



# TENDO Unit

YOUR INTELLIGENT WEIGHT TRAINING

## SOFTWARE USER MANUAL



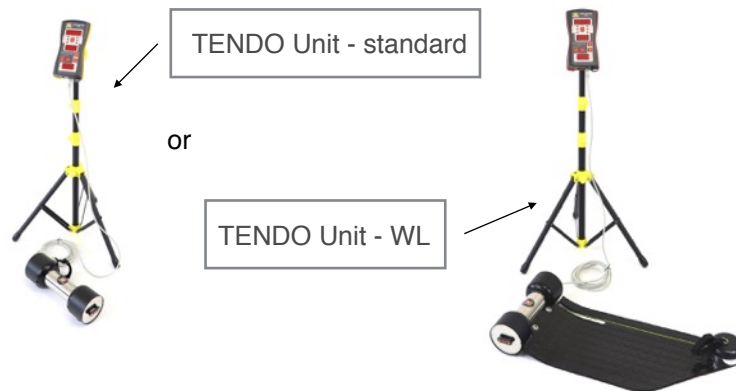
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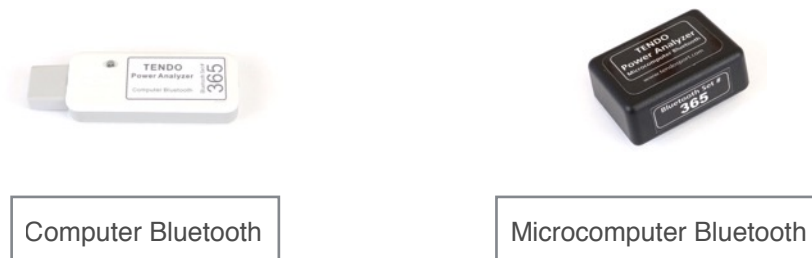
# 1. INTRODUCTION

You will need following items to use Tendo Power Analyser Computer Software:

A) TENDO Unit



B) TENDO Bluetooth Set **with the same set number**



C) TENDO Power Analyser Computer Software installation package



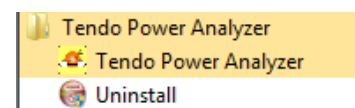
- The minimum computer requirements:
  - Processor 1.6GHz, RAM 1Gb
  - Operating system: Windows7, Windows 8, Windows 10, 32bit or 64 bit

## 2. INSTALLATION

Previous versions of the Tendo Weightlifting Analyser software (3.6.) does not work with the new Power Analyser system. Please, uninstall your existing software first.

### 2.1 UNINSTALLING TENDO POWER ANALYZER SOFTWARE

- Click Start → Settings → Control Panel → select “Add or Remove Programs”
- Select TENDO Power Analyzer
- Follow the instructions given on the screen to complete uninstallation
- Or
- Click Start → All Programs → Tendo Power Analyzer → Uninstall



## 2.2 INSTALLING NEW TENDO POWER ANALYZER SOFTWARE

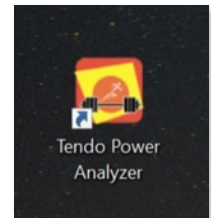
Run the installation by following the steps:

- Insert the Tendo Installation USB flash disc into the USB connector on your computer
- Double-click "TendoPowerAnalyzer\_7.0..." to display "setup.exe".
- Double-click "setup.exe".
- Follow the instructions on the screen to perform the installation.

If you do not have the Tendo Installation USB Flash disc, please, download the installation file from our website at <https://www.tendosport.com/support/software-updates/tendo-unit/>

- Download "TendoPowerAnalyzer\_7.0...zip"
- Double-click "TendoPowerAnalyzer\_7.0...zip". After decompressing the file, "TendoPowerAnalyzer\_7.0..." will be created.
- Double-click "TendoPowerAnalyzer\_7.0..." to display "setup.exe".
- Double-click "setup.exe".
- Follow the instructions on the screen to perform the installation.

When the installation is complete, a new program called "TENDO Power Analyzer" will be added to your system. An icon will be placed on your computer desktop too.



## 2.3 DRIVER INSTALLATION

Before you use the Tendo Power Analyzer computer software, it is necessary to install drivers for the Tendo Bluetooth. Your computer does not recognise the Tendo Bluetooth as a bluetooth device, but as a USB Serial (COM..). Every Tendo Bluetooth device is paired, so the user does not need to pair the Bluetooth Devices.

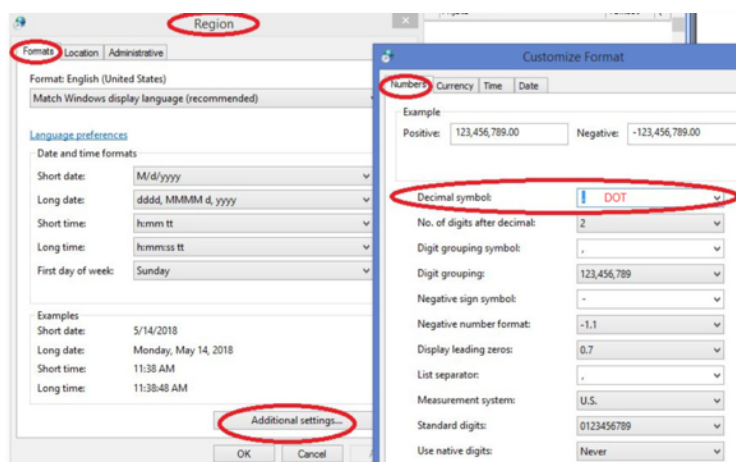
If the driver is not installed automatically, it is possible to run the setup file from the following directory. Please click to CDM21228 Setup to install driver for the Tendo Bluetooth.



Plug the Tendo Computer Bluetooth (with USB connector) to the computer. Then you can check the Device Manager and see that the USB Serial Port(COM..) is listed.

### ! Attention !

**\*\* Please check a format of the decimal symbol. The setting needs to be "DOT". You will find the setting in Control Panel, Region, Advance Setting, Numbers**

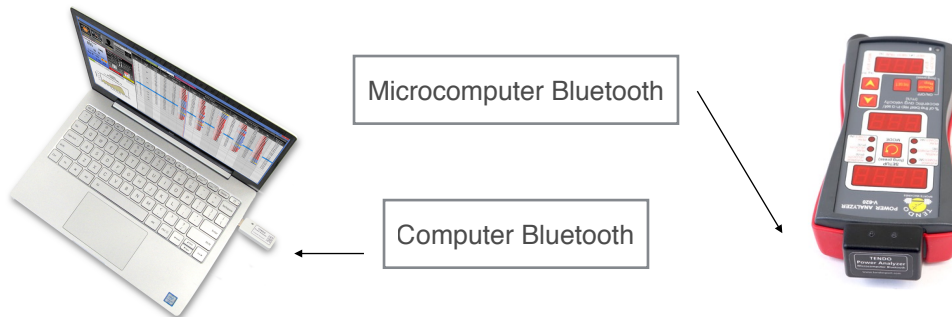


**\*\* The wireless bluetooth connection works only if the Tendo Computer Bluetooth and the Tendo Microcomputer Bluetooth have the same Set Number.**



### 3. CONNECTING MICROCOMPUTER AND COMPUTER.

1. Switch ON the microcomputer.
2. Plug the Tendo Microcomputer Bluetooth connector into the connector on the top of the microcomputer
3. Plug the Tendo Computer Bluetooth (USB connector) into the appropriate USB connector on your computer.
4. **Wait until blue LED of the Bluetooth indicates connection** - continuous blue light
5. Open Tendo Power Analyzer software



**\*\*** It is highly recommended to use fully charged batteries for microcomputer unit if the Tendo Bluetooth connection is used.

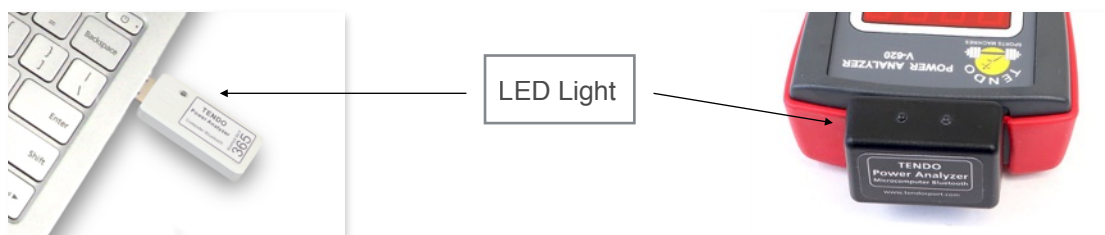
**! If microcomputer battery voltage is low, the microcomputer does not transfer the data to the computer !**

**\*\*** To reset the Bluetooth connection, unplug both the USB Tendo Computer Bluetooth from your computer and the Tendo Microcomputer Bluetooth connector from your microcomputer unit, and plug them in again. Wait until the blue LED is on - this indicates connection. *(The microcomputer unit must be turned on)*

### 4. INDICATION OF THE CONNECTION

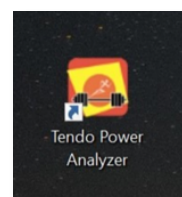
**Blue** LED light indicates correct wireless connection between a microcomputer and a computer.

