

EDUCATION



LabChart Quick Start

This guide will help you set up and start using LabChart with the PowerLab data acquisition system. You will be guided through the software installation, and will learn how to set up and record your finger pulse using a transducer.

Detailed setup, analysis and troubleshooting information can be accessed from within the LabChart application:

- **Help Menu** – Provides access to detailed software and hardware information.
- **Welcome Center** – Step-by-step tutorials are available from the Getting Started tab in LabChart for Windows.
- **Refer to the Further Resources** section at the end of this guide for more information.

System Requirements

Windows

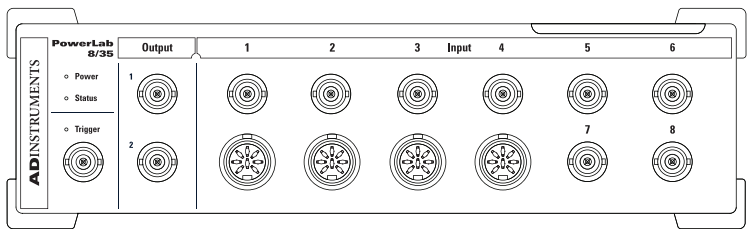
- LabChart 8.1.5 or later requires Windows 8.1 or later.
- LabChart 8.0 to 8.1.4 are not compatible with Windows 10 or 11, and require Windows 8.1.
- Microsoft .NET Framework 4 or later.
- Internet Explorer 8.0 or later.
- USB Interface for operation with PowerLab.
- Minimum screen resolution of 1280 x 768.

Mac

- OS X v10.8 Mountain Lion or later (LabChart 8.1.1 or later is required for Mac OS X 10.11 El Capitan).
- LabChart 8 Mac is not compatible with the Apple Silicon Mac and requires the x86 Intel Mac SB Interface.

What you will need

Please ensure you have the following equipment before you start

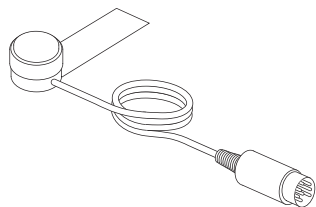


PowerLab

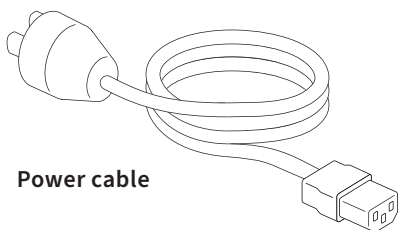


LabChart

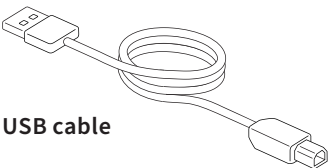
LabChart Installer



Pulse Transducer



Power cable



USB cable



If any item on the packing list is missing or your PowerLab seems to be damaged in any way, please contact your authorized ADInstruments® representative.

What you will do



1.	Install LabChart	
2.	Start LabChart	
3.	Create a New Document	
4.	Recording Setup	
5.	Sampling	
6.	Display	
7.	Channel Calculations	
8.	Adding Comments	
9.	Explore LabChart	
10.	Saving / Export	

Appendix

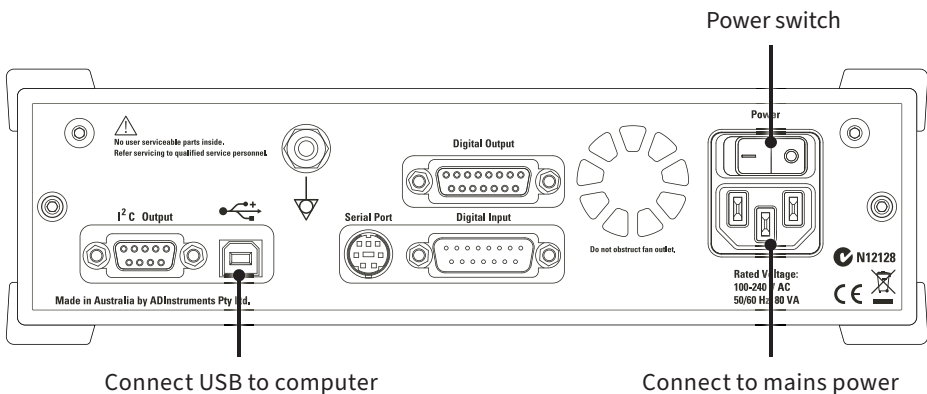
- Additional Information
- Additional Software
- Feature Manager
- Welcome Center
- Further Resources

1. Install LabChart

1. Run the LabChart Setup Installer from the LabChart media device (if supplied) or the downloaded stand-alone installer.
2. The installer will guide you through the installation.
3. When installation is finished, click **Finish**.

