

# VDRO User's Manual

## Table of contents

---

Introduction .....	4
Hardware Requirements .....	7
Software Features .....	8
Interface Hardware Installation .....	9
ProRF Wireless Receiver Setup .....	9
ProMUX Wired Multiplexer Setup .....	10
Gageway Adapter .....	10
Software Installation .....	11
Evaluation Screen .....	12
Purchasing the Software .....	13
Main User Screen .....	15
Part Search .....	17
Administration and Configuration .....	18
Entering System Administration .....	18
Selecting the Interface Hardware .....	19
Selecting the Interface Serial Port .....	20
Choosing the Correct Serial Port .....	20
Selecting the Number of Axes. ....	22
Configuring the Hardware Interface (ProRF and ProMUX ONLY) .....	23
ProRF Receiver with Two Encoder Transmitters .....	23
ProRF Receiver with Single SPC Transmitter .....	23
Initial Axis Configuration .....	25
Axis Direction .....	25
Axis Datum Preset .....	26
Axis Scaling Factor .....	26
Default Part Image Directory .....	28
Default Part Info PDF Directory .....	29
System Readout Precision .....	30
Changing Default Password .....	31
RAW Encoder Input .....	32
Allow Manual Measurements .....	32
Auto Clear Position .....	32
Gauge Name .....	32
Manual Measurement .....	34
Part Database Management .....	35
Creating a New Part .....	35
Editing an Existing Part .....	37
Deleting an Existing Part .....	39
Default Part Image Directory .....	40
Default Part Info PDF Directory .....	40
Default Database Directory .....	40
Reload Database when used .....	40
Measurement Sampling .....	41
Default Measurement File Directory .....	42
Saving Measurement Sample Data .....	42
Measurement Sample File Format .....	44
File Header .....	44

Individual Sample Data Format .....	45
Measurement Sample File Example .....	46
Notes Regarding Measurement Sample Files .....	47
Sample Acquired Message .....	48
Auto Save on New Measurement Data .....	50
Graphical Charting of Measurements .....	51
Measurement Error Distribution Histogram .....	51
Bell Curve Display .....	52
Histogram Limits .....	52
Tools Menu .....	53
Clear Part Data .....	53
Print Test Label .....	53
Part Info PDF .....	53
Appendix A - Barcode Scanner Option .....	54
Recommended Barcode Scanner .....	54
Recommended Barcode Symbology .....	54
Barcode Scanner Installation .....	54
Barcode Scanner Operation .....	54
Unsupported Barcode Scanners .....	54
Appendix B - Label Printer Option .....	55
Recommended Label Printer .....	55
Label Printer Hardware Installation .....	55
Label Printer Configuration .....	56
Configure Printer Serial Port .....	57
X and Y Field Locations .....	57
Barcode Printing Options .....	57
Label Configuration Values .....	57
Printng a Test Label .....	57
Printing Labels .....	58
Appendix C - External Go/No Go relay output/input module .....	59
Appendix D - Deactivate Product .....	60

## Introduction

---

The ProScale Virtual Digital Readout (VDRO™) software is designed to provide a cost effective solution for QC measuring applications where one or two axes of part measurement must be checked and/or recorded.

The software is designed to be used with either the Accurate Technology ProRF wireless PC receiver or the ProMUX-3 hard-wire 3 channel encoder multiplexer. In either case, the electronics interface device acquires measurement data from an Accurate Technology linear measuring system and reports the measurement data to the application via RS-232 serial or USB port.

Received measurement data can then be compared to part measurement geometry data stored in a database. Each part record in the database consists of:

- Part ID (Part number, text and/or numeric data).
- Part description, up to 100 characters long.
- X and Y measuring parameters, including:
  - Nominal Value.
  - Upper Limit.
  - Lower Limit.
- A field to record the name of an associated image file of the part such as a .bmp or .jpg. This is used when searching for a part to provide the correct part selection verification.
- A field to record the name of an associated Adobe® Acrobat™ PDF file that can contain user defined part information such as prints, specifications, etc.

Measurement samples of individual parts can optionally be stored to a data file on the PC. This data file includes the specified part parameters from the database plus the recorded results from each individual part measured on the system. Each part sample is identified by a sample number and includes:

- Time the measurement was recorded.
- Actual measurements for X and Y.
- Error between the actual measurement and the nominal measurement.
- In-specification result for X and Y based on the defined upper and lower limits.

The stored sample file is in CSV format that can be easily imported by Microsoft® Excel™ or other spreadsheet application such as Open Office® Calc™. Once imported to a spreadsheet, the data can be manipulated based on the customer's requirements.

**New to version 1.1.0.0**

CSV part history files have changed format from previous versions of VDRO:

- Part history files are now appended over multiple sample dates. Prior versions created separate part sample files every time a particular production run was measured. This resulted in numerous measurement files for the same part and was difficult to manage for data analysis. In version 1.1, one measurement data file is associated with each part when the part sampling option is selected. This file is appended after each measurement sample.
- The internal Histogram function imports previous measurements from the single part history file to display measurement distribution over the history of the part.
- The user interface has been increased to a resolution of 1024 by 768.
- The main user interface adds an area for an optional picture for the active part. If a part image has been stored in the part database, the image file is loaded and displayed on the main screen when the part is selected.
- VDRO, along with the associated ProRF receiver and encoder transmitter hardware now supports wireless streaming connections with ProScale General Purpose readouts.

**New to version 1.1.1.0**

- Added functionality to allow database file to be stored at a user definable location. This will allow multiple copies of VDRO to access a single database file.
- Database can be optionally reloaded whenever a database related operation occurs. Allows multiple copies of VDRO to update the database and stay synchronized.
- Added facility to name the gauge attached to the VDRO application. Allows for tracking of measurements for a particular part over various gauges.
- CSV output data files now record the Windows User Name and Gauge name.
- Added USB based output relay module support. This provides a mechanism to operate a two color light stack on the associated gauge to provide for Go/No Go operations when an associated part record has been loaded.

**New to version 1.1.1.2**

- Added capabilities for an external switch input on the USB interface module to allow remote activation of the Save Measurement operation of the software.
- Added a new Device Type selection to allow the Gageway interface to be use in single sample mode (SEND button activation) or in polled mode to allow for streaming data input.

**New to version 1.1.1.3**

- *Changed license operation.*

**New to version 1.1.1.4**

- *Added Pass/Fail count display fields. When saving a part measurement, the system tracks the current pass and fail sample counts for the current measurement run.*
- *Deleted X labels when using single axis operation.*
- *Fixed minor bugs.*

## Hardware Requirements

---

The following equipment is required to effectively use the Virtual DRO application and perform part measurements.

- A one or two axis precision measuring system such as the Accurate Technology ProTable™ or ProTable-CAB™ measuring system.
- Either an Accurate Technology ProRF wireless PC receiver **OR** ProMUX-3 hard-wired 3 channel encoder multiplexer **OR** Microridge Gageway USB adapter.
- A Pentium class (or greater) PC running Microsoft® XP or Vista, Windows 7 or Windows 10. The PC must have a serial port or utilize a USB to Serial port converter when using the ProMUX-3. The ProRF wireless receiver can utilize either a serial port or USB port directly. *The computer should have Internet access during the software installation to receive any necessary support upgrades from Microsoft.*

**Note:** If the measuring system is an in-house design and NOT a ProTable product, it is the customer's responsibility to assure the measuring accuracy of the system.

## Software Features

---

The following is a list of features provided by the Virtual DRO application:

- One or two axes of operation (X, X and Y)
- Programmable position datum preset for each axis.
- Programmable axis direction for each axis.
- Parts database for storage of part geometry parameters. Parts can be created, edited or deleted.
- Administration user code. Prevents unauthorized changes to the system parameters or database. User code can be reprogrammed from default value.
- Programmable measurement display precision. 1 to 4 places in inches, 1 to 2 places in millimeters.
- Programmable communications port.
- Programmable input device selection (ProRF, ProMUX-3 or Microridge Gateway interface).
- Sample part measurement recording to .csv file. **In version 1.1 and above, part measurement history is stored in a single file.**
- Show associated part image when selecting a part. **In version 1.1 and above, part image is also displayed on the main user interface.**
- Display a user defined Acrobat™ information document associated with the selected part from within the application.
- Display accuracy error distribution histogram of recorded measurement samples. In version 1.1 and above, histogram data also includes past measurement history.
- Optionally display part image or drawing during measurement operation.
- Optionally select a part from the database using a barcode scanner.
- Track Pass/Fail sample counts during current measurement run.
- Record Windows user name of operator in .csv file
- Allows individual gages to be named.
- Part database can reside either locally or on a network drive to allow access by multiple copies of VDRO
- Optionally print an adhesive label for the measured part consisting of:
  - Part Width.
  - Part Height (2D measuring system).
  - Part ID.
  - Time and date of measurement.
  - Optional barcode of part ID.

## Interface Hardware Installation

---

The VDRO software will support the ProRF wireless receiver **OR** the ProMUX-3 wired multiplexer OR Microridge Gateway USB Adapter (single axis only). The following section describes the required hardware configuration for each. **Only one setup procedure must be completed based on the interface hardware used.**

### ***ProRF Wireless Receiver Setup***

The typical installation of a ProRF receiver utilizes USB data communications. This installation procedure is outlined on page 9 of the ProRF user s manual. A summary of the process is given below:

1. Install the supplied USB drivers on the target PC **BEFORE** connecting the ProRF receiver to the PC.
2. After the drivers are installed, plug the ProRF receiver into a USB port on the PC. The PC will finalize the driver installation of the ProRF receiver.

When using the ProRF receiver with the USB interface, no external power supply is required. The device will be powered from the USB port of the PC.

If the user desires to use the RS-232, DB-9 interface, follow the procedure outlined on page 8 of the ProRF user s manual. **Note: The ProRF is configured, by default, for USB operation.** If the RS-232 interface is used, two internal jumpers JP2 and JP3 must be positioned on pins 1 and 2 for proper operation. In addition, an external power supply must be used to power the receiver. See page 13 of the ProRF user s manual for details.

### **ProRF Wireless Receiver Setup**

The typical installation of a ProRF receiver utilizes USB data communications. This installation procedure is outlined on page 9 of the ProRF user s manual. A summary of the process is given below:

1. Install the supplied USB drivers on the target PC **BEFORE** connecting the ProRF receiver to the PC.
2. After the drivers are installed, plug the ProRF receiver into a USB port on the PC. The PC will finalize the driver installation of the ProRF receiver.

When using the ProRF receiver with the USB interface, no external power supply is required. The device will be powered from the USB port of the PC.

If the user desires to use the RS-232, DB-9 interface, follow the procedure outlined on page 8 of the ProRF user s manual. **Note: The ProRF is configured, by default, for USB operation.** If the RS-232 interface is used, two internal jumpers JP2 and JP3 must be positioned on pins 1 and 2 for proper operation. In addition, an external power supply

must be used to power the receiver. See page 13 of the ProRF user s manual for details.

## ProMUX Wired Multiplexer Setup

The ProMUX-3 is a hard wired multiplexer typically used to interface ProScale ABS encoders directly with a PC. The ProMUX-3 can be used to acquire data from up to 3 encoders. In the case of the Virtual DRO application, a maximum of two encoders are used, one for X and one for Y.

Connect the ProMUX-3 to the PC as described in the ProMUX-3 user s manual using the provided DB-9 cable and power supply. Connect the X encoder to Port 1 and the Y encoder, if needed, to port 3.

## Gageway Adapter

The Gageway USB adapter is designed to connect a ProScale General Purpose readout directly to a PC via a USB cable. To prepare the Gageway adapter for collecting data, complete the following:

1. Plug the 10 pin connector into the SPC port on the side of the ProScale readout.
2. Plug the USB connector into an available USB port on the PC. Depending on the operating system in use, the computer may require drivers to be installed. Use the provided if necessary.

Once the driver is installed, the interface should be ready for use.

Configure the VDRO software for the Gageway interface by using the [Hardware Interface](#) dialog under the System Configuration menu.

Enable the [RAW Encoder input](#) selection.

Once configured, pressing the SEND button on the ProScale readout will send position data to the VDRO software.

## Software Installation

---

The ProScale VDRO utilizes Microsoft's .NET as the basis for its underlying operation. This requires .NET to be installed on the target PC prior to the application installation. If the PC does not already have Microsoft .NET Framework 3.5 installed, the user has two options to obtain the required files:

- A. If a high speed Internet connection is available to the target PC, the Virtual DRO Setup program will automatically download and install the .NET files prior to the application installation.
- B. A redistributable copy of .NET framework 3.5 is included on the Virtual DRO installation CD and can be manually installed prior to running the Virtual DRO setup program. Alternately, the user can download a copy of the .NET framework on another PC and write the executable to a CD or memory stick. The .NET Framework version 3.5 can be obtained from Microsoft at:  
<http://download.microsoft.com/download/6/0/f/60fc5854-3cb8-4892-b6db-bd4f42510f28/dotnetfx35.exe>

For the remainder of this section, it will be assumed that the target PC has access to a high speed Internet connection.

The VDRO software is distributed in two formats:

- Memory Stick/thumb drive
- Archive file (.zip) from the Accurate Technology website.

### Memory Stick Installation

Insert the memory stick into a USB port. Navigate to the memory stick drive and run the setup.exe file.

### Archive File Installation

Open the archive with WinZip® or other archive software. Double click on setup.exe. The setup program will start.