**Green** LED light indicates the connection is lost.

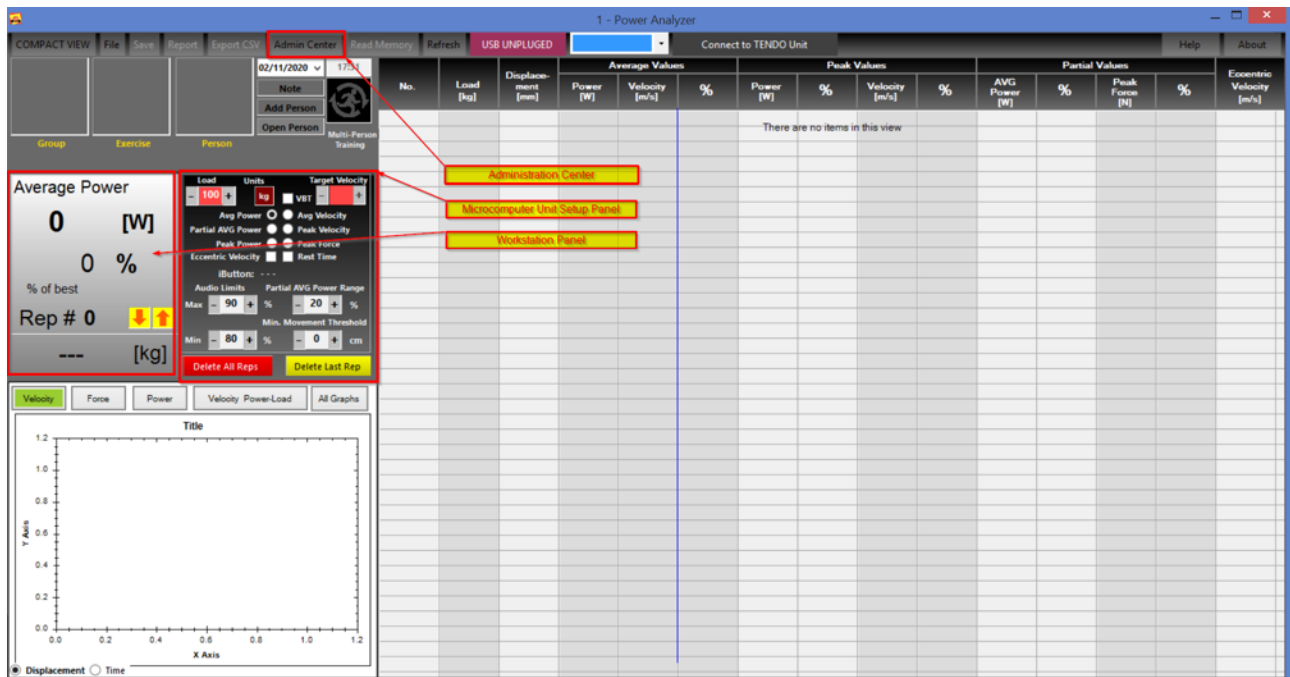


### 5. HOW TO START TENDO POWER ANALYZER (TPA) COMPUTER SOFTWARE

To open the Tendo Power Analyzer Computer Software, double-click on the Tendo Power Analyzer icon on your computer desktop.

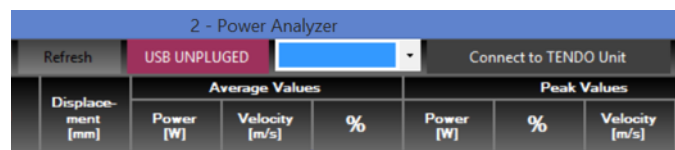
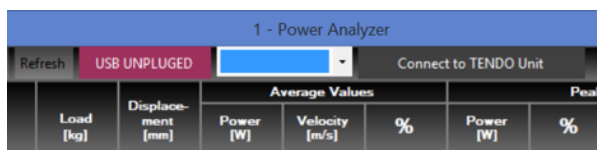


When you open the application you will see the program window:



### Workstation:

You will see “1 - Power Analyzer” in the middle upper part of the software window. If you would like to connect more Tendo Units to the computer software, you will need additional Tendo Bluetooth package for each Tendo Unit. To add another Workstations (e.g. “2 - Power Analyzer”), open additional panels.



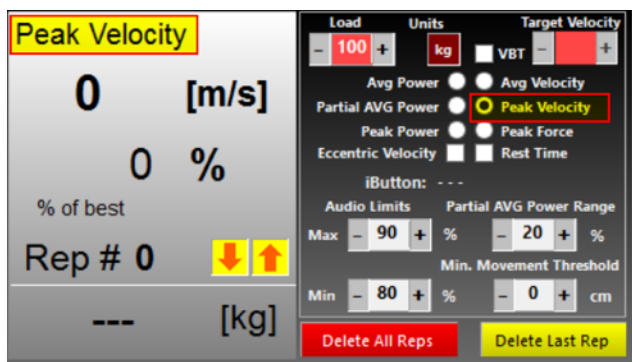
### The Tendo Power Analyzer Computer Software contains 3 sections:

- Workstation panel
- Table
- Graphs

### • Workstation panel:

You can view any parameter (Avg Power, ..., Peak Force) of recorded rep by simply clicking on a particular dot in the panel.

The section is depends on the microcomputer settings.



### • Microcomputer Setup Panel:

It is also possible to change the microcomputer settings directly from the "Workstation panel" in the computer software.

1. Show different parameters (Avg.Power ...Peak Force)
2. Set load, choose weight units, turn velocity based training mode on/off and choose your target velocity
3. Set limits for audio signals, minimum movement threshold, range for partial average power and range for peak force, turn eccentric velocity and rest time on or off

The Microcomputer Setup Panel is a control interface with the following sections:

- Top Section:** Load (100), Units (kg), Target Velocity (VBT).
- Parameter Selection:** Radio buttons for Avg Power, Partial AVG Power, Peak Power, Avg Velocity, Peak Velocity, and Peak Force.
- Buttons:** Eccentric Velocity and Rest Time checkboxes.
- Audio Limits:** Max (90%) and Min (80%) settings.
- Power and Movement:** Partial AVG Power Range (20%) and Min. Movement Threshold (0 cm).
- Buttons:** Delete All Reps and Delete Last Rep.

## 5.1 ADMINISTRATION CENTER

\*\* Before you start using the system, it is recommended to fill in the Administration Form to create your database/group.

1. Click "Admin Center" in the top bar menu and the database/groups will be shown.

The Admin Center menu is located in the top bar of the software. It includes options for Export CSV, Admin Center, Read Memory, and Refresh. Below the menu, there is a table with columns for Note, No., Load [kg], Displacement [mm], and Average Values (Power [W], Velocity [m/s]).

2. You will find there list of groups and persons, exercises, iButtons, Com Ports, Units and data directory in the Application

The Admin Center window displays a list of groups and persons on the left. The 'Add Group' button is highlighted with a red circle. The main area shows the details for a selected group, including fields for First Name, Last Name, Date of Birth, Gender, Assigned iButton, Metric, Height, Weight, and Note. There are also buttons for Add Picture and Delete Picture.

### Add Group:

1. Click "Add Group"
2. Write down the group name and click "SAVE" to save new group.
3. Click "Add photo" and choose your group's cover photo. Click "SAVE" to save new group or any new updated info. The group's photo will appear in the list of the groups and in the main window of the software.

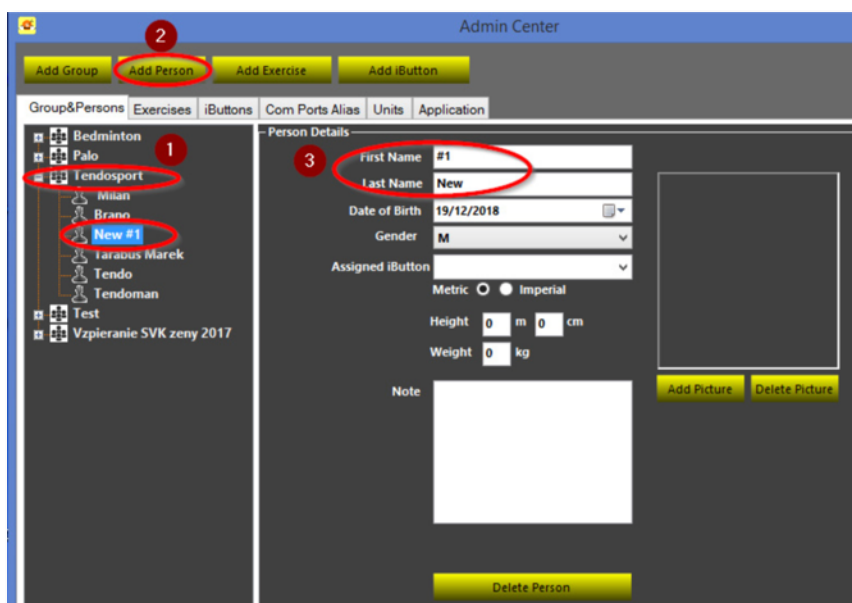


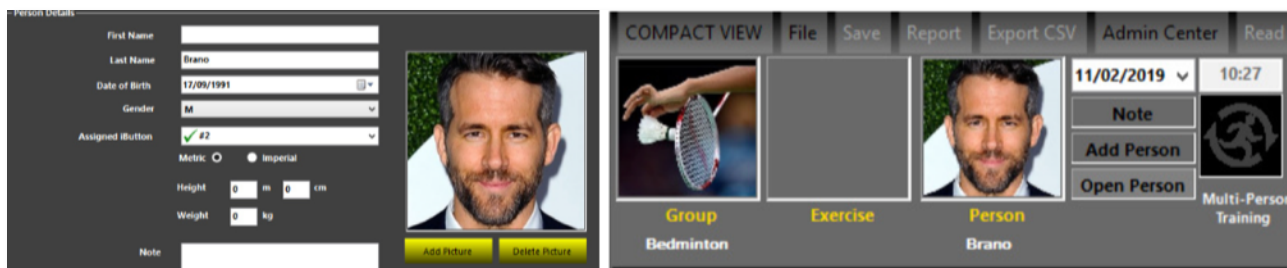
4. To delete a group, select a group you want to delete and click "Delete". If you delete a group that contains saved data, it is still possible to open the saved files using "File" command in the top bar menu.



