of the data acquired with all the operating modes and the complete programmability of the analysis to be carried out, obtained through our proprietary programming language: BANG © (Ballistics Analysis Language) which guarantees a unparalleled flexibility and practicality of use. The software can be configured to meet current and future user requirements in order to maximize the return on investments made and protect them over time. Following the philosophy of investment protection XBAL11 is compatible with both the most recent operating systems available and with all our data acquisition systems developed over the last 25 years. The software is compatible with PCs and standard peripherals to allow easy and cheap PC replacement in case of fault or obsolescence of the same. XBAL11 is simple to use, quick to program, has the help on line and is supplied with a complete documentation. XBAL11 can be installed and configured remotely via Internet In the same time it can be maintained, if required, via remote assistance from ours desk.

Acquisition

- Fully programmable acquisition units;
- Possibility of modifying the type of analysis to be carried out even after the firing session has been termined including operation on stored data.
- Virtualization of acquisition channels
- Acquisition of time / speed and analogical variables also on automatic weapons even simultaneously with the detection of shot coordinates;
- Possibility to connect multiple acquisition systems at the same time and / or more shooting lines at the same time.
- Unlimited acquisition configurations with an easy and fast loading system;
- Possible network operation and / or in multi-session: the data-logger can be used locally or remotely;
- Full integration between the data acquisition system (s) and the calibration system;
- Structure designed to handle large amounts of data simultaneously:
- Maximum number of series in memory at the same time: 10;
- Maximum number of shots per series: 1000;
- Maximum number of independent quantities measured per shot: 100;

- Maximum number of independent sensors for detecting the speeds that can be used simultaneously: real 64, virtual 100;
- Maximum number of analogue channels: real 64, virtual 100 1MWord per channel.

Analysis

- Dozens of specific functions for both internal and external ballistics measurements;
- **Control of various analogical quantities such as: pressure, recoil, sound intensity, accelerations, force / traction, temperature, light intensity, voltages and charges**;
- Measure of the impact coordinates on the target for shots fired. Calculation of the impact point on a virtual target and correction of the results
- Complete EPVAT test set according to NATO military standards AC225-D8, D9, D1, D190. (only with Mil version)
- Developed for testing ammunition, primers, protections, armor and weapons;
- Programmable results display in text and / or graphic mode with a wide range of statistical functions available;
- Graphic display and printing of results, pressure and shooting coordinates;
- Metric or imperial units of measurement with a different set up for times or analogical quantities
- Management of a test database with the possibility of parametric data searches and query-based filtering of stored results.
- Data base of the test systems with automatic management of fired shots, calibration interval, corrections made and / or carried out.
- Automatic calculation of the corrections based on a given reference.
- Digital filters programmable on analogue acquisitions with graphic simulation of the filter response curve.
- Algebraic operations on the channels acquired with the possibility of adding, subtracting, etc. between multiple channels and / or between channels and numerical constants.

Calibration & maintenance

- Include the use of both digital and analogical calibration instruments;
- Automatic update of the number of shots fired by the firing system and by the transducers;
- Can be used to generate arbitrary waveforms, import waveforms logged during a test, generate parametric stimuli, import externally generated waveforms;
- Use of the look-up table for linearization of the transducers for an optimal system response with possible importation of third-party data.

