

## PolygraphPro Suite Version 4.2

### Global / FrontEnd Enhancements

#### Newest Visual Studio Libraries Added

The entire Polygraph Professional Suite solution has been added and updated to use the latest version of Microsoft's Visual Studio. This ensures that our software is compatible with the latest releases and updates to the Windows operating system.

#### Generate Report

Version 4.2 now comes loaded with newly updated report templates and customizable score sheets.

#### Language addition

Hebrew has been added as a fully supported live switching language within our Polygraph Professional Suite.

#### ASIT Update

The ASIT scoring algorithm has been updated to the authors latest standards. Visual enhancements have been added along with some small calculation changes.

#### Question Viewing Area

The question viewing area in the ChartRecorder and ChartViewer has been enlarged and the default font made slightly smaller. This allows examiners to have longer questions 100% viewable in the window.

#### Archiving Utility

Several enhancements have been added to the archiving utility.

1. You can now choose to split zipped files up into multi part archives, including the size of the parts. This allows you to send large files including video via email.
2. You can now also choose to password protect zip files, they are protected with AES-256 encryption which is the highest available encryption for a zip file.

#### MultiVideo

The MultiVideo window has received an all new facelift and feature set.

- Microphone amplitude change is shown and recorded for playback afterwards directly into your video. This way you can see when an examiner begins speaking for even closer post test QC.
- Question Labels are marked and recorded within the video showing exactly when the examiner pushed the space bar and let go of it. The question label is coloured to reflect the question type and dims after the examiner has let go of the space bar. The exam and Chart numbers are also denoted within the video. This makes review of the video much easier and understandable for QC as well as non polygraph professional who may review the video.

## **ESS Additions**

ESS has been updated to allow the submission of PLE scores, these scores are added to the totals and calculated within the ESS score sheet.

## **Updated manual**

You can find our newly updated PDF manual under your help menu within the software.

## **ChartRecorder**

### **Optionally increased sampling rates (Paragon)**

Now in the ChartRecorder if you have a Paragon connected you will have the option to sample at 40, 80, 150, 240, 320, 400, 489, 560 samples per second. The original sampling rate of 80 samples per second is the default option selected.

### **Auto Question Set Advancing**

Now in the ChartRecorder when you finish asking all of the sequences within a question set the software will automatically advance you to the next question set. You still have the ability to manually choose between any of your available question sets as well.

### **Auto Centering**

Newly added to the ChartViewer as an option you can now auto center all of your tracings before each questions (without the center arrow).

### **Question timer enhancement**

You can now choose to have your question timer begin to count after you have finished your question to guarantee a desired minimum amount of time between your question offset and the next question onset.

### **More session details**

Now on your chart you will notice the serial number of the instrument that was used to record the chart. You will also get a timestamp for when the chart was ended.

### **Room temperature**

An option has been added to stamp the room temperature at the beginning and end of each chart recorded (requires room temperature sensor / transducer).

## **ChartViewer**

### **Vasomotor Response Calculations and Tracings**

New post test channels have been added which can be used to easily see the Vasomotor Reactions directly on your chart.

### **Customizable Scratch Pad**

The latest version of our scratch pad allows you to click the "customize" button and then totally redesign the built in scoring sheet

however you would like. Customize your scratch pad directly in Excel using all of the features within and then the ChartViewer will automatically load it up and manage it for you while scoring.

### **Hand Calipers improvements, including more precision**

The hand calipers have been improved to include memory for their time span, the caliper data is now saved along with the chart meaning that when you pull them up they are where you left them the last time you were using that on any particular chart. The hand calipers within the ChartViewer have also been improved to display measurement accuracy to two decimal places for the horizontal and three for the vertical measurements.

### **Chart Biometrics**

You can now add examinee images to your chart along with finger prints. These examinee images are larger and of much higher quality. Not only can you add examinee photos to each chart, you now have the ability to choose which photo if you have taken several photos of your examinee, just right click and "Select Examinee Photo".

### **Chart Inclusion / Exclusion**

You can now right click on any chart tab at the top of your currently selected chart and choose to include or exclude it from the scoring window. By default all charts are included, if you choose to exclude a chart then the scoring algorithms will ignore them when calculating their measurements.

### **Response window markers**

The ChartViewer now has a post test analysis option to add response window markers. You can choose to denote these 5 seconds from the stimulus offset of 5 seconds from the examinee response marker.