### Add Person:

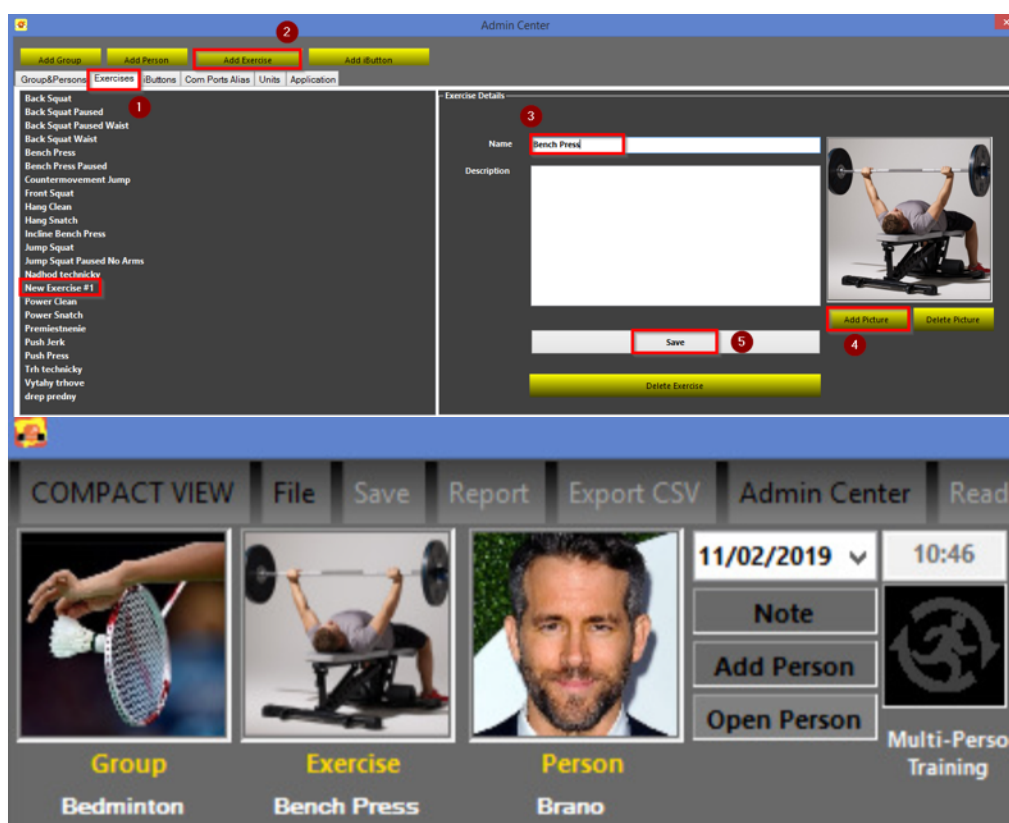
1. Select Group
2. Click "Add Person"
3. Fill in personal details. (It is possible to update personal details anytime.) After the personal details are updated, click "SAVE" to save new person or updated info.
4. To delete a person, select the person you want to delete and click "Delete".
5. It is also possible to add a photo of a person. Click "SAVE" to save new person or any updated info. The photo of the person will appear in the list of persons and in the main window of the software.





### Add Exercise:

1. Select "Exercises"
2. Click "Add Exercise"
3. Write name of the exercise
4. It is also possible to add a photo of an exercise.
5. Click "SAVE" to save new exercise or any updated info. The photo of the exercise will appear in the list of exercises and in the main window of the software.
6. To delete an exercise, select an exercise you want to delete and click "Delete". If you delete an exercise



that contains saved data, it is still possible to open the saved files using "File" command in the top bar menu.



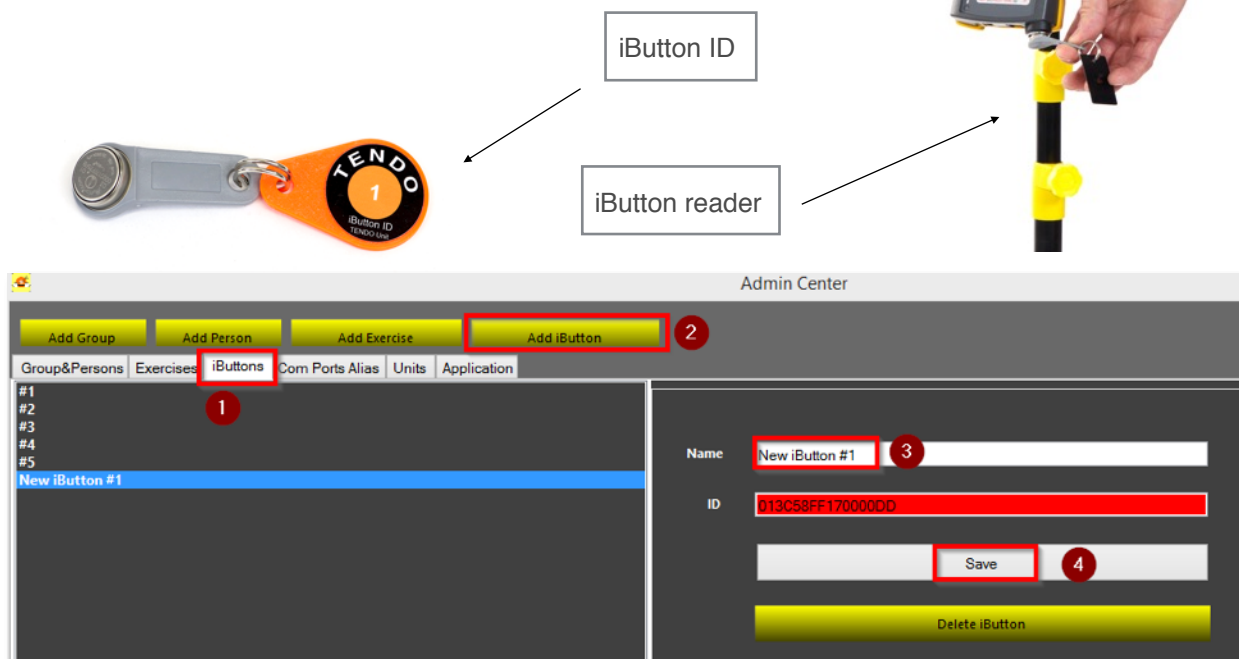
**!! Recommendation !!** We recommend to add pictures to the database in square shapes.

### Add iButton ID:

An iButton ID is an RFID-like microchip, which is used for identification of athletes in training and testing, by simply touching the iButton Reader of the microcomputer unit with an iButton ID chip.

**!! Attention !!** the Tendo Unit must be connected to the software to add new iButton ID to list of iButtons.  
www.tendosport.com

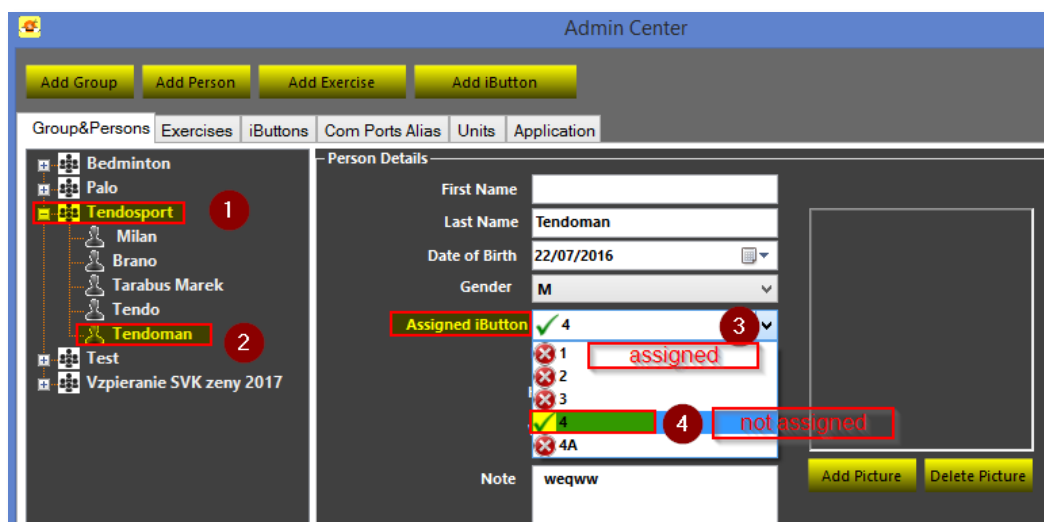
1. Select “iButton”
2. Click “Add iButton”
3. Touch the iButton ID to the iButton reader on the microcomputer unit. The software displays the iButton ID number.
4. Assign a number or a name to the iButton chip.
5. Click “SAVE” to save the new iButton.
6. To delete an iButton ID, select an iButton you want to delete and click “Delete”



### Assign iButton ID to an athlete:

If the database of the iButton IDs is created, it is possible to assign a particular iButton to a particular athlete.

1. Click “Group & Persons” and select Group
2. Select Person. Person details will open.
3. Click “Assigned iButton” to open list of iButtons.
4. Assign available iButton (not yet assigned to this group) to particular person.
5. Click “SAVE” to save updated info.





### Com Ports Alias:

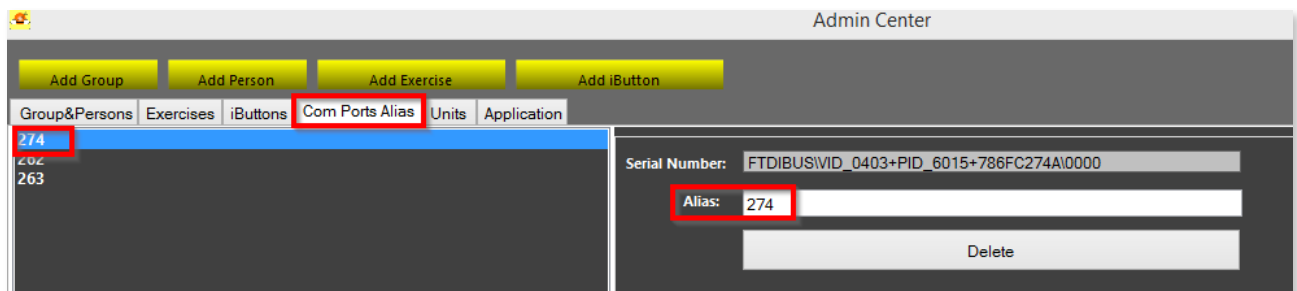
If the USB Tendo Bluetooth is connected to the computer, the Tendo software displays a set number for each connected USB Tendo Bluetooth automatically.



It is possible to change the name of the Tendo Bluetooth set or add new name for the Tendo Bluetooth.

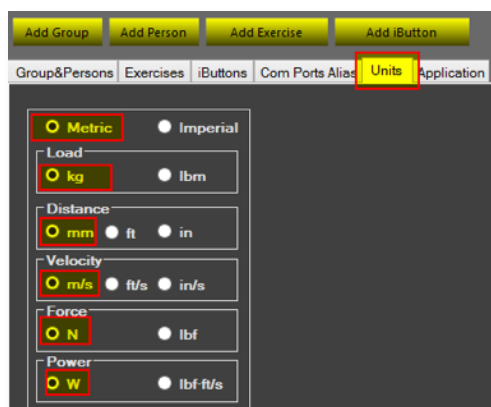
**\*\*** It is not recommended to change the Bluetooth set number, only to add additional name to the set number.

1. Click “Com Ports Alias”
2. Select Tendo Bluetooth set number form the list of COM Ports.
3. Add the additional name to the Bluetooth number. Click “Save”



### Units:

It is possible to select different units of measurement for the Tendo Power Analyser Computer Software.