Hardware Setup

1. Connect the PowerLab to the mains (AC) using the power cable.
2. Connect the PowerLab to your computer using the USB cable.
3. Turn on the PowerLab using the switch on the back panel.



Multiple Devices

LabChart can record from multiple PowerLabs simultaneously into a single LabChart document or independently into separate LabChart documents.

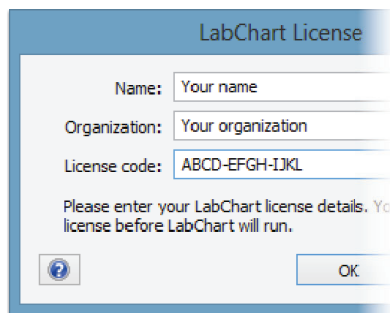
The Devices and Channels dialog allows you to choose which devices to use in a document and you can map LabChart channels to different input sources. See the Help for further information.

You only need one PowerLab to follow the instructions in this guide.

2. Start LabChart

License Registration

1. When you start LabChart for the first time, a dialog will appear asking you to enter your license code.
2. Enter your license details.

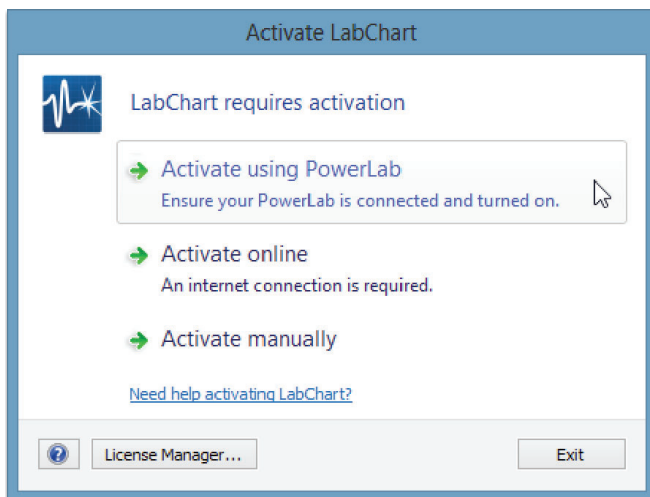


Device Discovery

When LabChart starts, it will scan for compatible devices. If no devices are found, ensure that the PowerLab is properly connected and turned on and click **Device Scan**. You may need to reset the PowerLab by switching it off, then on.

License Activation

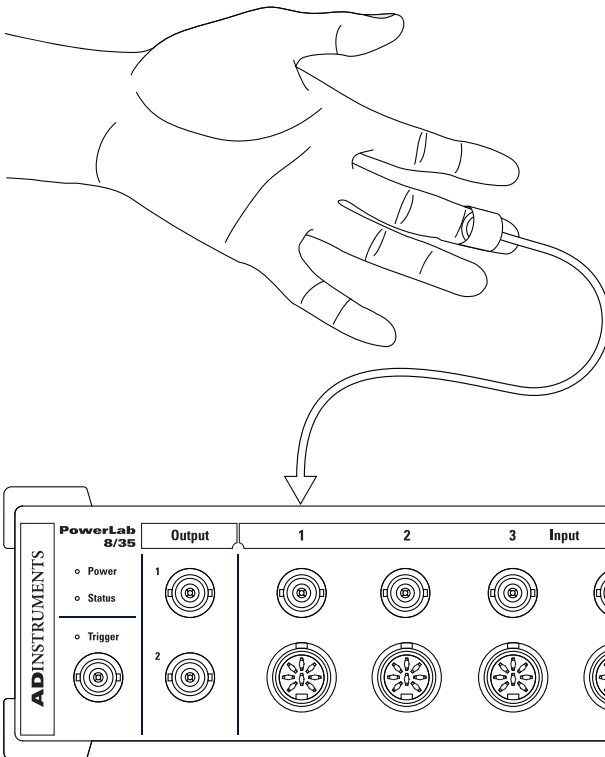
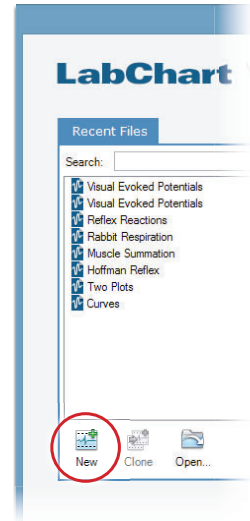
Activation is only required once per machine. If a supported PowerLab is already connected and turned on, your license will activate automatically. Otherwise, you may choose online or manual activation.