### Common Installation

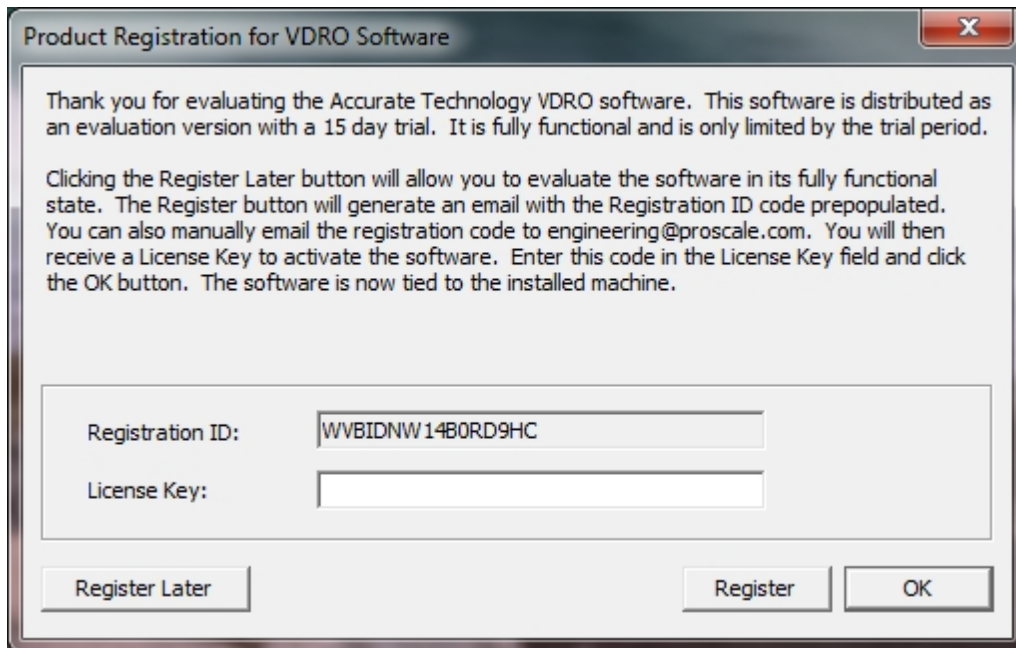
Once setup has started, the program will automatically check if the latest version of .NET is installed on the PC. If not, the .NET Framework will be downloaded from the Microsoft™ site and installed. This operation may require the PC to be restarted.

Once the .NET framework is installed, setup will install the Virtual DRO software and add a shortcut for the application to the Start menu.

## Evaluation Screen

The VDRO application is distributed initially as **full feature** demo software. The program is fully operational for a period of 15 days from initial installation. The user can purchase the software at any time during the trial period. After the trial period has expired, the application will not execute.

When the VDRO is launched in demo mode, the screen shown below is displayed:



The image shows a Windows-style dialog box titled "Product Registration for VDRO Software". The dialog contains the following text:

Thank you for evaluating the Accurate Technology VDRO software. This software is distributed as an evaluation version with a 15 day trial. It is fully functional and is only limited by the trial period.

Clicking the Register Later button will allow you to evaluate the software in its fully functional state. The Register button will generate an email with the Registration ID code prepopulated. You can also manually email the registration code to [engineering@proscale.com](mailto:engineering@proscale.com). You will then receive a License Key to activate the software. Enter this code in the License Key field and click the OK button. The software is now tied to the installed machine.

Below the text are two input fields:

- Registration ID:
- License Key:

At the bottom of the dialog are three buttons: "Register Later", "Register", and "OK".

The form provides the following information/options:

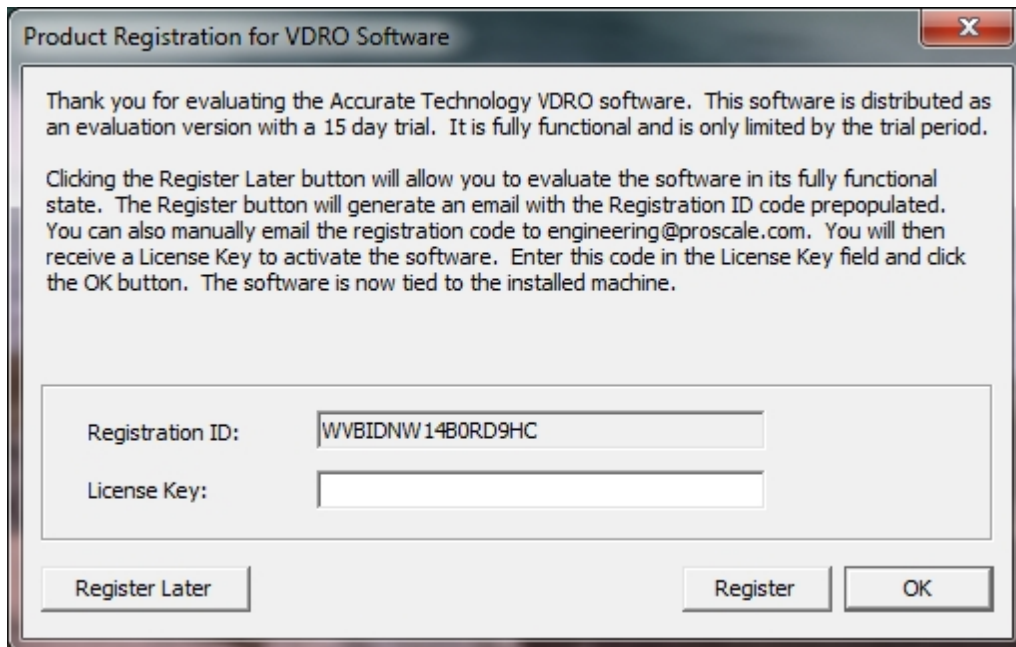
- A. The option to register the application after purchase by clicking "Register". This sends an email with the Registration ID in the body of the email.
- B. Continuation of the evaluation period by clicking "Register Later".
- C. Inputting a license key and clicking OK.

To run the program in DEMO mode, click on the **Register Later** button. Skip to the [Main User Screen](#).

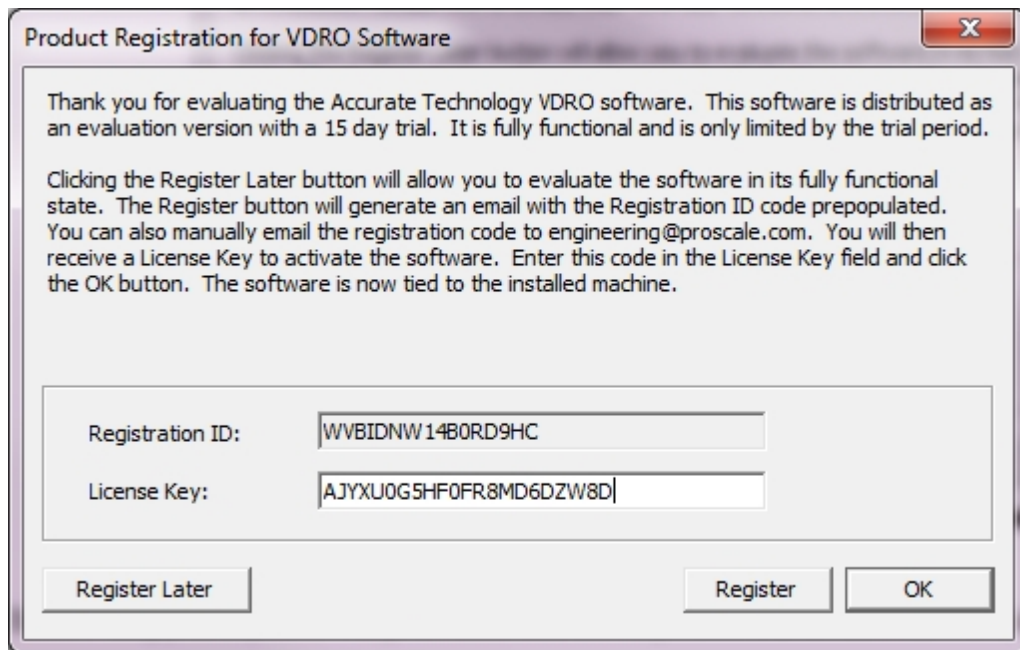
## Purchasing the Software

To purchase the software and register it for permanent operation on a specific PC, complete the following:

1. Contact Accurate Technology, Inc. to purchase the desired version of the software at 800 233 0580 (Toll free in the U.S.) or at +1 828 654 7920 or by email at [sales@proscale.com](mailto:sales@proscale.com). We accept Visa, MasterCard, American Express and Discover.
2. After the payment has been completed, you can then click on the **Register** button which will generate an email with the Registration ID as the body of the email. It will be emailed to [engineering@proscale.com](mailto:engineering@proscale.com). **Note: Allow up to one business day to receive the license key code.**



3. After the registration ID is sent, a license key will be emailed back. Copy and paste the provided license key from the email into the License Key field and click OK. If the entered license key was valid, the [Main User Screen](#) will be displayed.

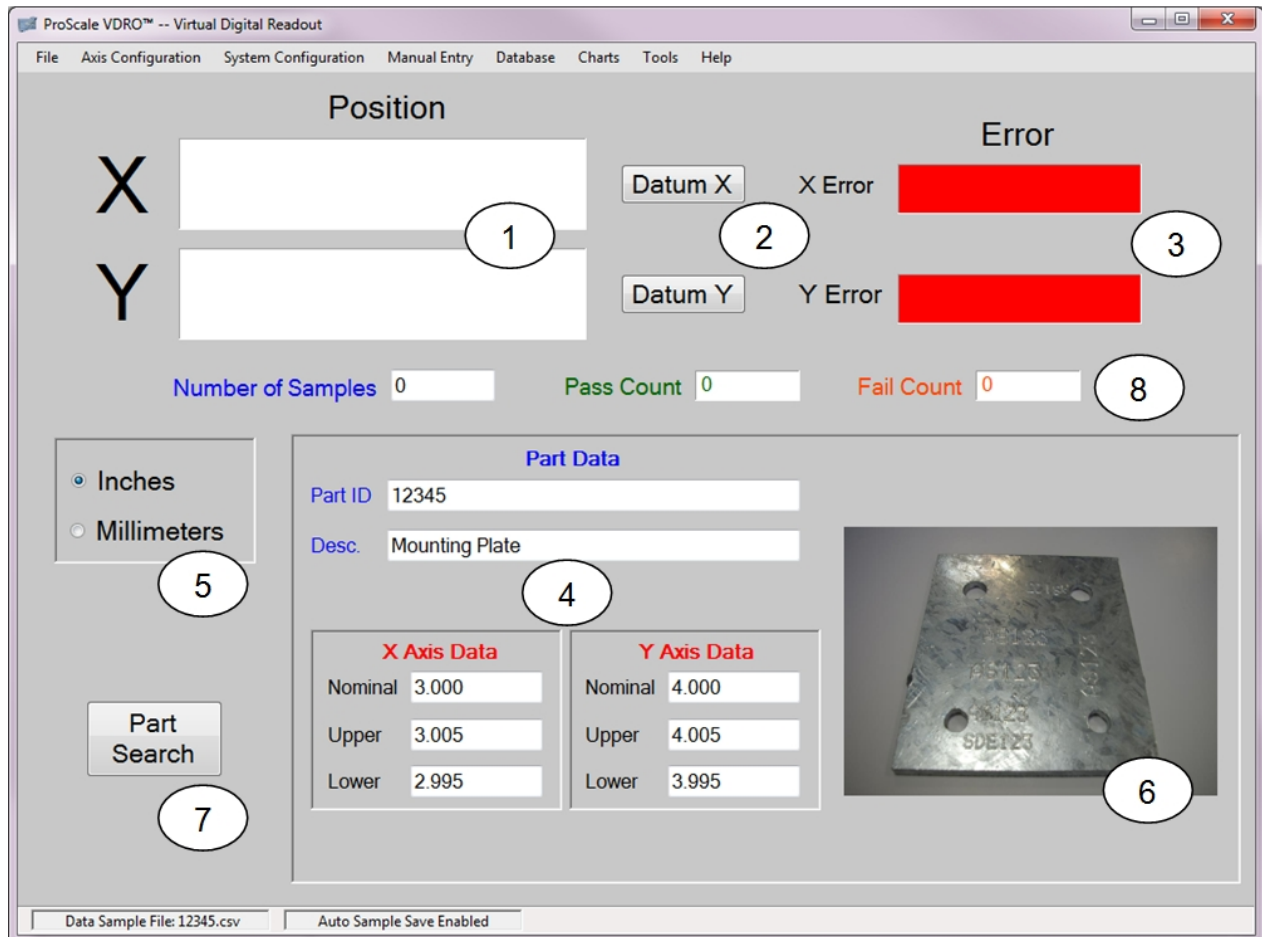


**NOTE:** The software is now licensed to the specific machine on which it was installed. You will not be able to install the application permanently on another machine unless you complete either of the following:

- Purchase an additional copy of the software for use on another machine.
- Uninstall the software from the current machine and re-install it on another machine. Note: You must follow the procedure in [Appendix D](#) to properly transfer the license from the current machine to a new machine.

## Main User Screen

The image below illustrates the primary user application.



1 – The real-time measurements for X and Y provided by the hardware input device, ProRF receiver or ProMUX-3. **NOTE: When the VDRO application is launched, the initial X and Y positions are shown as NO DATA when using the ProRF receiver. When position data is received for each axis, the fields will automatically update.**

2 – Datum buttons for X and Y axes. Clicking the associated button forces the displayed axis position to a preset value. By default, the position is 0.0. These buttons are disabled when the "Use RAW Encoder Input" option is enabled.

3 – The measurement error for axes X and Y. The background color is green if the current measurement is inside the upper and lower limits for the axis. It is red if the current measurement is outside the limit tolerance. The displayed error is the current measurement less the nominal measurement for the axis. **NOTE: This feature is only active after a part has been selected from the database.**

4 – The data for the currently selected part. This data includes the part ID, a description and X and Y axis data. Axis data consists of a nominal value plus upper and lower

tolerance limits.

5 – User selectable measurement units display. Click on either the Inches or Millimeters button to change the displayed units. Note that changing the current units changes all numeric fields that hold measurement data.

6 - The image of the part to be tested. This can be any standard image file format such as jpg or png. The image can be an actual photo, drawing or other graphic.