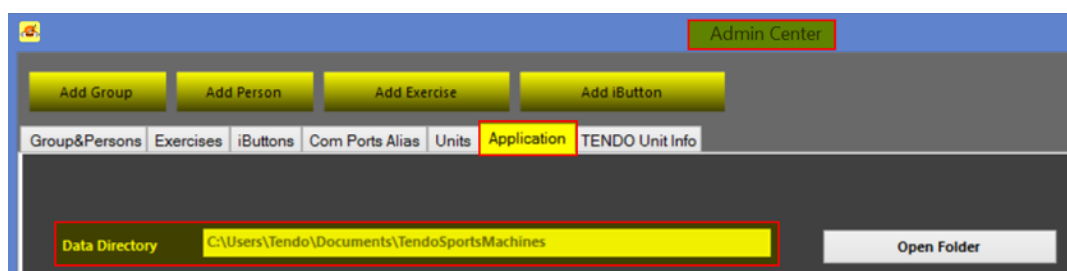


### Application:

**Data directory** - Database directory will be collated automatically

**The location of the TENDO Power Analyzer database is in the following directory:**

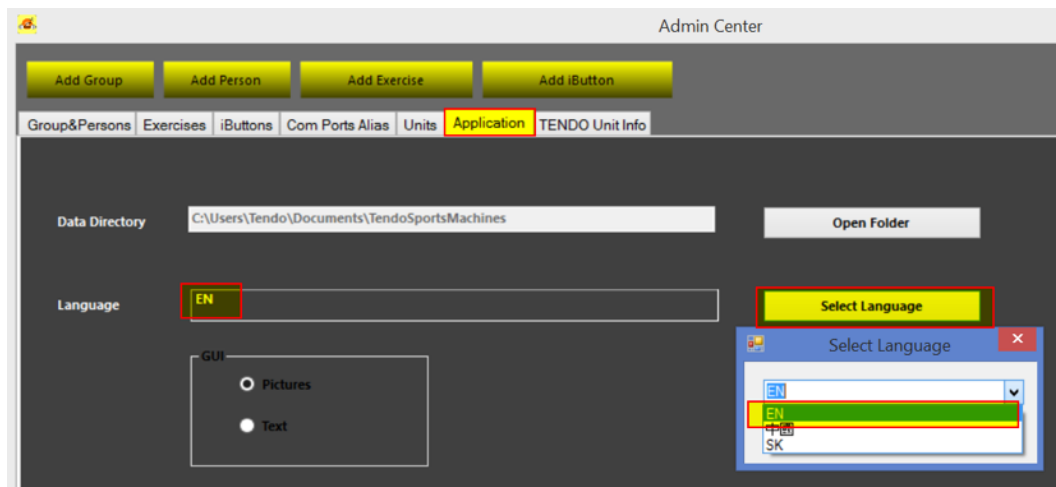
*C:\Users\.....\Documents\ Tendo Sports Machines\Group\Exercise\Name*



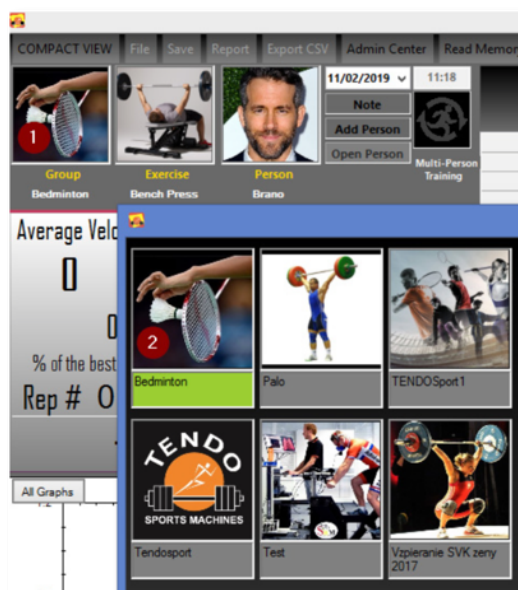


### Language:

1. Click on "Select Language"
2. Choose language of your choice. You can choose between English, Slovak and Mandarin Chinese.
3. Click "OK" to confirm your selection.



- Close "Admin Center".
- Select Group, Exercise and Person before you start your measurement for easy identification of the measurement later on.
- Click on Group, Exercise or Person panel in the main window to open list of groups, exercises or persons. Select particular group, exercise or person by clicking on your selection.



### There are two modes to work from - ONLINE and OFFLINE

- **ONLINE** = Tendo Microcomputer Unit is linked to your computer via Bluetooth and the data is collected instantly (in real time)
- **OFFLINE** = the data are already stored in the computer and the Tendo Microcomputer Unit is not connected.

## 6. ONLINE MODE

TENDO Power Analyzer computer software is connected to a microcomputer unit.

### 6.1 CONNECTING MICROCOMPUTER UNIT

1. No USB Bluetooth is plugged in - the fields are **black**



2. Switch the microcomputer unit on and plug the Tendo Microcomputer bluetooth to the microcomputer unit.

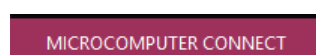


3. Plug the USB Bluetooth to the computer (the software automatically recognises the USB. If not, click Refresh USB) - the **fields turn red** when the USB bluetooth is recognised

Tendo Bluetooth **LED blue lights** indicate that the bluetooth connection between the microcomputer unit and the computer is OK. **Red field** indicate the Tendo Computer Bluetooth is plugged in.



4. Click "Microcomputer Connect" to connect the microcomputer unit with the software

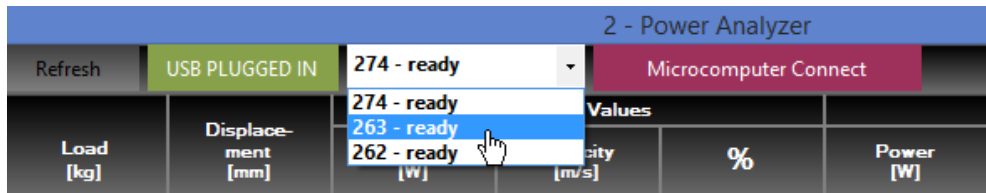


5. Indication of the correct connection: Microcomputer is switched on and the connection between the software and the microcomputer is OK - **fields turn green**



Program detects the Tendo Bluetooth Set number automatically.

If you open multiple Tendo Power Analyzer program windows for connection of multiple Tendo Units, you have to choose different TENDO Bluetooth Set number (not used) for each program window.

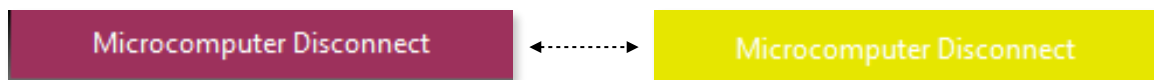


**!! Attention !!** Click "Microcomputer Connect" only if **blue LED light** is ON on Bluetooth devices, which indicates correct wireless connection between a microcomputer unit and the computer.

6. If the communication between the computer and the microcomputer is lost, or the microcomputer is switched off and then again the microcomputer unit is switched on, the software will reconnect with the microcomputer automatically.

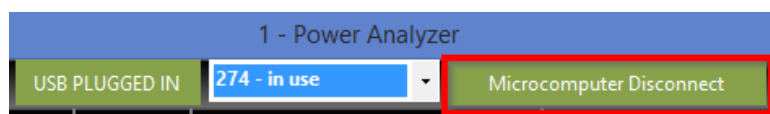
Clicking on "Microcomputer Connect" is necessary only when you open the software or choose different bluetooth set.

The software indicates lost connection by changing colours of the field between **red** and **yellow**



**!! Attention !!** If there is still no connection, unplug both the USB Bluetooth and Tendo Microcomputer Bluetooth and plug them in again. Or close the Tendo Power Analyzer computer software and open it again. If there is still no connection, restart your computer.

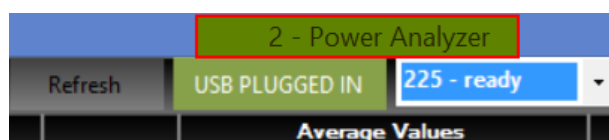
7. To disconnect connection click "Microcomputer Disconnect".



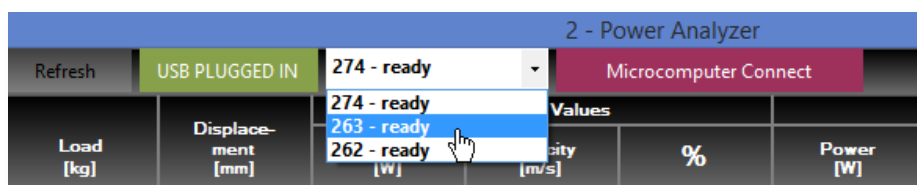
## 6.2 CONNECTING DIFFERENT MICROCOMPUTER UNITS TO THE COMPUTER

If you would like to connect more than one Tendo microcomputer unit to the Tendo Power Analyser Computer Software, you will need additional Tendo Bluetooth Sets.

1. Plug in another Tendo Computer Bluetooth (USB connector) into a USB connector on your computer. If you do not have more USB connectors available on your computer, it is possible to use a USB Hub.
2. Open new Tendo Power Analyzer computer software window by clicking on the Tendo Power Analyzer desktop icon. New window will open as "2 - Power Analyzer". This way is possible to open desirable number of Tendo Unit connections.



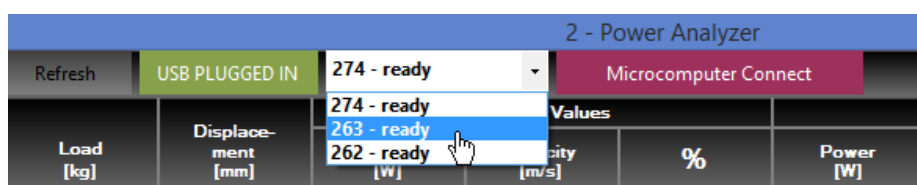
3. **Black** fields of the microcomputer connection button indicate OFFLINE Mode = microcomputer unit is disconnected
4. Select new unused number of the Tendo Bluetooth Set and click "Microcomputer Connect".



5. **Green** fields of microcomputer connection button indicate correct connection between the microcomputer unit and the Tendo computer software



6. If the software detects several Tendo Bluetooth Sets, it is necessary to choose different number ("ready") for each program window.



