



Trigger device

A System
for optimizing the triggering
in sports shooting

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1 Contents of the transport case

- Trigger device DPT(1)
- Cable connector to shot sensor(2)
- Trigger sensor(3)
- Cable connector USB
- Batteries MN1400 (2 pieces), already plugged in at delivery
- CD with USB-Driver and software Abzugstrainer.exe(4)
- Users manual



Figure 1: Transportcase

2 Functional principle

The trigger force is measured and converted into an electrical signal by a sensor at the trigger of the weapon. These measured values are saved in the device's memory and, if needed, sent simultaneously over a USB port to a PC. Starting with a force of about 5% of the final weight, a sound appears with a frequency changing by an increasing force. The force at which the sound disappears can be adjusted by a control element (between 40% and 90% of the final force). The amplification is automatically adjusted so that the shot is always approximately located at the same position within the measuring range (at about 90%). Thus, the sensor can be attached to weapons with a trigger-weight between 100g (i.e. air-gun) and 700g (e.g. pistol, biathlon gun) without any manual calibration.

A LED indicates if a selected memory bank contains any data. A memory overflow is announced by a blinking LED and a sound. The data is kept when switching off the device and can be transmitted to a PC over a USB port later. It can be erased with a button on the DPT as well as with the PC-Software. The power supply of device (=DPT) are two conventional batteries (type: LR14 / MN1400) or identical accumulators.

3 Preparation

Plug the multipole plug of the trigger device at the DPT-Device to the **Sensor** connector. Mount the trigger device at the gun. Detach or loosen the existing trigger at the gun and move it backwards. Make sure that no force is applied to the connecting cable. Fixate it with tape if necessary.

Attention!

The trigger sensor is a highly sensitive measuring device. Because of that it must be handled very carefully. Especially every tensile load of the cable and pollution of the gilded plug has to be avoided!

Afterwards add the trigger sensor at the gun barrel (it is clipped by a strong magnet). Put the plug of the trigger sensor to the connector of the shot sensor.

4 Operation

After switching on with the POWER button you can hear three short sound signals. The device is then performing a self calibration. During the calibration the Bank-LED's on the bottom side of the yellow switch are flashing.

Important!

Don't touch the triggering sensor during calibration phase!

After the calibration, the matching LED of the last chosen Bank will be shown. You can switch the current memory bank by pressing the yellow switch. If the chosen bank contains data, the LED between the keys is on. You can erase recorded data with the red key. When touching the trigger of the gun, the developing of the force is recorded by the device with a fixed time scale. Thereby the sound generator will be also activated. Its frequency changes with increasing force and it will be stopped at the adjustable limit. (Regulator **Tonschwelle %** at DPT). With the software it can be selected if the frequency is increased or decreased by increasing force. The volume of the sound generator can be adjusted at the side of the DPT, next to the connector for the headphone. When plugging in the headphone, the speaker will be disabled. When first mounting the triggering device to a gun, a manual calibration of the amplifier should be done by performing several dry shoots (pull the trigger slowly but continuously until the shoot breaks). Afterwards the data of the calibration pulls should be erased by pushing the red key. The device is now ready for usage. The recorded data is kept permanently after switching off the device and can be transferred to a PC later for visualization and further analysis.

5 Memory size

The flash memory is divided into 4 areas(banks) which can be chosen by a key on the DPT or by the PC-software. Because data is only stored when touching the trigger, about 67 shoots with a mean duration of 10 seconds can be stored into one memory bank.

6 Power Supply

The DPT is using 2 normal batteries of type MN1400 as power supply. The supply voltage is about 3.2 V with new batteries. When the voltage is too low(<1,8V), a warning message occurs. When connected to a PC, the supply voltage of the USB port is used for power supply.

7 Battery exchange

To change the batteries the control for the audio threshold has to be removed and the screws on the bottom side of the DPT have to be opened. Then the batteries can be exchanged (Type LR14/MN1400 or accumulators batteries of the same style). Be careful about the polarity. Then fasten the screws again and put the control back on.