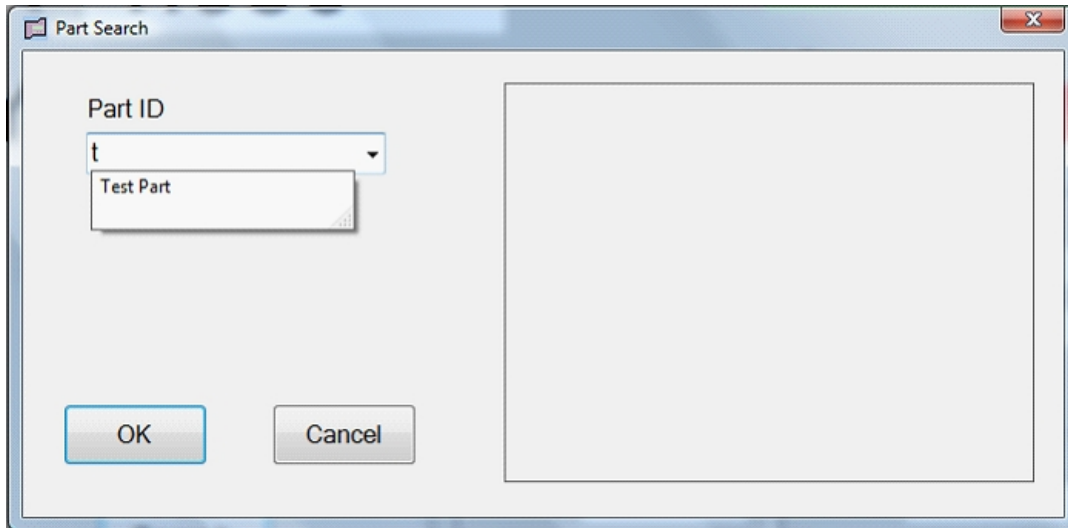
7 – Part Search button. Clicking this button opens the part search dialog shown below.

8 - Sample Count, Pass/Fail Count. These fields track the total parts measured THIS session including the count of passing and failed parts.

## Part Search

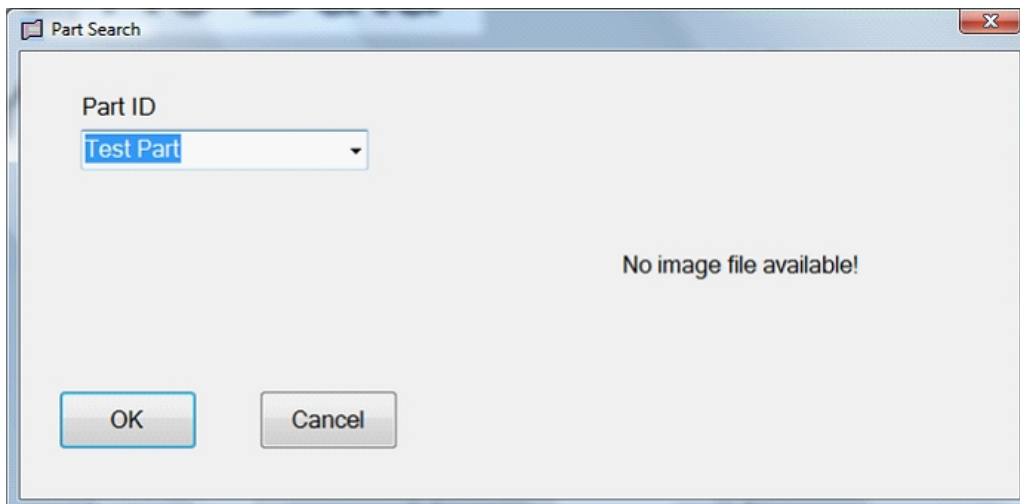
---

To load/search for a part in the database, click the Part Search button on the main screen. The dialog box below will be displayed:



As a part ID is entered, the system starts to find the closest match in the available list. The user can also scroll through the list to locate the desired part name. Once the desired part has been selected, the system will determine if an image file has been associated with the part. If so, the associated image will be displayed to the right of the list box.

If no image file has been defined for the part, the search dialog below will be displayed.



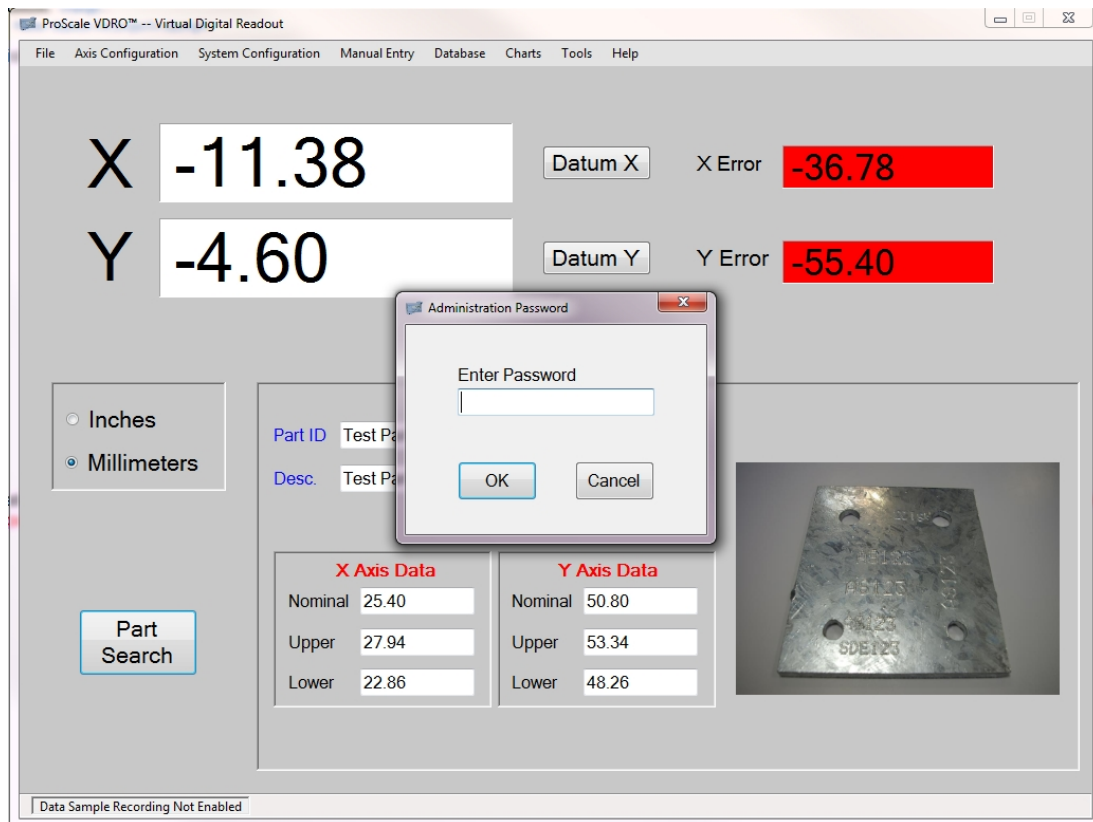
## Administration and Configuration

The VDRO software has two levels of operation:

- User Level – The standard mode of operation for the software. Allows the user to open available part files for measurement use and if configured, create and build measurement sample files.
- Administrator Level – A supervisory mode of operation for the software. This mode allows a supervisor to configure the system. This includes adding, editing and deleting parts from the database and setting parameters for system operation.

### Entering System Administration

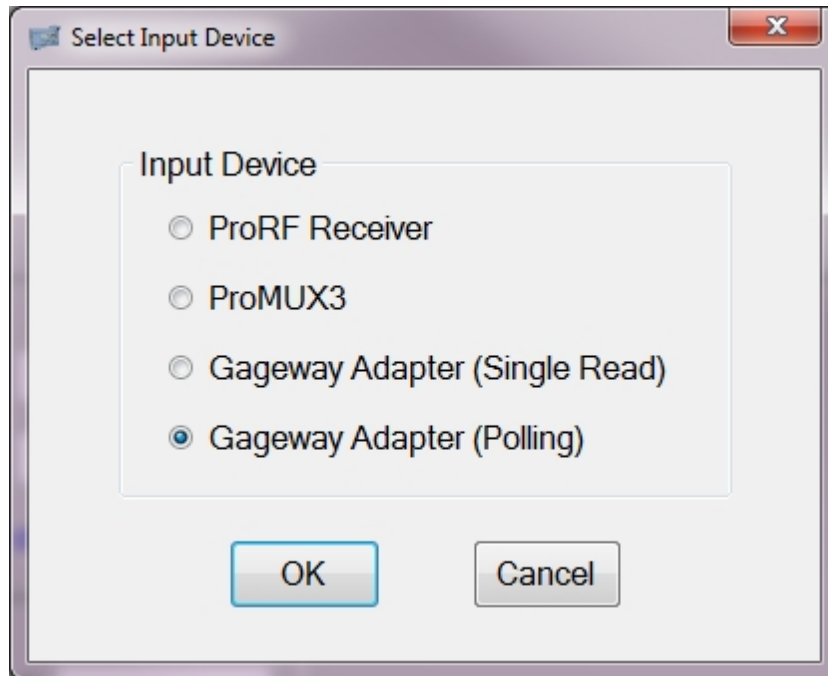
To access the system administration, click on the System Configuration menu and select Enable Administration. A dialog box will be shown below.



Enter in the current administrator password followed by clicking OK. **The default password is 1234.** It is strongly recommended that the default password be changed after the software is initially configured. This will help to prevent unauthorized tampering with part data and system configuration.

## Selecting the Interface Hardware

The first step in configuring the system for operation is to configure which type of Interface Hardware is to be used. To do this, select the *System Configuration* menu then the *Input Device Type/Set Input Device* item. The following dialog will be shown.



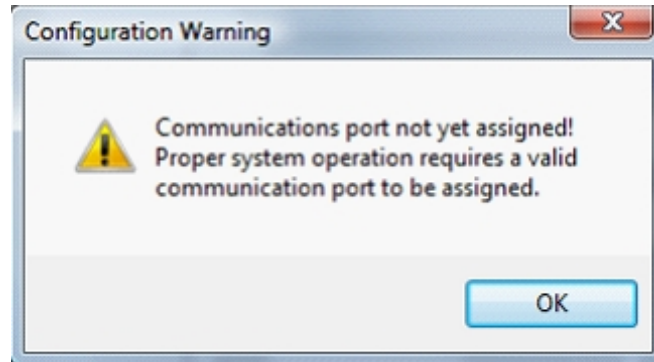
Select the correct input device based on the interface hardware installed.

- ProRF Receiver - Selected if using the ProRF wireless receiver with either the ProRF Encoder transmitters or SPC transmitters.
- ProMUX3 - Selected if using the ProMUX3 hardwire input device.
- Gageway Adapter (Single Read) - Used if using a Gageway wired SPC adapter or other similar input device (X Axis only). Displays position only on SEND button activation.
- Gageway Adapter (Polling) - Used with a Gageway adapter and displays continuous position information

Finalize the selection by clicking OK.

## Selecting the Interface Serial Port

The application must be configured with the appropriate serial port to be used to communicate with the interface hardware. When the application is initially installed and a serial port is undefined, the warning message shown below is displayed.



To select a serial port, click on the *System Configuration* menu followed by the *Input Device Type/Communications Port* menu item.



Click on the down arrow in the Available Com Ports field. The field will expand to show all of the available serial ports on the PC. Choose the port associated with the connected interface hardware being used and click OK. The dialog will automatically close.

## Choosing the Correct Serial Port

Selecting the correct serial port can sometimes be troublesome depending on your particular PC. This will mostly depend on the interface device connected and the type of serial port being used.

**ProRF Receiver using USB** – When using the USB port on the ProRF receiver, a *virtual* communications port is installed in Windows™. This will typically be defined as COM4 or higher, depending on your machine. You can verify the actual port used by launching the

Control Panel. Go to the System icon and launch the Device Manager. In the Device Manager, locate the Ports icon and expand it to show all COM ports. If the ProRF is **connected** to the PC, an entry should be displayed entitled ProScale ProRF receiver (COMX) where X is the COM port number. This is the port that should be used in the case of the ProRF.

**ProMUX-3 or ProRF using the DB-9 Connector** – If you are using a native hardware communications port that is built in to the computer, this will typically have an ID of COM1 to COM4. A hint will be that only valid COM ports are listed in the Communications Port Selection dialog shown above. In this case, if only COM1 is shown in the list, then that is potentially the correct port to be used.

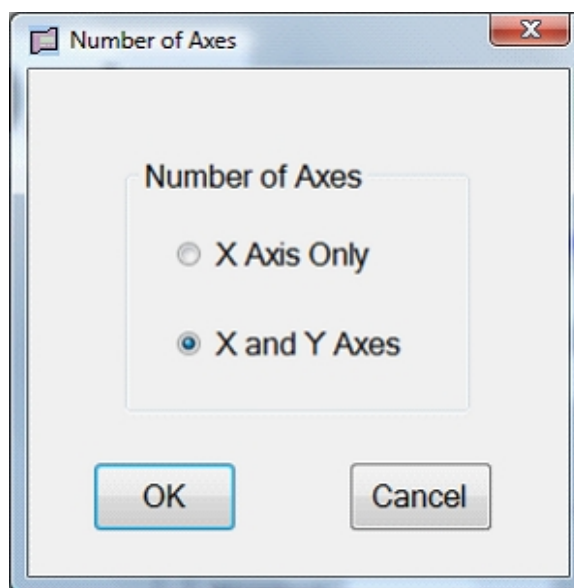
**RS-232 to USB Adapter** – In some cases, an RS-232 to USB adapter can be used to provide a DB-9 type serial port connection for devices such as the ProMUX-3. In this case, a *virtual* communications port is created like that used by the ProRF USB installation. In this scenario, a software driver needs to be installed to provide the serial port connection. Again, viewing the Ports icon in the Device Manager can indicate what COM port is assigned to the RS-232 to USB adapter.

## Selecting the Number of Axes.

Prior to configuring the Interface Hardware, the user must decide on the number of axes to be used in conjunction with the VDRO application.

By default, the VDRO is installed for two-dimensional (2D) operation. If you are using a ProTable-CAB or other two-dimensional measuring system, no other configuration is necessary regarding this parameter.