## 6.3 MICROCOMPUTER SETTING

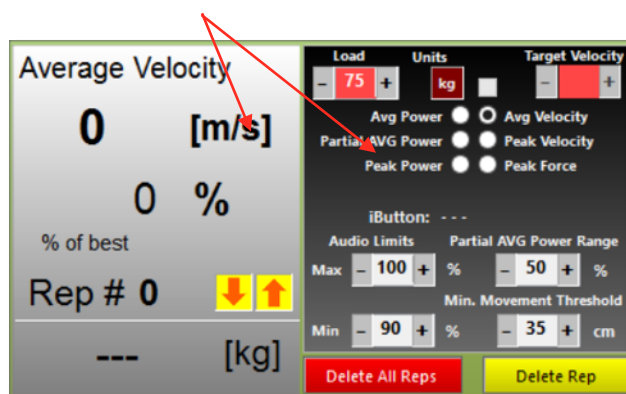
The program reads actual microcomputer setting (if not, press *Reset* button).

It is possible to change settings by using the microcomputer unit itself or using the TENDO Power Analyzer Computer Software.

To change the microcomputer settings from the computer software, use **Setup Panel**

—> *change*: Load, Units of the Load, Audio Limits, Percent value for Partial average Power range and Minimum Movement Threshold, VBT mode (on/off) and Target Velocity

—> Switch parameters which are displayed on microcomputer's upper display or on the numerical Workstation panel of the Tendo software.

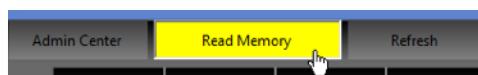


—> At the bottom of the Setup Panel there are 2 buttons: **DELETE ALL REPS** and **DELETE REP**.

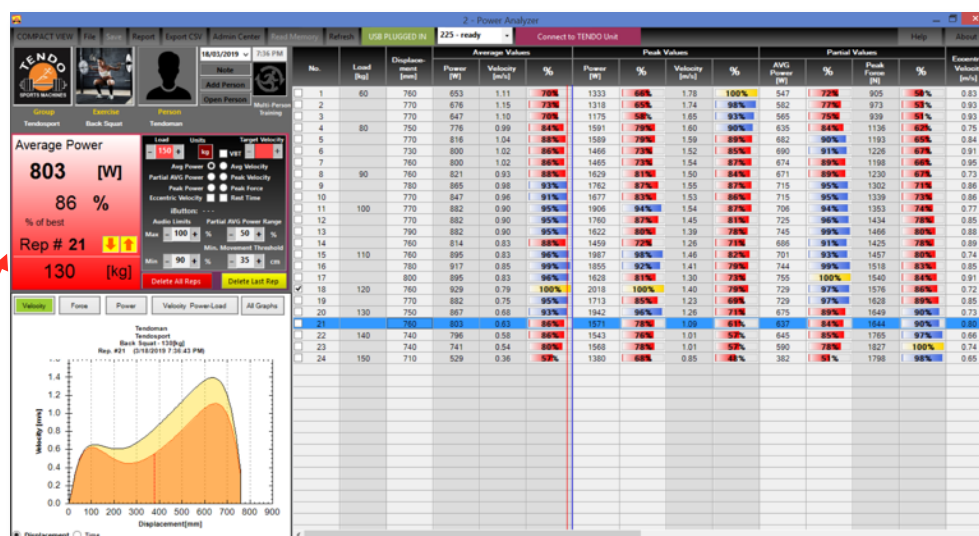
**!! Caution !!** Make sure you save the data before using “Delete All Reps” command.

“Delete Rep” command deletes the selected repetition only.

—> If you want to transfer data from the microcomputer memory to the computer software, press the “Read Memory” button. Data will be transferred to the software without graphs.



## 6.4 SOFTWARE WINDOW WITH MEASURED DATA



On the left hand side you can see the Panel of Values for actual or selected repetition.

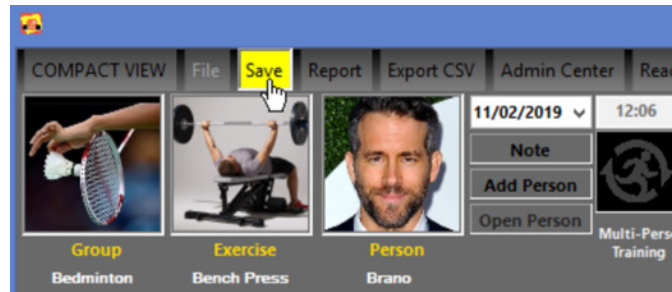
E.g. In the red field you will be able to see the recorded Watts for Average Power, Load, % of Maximum for Rep Number 21. The colour of the panel is identical with a colour of the bar graph in the table on the right.

## 6.5 SAVE DATA

Collected data can be save by clicking "Save" button.

**\*\* Prior to data saving, fill in information about group, exercise and person to identify the file.**

Click „Yes“ to confirm.



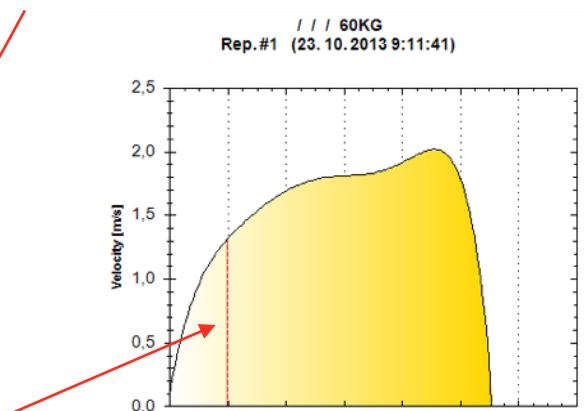
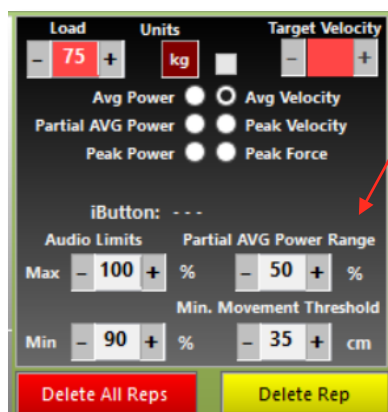
**\*\* If you did not fill in "Personal Info" (Group, Exercise, Person), the software saves file to Tendo Sports Machines Temporary Files. The File name is possible to rename anytime.**

**!! Notice!!** Each workstation window works independently. The workstations that are not connected can be used in offline mode and open saved files. If the system is connected = online, it is not possible to open saved files.

## 6.6 PARTIAL AVERAGE POWER

Partial Average Power is the value of average power, which is measured from a start (0) of an exercise to a certain predefined percentage value of the range of motion. The Default setting is 50%.

- The settings range from 1 to 100%
- It is possible to change the range for the partial average power measurement.



- The value of the partial range is also shown as a vertical red line on the "Velocity – Displacement (Time)" graph. The range of measurement for Partial Average Power is from 0 to the red vertical line.

**Peak Force** measurement has the same range setting as Partial Avg. Power.

It means the system finds the peak force for the set range (0 to a previously predefined percent value of the range of motion). The default setting is also 50%.

### WHY PARTIAL AVERAGE POWER (PAP)?

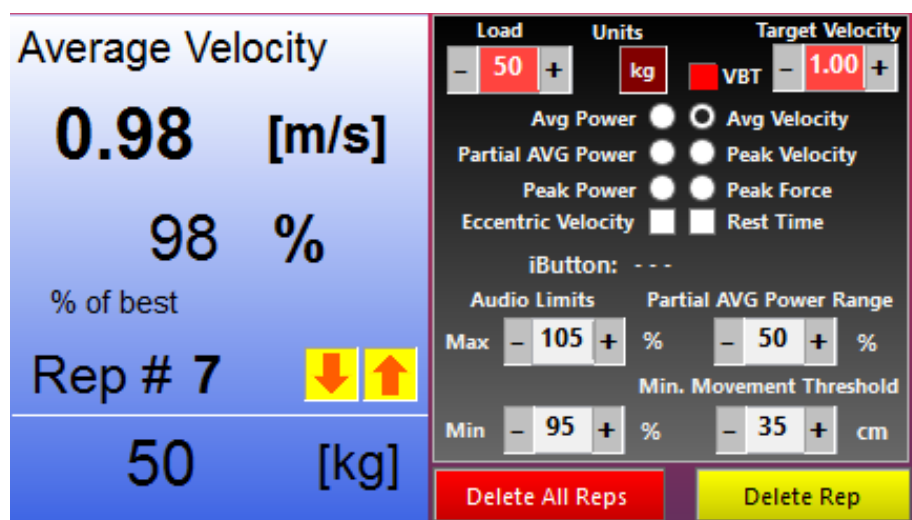
PAP is the best way to measure **Rate of Force development** (RFD)



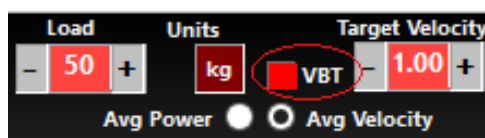
Sometimes the average or peak power are not sufficient parameters for the assessment of athlete's qualities in weight training. This is because many athletes, in an effort to reach a maximum power value, try to accelerate at the end of their movement. By doing so, they obtain a high average and peak power, but those parameters are misleading. Simply said, accelerating at the end of the movement is too late! They have high average and peak power values but a low RFD - rate of force development. The Rate of force development (RFD) is a key factor in sports performance where explosiveness is required. The Partial Average Power will help emphasise RFD.

**!! Recommendation !!** If you are interested in RFD, set Partial Average Power to 20%.

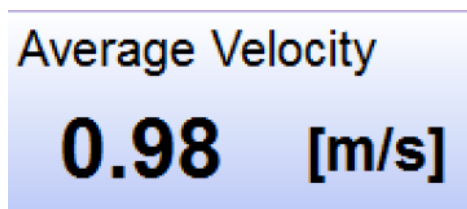
## 6.7 VELOCITY BASED TRAINING MODE



- Click on "VBT" button to turn on Velocity Based Training mode (or let the software read the setting from your microcomputer unit)



- Now, you can set your "Target Velocity". The set value of Target Velocity will stay displayed in the Target Velocity window.
- The setting range for Target Velocity is from 0.1 to 5 m/s with intervals of 0.01 m/s.
- The setting can be changed anytime as long as the Velocity Based Training mode (VBT) is turned on.
- If the VBT mode is turned off, it is not possible to enter Target Velocity. The Target Velocity window will stay empty



- Numerical workstation panel will be preset to show "Average Velocity"

### Indication via Audio Signals

- The set Target Velocity is considered as 100%
- The setting interval for an upper audio limit is 101 - 200% and lower limit is 99 - 1%



- The preset audio signals are following: 105% for upper limit and 90% for lower limit, i.e. if you turn VBT mode on, the audio signal settings are automatically switched to preset values (105% upper limit and 90% lower limit) or according to setting of microcomputer unit.