3. Create a New Document

1. Click the new document icon in the **Welcome Center** to create a LabChart document.
2. Connect the pulse transducer to Input 1 on the PowerLab.
3. Place the pressure pad of the pulse transducer against the tip of the middle finger or thumb. Use the Velcro strap to attach it firmly.

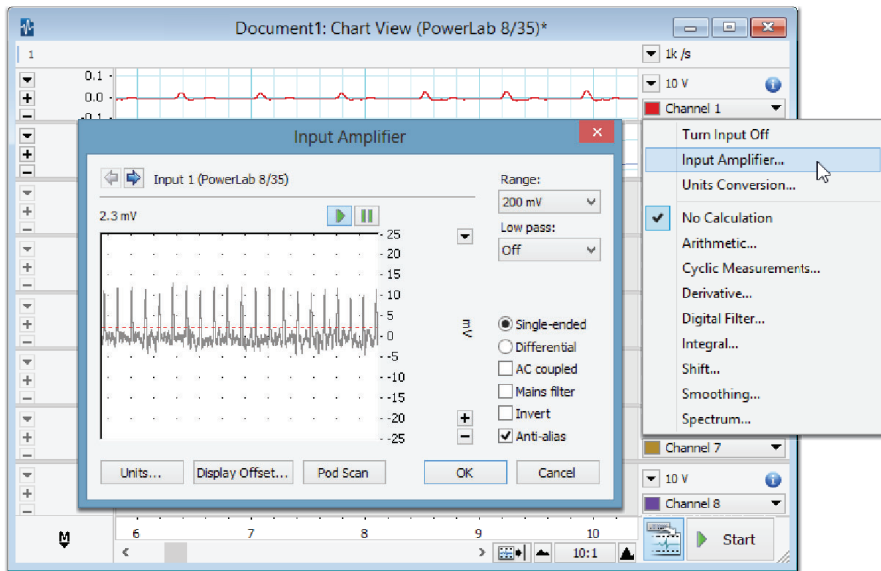
If the strap is too loose the signal will be weak or noisy.
If the strap is excessively tight it will reduce blood flow to the finger, causing discomfort and weakening of the signal.



4. Recording Setup

The Input Amplifier allows you to set up the recording parameters and preview the signal using your chosen settings.

1. Click on the Channel 1 dropdown menu.
2. Choose Input Amplifier...
3. Use the Range dropdown list to adjust the sensitivity of the recording.
Choose a range that provides you with a signal that fills 25-75% of the full scale.
4. Click **OK** to accept your settings.

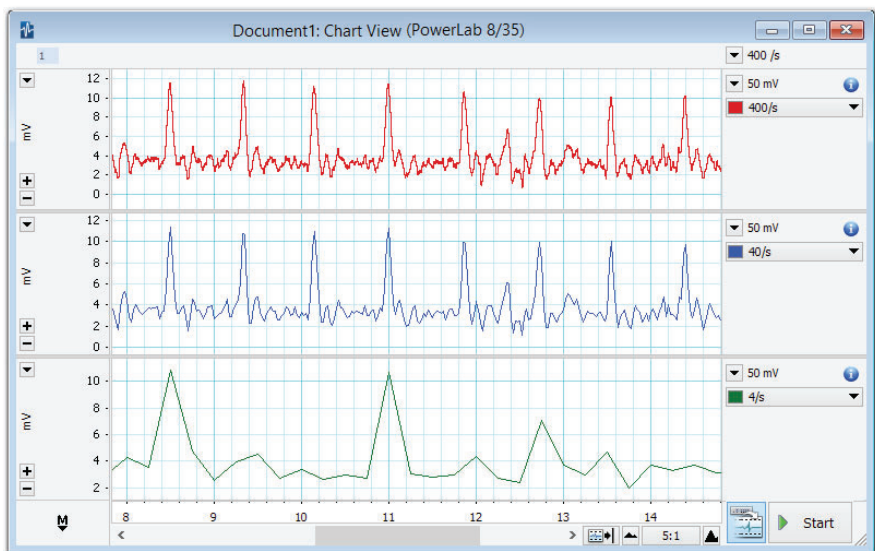
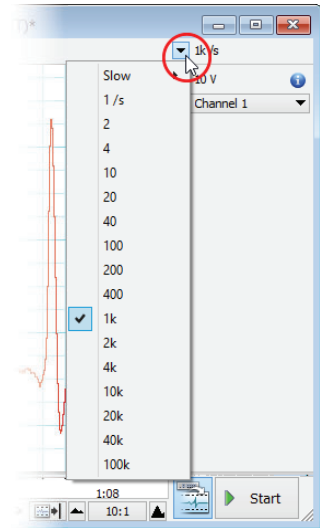


5. Sampling

When the PowerLab digitizes a signal, it records the voltage of the analog signal at discrete instants of time. The number of times that this happens per second is known as the sampling rate.