If you are using a single axis ProTable or other single axis measuring gauge, the VDRO application should be configured for single axis operation. Click on the *System Configuration* menu followed by selecting the *Number of Axes* menu item. The dialog box shown below will be displayed.



Click on the "X Axis Only" button and then click OK. The main user interface will change to reflect only a single axis with no label.

## Configuring the Hardware Interface (ProRF and ProMUX ONLY)

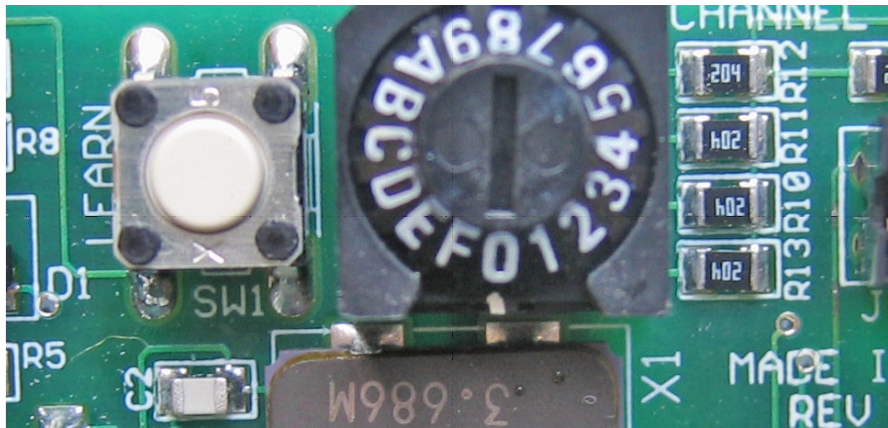
The interface hardware, ProRF or ProMUX, must be configured prior to its initial use. This operation has been automated for the user and is activated by clicking the *System Configuration* menu and selecting the *Input Device Type/Auto Configure Device* menu item.

After selecting *Auto Configure Device*, the VDRO application will pop up a dialog box that will show the progression of the auto configuration process. In the case of the ProMUX-3 hardware, the process is fully automatic. When using the ProRF receiver, some user interaction is required.

**NOTE: WHEN USING THE GAGWAY ADAPTER, NO ADDITIONAL CONFIGURATION IS REQUIRED OTHER THAN CHOOSING THE INPUT DEVICE AND THE COMMUNICATION PORT.**

### ProRF Receiver with Two Encoder Transmitters

When configuring a ProRF receiver for operation with the VDRO software, the auto configure dialog box will eventually stop with the message: "Press Transmitter X Learn Button". The user will need to open the enclosure on the X axis transmitter and press the LEARN button on the circuit board. The picture below illustrates its location on the transmitter circuit board.



When the X axis transmitter has been "learned" or associated to the receiver, the auto configure dialog will stop with the following message: "Press Transmitter Y Learn Button". Open the Y axis transmitter and press the LEARN button.

The configuration process will continue automatically and when completed, the configuration dialog will close. The X and Y encoder transmitter covers can be reinstalled.

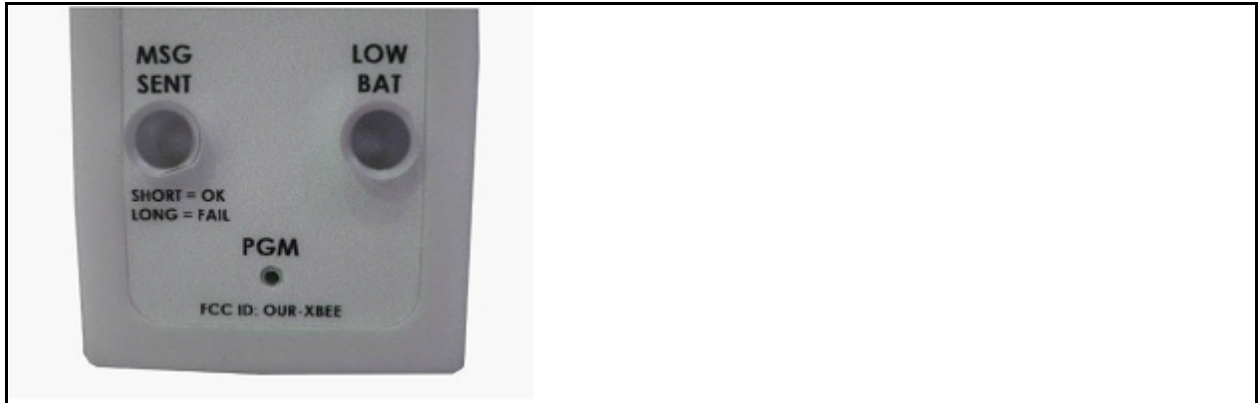
### ProRF Receiver with Single SPC Transmitter

When using the VDRO application with a single axis ProTable, the ProScale digital readout will be equipped with a ProRF SPC transmitter instead of an Encoder Transmitter.

The same operation is completed as above except that the system will only configure a single transmitter for operation (X Axis).

After initiating the *Auto Configure Device* item from the configuration menu, the configuration dialog will appear as related in the previous section. When the configuration message stops showing: "Press Transmitter X Learn Button", the LEARN button on the SPC transmitter must be pressed.

Using a bent paperclip, insert the end of the paperclip into the PGM hole in the face of the SPC transmitter as shown below.



A small pushbutton is located below the hole. Press on the button until it is activated and the MSG SENT LED flashes. The auto configuration will continue and will close the dialog box when complete.

## Initial Axis Configuration

Each axis can be independently configured for:

- Axis Direction
- Datum Preset
- Scaling Factor

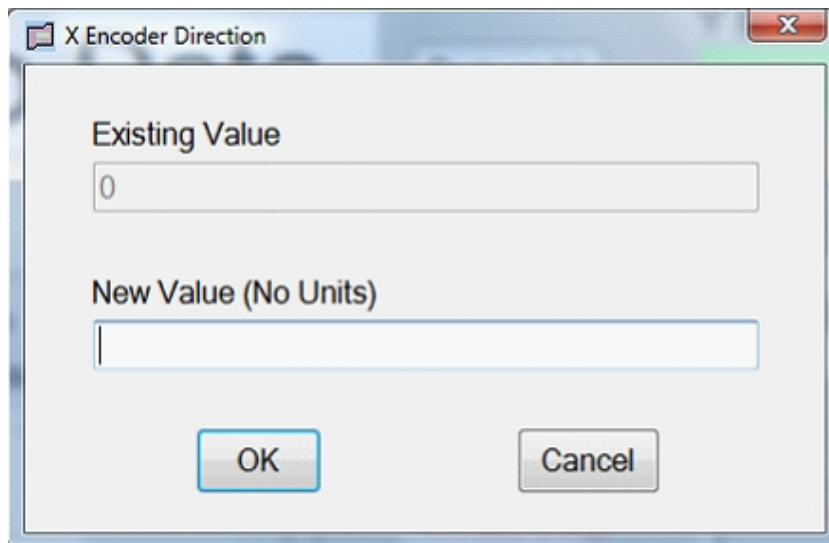
Axis Direction allows for changes in the sign of an axis measurement based on a particular direction of travel.

The Datum Preset allows the axis to assume a specific position reading when the axis is moved to a particular known location and the Datum X or Datum Y buttons are pressed.

The Scaling Factor allows for a linear accuracy error correction factor to be applied to the axis.

### Axis Direction

To change the direction for the X axis, click on the *Axis Configuration/X Axis/Encoder Direction* menu item. This will bring up the parameter editor shown below.

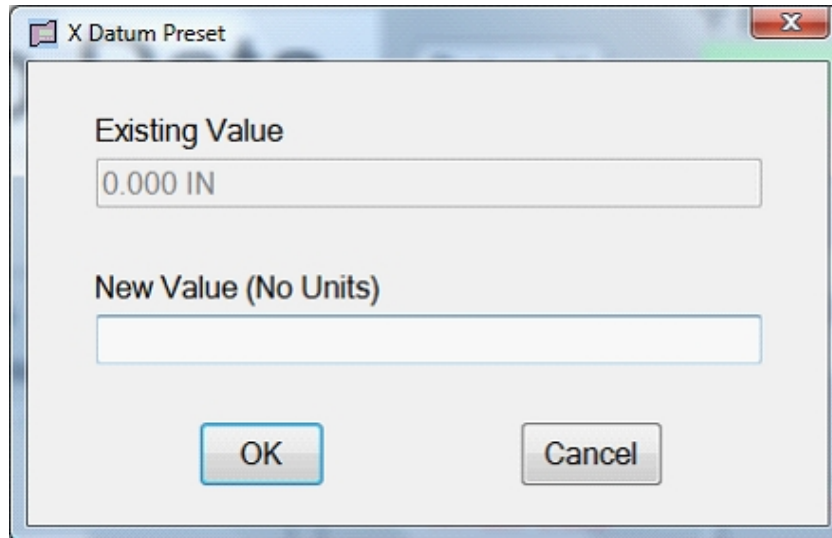
A screenshot of a software dialog box titled "X Encoder Direction". The dialog has a standard Windows-style title bar with a close button (X) in the top right corner. Inside the dialog, there are two text input fields. The first field is labeled "Existing Value" and contains the number "0". The second field is labeled "New Value (No Units)" and is currently empty. At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

The available choices are 0 or 1. The top line shows the current value. If the current value is 0, set the new value to 1. If the current value is 1, set the new value to 0. Press the OK button to save the changes.

To change the Y axis direction, choose the *Axis Configuration/Y Axis/Encoder Direction* menu item and follow the same procedure.

### Axis Datum Preset

To change the datum preset for the X axis, select the *Axis Configuration/X Axis/Datum Preset* menu item. The parameter editor shown below will be presented.

A screenshot of a software dialog box titled "X Datum Preset". The dialog has a standard Windows-style title bar with a close button (X) in the top right corner. Inside the dialog, there are two text input fields. The first field is labeled "Existing Value" and contains the text "0.000 IN". The second field is labeled "New Value (No Units)" and is currently empty. At the bottom of the dialog, there are two buttons: "OK" on the left and "Cancel" on the right.

The existing datum preset is displayed on the top line. To change the datum preset, enter a new value and click the OK button.

Whenever the Datum X button is pressed on the main user interface screen, the current X position being displayed will change to the datum preset programmed.

To set the Y axis datum preset, select the *Axis Configuration/Y Axis/Datum Preset* menu item. Use the dialog shown above to complete the parameter editing.

**NOTE:** The current datum preset values shown are in the current system units. New values should be entered using the same units.

For single axis ProTable applications, the datum preset should be 0.0 since any datum would be applied by the ProScale digital readout, NOT the VDRO software.

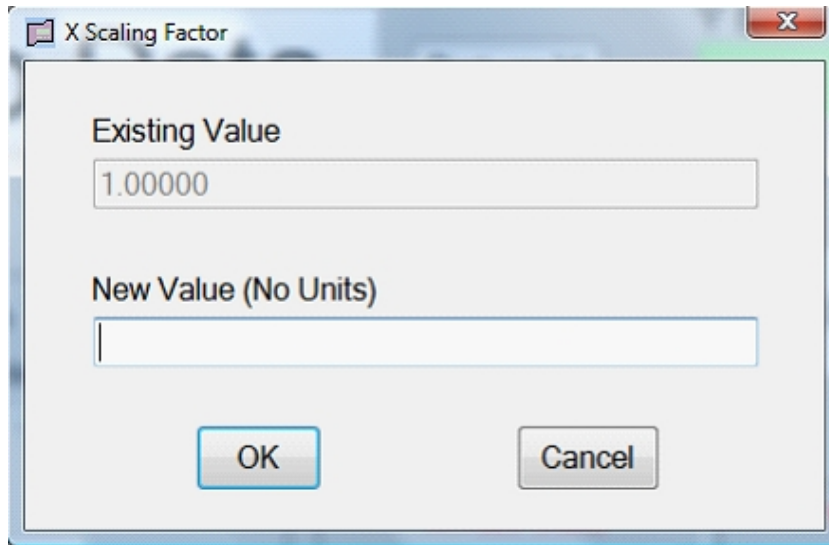
### Axis Scaling Factor

Each axis has an individual linear scaling factor that can be applied to the axis measurement. This scaling factor provides a linear error correction capability that can be used to accuracy calibrate the axis. This scaling factor is linear in nature and is applied to the overall measuring range of the scale. Values greater than 1.0 act as a multiplier to the measured distance. Values less than 1.0 act as a divisor. The default scale factor is 1.0.

In the case where the VDRO is supplied with a ProTable measuring system, a scaling factor other than 1.0 may have been determined during the factory accuracy test. This scaling factor should be configured on the customer's PC after installing the VDRO software.

To configure the scaling factor for the X axis, select the *Axis Configuration/X Axis/Scaling*

*Factor* menu item. The parameter editor shown below will be presented.



Enter the new scaling factor for the X axis and press OK.

Move the axis to the machine datum location and press the Datum X button. The axis is now recalibrated and will have the defined scaling factor applied to new measurements.

To configure the Y axis, complete the same procedure from the *Axis Configuration/Y Axis/Scaling Factor* menu item.

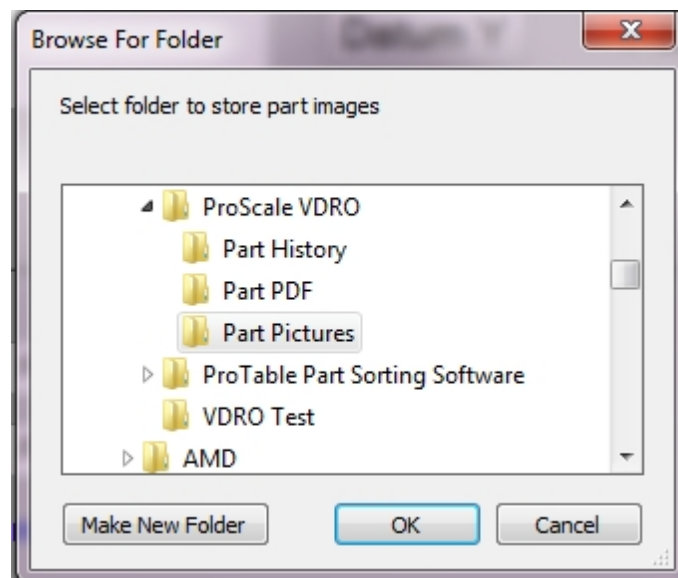
Note: Scaling factors must be positive numbers without units. New values greater than 5 decimal places in length will be rounded to five decimal places when saved.