### **Fast switching improved**

In previous releases of the version 4 series of Polygraph Professional Suite it was occasionally possible for charts to appear as doubled up if you switched very quickly between chart tabs in the ChartViewer, this fast switching has been improved to not reflect this.

## **QuestionEditor+**

### **Copy & Paste**

The QuestionEditor+ has been improved to now include right click context menus for whole questions and not just the question text. You can cut, copy, and paste whole questions within your exam. The cut, copy, paste feature works across multiple copies of the QuestionEditor+ which means you can open up a previous question set and copy and paste back and forth saving you time while creating new question sets.

## PolygraphPro Suite Version 4.0

### Global Enhancements

#### MultiVideo

The MultiVideo application now has an integrated sound meter which allows the examiner to choose their microphone and perform a sound test prior to recording for optimal audio. We have also included a feature that allows examiners to start the MultiVideo application in *Preview Only* mode. This can be useful if the examiner wishes to view the examinee or examination room from another camera angle without having to record this view with their session.

#### Improved Report Generation

Limestone clients can save more time than ever with our redesigned Report Generator. This Polygraph Pro application is now 50 times faster with convenient Office 2016 and Office 365 integration.

### Redesigned ChartRecorder

#### Comfortable New look

The ChartRecorder has been totally rewritten from the ground up in the latest .NET framework. This ensures our continued compatibility with operating systems moving forward and allows us to utilize the latest techniques available for software development. You will find the ChartRecorder although totally rewritten has the same comfortable look and feel that you're used to if you're an existing user. If you're a new or potential user you should find the easy to use and streamlined operation a welcomed change compared to our competitors software.

#### Changes in look and feel

The toolbar has been moved to the top of the chart and allows the user to hide and show it if they wish. This has freed up room to the left of the chart to allow space for some of our new real time meters (Described more under New Features)

#### New Features

The ChartRecorder has seen some additions and changes throughout the new development.

- You will find real time meters to the left of your live charts for: K Ohms, BP (Blood Pressure), Beats Per Minute (BPM), Temperature (Room / Skin), and O2 (Oxygen Saturation).
- We have also added the ability to record any channel that you wish without showing it on the chart.
- The PGauge (Standard Seat Cushion) can now be combined with the MMS All channel, this allows examiners who are taking advantage of the Movement Monitoring System (MMS) to truly combine all movement sensors into one tracing regardless of which instrument they are plugged into.
- There is a distinctly new status box above the chart which indicates clearly what mode the ChartRecorder is in and which hardware devices are attached. For example it could state: "Simulation Mode", "DataPac", "Paragon + MMS", and so on. With a quick glance you can tell which mode you are operating in. Along with this status box we have implemented the ability to plug/unplug any and all of your devices in on the fly, if it says "Simulations Mode", just plug in your hardware and the status will change to "DataPac" / "Paragon" and so on, your data will automatically adjust to the current input, switching from simulation to real.
- You will notice a new button on the toolbar labelled "Auto Tracking", if you enable auto tracking the chart will attempt to

keep all of the tracings nice and clean and on your chart for you, by centering real time and automatically adjusting the sensitivity for each visible channel.

## Redesigned ChartViewer

### Comfortable New look

The newly rewritten ChartViewer purposely mimics the same clean and intuitive look and feel of the ChartRecorder. This helps the user easily navigate and work without any major change in design and layout. As with the ChartRecorder the ChartViewer has been totally re written from the ground up in the latest .NET framework. This ensures our continued compatibility with operating systems moving forward and allows us to utilize the latest techniques available for software development. You will find the ChartViewer although totally rewritten has the same comfortable look and feel that you're used to if you're an existing user. If you're a new or potential user you should find the easy to use and streamlined operation a welcomed change compared to our competitors software.

### Faster loading times

The ChartViewer now loads charts up to 20 times faster, this allows for fast seamless switching between charts during review and scoring

### Faster Autoscoreing

The measuring time has also been drastically decreased while using the calipers and scoring algorithms as a result of faster loading times. This also results in a much faster autoscore process while scoring OSS3.

## Redesigned ChartStacker

### Comfortable New look

The newly rewritten ChartStacker also incorporates and takes advantage of the latest .NET framework. You will notice that the ChartStacker loads and reacts much quicker than any previous versions, while still accomplishing all of the same seamless tasks.

## New Measuring Features

**We have seen increased interest in looking at the data using a variety of measuring options. Below is a summary of our built-in measurement options for version 4.0**

### Vasomotor Reaction Ratio Tool

We compare the Mean Amplitude within the second five second duration period after question onset to the Mean Amplitude within the three second window collected pre- stimulus onset (start of question onset).