Average Values		
Power [W]	Velocity [m/s]	%
304	0.62	62%
515	1.05	105%
544	1.11	111%
475	0.97	97%
461	0.94	94%
470	0.96	96%
480	0.98	98%
470	0.96	96%
500	1.02	102%

- When VBT mode is turned on, the bar graphs for average velocity and average power are show in accordance with the setting of Audio Limits for Velocity Based Training Mode.
- i.e., the column colour indicates whether the repetition was done in line with the prescribed Target Velocity range for Velocity Based Training

#### Column colours:

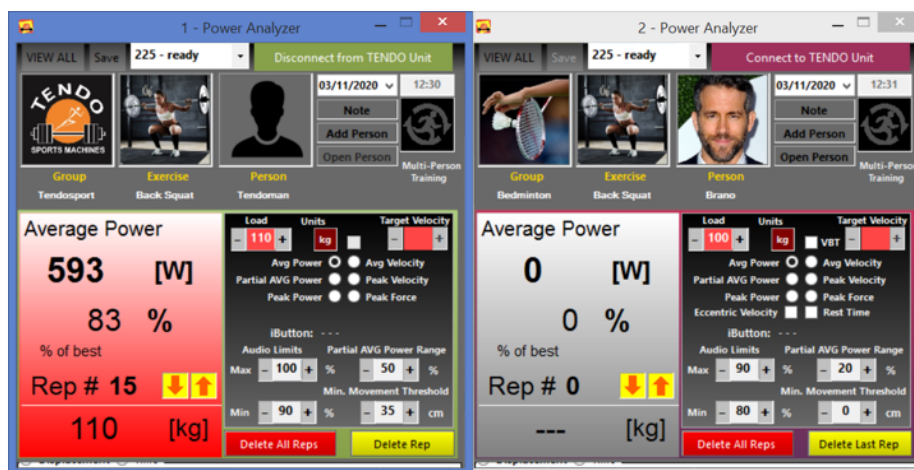
- **Red column:** velocity above upper limit = repetition was too fast
- **Yellow column:** 100% = Target Velocity was hit
- **Blue column:** reps falling between upper and lower limit = well performed rep, falling within the Target Velocity range
- **Red column:** velocity below lower limit = repetition was too slow

## 6.8 MULTIPLE MICROCOMPUTER UNITS CONNECTED TO A COMPUTER

It is possible to **select a compact view** of the Tendo Power Analyzer software window.

—> Click “Compact View” command and you will see a panel for the Tendo Unit setup and Panel of Values for each software window.

—> To return to full screen view, click “View All” command.



If you would like to **connect multiple microcomputers** to the computer, you will need additional Tendo Bluetooth Sets.

1. Plug another Tendo Computer Bluetooth (USB connector) into an appropriate USB connector on your computer.
2. Open a new Tendo Power Analyzer software window by clicking on the Tendo Power Analyzer desktop icon.

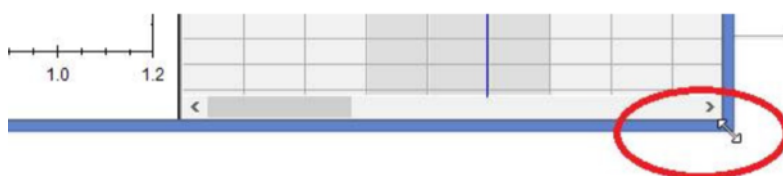
3. A new window will open as “2 - Power Analyzer”.
4. If you select the “Compact View”, it is possible to arrange the software windows on the computer screen in order to see them all at the same time.



It is also possible to **change software window dimensions**.

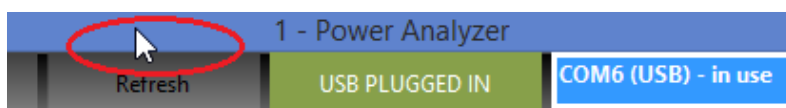
—> Place your mouse cursor on a bottom right corner (or side line) of the software window, press left button of your mouse and hold.

—> Change the software window to the desirable dimensions.

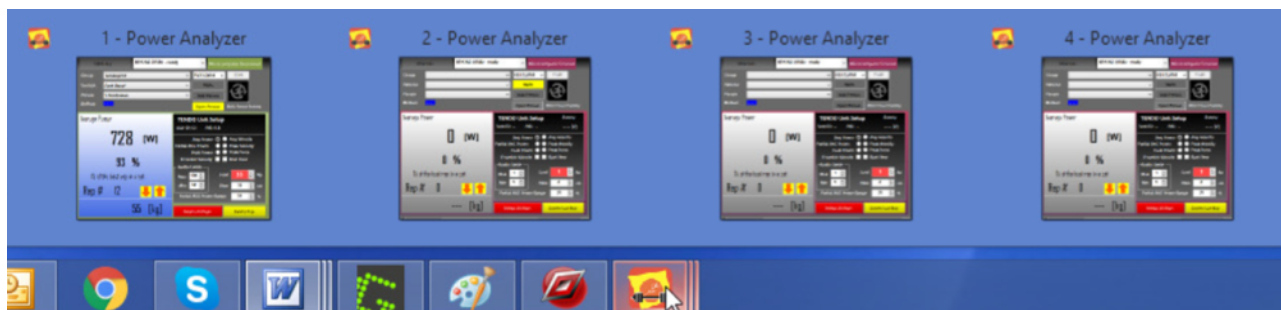


**How to move the software window.**

—> Place the mouse cursor on the upper bar of the software window. Press left button of your mouse and you can move the software window anywhere on your computer screen.



If you click on the Tendo Power Analyzer software icon placed on a lower bar of your computer, you will see all opened Tendo software windows.



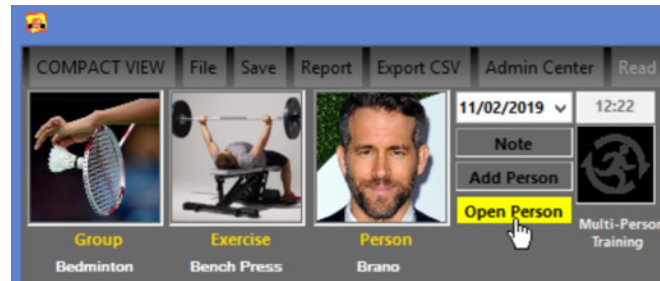
## 7. OFFLINE MODE

If the microcomputer is not connected to a computer, it is possible to open saved files from the database and analyze the measurements.

—> Click “File” on workstation panel and choose the group, exercise, and name and select particular file from the database.



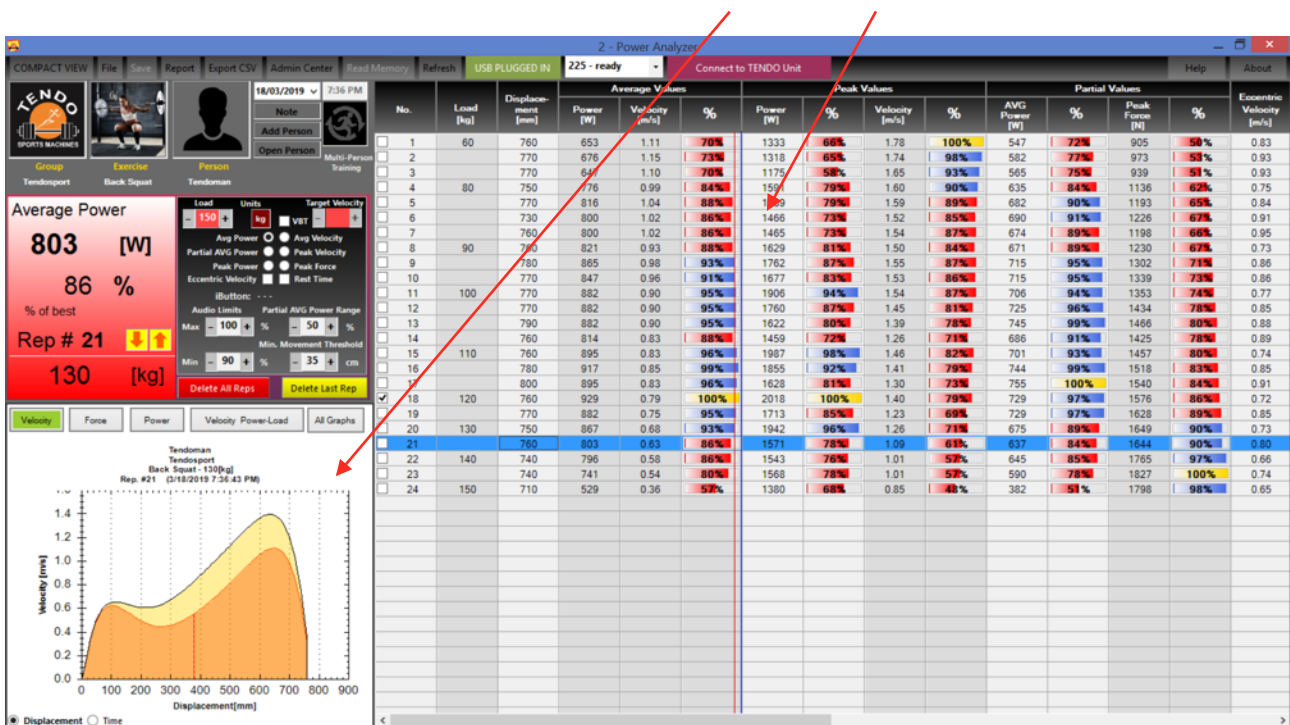
—> For fast search, fill in Personal Info and click "Open"



Database directory: :C:\Users\.....\Documents\ Tendo SportsMachines\Group\Exercise\Name

## 8. ANALYSING RESULTS

The computer software has two sections for data analysis: Graphs and Tables



### 8.1 TABLE SECTION

The table section contains:

- Repetition Number, Load, Displacement
- Average Power, Average Velocity, and Percent of the best rep. – for average value Peak Power, Percent of the best rep. for peak power
- Peak Velocity, Percent of the best rep. for peak velocity
- AVG Partial Power – partial average power for predefined range from 0 to setting value, Percent of the best rep. – for partial average power
- Peak Force - for predefined range from 0 to setting value, Percent of the best rep. – for peak force