## Default Part Image Directory

Each part in the database may have an image file associated with the part. This image file is displayed when a part is selected from the list of available parts in the part search dialog.

Part image files can be stored anywhere on the system but the VDRO application allows the user to define a default directory location where the files can be stored. This allows the user to quickly locate the image files starting at the default directory when a part record is created or edited.

To set the default image directory, choose *Database/Default Part Image Directory*. The following folder dialog will be provided.

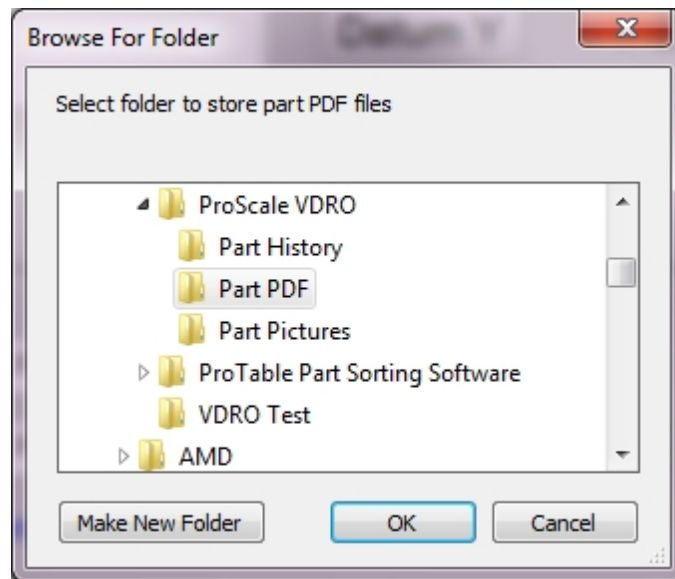


The initial default directory is C:\Accurate Technology\ProScale VDRO\Part Pictures. Any existing folder can be used or a new folder can be created on any available drive. Navigate to the desired folder that will be used as the default image folder and click OK.

## Default Part Info PDF Directory

Each part in the database may have an Adobe Acrobat Reader file (PDF) associated with it. The PDF file can be used to provide user defined data relating to the part. PDF files can be stored anywhere on the system but the application allows the user to define a default directory where PDF files can be stored. This allows the user to quickly locate the PDF files starting at the default directory when a part record is created or edited.

To set the default PDF directory, choose *Database/Default Part Info PDF Directory*. The following folder dialog will be provided.



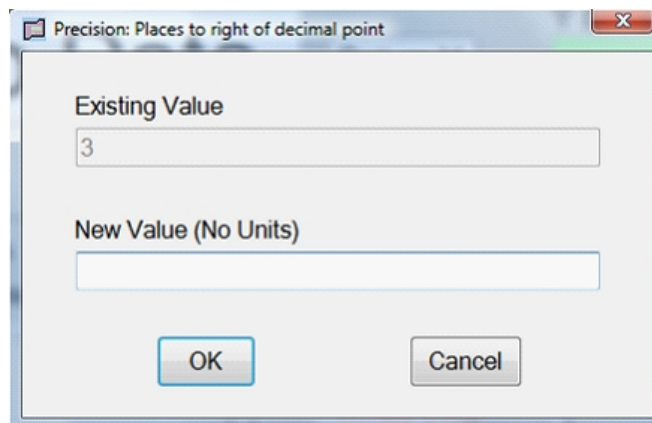
The initial default directory is C:\Accurate Technology\ProScale VDRO\Part PDF. Any existing folder can be used or a new folder can be created on any available drive. Navigate to the desired folder that will be used as the default PDF folder and click OK.

## System Readout Precision

The VDRO application can be defined to display positional information in various resolutions. The default resolution for the system is:

- 3 decimal place for inch measurement.
- 2 decimal place for millimeter measurement.

To change the system precision, click the *System Configuration/Display Precision* menu item. The following dialog box will be provided.



Enter the new resolution value and click the OK button to accept. The system will immediately update the position readout fields including the active part dimension fields.

Note that the maximum (highest) resolutions for the measuring units are as follows:

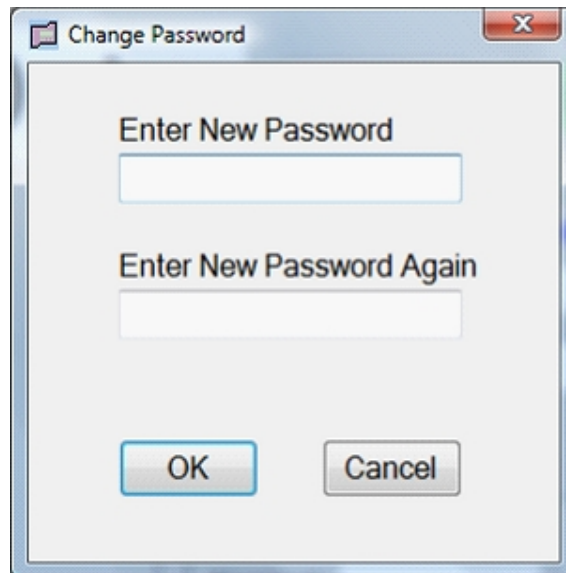
Inches: 4 decimal places  
Millimeters: 2 decimal places.

Precision values of 3 or 4 will still result in 2 decimal place resolution in millimeters. The minimum resolution for either measuring unit is 1 decimal place.

## Changing Default Password

It is highly recommended to change the default password from 1234 to another value. This helps to protect the configuration of the system from accidental or malicious changes.

To change the password, click on the *System Configuration/Change Password*. The system requests that the old password be entered. After entering the old password, the dialog box shown below is provided.

A screenshot of a Windows-style dialog box titled "Change Password". The dialog box has a standard title bar with a close button (X) in the top right corner. Inside the dialog, there are two text input fields. The first field is labeled "Enter New Password" and the second field is labeled "Enter New Password Again". Below the input fields, there are two buttons: "OK" and "Cancel".

Enter the new password on the first line. Re-enter it again on the second line. If both entries match, the new password is saved and a message is provided that the password change has been successful.

## RAW Encoder Input

Raw encoder input is used when a ProScale Digital Readout is used with the VDRO software. This can be accomplished by either using the ProRF receiver and SPC transmitter or by using a Gageway hardwire SPC interface cable.

When using Encoder transmitters, VDRO supports features used in the configuration of each axis. This includes:

- Scaling Factor.
- Encoder Direction.
- Datum Offset.

When using a ProScale Digital Readout in conjunction with the VDRO software, the readout provides these functions internally and thus is redundant to the same features built into VDRO. When the Use RAW Encoder Input function is selected, VDRO disables its internal axis transformation operations so that the operations are not duplicated.

## Allow Manual Measurements

Allow Manual Measurements are used to provide a method for the operator to manually enter sample measurements without using the attached measurement hardware. This provides capability for the following:

- If the part under test exceeds the measurement capability of the attached measurement hardware, the operator can complete a measurement using another acceptable method and enter the measurement data manually.
- Demo the VDRO software without having the associated measurement hardware available.

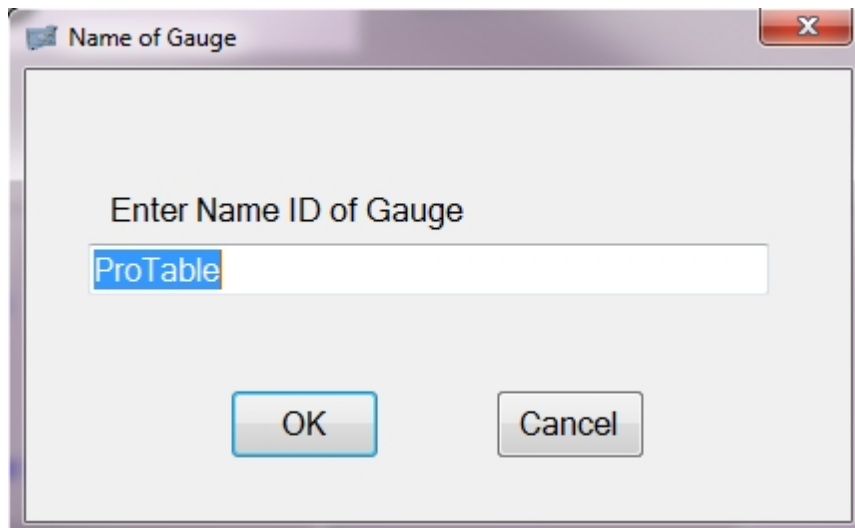
The default functionality of this feature is enabled, to allow manual measurement. If so desired, the administrator can un-check the Allow Manual Measurement option to prevent manual measurement entries from being applied.

## Auto Clear Position

This feature allows for the VDRO software to automatically clear the position and error fields 2 seconds after a single position event has been received. This feature is only available when either a Gageway wired interface or ProRF SPC transmitter are being used. This allows for the discrete measurement sample to be displayed momentarily and then blanked out, waiting for the next measurement sample to be received.

## Gauge Name

This selection allows the user to provide a name for the gauge that is attached to this computer running VDRO. In the case where multiple gauges are in use with multiple copies of VDRO, measurements from different gauges can be easily tracked when measuring the same part file. Clicking the Gauge Name menu selection provides the following dialog box:

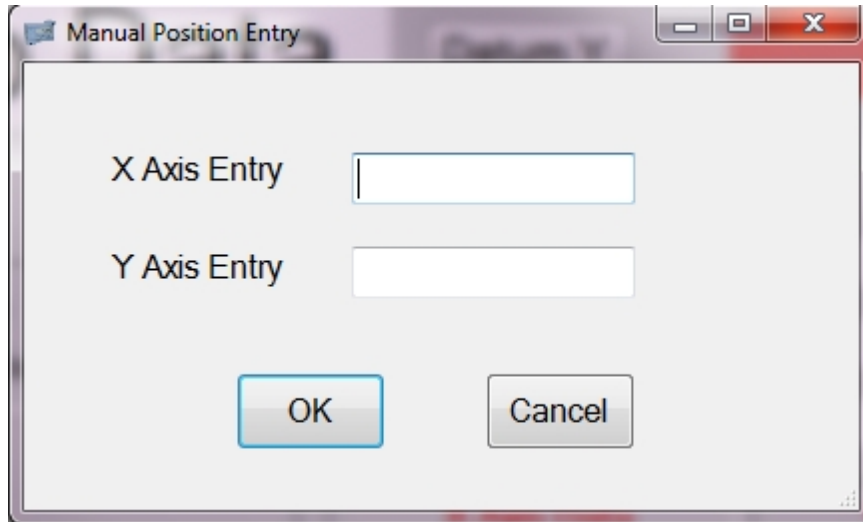


The user can then enter the desired name that best describes the tool or possibly its location. This gauge name is then used when writing the part CSV file output when recording measurements.

## Manual Measurement

---

When the Manual Entry menu button is clicked, VDRO provides the dialog shown below:



This allows the operator to manually enter measurement data into the system without the need for the measurement hardware to be used. This is convenient when the part under test exceeds the measurement capability of the measurement system hardware or while using the software under demo mode.

To complete the entry, enter the X and Y measurement data into the appropriate fields and click OK. The dialog will close and the measurement data will appear in the X and Y position window. The current nominal part values are then compared and a "Go" or "No Go" operation is evaluated.

Notes regarding Manual Measurement entry:

- This functionality will not operate properly when using the ProMUX 3 interface since the data received from the ProMUX will overwrite the manual measurement entry.
- If non-numeric data is entered, an error message will be issued.
- The units type (inches or millimeters) of the entered data should be the same as the currently selected Units type displayed on the VDRO main dialog.
- If only the X axis operation is selected, then only the X Axis entry field will be visible.
- This functionality can be disabled in the Administration menu.

## Part Database Management

---

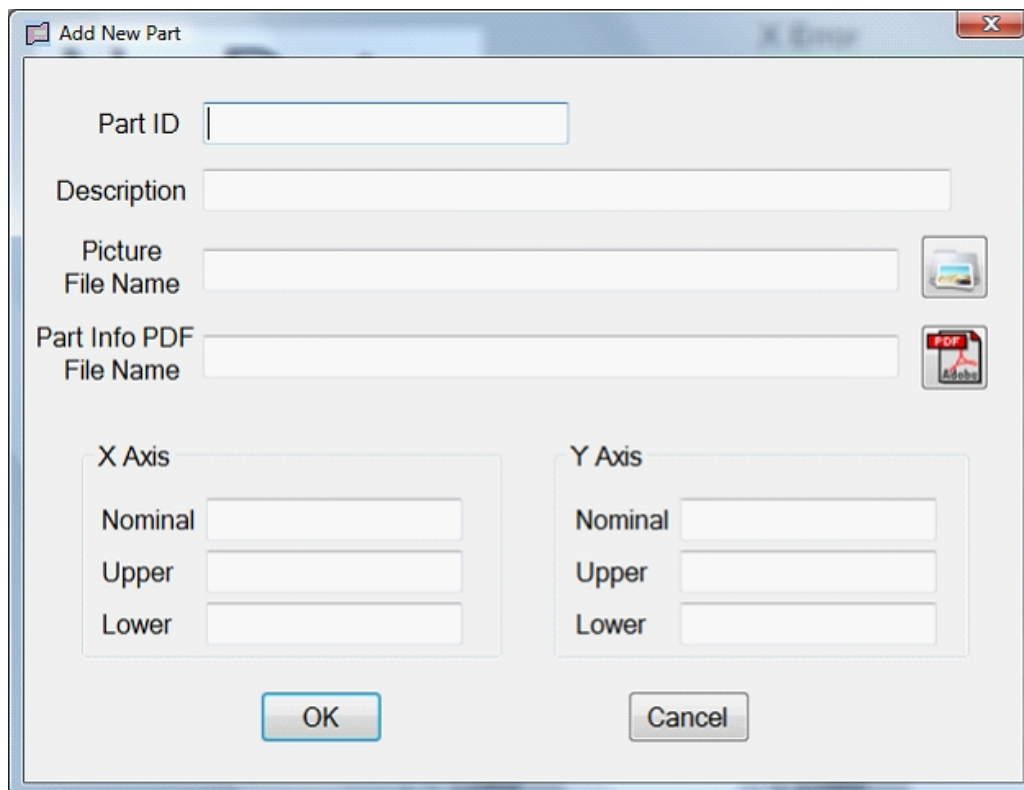
Once the VDRO system has been initially configured, the user will want to start entering and maintaining part data in the database. The following sections outline the procedures for part database maintenance.

