

Personal Daq

Quick Start Guide

USB Data Acquisition Modules



IOtech, Inc.

25971 Cannon Road
Cleveland, OH 44146-1833
Phone: (440) 439-4091
Fax: (440) 439-4093
E-mail: sales@iotech.com
Internet: <http://www.iotech.com>

Personal Daq Quick Start Guide

p/n **491-0940**, Rev **4.0**

Warranty Information

Your IOtech warranty is as stated on the *product warranty card*. You may contact IOtech by phone, fax machine, or e-mail in regard to warranty-related issues.

Phone: (440) 439-4091, fax: (440) 439-4093, e-mail: sales@iotech.com

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IOtech devices emit radio frequency energy in levels compliant with Federal Communications Commission rules (Part 15) for Class A devices. If necessary, refer to the FCC booklet *How To Identify and Resolve Radio-TV Interference Problems* (stock # 004-000-00345-4) which is available from the U.S. Government Printing Office, Washington, D.C. 20402.

CE Notice



Many IOtech products carry the CE marker indicating they comply with the safety and emissions standards of the European Community. As applicable, we ship these products with a Declaration of Conformity stating which specifications and operating conditions apply.

Warnings, Cautions, Notes, and Tips



Refer all service to qualified personnel. This caution symbol warns of possible personal injury or equipment damage under noted conditions. Follow all safety standards of professional practice and the recommendations in this manual. Using this equipment in ways other than described in this manual can present serious safety hazards or cause equipment damage.



This warning symbol is used in this manual or on the equipment to warn of possible injury or death from electrical shock under noted conditions.



This ESD caution symbol urges proper handling of equipment or components sensitive to damage from electrostatic discharge. Proper handling guidelines include the use of grounded anti-static mats and wrist straps, ESD-protective bags and cartons, and related procedures.



This symbol indicates the message is important, but is not of a Warning or Caution category. These notes can be of great benefit to the user, and should be read.



In this manual, the book symbol always precedes the words "Reference Note." This type of note identifies the location of additional information that may prove helpful. References may be made to other chapters or other documentation.



Tips provide advice that may save time during a procedure, or help to clarify an issue. Tips may include additional reference.

Specifications and Calibration

Specifications are subject to change without notice. Significant changes will be addressed in an addendum or revision to the manual. As applicable, IOtech calibrates its hardware to published specifications. Periodic hardware calibration is not covered under the warranty and must be performed by qualified personnel as specified in this manual. Improper calibration procedures may void the warranty.

Quality Notice



IOtech has maintained ISO 9001 certification since 1996. Prior to shipment, we thoroughly test our products and review our documentation to assure the highest quality in all aspects. In a spirit of continuous improvement, IOtech welcomes your suggestions.

Your order was carefully inspected prior to shipment. When you receive your system, carefully unpack all items from the shipping carton and check for physical signs of damage that may have occurred during shipment. Promptly report any damage to the shipping agent and your sales representative. Retain all shipping materials in case the unit needs returned to the factory.

CAUTION



Using this equipment in ways other than described in this manual can cause personal injury or equipment damage. Before setting up and using your equipment, you should read *all* documentation that covers your system. Pay special attention to Warnings and Cautions.

Note: During software installation, Adobe® PDF versions of user manuals will automatically install onto your hard drive as a part of product support. The default location is in the **Programs** group, which can be accessed from the *Windows Desktop*. Initial navigation is as follows:

Start [Desktop “Start” pull-down menu]
⇒ **Programs**
⇒ **Iotech DaqX Software**

You can also access the PDF documents directly from the data acquisition CD by using the <**View PDFs**> button located on the opening screen.

Refer to the PDF documentation for details regarding both hardware and software.

A copy of the Adobe Acrobat Reader® is included on your CD. The Reader provides a means of reading and printing the PDF documents. Note that hardcopy versions of the manuals can be ordered from the factory.



PDF

491-0901

PersonalDaq_UsersManual.pdf

Contains the Personal Daq hardware-related and software-related chapters, as well as a link to the following .pdf file. This pdf file, plus the following constitute a complete set of documentation for the Personal Daq Devices.