Flexibility and integration with other programs

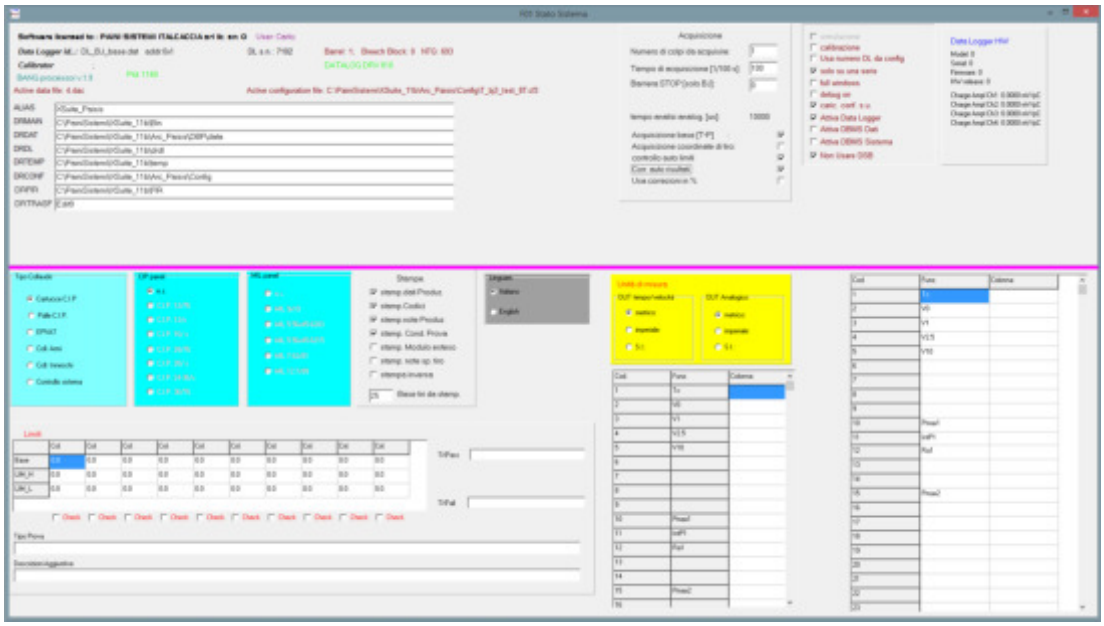
- Full integration with the other X series ballistic software
- Multiple personalities to facilitate testing tasks
- Data export via WINDOWS © Clipboard, or via text file (.csv);

Quick & Easy to use *fast set up, on line help and wizards.*

- Automatic loading at power on of the last configuration used (can be disabled)
- Intuitive and self-explanatory graphical interface.
- Numerous standard test configurations already pre-set;
- Automatic evaluation of results according to the main civil and military regulations;
- Metric and imperial measuring units independently managed on analogue section and times on the result modules.
- Multiple languages for printing certificates in various languages, multiple and customized print forms
- Possibility of quick loading by single data code related to the test to be performed. For example: load the production data of a cartridge in association with the configuration of the firing line (barrel transducer, test standard).
- Ability to store a virtually unlimited number of test configurations.
- Dual video output to place a control monitor near the breech block with the possibility of a remote control keypad
- "Hot Keys" to select of Acquisition, Print, Storing Results.
- Graphic programming of the characteristic of the sensors and shooting line with set up memorization for each user and / or line.
- Use of the scroll wheel of the mouse to quickly scan the graphs, automatic (selectable) scale of the same, pan, zoom etc.
- Possibility of direct connection to other tools for loading variables. Eg: connection to weight scales for the calculation of the average dust weight, weather stations etc.

- Comprehensive and detailed manuals, exhaustive user training, efficient and free remote support, online help, self-tests of functions and tools connected to the system, possibility of remote control via the Internet for a quick solution to any problems or doubts.
- Update via WEB

Test Configuration

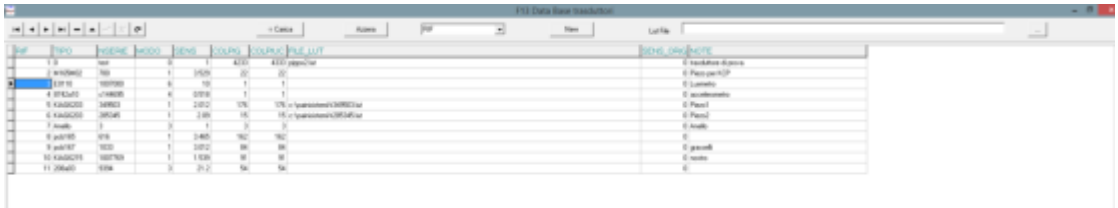


A quick access screen contains all the main parameters to be configured (saved in the configuration files and retrieved from them): from the operating directories to the language, the units of measurement the control limits and the type of test: Ammunition, Weapons, Triggers

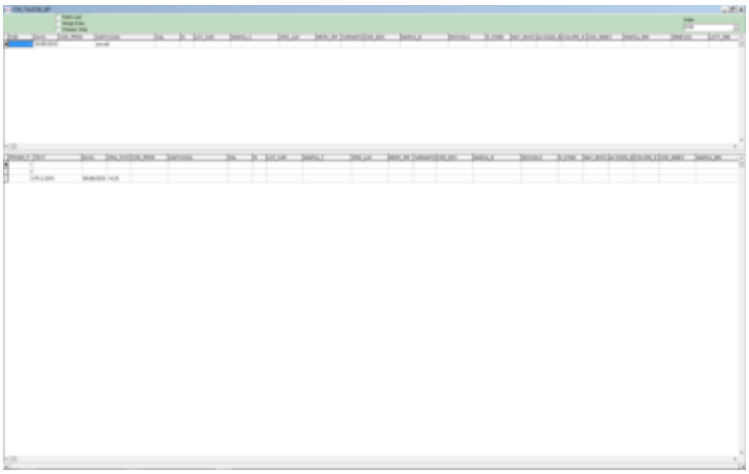
Data Logger Unified Set Up

The unified set up for any type of acquisition tool allows an optimal control of all the data loggers connected to the system with the visualization of the information related to the connected instrument and the possibility of using pre-configured virtual channels on different machines. The system can connect multiple data loggers and configure them simultaneously on multiple firing lines.