Note that the Enable Administration password must be used under the System Configuration menu to unlock the Database Management menu.

### Creating a New Part

All system configurations, including the part database management are password protected. To access the part database management menu, click *System Configuration/System Administration*. Enter the password into the password field and click OK. If the password was accepted, the *Database* menu items should now be active and available.

To create a new part in the database, select the *Database/Add Part* menu item. The part editor shown below will be provided.



**Part ID** – The name or identifier of a part. This must be unique for each part. The field can contain letters, numbers and spaces. This field is required. Maximum length is 100 characters.

**Description** – A free form description of the part. This field is optional. Maximum length is

100 characters.

**Picture File Name** – The file name and path that point to an optional image file of the part. Click on the image folder icon at the end of the field to navigate to the desired file. This field is optional. Maximum length is 255 characters.

**Part Info PDF File Name** – The file and path name that point to an optional Adobe® Acrobat™ PDF file that contains user defined part data information. This information could include drawings, specifications, materials, etc. Click on the PDF icon at the end of the field to navigate to the desired file. This field is optional. Maximum length is 255 characters.

**Axis Nominal** – The desired target value for the respective X or Y dimension. This represents the ideal dimension for the part in either X or Y respectively. i.e. 6.000 inches. This field is required.

**Axis Upper** – The largest dimension, in X or Y respectively that is considered within tolerance. i.e. 6.010 inches. This field is required.

**Axis Lower** – The smallest dimension, in X or Y respectively that is considered within tolerance. i.e. 5.990 inches. This field is required.

## NOTES:

The application verifies that the upper limit is greater than or equal to the nominal and that the lower limit is less than or equal to the nominal.

If a part ID is already in the database, the system will not allow a duplicate.

Dimensions are in the current system units that were active when the part editor was activated.

If VDRO is configured for single axis operation, the Y Axis data entry fields will not be displayed. Internally, they will be assigned to 0.0.

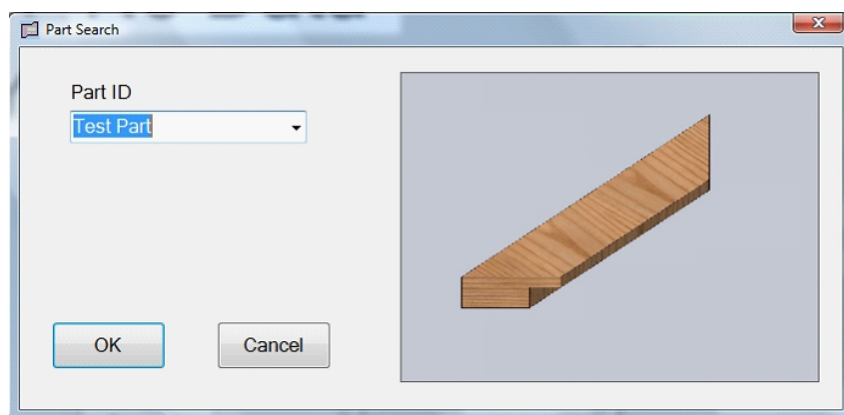
**DO NOT add unit text to the dimension data (i.e. mm or in) as an error will be detected.**

## Editing an Existing Part

To edit an existing part in the database, the user must first enter the administration mode of operation.

To access the part database management menu, click *System Configuration/System Administration*. Enter the password into the password field and click OK. If the password was accepted, the *Database* menu items should now be active and available.

Select the *Database/Edit Part* menu item. The Part Search dialog will be presented. Select the desired existing part from the list or type in the part ID. When a valid part is selected, the system will show the associated part picture if defined as illustrated below.



To accept and edit this part, click the OK button. The Part Editor will be displayed with the current part data shown.

 The image shows an 'Edit Part Data' dialog box. It contains several input fields: 'Part ID' (containing 'Test Part'), 'Description' (containing 'Test Part 1'), 'Picture File Name' (containing 'C:\Virtual DRO Data\standard moulding.jpg'), and 'Part Info PDF File Name'. To the right of the file name fields are icons for selecting a picture and a PDF file. Below these fields are two groups of dimension inputs: 'X Axis' and 'Y Axis'. Each group has three fields: 'Nominal', 'Upper', and 'Lower'. The X Axis values are 12.0000, 12.1500, and 11.9500 respectively. The Y Axis values are 2.0000, 2.1000, and 1.9000 respectively. 'OK' and 'Cancel' buttons are at the bottom.

**Part ID** – The name or identifier of a part. This must be unique for each part. The field can contain letters, numbers and spaces. This field is required. Maximum length is 100 characters.

**Description** – A free form description of the part. This field is optional. Maximum length is 100 characters.

**Picture File Name** – The file name and path that point to an optional image file of the part. Click on the image folder icon at the end of the field to navigate to the desired file. This field is optional. Maximum length is 255 characters.

**Part Info PDF File Name** – The file and path name that point to an optional Adobe® Acrobat™ PDF file that contains user defined part data information. This information could include drawings, specifications, materials, etc. Click on the PDF icon at the end of the field to navigate to the desired file. This field is optional. Maximum length is 255 characters.

**Axis Nominal** – The desired target value for the respective X or Y dimension. This represents the “perfect” dimension for the part in either X or Y respectively. i.e. 6.000 inches. This field is required.

**Axis Upper** – The largest dimension, in X or Y respectively that is considered within tolerance. i.e. 6.010 inches. This field is required.

**Axis Lower** – The smallest dimension, in X or Y respectively that is considered within tolerance. i.e. 5.990 inches. This field is required.

## NOTES:

The application verifies that the upper limit is greater than or equal to the nominal and that the lower limit is less than or equal to the nominal.

If a part ID is already in the database, the system will not allow a duplicate.

Dimensions are in the current system units that were active when the part editor was activated.

Inches are displayed in 4 decimal place resolution regardless of the system defined Display Resolution. This is required to help minimize rounding errors when switching between inches and millimeters.

If VDRO is configured for single axis operation, the Y Axis data entry fields will not be displayed. Internally, they will be assigned to 0.0.

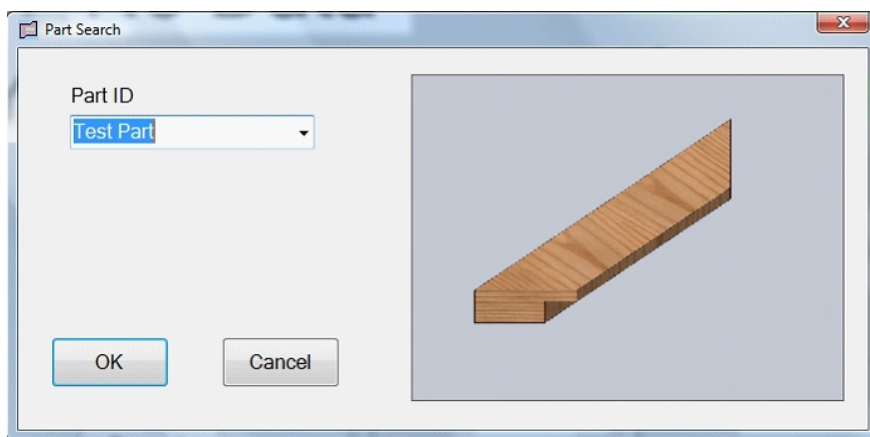
**DO NOT add unit text to the dimension data (i.e. mm or in) as an error will be detected.**

## Deleting an Existing Part

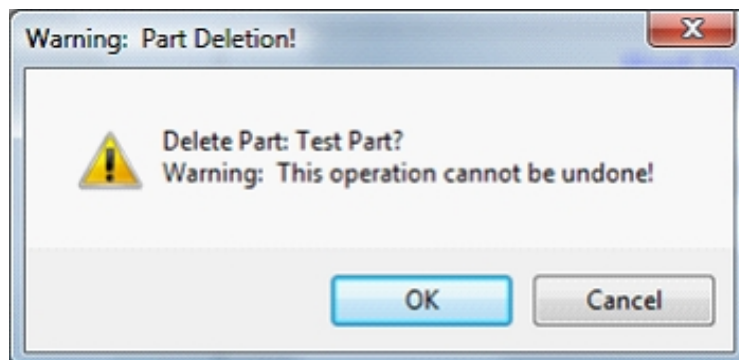
To delete an existing part from the database, the user must first enter system administration mode.

To access the part database management menu, click *System Configuration/System Administration*. Enter the password into the password field and click OK. If the password was accepted, the *Database* menu items should now be active and available.

Select the *Database/Delete Part* menu item. The Part Search dialog will be presented. Select the desired existing part from the list or type in the part ID. When a valid part is selected, the system will show the associated part picture if defined as illustrated below. Click the **Ok** button.



A warning message will be presented as shown below.



Clicking OK deletes the part from the database. Cancel will abort the operation.

**NOTE: Deleting a part cannot be undone. The part record would need to be re-created, if accidentally deleted.**

## Default Part Image Directory

The default Part Image Directory menu selection is used to determine where part images are stored. By default, the directory is under C:\Accurate Technology\ProScale VDRO\Part Pictures. Any local or network directory can be used to store the picture files. Pictures can be .jpg, .bmp, .gif, .png.

## Default Part Info PDF Directory

This is the default directory where PDF files are stored that are related to parts. Each part can have an optional PDF file referenced to it that can contain drawings, pictures or other related information. The default folder is C:\Accurate Technology\ProScale VDRO\Part PDF. The PDF folder can reside on any local or network drive.

## Default Database Directory

The Default Database Directory points to the folder that stores the parts database file. The default folder is C:\Accurate Technology\ProScale VDRO. The database can reside in a local or network folder. This is a new feature for Version 1.1.1.0 and allows multiple copies of VDRO to share a common database. In this way, parts that are created or edited on one PC can be used on other PCs if the Default Database Directory on all machines point to this common database. See "Reload Database when Used".

## Reload Database when used

This check box selection is used to determine if the database is to be reloaded whenever a database function is accessed. The database used by VDRO is a snapshot of the database file when VDRO is launched. In version 1.1.1.0, multiple copies of VDRO can share a common database. In this case, it is possible to have one copy of VDRO modify a part entry and have another copy then try to access the same part entry. If "Reload Database when used" is enabled, VDRO will reload the database whenever a part is recalled for measurement, edited, created or deleted. This helps to keep all active copies of VDRO in sync when a common database is used.

The down side to this feature is if the database gets very large, reloading the database for every database related operation can take time to execute, especially over a network. In the case where only one copy of VDRO is used, it is recommended to turn off this feature to maximize operation speed.

## Measurement Sampling

Measurement sampling allows the user to store the recorded measurements of part samples to a CSV data file. This file can later be opened and read by a spreadsheet program or other application.

Upon initial installation of the VDRO software, measurement sampling is disabled. To enable measurement sampling, the user must first enable system administration by selecting the *System Configuration/Enable Administration* menu item. Enter the administration password and click OK.

Click on the *System Configuration/Sample Measurement* menu item. A secondary pop-up menu appears. Click on the *Enable Sample Measurement* menu item. The menu disappears and the general user interface changes to the format shown below.

The screenshot displays the ProScale VDRO software interface. The title bar reads "ProScale VDRO™ -- Virtual Digital Readout". The menu bar includes: File, Axis Configuration, System Configuration, Manual Entry, Database, Charts, Tools, Help.

The main interface is divided into several sections:

- Position:** Large input fields for X and Y coordinates.
- Error:** Red input fields for X Error and Y Error.
- Counters:** Number of Samples (0), Pass Count (0), and Fail Count (0).
- Units:** Radio buttons for Inches (selected) and Millimeters.
- Save Measurement:** A button to save the current measurement.
- Part Search:** A button to search for a part in the database.
- Part Data:**
  - Part ID: 12345
  - Desc: Mounting Plate
  - X Axis Data:**
    - Nominal: 3.000
    - Upper: 3.005
    - Lower: 2.995
  - Y Axis Data:**
    - Nominal: 4.000
    - Upper: 4.005
    - Lower: 3.995
- Image:** A photograph of a metal mounting plate with four holes and the text "SDE123" engraved on it.

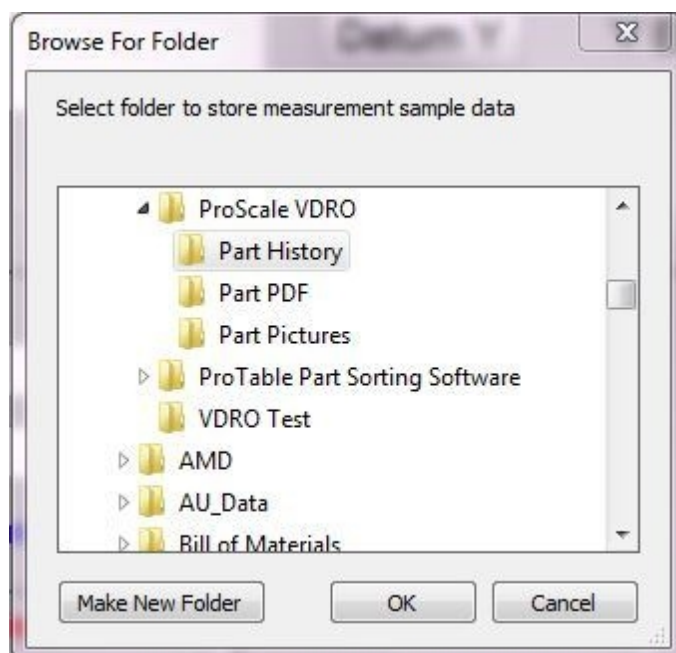
The status bar at the bottom indicates "Data Sample File: 12345.csv".