1. Click the button beside the Rate/Time display to open the Rate dropdown menu.
2. The sampling rates available are listed here.
3. Click **Start** and record for about 20 seconds at the default 1k /s sampling rate.
4. Repeat using sampling rates of 100 and 10 samples per second.

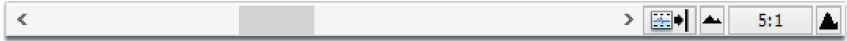
The sampling rate should be set high enough to capture all significant changes in the signal, but low enough to avoid excessive over-sampling.



Data recorded at 400 /s, 40 /s and 4 /s simultaneously into three separate channels.

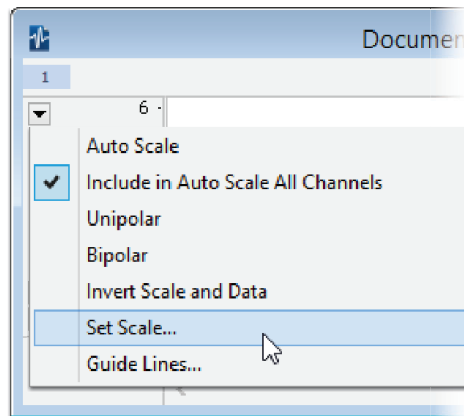
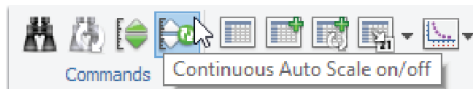
6. Display

The scroll bar can help you move backwards and forwards through your file. In addition to the scroll bar, are the horizontal compression controls. The horizontal scroll and compression controls are the buttons in the bottom part of the Chart View, just to the right of the horizontal scroll bar.



The scale of the (vertical) amplitude axis of each channel can be independently shifted, stretched, compressed or set exactly for optimum data display.

- You can auto scale the axes in all channels simultaneously.
- You can manually set scale appearance options using the scale dropdown menu, accessed either by right-clicking on the vertical axis or clicking the button located at the top left of each channel's amplitude axis.
- Each axis has scaling buttons and the axis can be dragged in various ways.
- You can also continually auto scale the amplitude axes while recording or while reviewing data files by toggling the Continuous Auto Scale toolbar item.

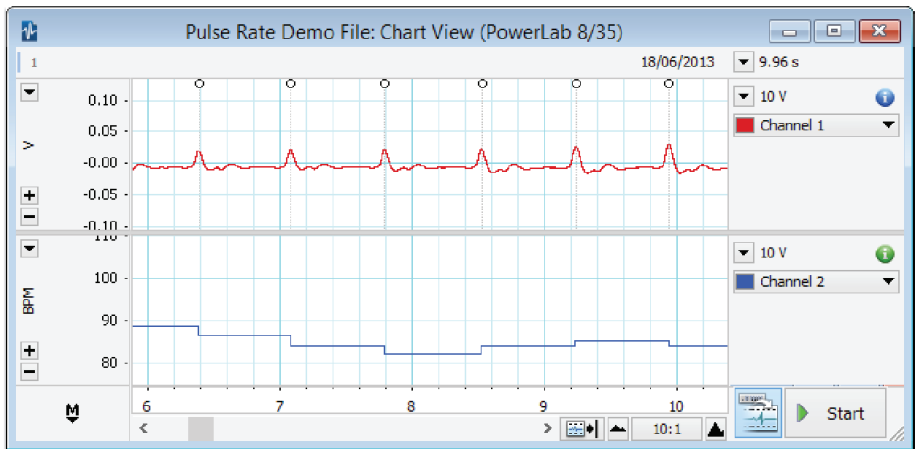
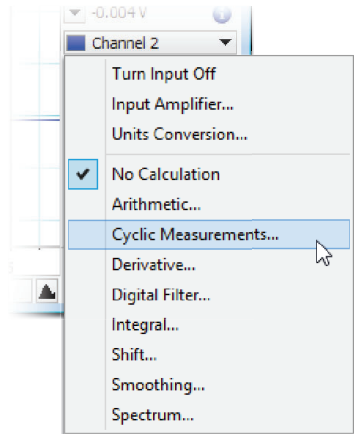


7. Channel Calculations

LabChart allows you to apply calculations to channels of recorded data. The calculated data are generated and displayed dynamically, so that they can be created, modified and removed as necessary.