Quick selection with double-click of the transducers from the database as well as the manometric barrels



Integrated data base for loading data and test results



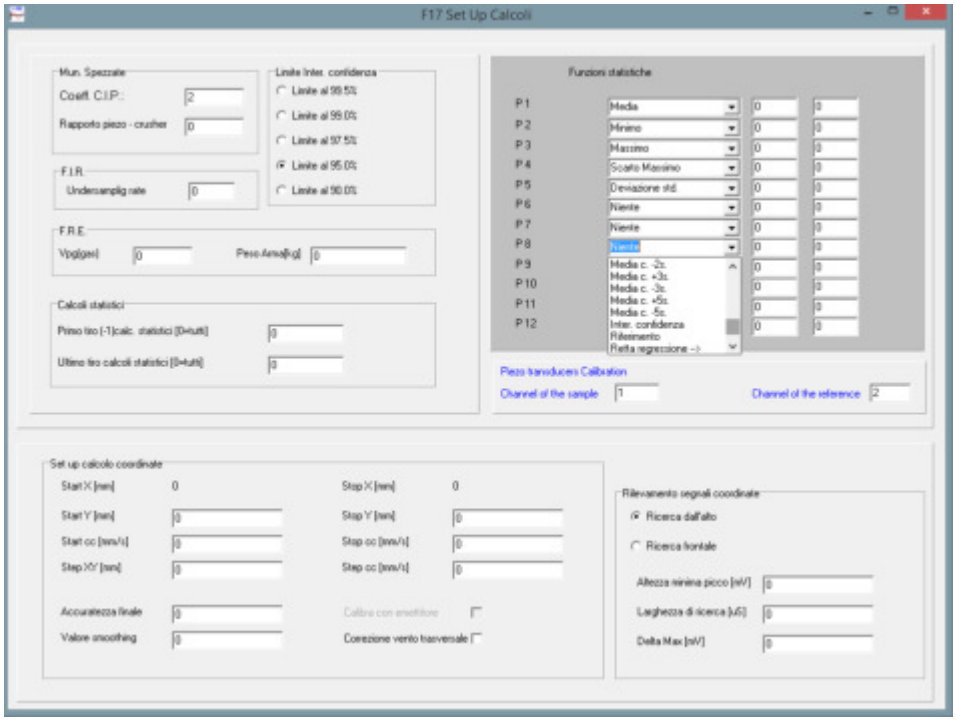
XBAL11.x contains a powerful industry standard data base with advanced search and indexing functions. The local database which, in addition to being used for the management of test instruments, transducer calibration, weapons, etc., is used to index the tests and management of the ammunition loading data The results of the tests are saved in binary and recalculated format (even if differently from the ones used in the acquisition) every time we need them thanks to the fact that they are saved in lossless RAW format exactly as they were acquired without loss of information.
The local database indexes the data in a DB IV compatible format to allow an easy sorting of the results also through external programs such as Excel ©; XBAL11 and can be interfaced with an external company database such as Oracle ©. Posgres ©, MsSQL ©, MySql ©, MariaDB ©

Loading data can also be created from a remote office using the XSS_DSB program included in the multi-license installation package.

Analysis Macrolanguage BANG©

BANG © is our macrolanguage to manage acquisition, analysis, visualization and calibration. The language consists of several tens of parametric functions that cover the fields of internal, external and terminal ballistics as well as additional calibration and support functions. The use of this macro language allows a flexibility and a very high level of personalization in the management of the work as well as a boosted automation of the repetitive jobs; at the same time it allows the use of the system for routine operations to be managed from unskilled personnel thanks to the ease of use permitted by the structure of the program itself.

Complete Set of Statistics functions



Using the drop-down menus such as the one displayed on the left, it is possible to set up to a maximum of **12 statistical functions to be printed and / or to view selected from more than 30 available** which will operate on all the logged results. Using the same drop-down menus is possible to select the visualization sequence of the function. The functions are listed in the menu options.