A new button appears above the Part Search labeled **Save Measurement**<sup>(1)</sup>. In addition, a new field is added in the *Part Data* section labeled **Number of Samples**. The program is now ready to recall parts from the database and save measurement samples.

Note (1): The **Save Measurement** button will be hidden if the "Enable Auto Save on New Data" option is checked under the *Sample Measurement* menu. This feature forces VDRO to save the measurement data when a new single data sample is received, thus making the **Save Measurement** button redundant.

## Default Measurement File Directory

Prior to creating measurement sample part files for the first time, the user should define a default directory location where measurement sample files are stored. To complete this, choose *System Configuration/Sample Measurement/Change Target Directory*. The VDRO application will provide the following dialog.



Locate a folder on the system or using a network share by expanding the drive locations in the folder explorer. If the desired folder does not exist, use the **Make New Folder** button to create a new folder under the current drive or directory. When completed, click on the **OK** button. The folder path is now stored on the system. The default measurement file folder is C:\Accurate Technology\ProScale VDRO\Part History.

## Saving Measurement Sample Data

Complete the following procedure to record a measurement sample.

1. Place the part to be measured on the measuring table.
2. Move the X and/or Y axis gantry of the measuring system to locate the desired measurement point on the part.
3. Click on the **Save Measurement** button on the main user screen<sup>(2)</sup> OR press the SEND button on the readout, if readout(s) are in use.
4. The status bar at the bottom of the application will indicate that the measurement was saved and indicate the time when the measurement was recorded.

Note that the *Number of Samples* field in the Part Data section has incremented by 1 count. Each time the **Save Measurement** button is activated, the status bar will be updated to reflect the sample recording time and the *Number of Samples* field will be

incremented.

Optionally, the VDRO software can be configured to momentarily show a "Measurement Acquired" message dialog whenever a sample is recorded. See [Show Sample Acquired Message](#) configuration.

Note 2: If the "Enable Auto Save on New Data" option is checked under the *Sample Measurement* menu, the **Save Measurement** button will not be displayed.

## Measurement Sample File Format

When a part is selected from the part database, VDRO searches for an existing .csv file with the part number as the file name. If a file exists, it reads in the previous measurement data to build a dataset for the histogram functionality. If it does not exist, it creates a new .csv file with the name being that of the part number.

When the file is initially created, it writes a header section that includes details about the part such as nominal measurements, tolerances and measurement units used. The details of the header is provided in the next section, File Header

When a measurement is taken, the measurement sample data is appended to the file with a date and time stamp, the measurement data and tolerance results. The details of the measurement sample data is provided in Individual Sample Data Format.

### **New to Version 1.1.1.0**

Each measurement entry now also includes the current user name logged into Windows and the Gauge name defined for the system. This information can be used to track operator use and which gauge in a multi-gauge facility the part under test was measured on.

## File Header

When the measurement sample file is initially created, a predefined group of data is written to the file called the file header. This information consists of the following:

- Part ID.
- Part Description.
- Nominal X dimension
- Upper X limit
- Lower X limit
- Nominal Y dimension
- Upper Y Limit
- Lower Y Limit
- Column headings for each measurement sample

Note that if only a single axis is in use (X), the Y axis data is not displayed. Since the file header is only written once, it becomes static throughout the life of the file. If the file is initially created when only one axis is in use and then the VDRO configuration data is changed for two axes, the header WILL NOT be updated to reflect the now active Y axis data. It is recommended that the part sample file be deleted and created with both axes active.

Part measurement samples are stored in the initially selected display measurement units of the VDRO software. Once a part sample file is created, all future measurements will be completed in the original saved measurement units, regardless of the VDRO's selected display units.

### Individual Sample Data Format

Each time the **Save Measurement** button is pressed, the measurement sample data is recorded to the file. The data recorded consists of the following information.

Sample recorded date	
Sample recorded time	
Sample number	
X measurement recorded	
X measurement error	
X in specification (yes or no)	
Y measurement recorded	(If 2 axes operation enabled)
Y measurement error	
Y in specification (yes or no)	
Windows User Name currently logged in	New in Version 1.1.1.0
Gauge Name	New in Version 1.1.1.0

## Measurement Sample File Example

The following is an example of a measurement sample file imported by Microsoft® Excel™.

	A	B	C	D	E	F	G	H	I	J	K	L
1	Part ID:	Part 3										
2	Description:	Part number 3										
3	Nominal X:	1 Inches										
4	Upper Limit X:	1.01 Inches										
5	Lower Limit X:	0.99 Inches										
6	Nominal Y:	1 Inches										
7	Upper Limit Y:	1.01 Inches										
8	Lower Limit Y:	0.99 Inches										
9												
10	Date	Time	Sample Number	X Measurement	X Error	X In Spec	Y Measurement	Y Error	Y In Spec	User	Gauge	
11	6/29/2016	2:39:45 PM	1	0.992	-0.008	YES	1.009	0.009	YES	Frank	ProTable	
12	6/29/2016	2:39:50 PM	2	0.992	-0.008	YES	0.998	-0.002	YES	Frank	ProTable	
13	6/29/2016	2:40:03 PM	3	1	0	YES	1.004	0.004	YES	Frank	ProTable	
14												

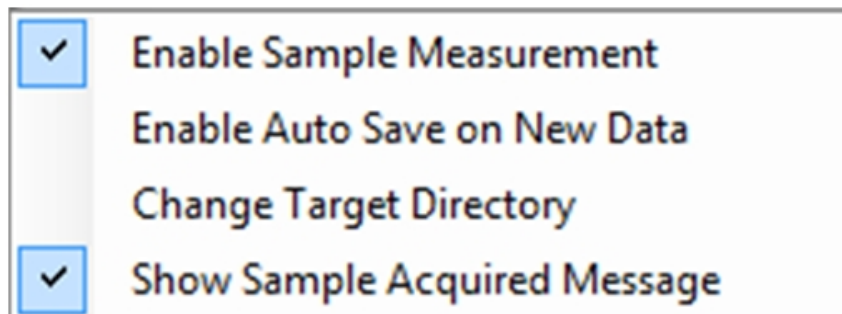
## Notes Regarding Measurement Sample Files

- The measuring units that are used for measurement sample recording must be chosen **PRIOR** to selecting the part from the database. When the file header is written, the part data is displayed in the selected units. Subsequent measurement samples will be recorded in the defined units regardless of the current units setting on the user interface.
- The raw measurement data information is stored in the file using the precision defined in the system configuration. Your spreadsheet program may override this precision based in the column definition.
- When each measurement sample is completed, the data file is opened, written to and closed. The number of rows of data is limited only by the amount of drive space available.
- Measurement samples are written to the same data file sequentially until one of the following events occurs:
  - A new part is loaded from the part database.
  - The part data is cleared using the *Tools/Clear Part Data* menu item is selected.
  - The number of system axes is changed.
  - The VDRO program is exited.
- The “In Spec” entry is determined to be true (yes) if the recorded measurement is greater than or equal to the lower limit **AND** is less than or equal to the upper limit. Otherwise, it is false (no).
- The sample numbers represent the sample count from a particular measurement set and are reset when a new measurement set is completed. This occurs whenever the part is selected from the database.
- Version 1.1 now incorporates the capability for the system to read in measurement data from the part sample file to update the histogram operation. It is important that the structure of the data in the part sample file not be altered, otherwise VDRO may not be able to read in the data correctly.

## Sample Acquired Message

In certain situations, particularly when using an Accurate Technology ProRF SPC transmitter, it may be beneficial to provide the user with a message that a measurement sample has been saved. This feature can be enabled or disabled via the system configuration.

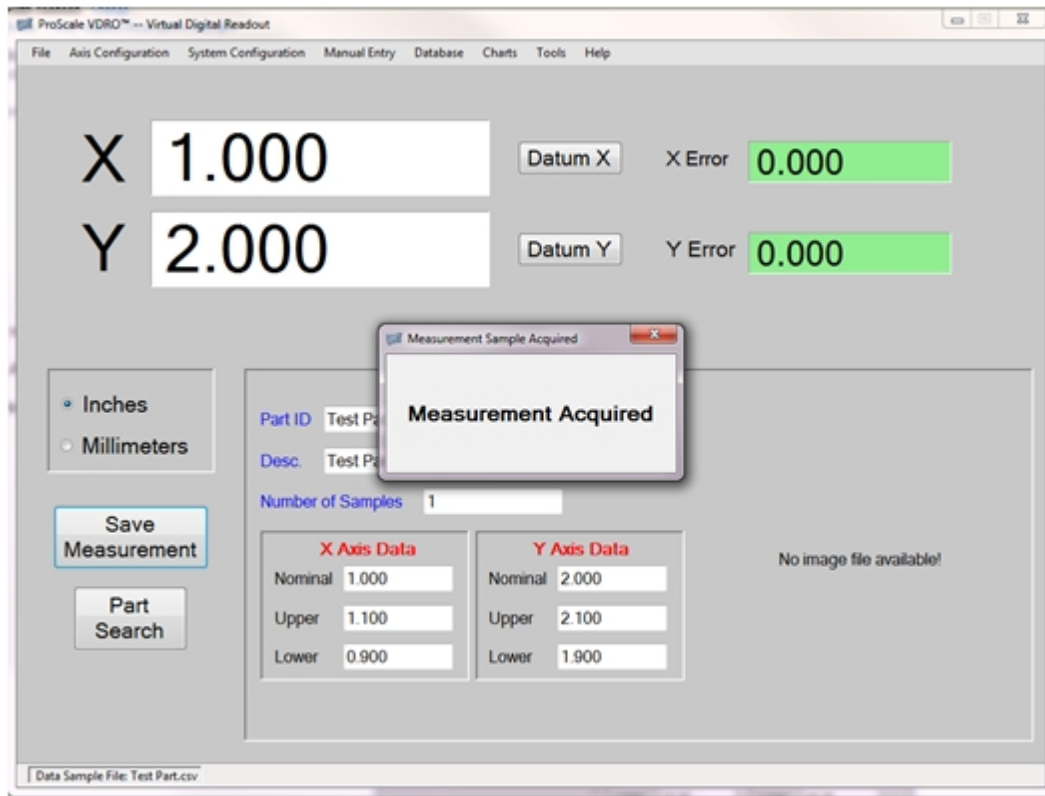
To enable or disable the message feature, choose the *System Configuration/Sample Measurement* menu item. The Sample Measurement will be displayed as shown below.



If a checkmark is shown next to the *Show Sample Acquired Message* menu item, the feature is enabled. Otherwise, it is not.

Click the *Show Sample Acquired Message* menu item to toggle its status.

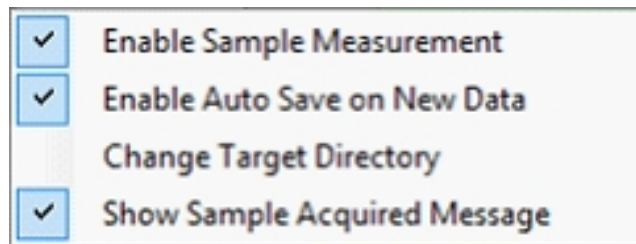
If the *Show Sample Acquired Message* feature is enabled, a timed dialog shown below will be displayed whenever a measurement sample is recorded to the data file.



## Auto Save on New Measurement Data

When using the ProRF wireless receiver system with an Accurate Technology SPC transmitter, measurement data is only received by the VDRO application when the user presses the **SEND** button of the ProScale display. To allow the VDRO application to automatically save the measurement sample data when this event occurs, the user should enable the *Auto Save on NewData* feature.

To enable or disable this feature, click on the *System Configuration/Sample Measurement* menu item. The sub-menu shown below will appear.



If Auto Save is enabled, a checkmark will be shown next to the menu item. Otherwise, it is disabled.

It is recommended that the *ShowSample Acquired Message* also be enabled in this scenario. This provides an easily identifiable confirmation that the measurement was recorded.

Note that this feature is only functional whenever a part has been selected AND a measurement sample file has been created.

**The user SHOULD NOT enable the Auto Save feature when utilizing Accurate Technology Encoder Transmitter devices.** These devices provide new position data **whenever** the encoder position changes. Enabling this feature would cause measurement samples to be automatically saved while positioning the measuring system axis. This is typically an undesired operation and also causes the measurement sample file to grow excessively large very quickly.

If the VDRO software is configured for ProMUX-3 operation, the Auto Save feature is not available.

