# **Santo Pharmstat App User Guide**

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## Table of contents

[Table of contents 1](#_ulmwetedv9zw)

[1. Introduction 1](#_adjj7fhz2lgm)

[1.1 App Purpose 1](#_mrz73nvbmxwt)

[1.2 Key Features 2](#_ht0w8aorgj6e)

[1.3 System Requirements 2](#_xh2w0b3mzpod)

[2. Access to the app 2](#_3fxfihk4d8x0)

[2.1 How to Launch the App 2](#_9eaj3ghvinj3)

[2.2 Web Browser Requirements 2](#_zxuwrvuvb8u)

[3. Navigating the interface 3](#_nub835n6rqwi)

[3.1 Language selection 3](#_k8z2oyq7vuio)

[3.2 Main menu and subpages 3](#_7w6ui13dgewm)

[3.3 Loading data 3](#_kmxbjzcdpph8)

[4. Description of application modules 4](#_wccw06fap7cq)

[4.1 Descriptive statistics 4](#_cvc2lzok06qk)

[4.2 Histogramy 4](#_ujfyypg7c70u)

[4.3 BoxPlot Plots 5](#_7no2j3hsqy5p)

[4.4 ImR Control Charts 5](#_t9a2vbj8kus2)

[4.5 Analysis of Litigability 6](#_uhcetqmfn4h8)

[4.6 Regression for Stability 6](#_uexh3fgz594x)

[4.7 Temperature and Humidity Analysis 6](#_nv7nukmous4g)

[5 Frequently Asked Questions (FAQs) 7](#_ik8wgvfxl7i)

[5.1 What file formats are supported by the application? 7](#_jwyccrvmwfmd)

[5.2 What to do if I get an error loading a file? 7](#_xwr4jr3mgpd9)

[5.3 How do I change the language of the app? 7](#_rdibehlcqa57)

[5.4 Can I export the results of the analysis? 7](#_vrmsbla5yhx0)

[5.5 What are the minimum system requirements to use the app? 8](#_yf8u8yxpio3b)

[5.6 What to do if the app is not working properly? 8](#_87r4at8xk25l)

## 

## 1. Introduction

### 1.1 App Purpose

The Santo Pharmstat **application**  is designed to facilitate the analysis of statistical and quality data in the pharmaceutical industry. It enables quick and intuitive processing of information and the generation of clear results in the form of charts, tables and statistical indicators.

### 1.2 Key Features

* **Multi-language support**: Polish, English and Russian user interface.
* **Modular Data Analysis**: Descriptive statistics, histograms, BoxPlots, ImR control charts, process capability analysis, regression for stability, and temperature and humidity analysis.
* **Convenient data management**: Easily load Excel files and view results in real time.
* **Secure data storage**: No installation required – data is processed in the cloud.

### 1.3 System Requirements

The Santo Pharmstat **app**  runs entirely through a web browser and does not require local installation. Users must have access to the Internet and an up-to-date version of a browser that supports modern web technologies (e.g. Google Chrome, Mozilla Firefox, Microsoft Edge).

## 

## 2. Access to the app

### 2.1 How to Launch the App

The Santo Pharmstat **app**  is hosted on the Streamlit platform and available at:

**<https://santo-pharmstat1.streamlit.app/>**

To run the app:

1. Open your preferred web browser.
2. Enter the https://santo-pharmstat1.streamlit.app/ address in the address bar.
3. Press **Enter** to load the app.
4. Once the app loads, select your preferred language from the drop-down menu on the left.

### 2.2 Web Browser Requirements

To ensure that the application works properly, it is recommended that you use the latest versions of browsers:

* **Google Chrome** (recommended)
* **Mozilla Firefox**
* **Microsoft Edge**
* **Safari** (na systemach macOS)

**Minimum requirements:**

* JavaScript support.
* Support for HTML5 and CSS3.
* A stable internet connection of at least 1 Mbps.

**Compatibility issues:** Older versions of browsers may not support all of the app's features, which can lead to incorrect display of items or data loading errors.

## 

## 3. Navigating the interface

### 3.1 Language selection

Once you launch the **Santo Pharmstat app**  , the first step is to select the interface language. In the left side panel, there is a drop-down menu that allows you to choose from three available languages:

* **Polish**
* **English** (Angielski)
* **Русский** (Russian)

Language selection automatically adapts the entire application interface to the selected translation.

### 3.2 Main menu and subpages

Once the language is selected, the user can navigate through the app using  **the side menu**, which contains a list of available data analysis modules:

* **Descriptive statistics**
* **Histograms**
* **BoxPlot Plots**
* **ImR control charts**
* **Analysis of litigation capacity**
* **Regression for Stability**
* **Temperature and humidity analysis**

Clicking on the module name redirects to the appropriate subpage, where you can load data and perform analysis.

### 3.3 Loading data

The application allows you to load data in Excel format **(.xlsx, .xls).** The process of loading data is similar in each of the modules:

1. **Select File**: Click the "Select Excel File" button to open the dialog box and select the data file.
2. **Data Preview**: When a file is loaded, the app will preview the first few lines of data for quick validation.
3. **Selecting columns to analyze**: In some modules, you can specify specific columns that you want to analyze.
4. **Analysis**: Once the data is loaded and configured, the application will automatically generate the analysis results, which will be visible in the main area of the page.

In case of errors in the file or data format, the application will display an appropriate message with information about the problem.

## 4. Description of application modules

### 4.1 Descriptive statistics

The **Descriptive statistics** module allows you to quickly calculate basic statistical measures, such as mean, median, standard deviation, minimum, and maximum. This tool is useful for initial data analysis and identification of underlying trends.