Main statistics functions are:

Mean (arithmetic); Minimum; Maximum; Range; Standard déviation rate.; Dispersion coefficient %; Positive déviation; Negative deviation; Median; Confidence interval upper limit (Student); Confidence interval lower limit (Student); Variance; Automatic limit checking; Variation coefficient %; Mean (Harmonic); Mean (Quadratic); Mean (Geometric); Mean +1s; Mean -1s; Mean +2s; Mean -2s; Mean +3s; Mean -3s; Total; Automatic correction using reference values; Mean corrected.; Mean corrected +2s; Mean corrected -2s; Mean corrected +3s; Mean corrected -3s; Mean corrected +5s; Mean corrected -5s;

To the above listed functions must be added application specifics functions such as maximum statistics pressure under C.I.P. rules and automatic range checking using specific testing procedure (eg. MIL qualification test).

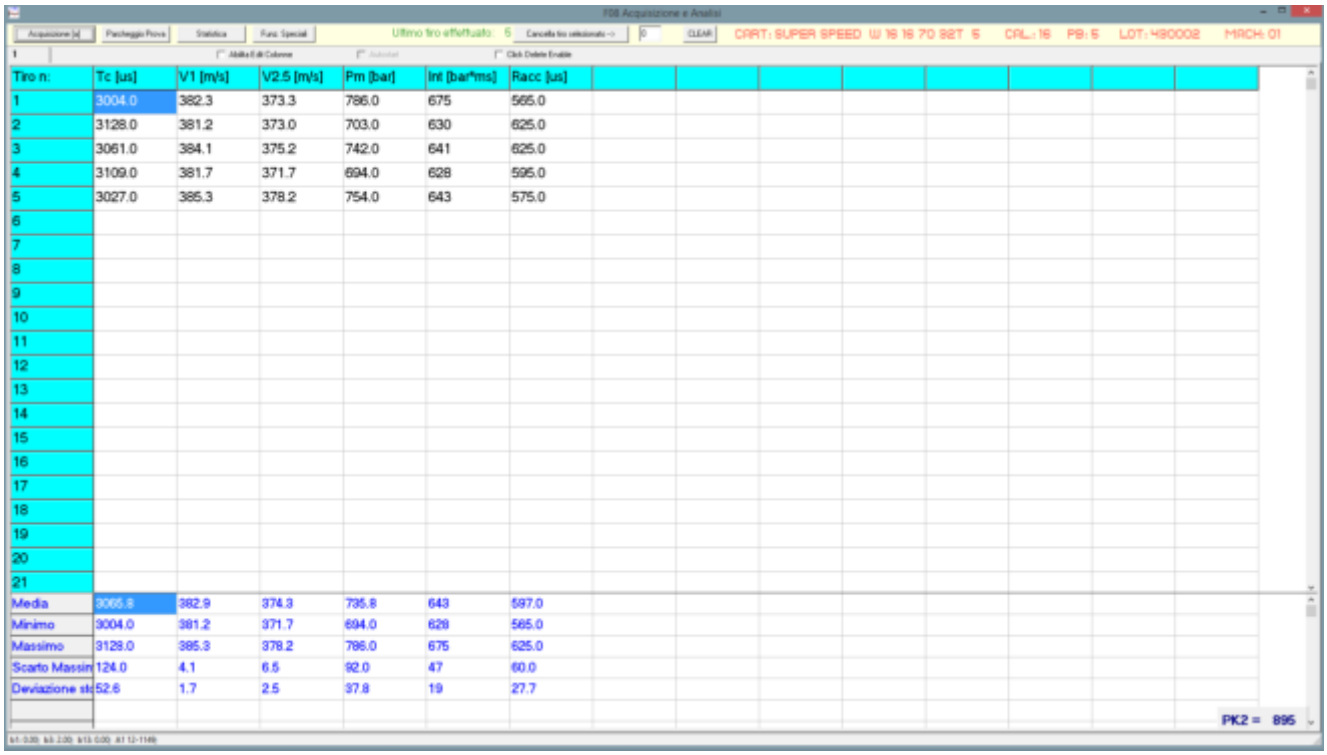
Ballistic Calculator

Evaluation of the theoretical impact point and residual velocity with graphical analysis

Some Screen Shot

Displaying results

Displaying results in text mode.
The format of the characters, the type and the color are programmable for optimal readability. Double click on the shot to see the pressure curve, "Enter" to add notes to the shot