PDF

1086-0926
1086-0922

PostAcquisition Analysis.pdf

This pdf consists of two documents. The first discusses *eZ-PostView*, a post data acquisition analysis program. The application is included free as a part of DaqTemp product support. The second includes information regarding *eZ-FrequencyView* and *eZ-TimeView*. These two applications have more features than does *eZ-PostView* and are available for purchase. They can; however, be used freely during a 30-day trial period.



PDF

491-0905

Personal DaqViewXL.pdf

This pdf discusses *Personal DaqViewXL*, optional software that allows *Personal DaqView* and *Personal DaqView Plus* to execute functions from within *Microsoft Excel*™

CAUTION

When using Personal Daq modules to acquire data, computer *energy save* modes can cause false data readings. Prior to using Personal Daq modules, ensure your computer's *energy save* mode is disabled. If needed, consult your PC user's manual to disable *energy save (power suspension)* modes.

(1) Install Software

- **IMPORTANT: Software must be installed before installing hardware.**
- If you purchased software, for example, *Personal DaqViewXL* or *eZ-TimeView*, an associated authorization code(s) will accompany your order. If this is the case, keep your codes in a safe place. You will need to enter them once, prior to the initial run of that application.
- Remove any previously installed versions of *Personal DaqView* before installing a new version.

For successful operation, your computer should conform to the following, *as a minimum*:

- PC system with Pentium® processor
- Available USB port
- *Microsoft Windows 98SE (Second Edition), WindowsMe/2000 or /XP*
- 16 Mbytes of RAM (32 Mbytes, or greater, is recommended)
- *Energy Save* modes disabled (see the above Caution)

After reviewing the previous Caution, Notes, and ensuring that your computer meets or exceeds the minimum requirements, perform the installation according to the following steps:

1. Remove previous version Daq drivers, if present. You can do this through Microsoft's **Add/Remove Programs** feature.
2. Place the Data Acquisition CD into the CD-ROM drive. *Wait for PC to auto-run the CD. This may take a few moments, depending on your PC.* If the CD does not auto-run, use the Desktop's Start/Run/Browse feature.
3. After the intro-screen appears, follow the screen prompts.

Installing Personal DaqViewXL

Personal DaqViewXL is an Excel-based application that is available as a purchased-option. To install a non-trial version of the application you will need an authorization code. The code is provided at the time of purchase. To install the application:

1. Run *Personal DaqView*.
2. Select *Authorization* from the **File** pull-down menu. An Authorization dialog box will appear.
3. Type in the code, as it appears on your Authorization Sheet.
4. Click the <**Apply Code**> button.

Refer to the associated document, 491-0905, *Personal DaqViewXL User's Guide*, for additional information regarding *Personal DaqViewXL*.

Installing a Post Acquisition Data Viewing Application

The *eZ-PostView* application is included free with your software package. However, two other view programs, with additional features, are available for purchase. These are *eZ-TimeView* and *eZ-FrequencyView*. The document entitled *eZ-Analyst Series Software Reference* (p/n 1086-0922) contains detailed information regarding these applications.

When *eZ-PostView* is about to be installed, an authorization box will appear, allowing you to install one of the purchased options [providing you have an appropriate code]. You do not need a code to install *eZ-PostView*. In this case, simply proceed without entering a code and *eZ-PostView* will automatically install.

To install *eZ-TimeView* or *eZ-FrequencyView*, enter the applicable code as it appears on your Authorization Sheet; then click the <**Apply Code**> button.

Note that you can install a purchased view application at a later time, as follows:

1. Run *eZ-PostView*.
2. Select *Authorization* from the **File** pull-down menu. An Authorization dialog box will appear.
3. Type in the code, as it appears on your Authorization Sheet.
4. Click the <**Apply Code**> button.