The result is the degree of suppression (if any) between the pre-stimulus average and the five second degree of suppression (if any) expressed as 1 being no difference and less than 1 being the ratio of suppression or increase (1. something, 1.1, 1.2, etc)

## Improved Measurement Options (Caliper Windows)

Measurements are taken within a sample window, indicated on the chart as a resizable rectangle. The horizontal dimension of the rectangle (caliper) determines the start and finish time of the sample. The vertical dimension of the rectangle (caliper) is used to 'clip' or limit the waveform should artifacts exist in the sample.

### Amplitude

The distance in inches or centimeters between the maximum and minimum values within the sample window.

### EDA Amplitude

The distance in inches or centimeters between the maximum value in the sample window and the first value in the sample window.

### Cardio (Diastolic) Amplitude

The cardio analysis module is used to perform this measurement. This measurement is the distance in inches or centimeters between the diastolic minimum and diastolic maximum.

### Line Length (Y)

Calculates the sum of the vertical changes in the waveform contained within the sample window.

### Cycles

Calculates the number of cycles within the sample window. See 'The Cycle Measurement' section for more details.

### Frequency (CPM)

Uses the cycles measurement to determine the number of cycles in the sample window and converts that value to cycles per minute.

### Inches

Measures the height of the caliper rectangle in inches. You can take a direct vertical measurement by placing the top and bottom of the caliper box on the points to be measured.

### Centimeters

Measures the height of the caliper rectangle in centimeters. See the 'Inches' measurement for more details.

### Line Length (H)

Moves along the waveform in increments calculating delta X and delta Y. These values are used to calculate the hypotenuse of a right angled triangle. The hypotenuse represents the distance travelled along the waveform.

### **Cardio (Systolic) Amplitude**

The cardio analysis module is used to perform this measurement. This measurement is the distance in inches or centimeters between the systolic maximum and minimum within the sample window.

### **Cardio (Systolic) Mean BP**

Calculates the mean systolic value and performs an internal conversion to give a readout in millimeters of mercury (mmHg) representing the mean systolic blood pressure.

### **Cardio (Diastolic) Mean BP**

Calculates the mean diastolic value and performs an internal conversion to give a readout in millimeters of mercury (mmHg) representing the mean diastolic blood pressure.

### **Microsiemens**

Is a measure of electrical conductance between the EDA leads. The reading is taken at the left (or left hand side) of the measurement calipers and represents the instantaneous value at that point.

### **ASIT Cardio (Diastolic) Amplitude**

The cardio analysis module is used to perform this measurement. The first diastolic tip or peak of the first full cycle is located and that point is used as a horizontal reference within the measurement window. The distances between the line and the diastolic minimum and diastolic maximum are calculated. The larger of the two numbers is taken as the result. If the result is negative blood pressure is decreasing within the sample window and if the result is positive the blood pressure is increasing within the sample window.

### **% Oxygen**

The percentage of oxygen saturation refers to the portion of oxygen-saturated hemoglobin relative to total hemoglobin in the blood. The data is collected using the Nonin photoplethysmograph. The reading is taken at the left (or left hand side) of the measurement calipers and represents the instantaneous value at that point.

### **Cardio Analysis Module**

The cardio analysis module in Polygraph Professional Suite is designed to count cycles and perform systolic and diastolic measurements with a high degree of accuracy. The techniques used are highly tolerant of signal noise and drift due to changes in the subject's blood pressure.

This module is capable of, but not limited to, performing the following calculations:

- Cycles (to a fraction of a cycle)
- Systolic and Diastolic Amplitude

- Systolic and Diastolic Minimum, Mean and Maximum
- Mean Blood Pressure (systolic or diastolic)

### **Systolic Measurement**

The cardio analysis module identifies the systolic tips or peaks of the waveform within the sample window and uses those values to take measurements. For example, systolic amplitude can be calculated by locating the minimum and maximum systolic values and calculating the difference.

### **Diastolic Measurement**

The diastolic measurements are calculated in the same manner as the systolic measurements, but instead use the diastolic tips or peaks of the waveform.

### **The Cycle Measurement**

The cycle measurement uses historical data within the sample window to establish a mean cycle time. Whole cycles are measured directly from the data while partial cycles are pro-rated against the mean cycle time. These two values are combined to produce the final result.