In this exercise you will use Cyclic Measurements to calculate the heart rate from the raw pulse data in Channel 1.

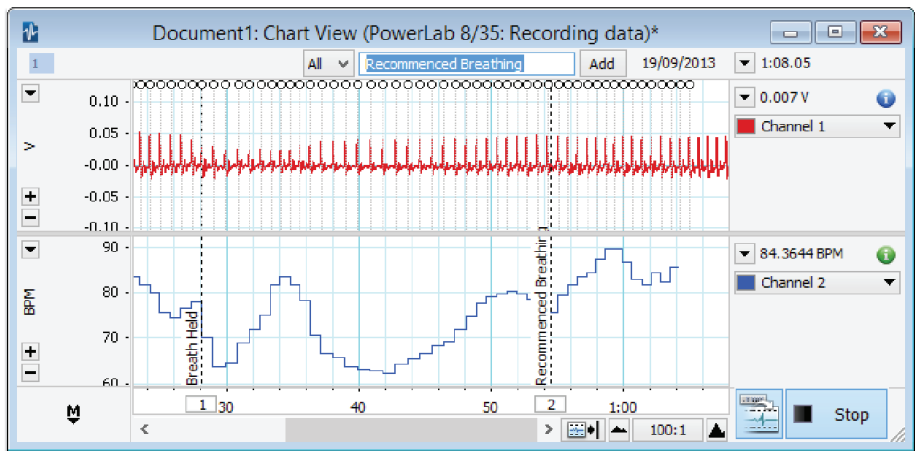
1. In Channel 2, select Cyclic Measurements... from the Channel dropdown menu.
2. In the Cyclic Measurements dialog choose the Cardiovascular - Finger Pulse preset from the detection settings panel.
3. Ensure that source is set to Channel 1, and measurement is set to Rate.
4. Click **OK**.



8. Adding Comments

Comments allow you to annotate your data and they provide a quick and accurate method of locating places of interest.

1. Click **Start** to begin sampling.
2. Click the **Add** button to add a comment with the text in the comment bar. A vertical dotted line appears in the Chart View which marks the comment.
3. Type “*Breath Held*” into the comments bar.
4. After a few seconds of recording, take in a large breath and hold your breath and press the Enter key or click **Add**.
5. After 15-30 seconds of breath holding, start breathing and press the Enter key or click **Add** to add a blank comment.
6. After a few more seconds click **Stop**.
7. Choose **Window > Comments** to open the comments window. The comments window displays a list of all the comments and you can review, edit, delete and find comments.



9. Explore LabChart

Data Pad. Extract and log data and statistics to the Data Pad spreadsheet.

Plots. Create and access histograms, scatter plots, and more.

Commands. Find and select functions and autoscaling.

Share. Send and Publish your data.

File. Create, open, save and print files.

Scaling. Compress or expand the amplitude axis using the compression buttons or the scale dropdown menu.

Marker. Drag onto a waveform to mark relative time and amplitude values.

Open the Welcome Center.

Split Bar. Split the Chart View to compare data recorded earlier with data being recorded in real-time.

Comment. Display comments on your recording.

The screenshot displays the LabChart software interface. At the top is a menu bar with 'File', 'Edit', 'Setup', 'Commands', 'Macro', 'Window', and 'Help'. Below the menu bar is a toolbar with icons for File, Commands, and Data Pad. The main window is titled 'Pulse: Chart View (PowerLab 8/35:'. It shows a waveform plot with a vertical axis labeled 'mV' ranging from 0 to 10 and a horizontal axis with time markers at 2:46, 2:47, 2:40, and 2:41. The waveform is a red line showing a series of sharp peaks. On the left side of the plot, there are controls for scaling, including a dropdown menu and buttons for compression and expansion. At the bottom of the plot, there is a split bar with a vertical line and a button labeled 'Pulse'. Annotations with lines pointing to various parts of the interface explain their functions: 'Data Pad' points to the Data Pad icon in the toolbar; 'Plots' points to the Plot icon in the toolbar; 'Commands' points to the Commands icon in the toolbar; 'Share' points to the Share icon in the toolbar; 'File' points to the File icon in the toolbar; 'Scaling' points to the scaling controls on the left; 'Marker' points to a marker on the waveform; 'Open the Welcome Center' points to the Welcome Center icon at the bottom left; 'Split Bar' points to the split bar at the bottom; and 'Comment' points to the Comment icon at the bottom right.

Comments. Add and review text comments.

Windows. Access the different data views and the analysis manager.

Comments Bar.

