# LabChart Training Course
## Level I: The Basics of Data Acquisition

ADINSTRUMENTS

### Course Overview

Not sure how to start recording data with PowerLab systems and LabChart software? This course will take you step-by-step through the initial stages of computerised data acquisition - from connecting your hardware to choosing appropriate settings for your signal. You will become familiar with data acquisition and LabChart terminology and understand the importance of accurate data collection.

As well as extensive instruction by our experienced staff, this course provides each participant with access to an individual computer and hardware terminal. This ensures that you will get plenty of hands-on experience during your training. You will also take home detailed notes and example data files. The course will leave you confident and ready to apply to your new skills and knowledge to existing experimental set ups.

#### Who should attend?

This course is for life scientists with little or no computerised data acquisition experience. The curriculum assumes no prior experience with PowerLab systems or LabChart software, and will suit users who require a structured, intensive course to learn how to record any type of analog signal.

The course is ideal for researchers and post-graduate students who are new to your laboratory. It is equally suited to educators wishing to use LabChart software and experiments in their teaching practicals.

#### Learning Outcomes

At the end of this training course you will be able to:

- Set up channels for incoming data and choose settings for optimal signal display in both Chart and Scope Views
- Calculate the optimum rate at which to sample your data and understand the problems associated with undersampling and aliasing
- Choose the correct range to capture your data, at the best resolution and signal-to-noise ratio
- Decide if a signal needs amplification, understand different filter types and choose an appropriate hardware or software filter
- Understand the different options for saving LabChart data and settings files
- Store and easily access data and settings files as well as associated documents or analysis files

## Course agenda

### Setting Up PowerLab & LabChart

- An overview of the PowerLab hardware and how it connects to your computer
- Selecting the number of recording input channels that are required for your experiment
- Configuring the display features of your file including time format, colour and style of the signal waveform
- Deciding to record in Chart View (continuous recording) or Scope View (traditional oscilloscope short page format)

### Sampling Rate

- Available sampling rates for PowerLab
- The theory of required sampling rate relative to waveform type and frequency
- Using Spectrum to find maximum signal frequency
- The effects of undersampling/oversampling and the concept of aliasing

### Range

- Deciding on the correct range for your signal type
- Signal resolution and signal-noise ratio
- The effects of choosing the wrong range
- The difference between Range and Scaling

### Amplification & Filtering

- When does a signal need amplifying?
- Input amplifier settings
- When to filter and different hardware filters including mains, notch, high pass and low pass
- Hardware filters versus software filters

### Visual Features in LabChart

- Scaling options
- Compression features
- Split Screen option
- Digital Volt Meters

### Annotating Chart View

- Adding comments during and after recording
- Navigating through files using comments
- Modifying and removing comments
- Using preset comments

### Saving Options

- Different LabChart File types including data files and settings files

**Manage Files**

- Using the LabChart Welcome Centre to store files
- Accessing recently used files
- Cloning existing files
- Creating ADI package files