8 Windows Software

The included CD contains a folder 'Software' which contains the program 'Abzugstrainer.exe' and some required files. The software is running under Microsoft Windows 95 or newer. The data obtained by the trigger training device (DPT) can be transferred to the PC over the USB connection. The measured values can then be visualized as force curves on a grid. Additionally, the sound threshold as well as a marker for the shot are contained in the plot. Optionally, data like date, name or a short description of the training unit can be added. The plots can be stored to a file or be printed. Several adjustments processes of the some configuration values of the DPT can be also performed with the PC software.

8.1 Driver installation

The first time the DPT is plugged in, windows will search for a USB driver. This driver can be found on the included CD. When you insert it, windows will guide you through the installation. After finishing the installation, you can find the DPT on a COM-Port (normally the one with the highest number). You have to choose this COM-port in the program Abzugstrainer.exe at 'Preferences'.

8.2 Program installation

First create a new unique folder with the Windows Explorer, for example 'Shoot-training'. Then copy the files of the folder 'Software' on the CD into the new folder and create a desktop shortcut. Then, the program 'Abzugstrainer.exe' can be executed. To execute the program in a maximized window, the option 'maximize' in the shortcut preferences can be used.

8.3 Usage

The first time you the application is executed, you have to select the right serial port in the application preferences, accessible through the menu item 'Preferences'.



The device can be used in two different modes:

DPT connected with PC: Connect the DPT to the PC via USB. The automatic calibration starts immediately because the USB-port is used for power supply of the DPT independently from the power switch. Thus, the sensor should already be connected. With the menu item 'Data>New F2', a new document with an empty grid will be created. In the headline 'unbenannt1.dru' as a temporary name is shown. The sound threshold is shown as a colored line with percentage information. If you pull the trigger of the gun, the force will be shown at the grid. The shot will be visualized as a spot or cross with the pre-configured line width and color. By releasing the trigger, a new grid will be drawn and the next trigger operation will be shown in the grid. The sound threshold of the DPT is shown within 40% and 90% of the end force. The trigger force will be shown at the left side of the screen with a gauge. Is the force higher than the sound threshold, the color of the bar will change from green to red. The data is also stored in the selected memory bank of the DPT.

The data was recorded on the DPT without a PC: Connect the DPT to the PC via USB. The DPT starts up immediately, because the device is powered by the USB port independent of the power switch. The sensor cable needs not to be connected. Go to the menu item 'Hardware DPT > memory banks'. The memory banks will be shown. Choose the bank you want to dump and press the button 'Read out'. If there is a file already open, the data will be added to the existing data. Otherwise you will be asked to create a new file. The software will read the data from the DPT and display it.

The sound threshold indicating the point no sound can be heard anymore is visualized on the grid by a colored line with percentage information. The location of the shot is marked by a cross or circle. The complete data can be stored on hard- or floppy disk with the menu

item **'File>save as...'** and can be opened with the menu item **'File>open'**. At the menu **'Statistics'**, some statistical properties of the data can be viewed and printed.

The complete measured data set can be printed with the menu item **'File>print'**. 20 different plots are printed on a single page.

8.4 Menu Structure

8.4.1 File



File>New F2: A new file, named 'Unbenannt1.dru', is opened. The shortcut for this menu item is F2.

File>Open: A file with the extension *.dru is opened

File>Save: The current file is saved under the current name. This menu item is only available when a file is open.

File>Save as...: The current file will be saved under a new name which can be chosen. This menu item is only available when a file is open.

File>Print: The current file can be printed. This menu item is only available when a file is open.