Quickly enter comments while sampling.

Layout. Control window arrangement.

Start and stop recording.

Sampling rate.

Sampling range.

Channel dropdown menu.

Access all of the major channel functions.

Input Amplifier.

Configure sampling settings and preview the signal in real-time.

Units Conversion.

Calibrate the raw data of a channel and apply the appropriate units.

Channel Calculations.

Apply calculations without losing the raw data.

Start and stop recording.

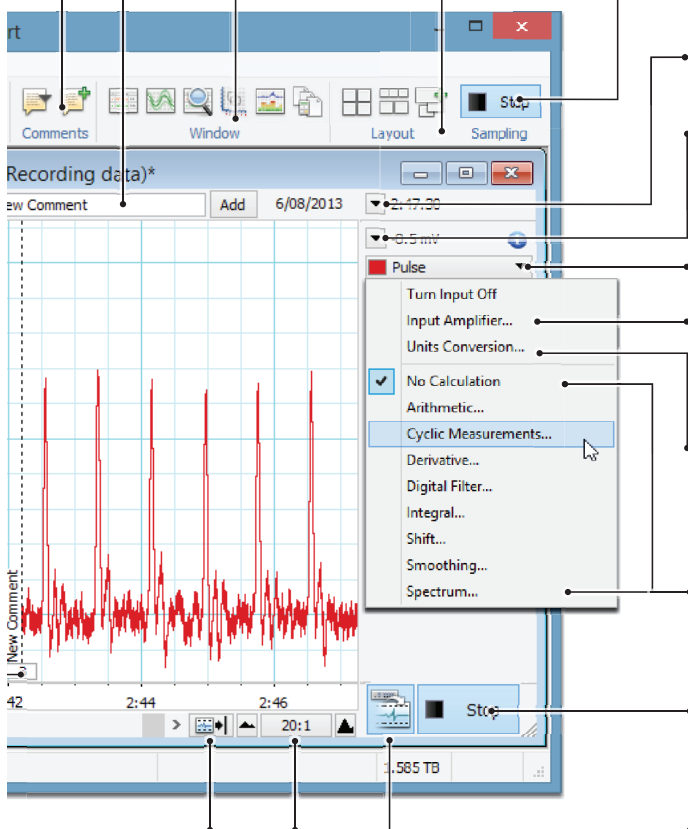
Record/Monitor. Record and monitor sampled data.

Scroll / Review.

Scroll through data while sampling.

Time Axis Compression.

Compress or expand the horizontal axis.

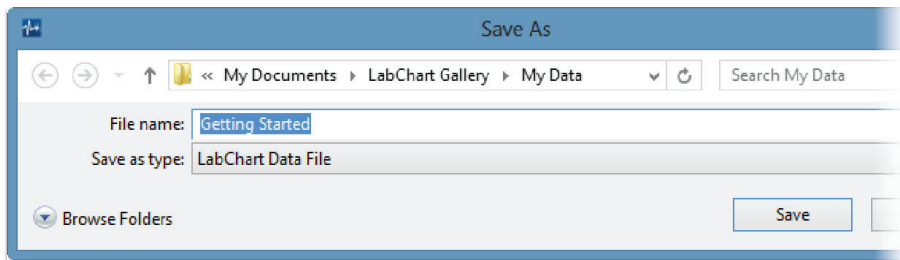


10. Save / Export

Save the current File

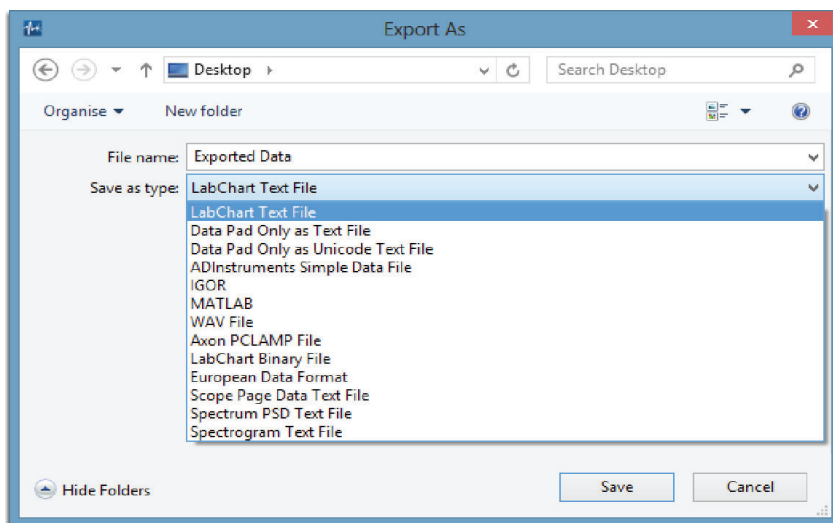
1. Choose **File > Save**.
2. Save your data as a LabChart data file.