**How to use the module:**

1. **Load the Excel file** containing the measurement data.
2. **Select the columns** for which you want to calculate descriptive statistics.
3. The results will be displayed in a table format containing key statistical measures.

**Additional features:**

* Assessment of normality of decomposition using the Shapiro-Wolf test.
* Calculation of skewness and kurtosis indices.

The module allows you to quickly assess the quality of your data before moving on to more advanced analyses.

### 4.2 Histogramy

The **Histograms module**  allows you to visualize the distribution of data and assess their compliance with the normal distribution. Histograms are useful for identifying patterns in data, such as asymmetry or the presence of outliers.

**How to use the module:**

1. **Load the Excel file** containing the measurement data.
2. **Select the column** to analyze from which you want to generate a histogram.
3. The histogram will be generated automatically along with the normality assessment of the distribution.

**Additional features:**

* View descriptive statistics for a selected column.
* Calculation of skewness and kurtosis indices.
* Shapiro-Wilk test to assess the normality of the distribution.

The module allows for quick and intuitive visual analysis of data, which makes it easier to identify irregularities before conducting more advanced analyses.

### 4.3 BoxPlot Plots

The **BoxPlots** module is used to visualize the distribution of data and identify outliers. Box plots allow you to quickly compare the distributions of different data sets.

**How to use the module:**

1. **Load the Excel file** containing the measurement data.
2. **Select the columns** to analyze from which you want to generate BoxPlots.
3. The graphs will be generated automatically, showing the median, quartiles, and outliers.

**Additional features:**

* View descriptive statistics for selected columns.
* Ability to compare distributions for multiple variables at once.

The module makes it easy to identify irregularities in your data, such as outliers or unusual distributions.

### 4.4 ImR Control Charts

The **ImR Control Cards** module allows you to monitor the stability of your processes by analyzing individual values (I) and moving range (MR). Control charts are a tool used in Statistical Process Control (SPC).

**How to use the module:**

1. **Load the Excel file** containing the measurement data.
2. The file should contain two columns: sample ID (time/ID) and measurement values.
3. The graphs will be generated automatically, showing individual values and a moving range.

**Additional features:**

* Assessment of normality of decomposition using the Shapiro-Wolf test.
* Identification of points outside control boundaries.
* Process stability assessment based on Shewhart's rules.

The module allows for ongoing monitoring of the quality of production processes and quick identification of potential problems.

### 4.5 Analysis of Litigability

The **Process Capability Analysis module**  allows you to assess how well your production process is able to meet specific specification requirements. Cp and Cpk indicators help determine the ability of a process to maintain quality.

**How to use the module:**

1. **Load the Excel file** containing the measurement data.
2. **Set the lower (LSL) and upper (USL) limits of the specification** and the target value (Target).
3. The process capacity analysis graph and the Cp and Cpk indices will be generated automatically.

**Additional features:**

* Calculation of Cp and Cpk indicators.
* Data visualization with specification boundaries.
* An overview of detailed statistics such as mean, standard deviation, and median.

The module allows you to identify quality issues and assess whether your production process is compliant with the requirements.

### 4.6 Regression for Stability

The **Regression for Stability module**  allows you to analyze trends in stability data using linear regression. This helps to assess the durability and stability of products over time.

**How to use the module:**

1. **Load the Excel file** containing the stability data.
2. **Select the series** to analyze that you want to display on the chart.
3. A graph with regression lines and a table with regression parameters will be automatically generated.

**Additional features:**

* View correlation coefficient (r), slope, and intercept.
* Marking specification boundaries on a graph.
* Review detailed regression analysis results.

The module supports the analysis of stability data, allowing you to assess the long-term quality of products.

### 4.7 Temperature and Humidity Analysis

The **Temperature and Humidity Analysis** module allows you to monitor environmental data, such as temperature and humidity, and identify exceedances of set limits.

**How to use the module:**

1. **Load an Excel file** containing temperature and humidity data.
2. **Set** temperature and humidity limits using the sliders.
3. Temperature and humidity graphs with a limit exceedance marking will be generated automatically.

**Additional features:**

* Calculate basic statistics such as average, minimum, maximum, and coefficient of variation (RSD).
* Identification of the moments of exceeding the limits and their visualization on the chart.
* Customizable limit ranges according to user needs.

The module allows for ongoing control of environmental conditions, which is crucial in processes that require maintaining constant environmental parameters.

## 

## 5 Frequently Asked Questions (FAQs)

In this section, you will find answers to the most frequently asked questions about using the Santo Pharmstat app.

### 5.1 What file formats are supported by the application?

The application supports files in Excel formats: **.xlsx** and **.xls**. Make sure that the data in the files is formatted correctly and complies with the requirements of each module.

### 5.2 What to do if I get an error loading a file?

* Check that the file is in the correct format.
* Make sure the file is not corrupted.
* Verify that the data in your file follows the required column layout.

### 5.3 How do I change the language of the app?

There are three languages available in the app: **Polish**, **English** and **Russian**. You can change the language in the app settings or on the home page.

### 5.4 Can I export the results of the analysis?

Yes, the results of the analysis (charts, tables) can be downloaded directly from the application in graphic formats or spreadsheets.

### 5.5 What are the minimum system requirements to use the app?

The application works in web browsers such as **Google Chrome**, **Mozilla Firefox** or **Microsoft Edge**. An internet connection is required.

### 5.6 What to do if the app is not working properly?

* Refresh the browser page.
* Check your internet connection.
* Contact your application administrator if the problem persists.

If you have additional questions or problems, please contact Technical Support.