File>Printer preferences: Choose and configure a printer

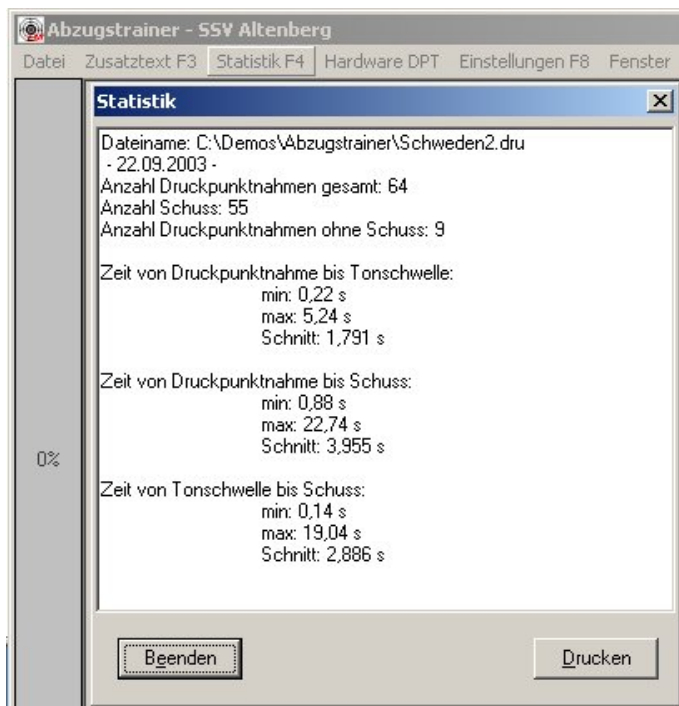
File>Exit: Quit the application.

8.4.2 Additional text F3



Additional information can be specified for the currently selected file. This text is then displayed as a headline when the data is printed. The shortcut for this menu item is F3.

8.4.3 Statistics F4



Here a statistic of the opened file is shown and can be printed. You can choose this menu with F4.

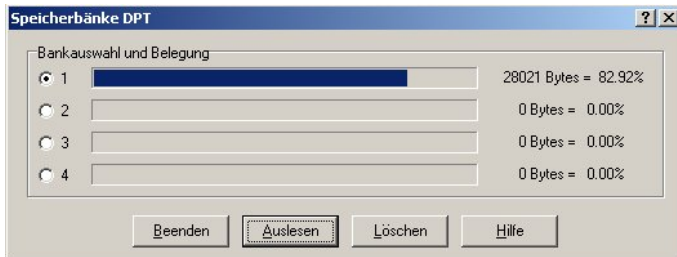
8.4.4 Hardware DPT



Hardware DPT > Connect F5:

If there is no connection to the DPT, you can activate it here. You can choose this menu with F5.

Hardware DPT > Memory Banks F6:



The assignment of the memory banks will be shown. Individual banks can be read out or erased. You can choose this menu with F6.

Hardware DPT > Service:

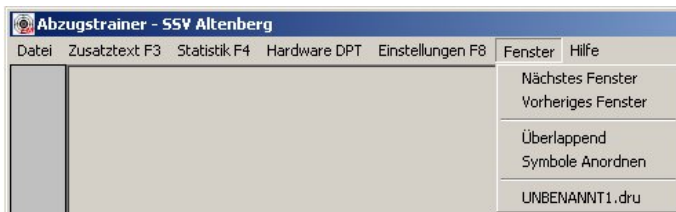
Here you can choose additional menus to adjust the sound generator to rising or falling frequency, show data of the DPT, calibrate the DPT or reset it to the initial configuration.

8.4.5 Preferences F8



In this dialog the line width and color of the measurement plot, the sound threshold and the shot mark layout (cross or dot) can be configured. The gauge on the left side of the main window can be enabled or disabled here. Additionally, a user name can be specified and the serial port the DPT is connected to can be selected in this dialog. This menu item can be selected with F8.

8.4.6 Window



The arrangement of the windows can be changed here if several files are open.

8.4.7 Help

The help for the program will be shown. This menu item can be executed by pressing F1.

For all Windows Vista Users: The online help of this and many other software products is in WinHelp-Format. The application for reading help files of that format is no longer delivered with Microsoft Windows Vista. But Microsoft still provides it on the Microsoft Homepage (www.microsoft.com).

9 Guarantee

The producer guarantees on the standard terms and conditions the functionality of the device and commits to repair or replace a defect device and its components within the period of guarantee. Damages caused by inappropriate handling and wear and tear elements are not included in the guarantee.

10 Service

For maintenance and repair exclusively appeal to the producer.

Serviceadresse:

Firma L. Mösenlechner Ganghoferstr. 2 D 83317 Teisendorf Germany

Maintenance and repair after the period of guarantee are charged.