Files saved into the LabChart Gallery will appear in the **Welcome Center**.



Exporting data

1. Choose **File > Export...** (Windows) or **File > Export As...** (Mac)
2. Choose the file type to export from the dropdown list.
3. Choose an appropriate name and location and click save.



Additional Information

Chart View

The Chart View is the main window in which data can be viewed in LabChart. The Chart View provides its own Start button, replicating the Start button in the toolbar. The Chart View can display up to 32 channels of data, with up to 16 input channels per PowerLab.

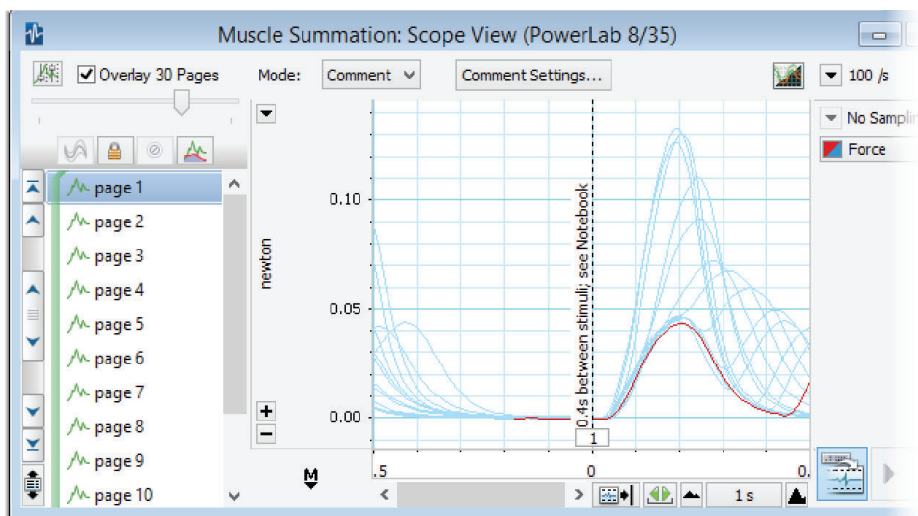
LabChart allows you to apply calculations to recorded data and display the result in a separate channel. The calculated channel data is not actually stored in the file, but generated and displayed dynamically, so they can be updated and changed as necessary. See the Help for further information.

To open the Chart View, choose **Window > Chart View** from the menu.

Scope View

The Scope View provides a different way of looking at the same underlying data that the Chart View displays. Scope View presents data in a similar way to the sweeps of an oscilloscope. Each sweep is recorded to a different page, creating a pad of recorded waveforms, that can be averaged and overlaid. Scope View can generate pages based on blocks, events or comments. See the Help for further information.

To open the Scope View, choose **Window > Scope View** from the menu.



Additional Software

Add-Ons

LabChart Add-Ons include Extensions, Modules and Device Enablers and are software additions to the LabChart application that add extra functionality, such as file translation capability or analysis capabilities for special areas of physiology. For example, the Metabolic Module, which calculates and displays a range of human metabolic variables using data recorded with LabChart, a PowerLab and appropriate front-end signal conditioners. LabChart Add-Ons can be downloaded using the **Feature Manager**.

LabChart Pro

The LabChart Pro package includes full-versions of all the latest LabChart Modules for Windows and Mac.