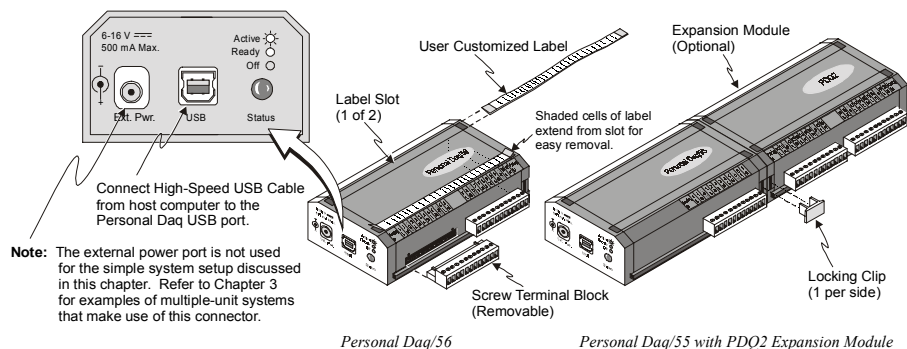
Reference Notes:

- Adobe Acrobat PDF versions of documents pertaining to Personal Daq are automatically installed onto your PC's hard-drive as a part of product support at the time of software installation. The default location is the **Programs** group, which can be accessed via the *Windows Desktop Start Menu*.
- Personal Daq documentation can be read directly from your data acquisition CD. After placing the CD in the CD-ROM drive simply click the <**VIEW PDFS**> button on the opening screen and select the desired PDF from the pull-down list.

After completing the software installation, continue with section 2, *Install Hardware*.

(2) Install Hardware

Depending on your order, your Personal Daq unit may not require all the steps under this heading; for example: if you did not order a PDQ expansion module you would not connect one. If a step does not apply to your unit, simply go on to the next one.



Reference Notes:

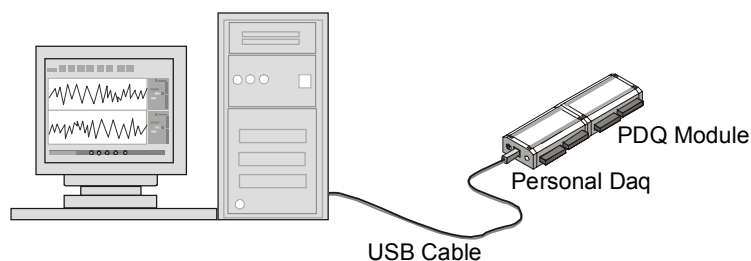
- If you plan to mount your Personal Daq system to a DIN rail, refer to the *PDQ10, DIN Rail Kit Installation Guide* (p/n 491-0903). Note that the DIN rail instruction is also provided in your *Personal Daq User's Manual*, included in Acrobat .pdf format on your installation CD.
- If you are expanding your Personal Daq system with an optional PDQ expansion module, refer to the *PDQ1 and PDQ2 Installation Sheet* (p/n 491-0902). Expansion module information is also provided in your *Personal Daq User's Manual*, included in Acrobat .pdf format on your installation CD.

(2a) Connect the Personal Daq to the Host PC



When using a power adapter with your Personal Daq system, be sure to supply power (from the adapter to the Personal Daq) before connecting the USB cable. This allows Personal Daq to inform the host computer (upon connection of the USB cable) that the unit requires minimal power from the computer.

Use an approved high-speed USB cable to connect the Personal Daq system to one of the host computer's USB ports. There is no need for an additional power source in this setup since the power pins (of the PC's USB connection) supply 500 mA at 4 to 5.25 V. Additional setup examples, involving USB hubs and power adapters, are described in chapter 3 of the user's manual.



Connection of Simple Personal Daq System to Computer USB Port



Some notebook PCs do not supply sufficient power through their USB port. When using one of these notebooks, the Personal Daq unit requires the use of a power adapter.

(2b) Connect the Channel Signal Inputs

CAUTION



The discharge of static electricity can damage some electronic components. Semiconductor devices are especially susceptible to ESD damage. You should always handle components carefully, and you should never touch connector pins or circuit components unless you are following ESD guidelines in an appropriate ESD controlled area. Such guidelines include the use of properly grounded mats and wrist straps, ESD bags and cartons, and related procedures.

Use Personal Daq's screw terminals to connect channel inputs to your Personal Daq system. The terminal blocks are detachable for ease in making connections. The main module (Personal Daq/55 and Personal Daq/56) and optional PDQ expansion modules (PDQ1 and PDQ2) have labels which clearly identify each input type and channel number. Each Analog Input channel can be configured for *single-ended* or *differential* volts, or for differential thermocouple inputs. The non-analog channels are designated as Frequency/Pulse Input (F) and Digital I/O (D).