No.	Load [kg]	Displacement [mm]	Average Values			Peak Values				Partial Values				Eccentric Velocity [m/s]	
			Power [W]	Velocity [m/s]	%	Power [W]	%	Velocity [m/s]	%	AVG Power [W]	%	Peak Force [N]	%		
<input type="checkbox"/>	1	60	760	653	1.11	70%	1333	66%	1.78	100%	547	72%	905	50%	0.83
<input type="checkbox"/>	2		770	676	1.15	73%	1318	65%	1.74	98%	582	77%	973	53%	0.93
<input type="checkbox"/>	3		770	647	1.10	70%	1175	58%	1.65	93%	565	75%	939	51%	0.93
<input type="checkbox"/>	4	80	750	776	0.99	84%	1591	79%	1.60	90%	635	84%	1136	62%	0.75
<input type="checkbox"/>	5		770	816	1.04	88%	1589	79%	1.59	89%	682	90%	1193	65%	0.84
<input type="checkbox"/>	6		730	800	1.02	86%	1466	73%	1.52	85%	690	91%	1226	67%	0.91
<input type="checkbox"/>	7		760	800	1.02	86%	1465	73%	1.54	87%	674	89%	1198	66%	0.95
<input type="checkbox"/>	8	90	760	821	0.93	88%	1629	81%	1.50	84%	671	89%	1230	67%	0.73
<input type="checkbox"/>	9		780	865	0.98	93%	1762	87%	1.55	87%	715	95%	1302	71%	0.86
<input type="checkbox"/>	10		770	847	0.96	91%	1677	83%	1.53	86%	715	95%	1339	73%	0.86
<input type="checkbox"/>	11	100	770	882	0.90	95%	1906	94%	1.54	87%	706	94%	1353	74%	0.77
<input type="checkbox"/>	12		770	882	0.90	95%	1760	87%	1.45	81%	725	96%	1434	78%	0.85
<input type="checkbox"/>	13		790	882	0.90	95%	1622	80%	1.39	78%	745	99%	1466	80%	0.88
<input type="checkbox"/>	14		760	814	0.83	88%	1459	72%	1.26	71%	686	91%	1425	78%	0.89
<input type="checkbox"/>	15	110	760	895	0.83	96%	1987	98%	1.46	82%	701	93%	1457	80%	0.74
<input type="checkbox"/>	16		780	917	0.85	99%	1855	92%	1.41	79%	744	99%	1518	83%	0.85
<input type="checkbox"/>	17		800	895	0.83	96%	1628	81%	1.30	73%	755	100%	1540	84%	0.91
<input checked="" type="checkbox"/>	18	120	760	929	0.79	100%	2018	100%	1.40	79%	729	97%	1576	86%	0.72
<input type="checkbox"/>	19		770	882	0.75	95%	1713	85%	1.23	69%	729	97%	1628	89%	0.85
<input type="checkbox"/>	20	130	750	867	0.68	93%	1942	96%	1.26	71%	675	89%	1649	90%	0.73
<input checked="" type="checkbox"/>	21		760	803	0.63	86%	1571	78%	1.09	61%	637	84%	1644	90%	0.80
<input type="checkbox"/>	22	140	740	796	0.58	86%	1543	76%	1.01	57%	645	85%	1765	97%	0.66
<input type="checkbox"/>	23		740	741	0.54	80%	1568	78%	1.01	57%	590	78%	1827	100%	0.74
<input type="checkbox"/>	24	150	710	529	0.36	57%	1380	68%	0.85	48%	382	51%	1798	98%	0.65

- *Eccentric Velocity* - average velocity in downward movement

Coloured Columns "%" represent percent value of the best rep for power, velocity and force.

**Column colours** depends on the audio limits settings.

**Yellow column:** each repetition with a value of 100% or performed above upper limit of the audio signal.

**Blue column:** each repetition with a value performed between upper and lower limit of audio signal.

**Red column:** each repetition with a value performed below lower limit of audio signal.

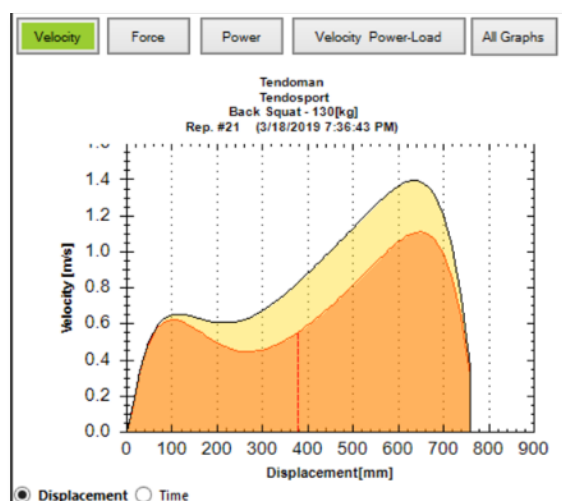
Blue (or grey row) represents actual repetition displayed in Graph Section e.g. Rep 21 is highlighted in example above.

## 8.2 GRAPH SECTION

The computer software offers 4 graphs:

- **Velocity: Displacement (Time)**
- **Force: Displacement (Time)**
- **Power: Displacement (Time)**
- **Velocity & Power – Load: for average values of power and velocity**

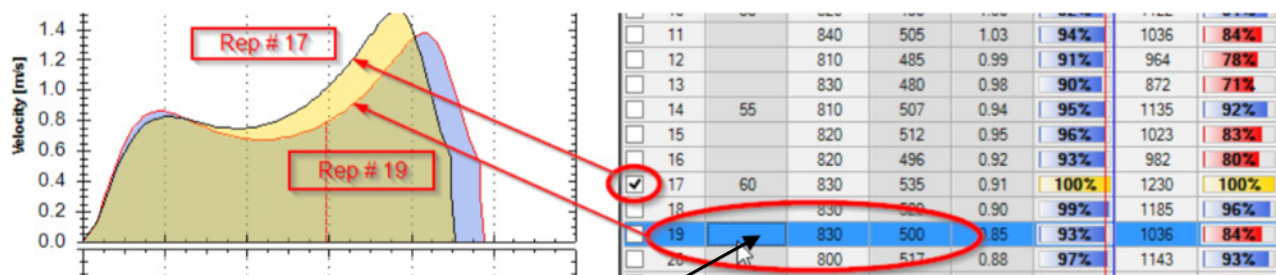
—> To change the graph, just click on the desired parameter in the graph menu





—> It is possible to select Displacement or Time axis by clicking on "Displacement" or "Time", located at the bottom of the graphs.

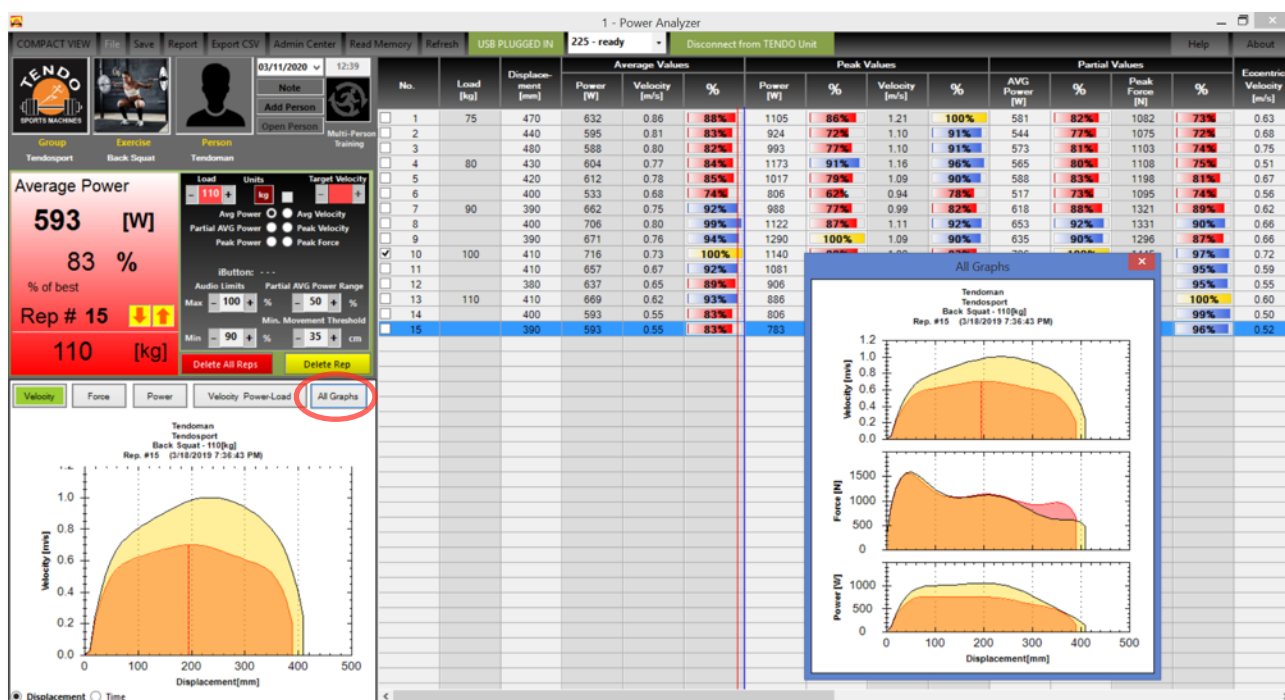
—> There are two curves in each graph. The **black curve** is for repetition with maximum value of Average Power or Velocity and the **red curve** is for the marked repetition.



The **red curve** is for selected repetition.

—> Click "All Graphs" to view all graphs.

Window for All Graphs is independent and can be moved anywhere on the computer screen.