LabChart Reader

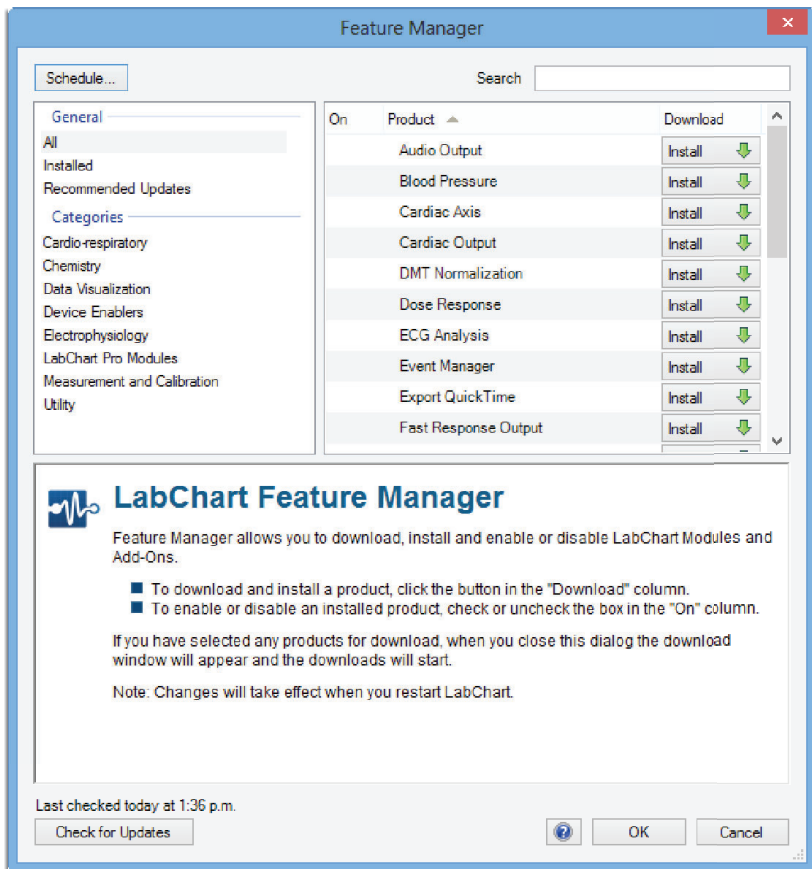
LabChart Reader for Windows and Mac is a free viewer for files created with the LabChart application. LabChart Reader allows you to open and view LabChart data files, and to perform most of the same analysis that can be done with the full LabChart application.

Feature Manager

The Feature Manager allows you to:

- Download and install LabChart software Add-Ons.
- Check for updates of LabChart software and any installed Add-Ons.
- Enable or disable any installed LabChart Add-Ons.
- Browse and search for new software from ADInstruments.

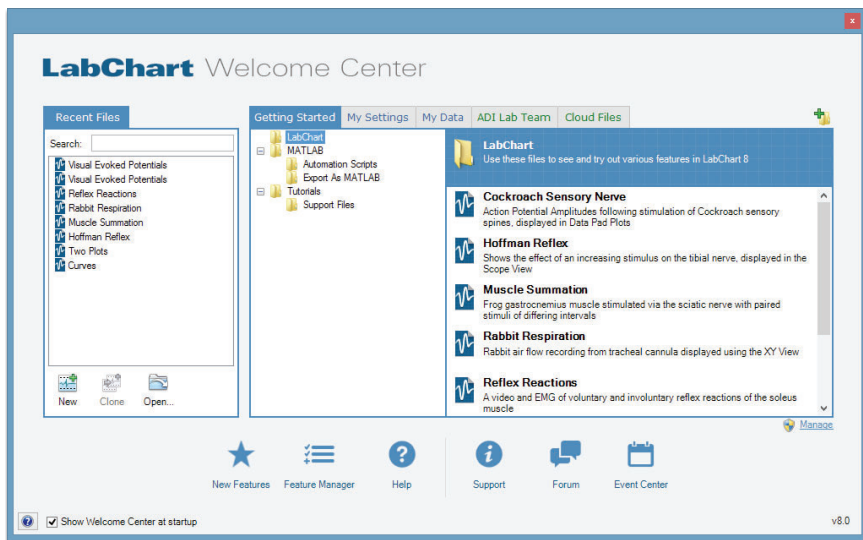
The Feature Manager can be accessed directly by selecting **Help > Feature Manager...** (Windows) or **LabChart > Feature Manager...** (Mac).



Welcome Center

When you first open LabChart you will see the **Welcome Center**, which provides a convenient way to store and access LabChart data and settings files, as well as any related material such as documentation, text files or multimedia files. It also promotes good saving techniques, which is particularly useful when there are multiple users on a computer, such as students in a classroom laboratory.

Adding Files to the Gallery



Add any folder on your computer or network as a tab in the **Welcome Center** gallery by clicking on the add folder icon, including cloud-storage system folders. These tabs are shown in green.



Files saved to the LabChart Gallery folders will also appear in the **Welcome Center**. These are default folders created locally: User > Documents > LabChart Gallery. When you create folders here, these folders and their files appear in the gallery as blue tabs.



You can open the **Welcome Center** by clicking on the home button in the bottom left-hand corner of the LabChart application window or by choosing **File > Welcome Center**.

Further Resources

There are many resources available to help you get the most from your LabChart system.

Help Menu

You can open the in-built LabChart help by choosing **Help > LabChart Help** from the menu. Each dialog in LabChart also has a help button that opens the help page for that topic. You can send feedback on help topics by clicking the send feedback link and entering your feedback in the form provided.

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