Reference Notes:

Connections for single-ended and differential modes are depicted in the figure on page 4.

Connecting Thermocouple Wires

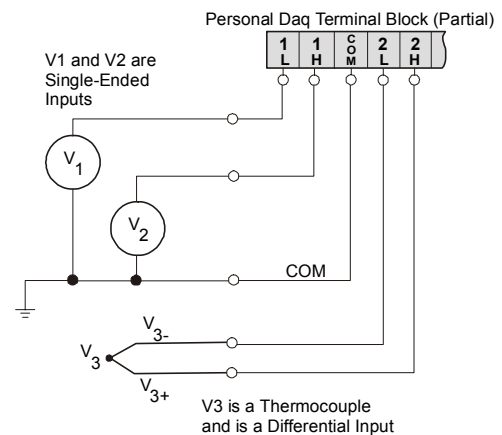


In Personal Daq applications, thermocouples should **not** be connected *single-ended*. Doing so can result in noise and false readings. This is especially true when acquiring other high-amplitude signals in conjunction with thermocouple signals that are connected *single-ended*.

Thermocouple wires are to be connected in *differential mode* only. Differential connection is made as follows:

- the red wire connects to the channel's Low (L) connector.
- the second [color-coded] wire connects to the channel's High (H) connector.

The section entitled *Signal Modes*, in chapter 5 of the user's manual, contains additional information.



Single-Ended and Differential Connections to Analog Input Channels

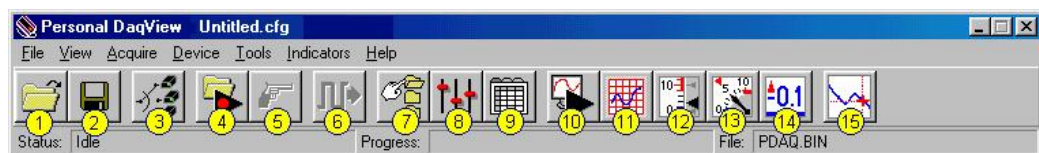
(3) Start Personal DaqView

From Windows, open Personal DaqView by double clicking on the Personal DaqView icon, or by using the Windows Desktop Start Icon to access the Personal DaqView program. You will find *Personal DaqView* listed in the desktop's **Program** group.

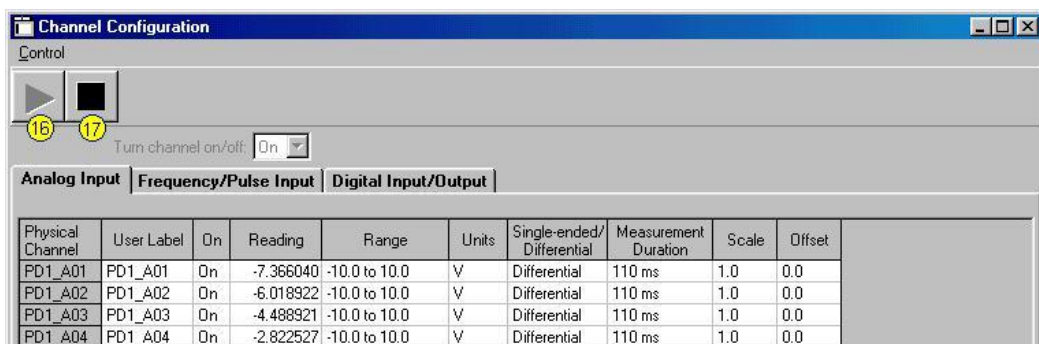
Once the program is executed, the software identifies your Personal Daq device and brings up the *Main Control Window*. This window is discussed briefly in the following text, and in more detail in chapter 4 of the *Personal Daq User's Manual* that is included on the installation CD.

(4) Configure the System

This step pertains to the configuration of channels and acquisition parameters through *Personal DaqView* software. To configure a set of parameters, use the appropriate toolbar button (or the View pull-down menu) to open the applicable window. Clicking on the Configure Channel Settings button (9) brings up the *Channel Configuration Window*.