Tiro n:	Tc [us]	V1 [m/s]	V2.5 [m/s]	Pm [bar]	Int [bar*ms]	Racc [us]
1	3004.0	382.3	373.3	786.0	675	565.0
2	3128.0	381.2	373.0	703.0	630	625.0
3	3061.0	384.1	375.2	742.0	641	625.0
4	3109.0	381.7	371.7	694.0	628	595.0
5	3027.0	385.3	378.2	754.0	643	575.0
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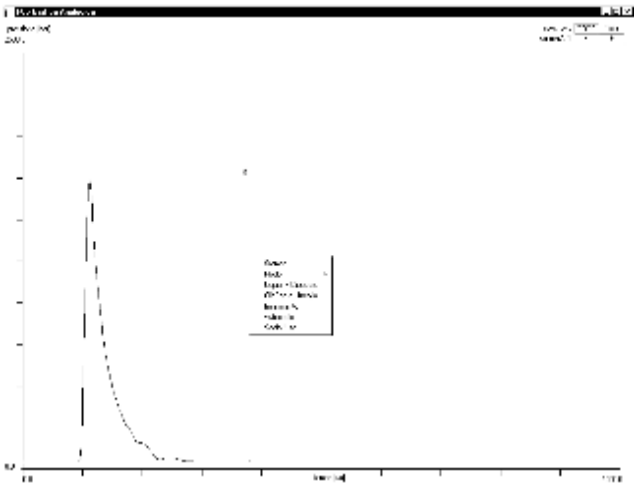
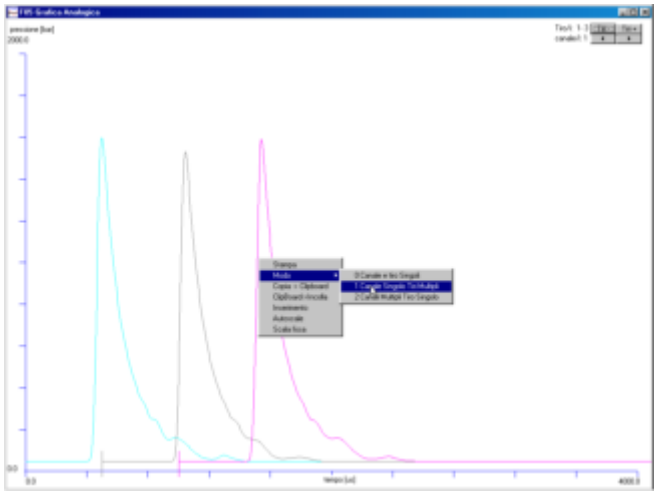
Media	3065.8	382.9	374.3	735.8	643	597.0
Minimo	3004.0	381.2	371.7	694.0	628	565.0
Massimo	3128.0	385.3	378.2	786.0	675	625.0
Scarto Massin	124.0	4.1	6.5	92.0	47	60.0
Deviazione st	52.6	1.7	2.5	37.8	19	27.7

PK2 = 895

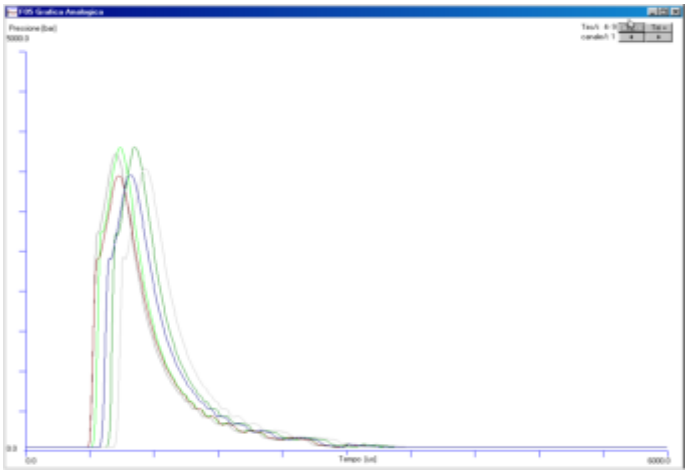
Display results in mixed mode (text + graph) with simultaneous display of statistical functions and highlight if the shot is statistically out of range.