## Velocity & Power - Load graphs

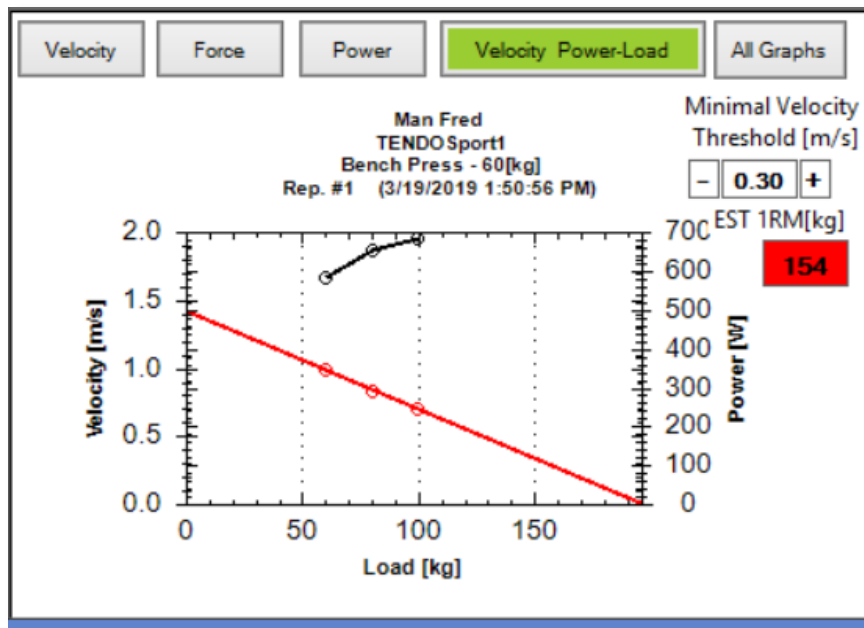
If you perform the exercise with more than 3 different weights, the computer software displays the Velocity – Load line and Power – Load curve. It is for average values of Power and Velocity.

**\*\* If you set a Minimal Velocity Threshold, the software will calculate estimated 1 RM. \*\***

The Minimal Velocity Threshold depends on exercise and also can differ from athlete to athlete.

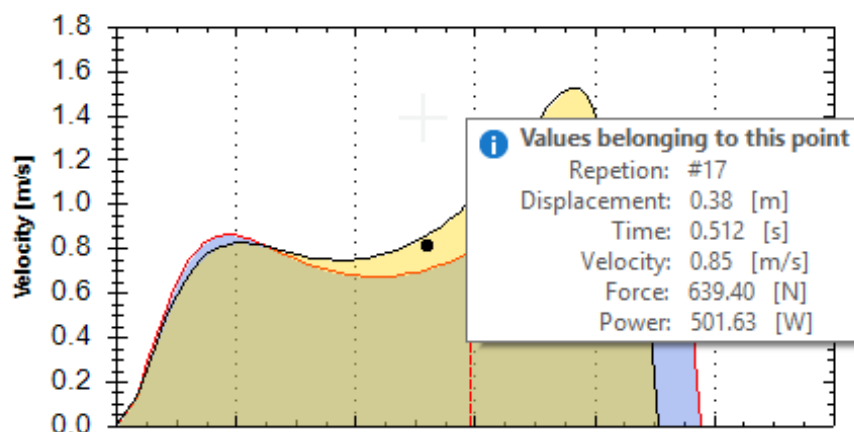
For example for Back Squat - MVT is around 0.35 m/s.

Bench Press - MVT is around 0.17 m/s



### 8.2.1 WORKING WITH THE GRAPH

If you place your cursor on a selected point of the “Velocity – Displacement (Time)” curve, actual values of displacement, time, velocity, force and power are displayed.



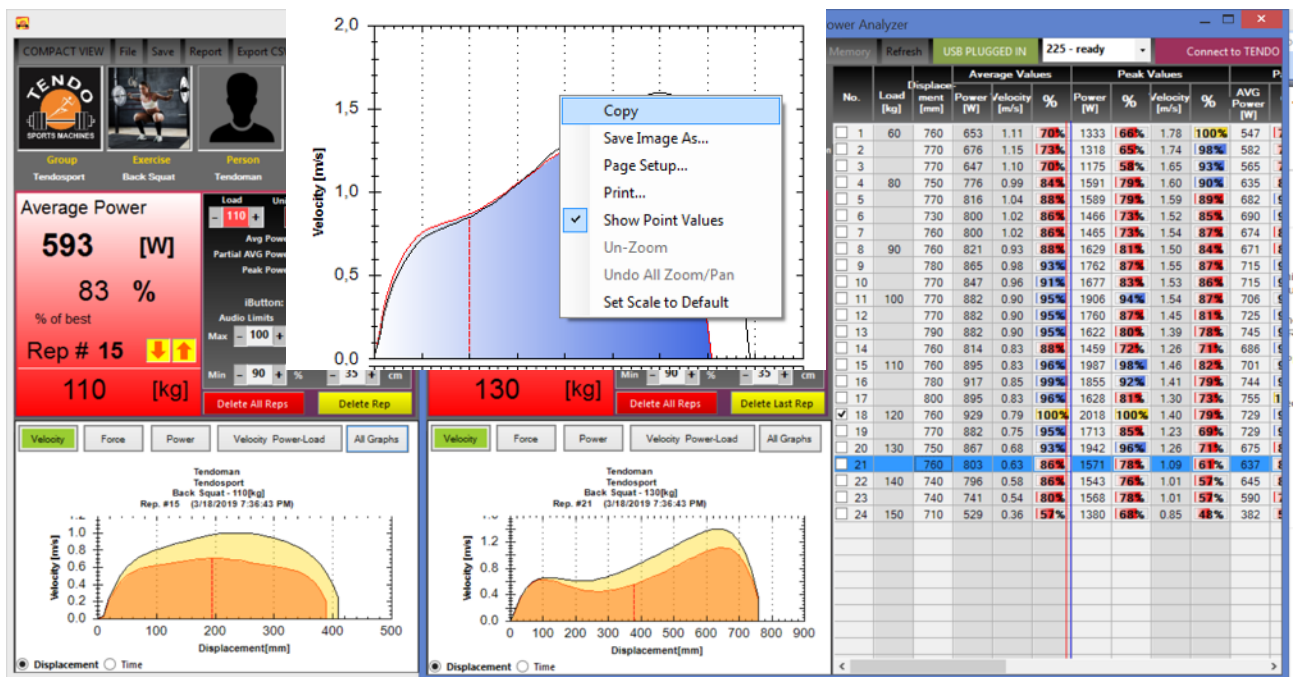
#### !! Recommendation !!

It is possible to open the Tendo Power Analyzer computer software several times. The purpose for the multi opening of the program is to track more workstations or to compare 2 or more different files.

1. Click "Restore Down" button on the upper right corner of the program window, to make each window smaller.
2. Go to the lower right corner of the program window, click and hold left mouse button and you can change the program window dimension.

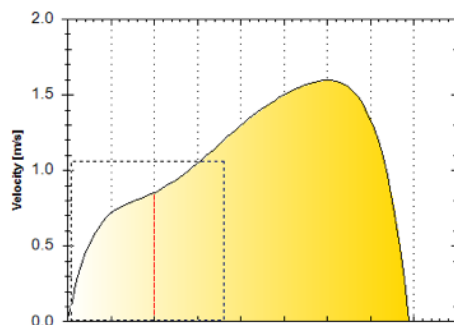


3. Open selected file in each opened Tendo Power Analyzer program window and get 2 or more independent measurements on your computer screen. You can create any combination of the program windows.
4. Move the cursor to the graph area. Click the right button of a mouse and a command window will appear. Select the command you want to use and click the left mouse button.

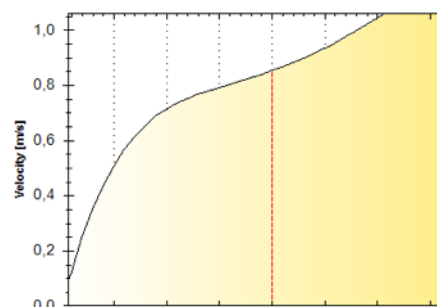


5. You can also “Zoom” any part of the graph. Press the left button of the mouse – hold and stretch the window to the part of the graph you want zoom and release the left mouse button.
6. To go back to “Default View”, click the right button of the mouse and select “Set Scale” to “Default” or “Un - Zoom”.

Default view



Zoom view



## 8.3 EXPORTING DATA

Tendo Power Analyzer computer software allows you to export data.  
 —> To export a file, click „Report“ on the top tool bar of the workstation.  
 Report Sheets will come up in an excel spreadsheet or equivalent.

There are 2 Report Sheets available:

1. Summary of the exercise set
2. Raw Data for each repetition from the exercise set.



### [EXERCISE SUMMARY REPORT]

Name Tendoman Group Tendosport  
 Exercise Back Squat Note  
 Load 100 kg  
 Date 13.10.2014 5:17 PM

#	AVERAGE			PEAK				PARTIAL AVERAGE	
	Power [W]	Velocity [m/s]	%	Power [W]	% of the best	Velocity [m/s]	% of the best	Power [W]	% of the best
1	922	0,94	94	1616	98	1,39	97	241	81
2	981	1	100	1643	100	1,43	100	275	92
3	941	0,96	96	1425	87	1,29	90	285	96
4	961	0,98	98	1504	92	1,33	93	298	100
5	922	0,94	94	1367	83	1,25	87	297	100
6	873	0,89	89	1130	69	1,11	78	285	96
7	824	0,84	84	1144	70	1,1	77	278	93
8	784	0,8	80	980	60	0,96	67	277	93

## 8.4 PRINTING DATA

Export data to e.g. Microsoft Excel program and use print commands.

It is useful to archive the data periodically (at the end of training cycle, or season) and then delete old files from the program database because the database has a lot of information and will reach a very big size quickly.

### [EXERCISE SUMMARY REPORT]

REPEITION NUMBER

Group	Tendosport	Load	100	kg		
Name	Tendoman	Note				
Exercise	Back Squat					
Date	13.10.2014 5:17 PM					
	#	DISPLACEMENT [m]	TIME [s]	VELOCITY [m/s]	FORCE [N]	POWER [W]
	0	0	0	0	608	0
	1	0,01	0,040656	0,0488	869	110
	2	0,02	0,066128	0,2109	1066	332
	3	0,03	0,086456	0,3452	1210	509
	4	0,04	0,104112	0,4557	1310	648
	5	0,05	0,119936	0,5457	1373	754
	6	0,06	0,134672	0,6187	1406	834
	7	0,07	0,148296	0,6774	1416	893
	8	0,08	0,161384	0,7244	1407	934
	9	0,09	0,173968	0,7618	1386	962
	10	0,1	0,186216	0,7917	1356	980
	11	0,11	0,198056	0,8158	1320	992
	12	0,12	0,209608	0,8355	1281	999
	13	0,13	0,220768	0,8521	1242	1003

### !! WARNING!!

Do not use the system in places subject to excessive humidity, dust, shock or vibration.  
 Protect the units from becoming wet and do not drop or strike the units against hard objects.

- Please check our website <https://www.tendosport.com/support/software-updates/tendo-unit/> for the latest Tendo Power Analyzer computer software updates.

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