Main Control Window



Channel Configuration Window, with Analog Input Spreadsheet Selected

Button	Function
1	Open Configuration File Opens a selected configuration file.
2	Save Configuration File Saves the current configuration file to disk.
3	Select Active Device Provides a means of selecting active devices from the Personal Daq system.
4	Arm Trigger for Disk Recording Arms the trigger and stores acquisition data to a designated disk file. If Auto Rearm is selected, clicking this button puts Auto rearm in effect. This button, is also used to disarm the data acquisition.
5	Manual Trigger Used to trigger the device when the mode of trigger is set to "Manual." Note that the Manual Trigger button can not be depressed until after the trigger is armed, for example, by first pressing button 4.
6	Update Digital Outputs Updates digital outputs for all digital channels that are selected to "output state." also see <i>Digital Input/Output Spreadsheet</i> , in chapter 4 of the user's manual.
7	Configure Data Destination Accesses the Configure Data Destination window. Note that this window provides a means of selecting sequential destinations through an auto rearm feature.
8	Configure Acquisition Accesses the Configure Acquisition window.
9	Configure Channel Settings Brings up the Channel Configuration window. From this window you can configure channels for Analog Input, Frequency/Pulse Input, and Digital Input/Output channels, depending on which tab is selected.
10	Update All Indicators Starts all on-screen indicators with a display of up-to-date data. Has no affect on the recording of data to disk. Auto Rearm, even if selected, will not occur when using this control. This button is also used to pause all indicators.
11	Display Scrolling Charts Displays data graphically in a scrolling chart.
12	Display Bar Meters Displays data in a bar graph format.
13	Display Analog Meters Displays data displayed in a dial-gage format.
14	Display Digital Meters Displays data in a digital meter format.
15	View Data Launches an independent post-data acquisition program such as <i>eZ-PostView</i> , if installed. The install CD includes a .pdf version of the <i>eZ-PostView</i> document.
16	Enable Readings Column Activates the <i>Channel Configuration Window's</i> reading column. Does not affect the recording of data to disk.
17	Disable Readings Column Stops the <i>Channel Configuration Window's</i> reading column. Does not affect the recording of data to disk.

(4a) Channel Configuration



The *Channel Configuration Window* first opens with the Analog Input screen selected. You can change from one configuration screen to another by selecting the appropriate tab. More information regarding *Personal DaqView* appears in chapter 4 of the user's manual. You can configure channels from the three configuration screens as indicated in the following table.

Channel Type	User Configurable Parameters
Analog Input	User Label, On, Range, Units, Single-Ended/Differential, Measurement Duration, Scale, Offset
Frequency/Pulse Input	User Label, On, Type, Units, Edge, Debounce, Min. Value, Max. Value, Resolution (Settling Time), Scale, Offset
Digital Input/Output	User Label, On, Input/Output, Output State, Power-Up State

Note: With the mouse cursor positioned in the desired spreadsheet cell, you can:

- "Single-click" with the left mouse button** to open an associated pull-down list for the applicable cell, from which a selection can be made. This pull-down list appears just below the toolbar.
- "Double-click" with the left mouse button** to cycle through listed selections or write-enable a cell, as applicable. If the cell has a given parameter list (such as those in the *On*, *Range*, and *Measurement Duration* columns) the parameter will change with each double-click, allowing you to cycle through all possible selections. Note that these selections are repetitive; in other words, you will eventually advance to the same selection you started with. "Type-in" cells (such as User Label, Scale, and Offset) can be selected on double-click for easy editing.
- "Single-click" left, then "single-click" right** to write-enable a cell. Completing this action with the mouse buttons (while having the cursor on a cell such as Scale or Offset) allows you to use your PC's keypad to type the desired value into the field.
- "Single-click" left, "single-click" right, then "single-click" left again** to open an associated pull-down list for the applicable cell, from which a selection can be made. This pull-down list appears in the selected cell's row.

(4b) Acquisition Configuration

To configure acquisition parameters, activate the *Configure Acquisition Window* by using the Configure Acquisition button (8).