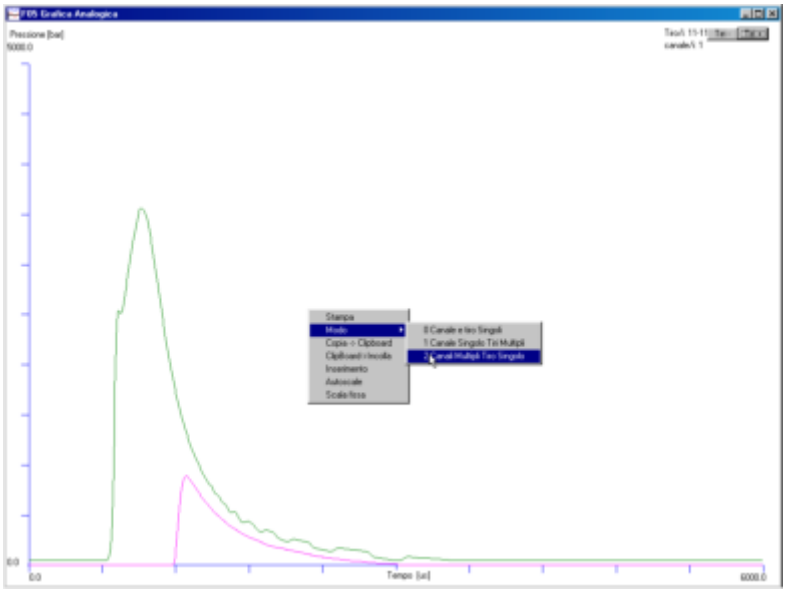
Analogue curve (Pressure): Single shot Single channel



Analogue curves (Pressure): Multiple shot Single channel (programmable horizontal and / or vertical displacement)



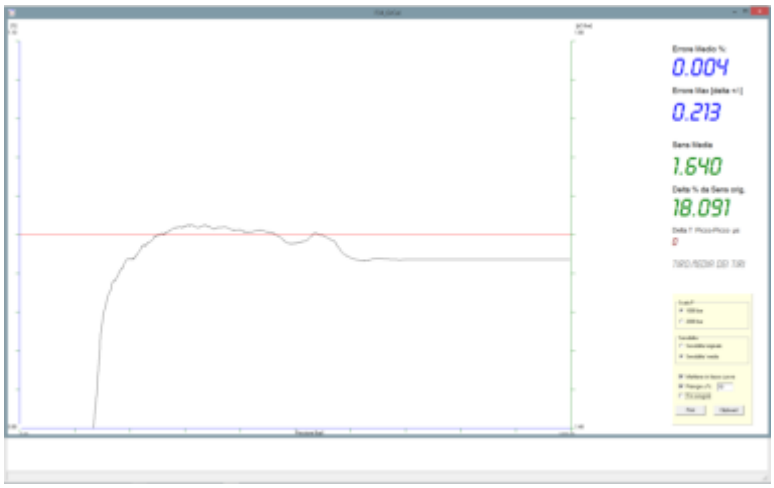
Analogue curves (Pressure) Multiple shot s (overlapped) single channel



Analogue curve (Pressure): Single shot Multiple channels

X-TTRA

X-TTRA is an operating mode for both absolute and relative testing and calibration of pressure transducers. The software allows functional verification, calibration and the generation of look up tables for a correction and linearization of values.
The format of the files is the same as that of the ammunition test to allow to make evaluations of transducers in real environment by firing in a manometric barrel with transducers in parallel on the same.



Add on programs

X-BMAN3

X-BMAN3 a versatile bomb propellant analysis software for quality control and research in the field of propellants from small arms to cannons.
The software allows a complete numerical and graphical analysis of the propellant in question. The software inter alia calculates:
Vibrancy, Strength-Covolume, W-alpha, gradient, burnt fraction and much more.
The software allows to program the bomb volume on any value from 0.1 to 100 dm3

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Specific functions can be added at the request of the user, for additional functions please contact our technical office.

The measurements indicated in this sheet can only be performed if the available hardware allows the acquisition and if such measurements are detectable in the type of test to be carried out.

Minimum computer required: computer and peripherals compatible with WINDOWS © XP or Linux 15.04 or newer
Processor with at least 1GB ((4GB recommended) of RAM and 5 Gbytes of free disk space (for programs and data)
Recommended CD player, screen with a resolution of at least 1920x1080 pixels (full HD).
The software is compatible for use within a VMWare © virtual machine. and VirtualBox ©

Compatible Data Logger: BY1, BY2, SAAC2, BY2K, BW04, BW15, BW15_ci, BJ14, BK19;

Compatible with many "National Instruments" acquisition cards, ask for details.

Data subject to change without notice.

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