The screenshot shows the **Configure Acquisition** window with the **Trigger** tab selected. The **Pre-Trigger** section includes: Source: Manual, Channel: (empty), Condition: Rising, Threshold: 0, Hysteresis: 0. The **Averaging** section includes: Type: None, Count: 2. The **Acquisition Parameters** section includes: Max. Rate: 80.0000 Hz, Min. Rate: 0.0007 Hz, Scan Rate: 23.2558 Hz, and checkboxes for Continuous Calibration (unchecked), Overrange Protection (checked), Period (unchecked), and Frequency (checked). OK and Cancel buttons are at the bottom.

Trigger Tab Selected

The screenshot shows the **Configure Acquisition** window with the **Pre-Trigger** tab selected. The **Duration** field is set to 0, and the **Scans** dropdown menu is open, showing options: Scans, Hour, Min, Sec, and mSec.

Pre-Trigger Tab Selected

The screenshot shows the **Configure Acquisition** window with the **Post-Trigger** tab selected. The **Stop On** dropdown menu is set to Manual, and the **Duration** field is set to 100. The **Scans** dropdown menu is also visible.

Post-Trigger Tab Selected

Configure Acquisition Window

The *Configure Acquisition Window* has the following default settings.

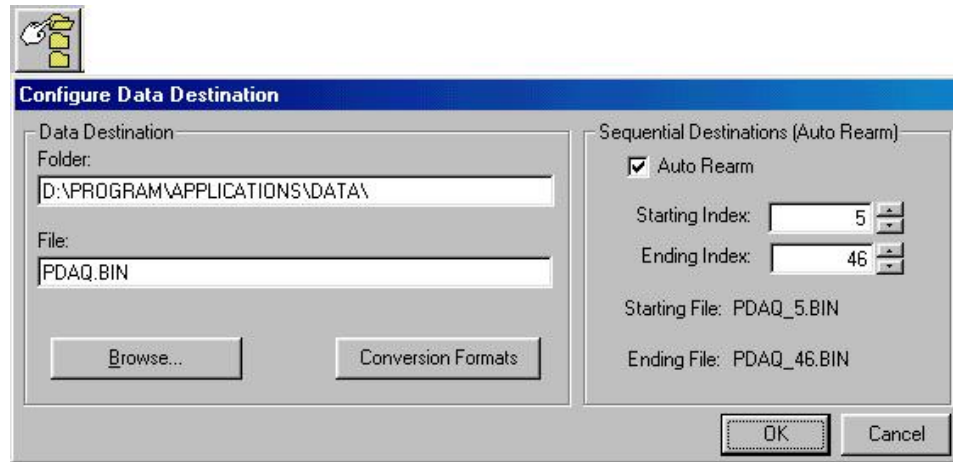
Pre-Trigger: No duration set, i.e., a duration of 0 scans
Trigger: Immediate
Post Trigger: Manual stop
Averaging: None
Acquisition Parameters:
Set for Maximum scan rate
Frequency: selected
Period: not-selected
Continuous Calibration: not-selected
Overrange Protection: selected

You can change the acquisition setup as desired. Explanations of setup options are discussed in chapter 4 of the user's manual.

Functions that can be obtained with *Main Control Window* toolbar buttons can also be obtained through pull-down menus (discussed subsequently). See chapter 4 of the manual for more detailed information.

(4c) Data Destination Configuration

The *Data Destination window* can be accessed with the Configure Data Destination button (7). From the Data Destination window you can assign a filename and folder location for the acquisition data. More detailed information is provided in chapter 4 of the manual.



Data Destination Window

(5) Collect Data

Press the Enable Readings Column button (16), or the Update All Indicators button (10) to start the acquisition. The data acquisition begins and the *readings* column becomes active. However, data is not recorded to disk. Pressing the Arm Trigger for Disk Recording button (4) will send the data to disk.

Press one of the toolbar's display icon buttons (11, 12, 13, or 14) to see your data in the form of a chart or meter. Display options are as follows: 11 – scrolling charts, 12 – bar graph meters, 13 – analog meters, and 14 – digital meters. Note that you can view all display types, or a combination of them, at the same time.

Note 1: For scrolling charts, a Chart Setup Wizard is used to set up the desired chart display. Channels not set up in the display can still be enabled and read on the *Channel Configuration Window*.

Note 2: Chapter 4 of the user's manual is devoted entirely to the *Personal DaqView* program and its *Chart Setup Wizard* feature.

A Brief Guide to Using Personal DaqView

Once your Personal Daq system has been properly connected to the PC and to the desired input signals, the following steps may be used to start *Personal DaqView* and begin collecting data. For this “Quick Start” approach to collecting data we will be making use of the program’s default settings.

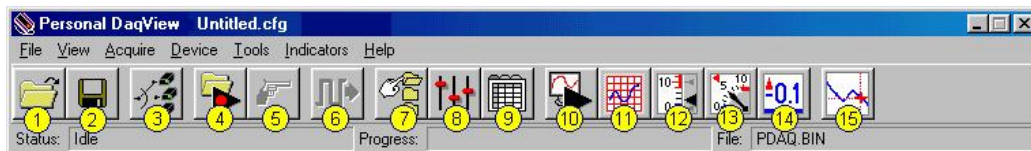
Note that acquisition settings can be changed from the *Configure Acquisition Window*. This window is accessed via the Configure Acquisition button (8). For ease of reference, related screen captures have been provided below.

1. From Windows, open *Personal DaqView* by double-clicking on the *Personal DaqView* icon, or by using the Windows Desktop Start Icon to access the *Personal DaqView* program.

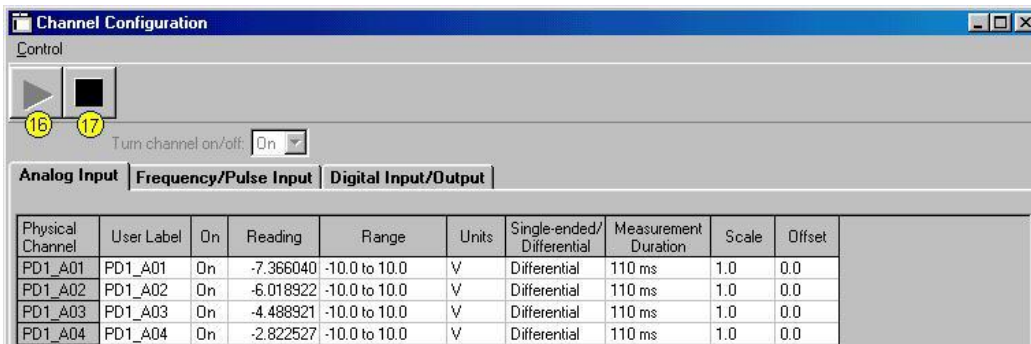
Once the program is executed, the software identifies your Personal Daq device and brings up the *Main Control Window* and *Channel Configuration Window*. The *Analog Input Spreadsheet* will be selected by default.

Note: If the *Channel Configuration Window* is not visible, click on the Configure Channel Settings button (9).

2. Select the desired spreadsheet, if other than **Analog Input**, by using the appropriate tab, i.e., **Frequency/Pulse Input**, or **Digital Input/Output**.
3. Ensure the desired channels are enabled. Positioning the cursor in a channel’s “On” column and double-clicking enables a channel that was previously “Off.”
4. **If you want to record data to disk**, click on the Arm Trigger for Disk Recording button (4). The data acquisition begins and data is stored to the disk file designated in the *Data Destination Window*.
5. **To see real time readings on the Channel Configuration Window**, click on the Update All Indicators button (10), or on the Enable Readings Column button (16).
6. **If you want to read data, but not record to disk**, click on button 10 or 16, but do not click on button 4. In addition to the Channel Configuration Windows reading column, you can click on one or more display icon buttons (11, 12, 13, or 14) to see your data in the form of a chart or meter. You can view all display types, or a combination of them, at the same time. Display options, listed as button number followed by display type, are: **11 – scrolling charts, 12 – bar graph meters, 13 – analog meters, and 14 – digital meters.**



*Main Control Window**



*Channel Configuration Window, with Analog Input Spreadsheet Selected**

*Button descriptions are provided on page 5 of this document.