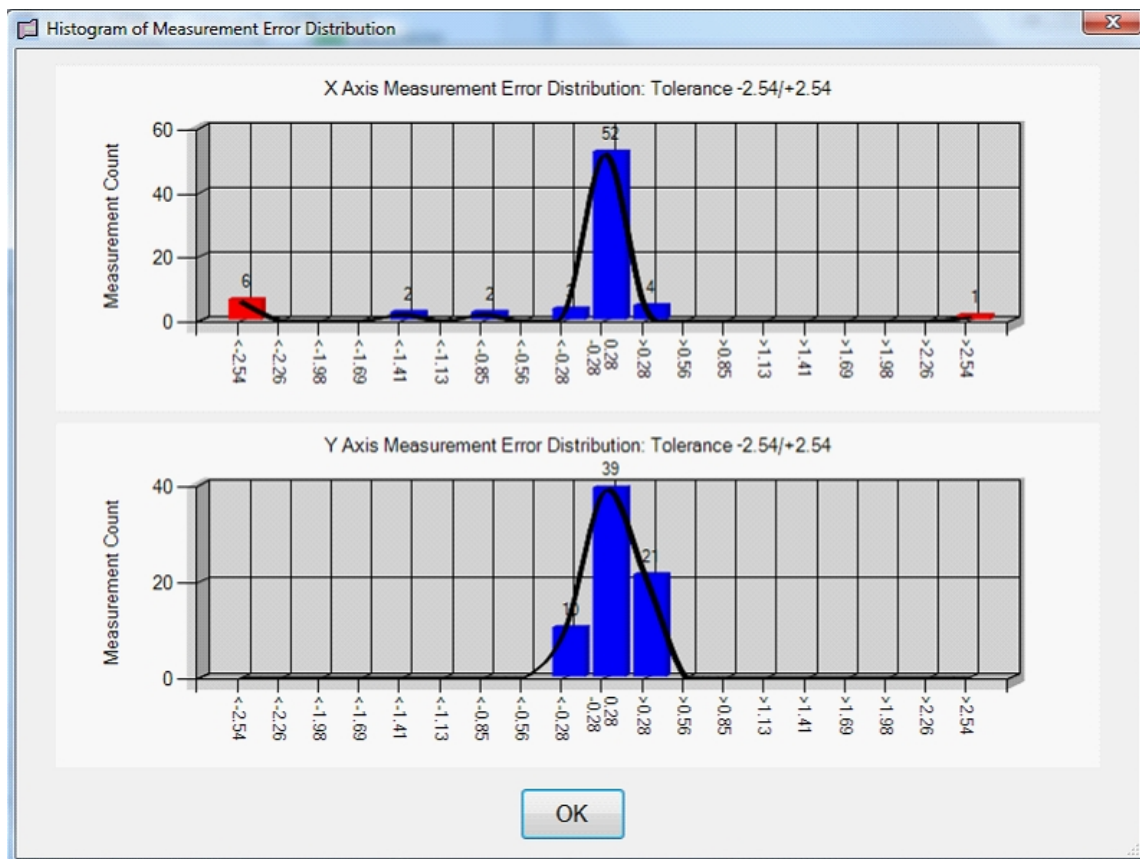
## Graphical Charting of Measurements

The VDRO software provides for the option of representing measurement data in graphical form. In many cases, quality control issues regarding the manufacturing process can more easily represented and interpreted using graphical models.

### Measurement Error Distribution Histogram

When utilizing the Measurement Sampling feature of the VDRO software, the application records the measurement error of each sample taken and stores the data in the form of a histogram. This histogram represents the distribution of measurement error, in X and/or Y over the defined acceptable measurement tolerance.

The measurement error range is based on the nominal dimension of the axis with the upper and lower tolerance limits defining the boundaries of the graph. An example chart is shown below.



The graph is divided in vertical tolerance groups with the nominal measurement being located in the center of the chart. Each tolerance group, except for the center, is labeled by a starting tolerance range (i.e. >.56, > 1.41, <-.85). As each measurement sample is completed, the measurement error for each axis is calculated and compared to each defined tolerance group. If the measurement error falls within a particular error range group, the count for that group is incremented by one. Each column of error tolerance provides the total number of measurement samples that have fallen into each group. This number is displayed above the column.

## Bell Curve Display

A second graphical representation of the measurement error data is shown as a black curve that tracks each column of measurement error distribution. This curve helps to outline the measurement error distribution in addition to the bar graph.

## Histogram Limits

The right and leftmost columns of the histogram define measurement error values that were outside the acceptable control limits. Like the other tolerance columns, these areas track the count of the number of measurement errors that fall within their defined ranges. The main difference is that these columns have no upper and lower range limits respectively. These columns are easily identified by their red color.

## Tools Menu

---

This menu controls miscellaneous general tool options for the VDRO application.

### Clear Part Data

Use this option to clear the currently loaded part data being displayed. This will also terminate writing measurement sample data to the current measurement file, if active. It will also clear all plot data and disable the graphing function.

### Print Test Label

If a label printer is installed (see [Appendix B](#)), selecting this menu item will print a test label on the label printer. This option is used to provide a quick print testing function of the label printer.

### Part Info PDF

Selecting this menu item opens an internal version of Adobe® Acrobat Reader™ and displays the associated PDF file for the selected part. This option is only available if a part is selected **AND** the part has a PDF filename define in the part's database record.

## Appendix A - Barcode Scanner Option

---

The Accurate Technology VDRO application can accept a bar code scanner for selecting parts from the database. The bar code scanner must be purchased separately.

### Recommended Barcode Scanner

Accurate Technology recommends the use of a Symbol® LS2208 handheld barcode scanner or equivalent. This scanner can read various 2D technology barcodes and utilizes a USB™ interface. It is a mid-priced and robust scanner. This unit is currently the only scanner tested and certified to work with the Accurate Technology VDRO software.

### Recommended Barcode Symbology

Although the LS2208 can scan various barcode symbologies, the recommended barcode symbology for use with the VDRO software is Code128. This symbology can support alpha-numeric data and can read barcodes of various lengths.

### Barcode Scanner Installation

The LS2208 is easy to install.

1. Plug the LS2208 into an available USB port on the host PC. Windows™ will automatically install the appropriate drivers. Since the scanner connects to the USB port, no external power supply is required.

### Barcode Scanner Operation

To scan a part number with the bar code scanner, either click on the Part Search button or press F2.

Point the scanner at a barcode that is encoded with the ID of a part in the database. Squeezing the trigger scans the barcode and causes the VDRO software to search the database for the specified part. If the part is found, it will be loaded into the application.

If the specified part is not located in the database, an error message will be issued to indicate that the part does not exist.

### Unsupported Barcode Scanners

Accurate Technology only certifies the Symbol® LS2208 barcode scanner for use with the VDRO software. Other barcode scanners may operate with the software but their operation is not guaranteed nor supported by Accurate Technology.

## Appendix B - Label Printer Option

---

The Accurate Technology VDRO software can optionally support a label printer. Labels that include the part measurements can be printed when a measurement sample has been completed and placed on the measured part.

Part labels include the following information

- Part Width
- Part Height (if X and Y axes used)
- Part ID
- Date and time of measurement
- Optional barcode of Part ID

### Recommended Label Printer

The recommended label printer for use with the VDRO software is a Zebra LP-2844 direct thermal printer. This printer has been tested with and certified to work with the VDRO software.

### Label Printer Hardware Installation

The Zebra label printer communicates with the VDRO software using an RS-232 serial port. Many new computers do not incorporate a standard serial port. If this is your situation, a USB to serial port converter can be purchased from most office supply or electronics stores to provide this capability.

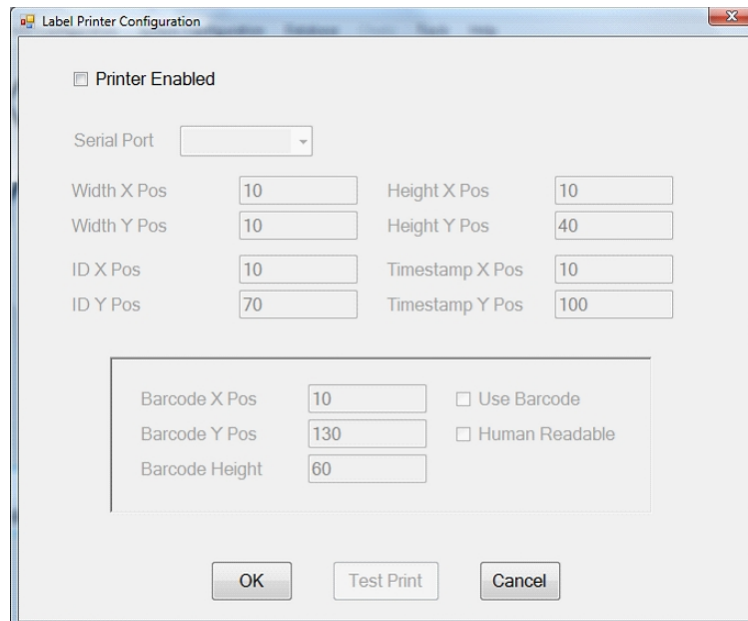
Connect a 9 pin male-female serial cable between the printer's DB-9 serial port connector and the computer's DB-9 serial port connector. If using a USB to serial port adapter, install the drivers FIRST. Connect the USB to serial adapter to an available serial port. Connect the printer serial cable to the DB-9 on the USB adapter.

Connect the power supply to the printer and plug the power supply into a wall outlet.

Install the label roll stock in the printer as outlined in the printer's user manual.

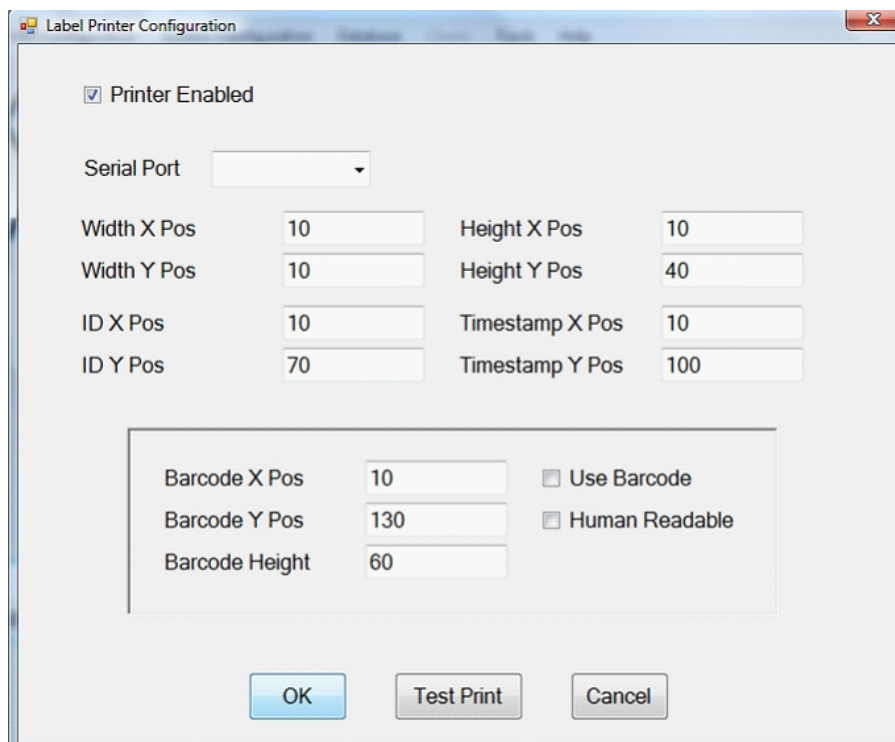
## Label Printer Configuration

The label printer must be configured prior to its initial use. To configure the printer, enable the system administration in the *System Configuration* menu. Then select *System Configuration/Label Printer Configuration*. The dialog shown below will be displayed.



The dialog box is titled "Label Printer Configuration". It contains a checkbox labeled "Printer Enabled" which is currently unchecked. Below this is a "Serial Port" dropdown menu. There are two columns of text input fields: the left column contains "Width X Pos" (10), "Width Y Pos" (10), "ID X Pos" (10), and "ID Y Pos" (70); the right column contains "Height X Pos" (10), "Height Y Pos" (40), "Timestamp X Pos" (10), and "Timestamp Y Pos" (100). A separate box contains "Barcode X Pos" (10), "Barcode Y Pos" (130), and "Barcode Height" (60). To the right of these are two unchecked checkboxes: "Use Barcode" and "Human Readable". At the bottom are three buttons: "OK", "Test Print", and "Cancel".

Click the *Printer Enabled* checkbox to access the other fields of the form.



The dialog box is the same as the previous one, but the "Printer Enabled" checkbox is now checked. The "OK" button is highlighted in blue, indicating it is the default action.

## Configure Printer Serial Port

Click on the pull down list for the *Serial Port* field. The list is populated with all of the available serial communications ports on the PC. Locate the serial port that is connected to the printer. Built-in serial ports are typically COM1 to COM4. Virtual COM ports used with USB serial converters are typically higher COM numbers. If you are using a USB serial converter, examine the Control Panel/System/Device Manager tool and expand the **Ports** icon. The virtual COM port with its port number should be listed.

## X and Y Field Locations

The four printable fields can be configured to print anywhere on the label. The default values shown are used to print the standard 2.25" x 1.25" labels used by Accurate Technology.

The user may choose a different label size to meet their particular needs. In doing so, the user will probably have to reconfigure the positions of the printed fields.

## Barcode Printing Options

The user may choose to print a barcode that encodes the Part ID. To enable this feature, check the *Use Barcode* checkbox. The position of the barcode on the label may also be defined by the user in both X and Y. In addition, the height of the barcode may be altered. The barcode type used is Code128. *The type of barcode used is not configurable.*

If the *Human Readable* checkbox is active, the encoded value of the barcode is printed directly below the barcode.

## Label Configuration Values

The X and Y values shown in the printer configuration dialog are in units of dots. The origin (0,0) of the label is in the upper left corner of the label.

## Printing a Test Label

Clicking on the **Test Print** button causes a label to be printed with pre-defined data to test the positioning of the fields on the label. The user can print test labels when configuring a different label setup.

## Printing Labels

Labels can be printed in two ways.

- If Measurement Sampling is enabled, clicking the **Save Measurement** button on the user interface will cause a new label to be printed in addition to saving the measurement data. This is only true if the printer is enabled in the printer configuration menu.
- If Measurement Sampling is disabled and printing is enabled, a new button is added to the user interface called **Print Label**. Pressing this button will print a label with the current X (width) and Y (height) measurements.

If a part record has been selected from the database, the width and height data are followed by either.

- [OK] – Part measurement was within the defined upper and lower limits.
- [FAIL] – Part measurement was outside the defined upper and lower limits.

If no part record has been selected, only the measurements are printed.

## Appendix C - External Go/No Go relay output/input module

---

**Version 1.1.1.0** now supports a USB based relay module that allows a light stack to be connected to the host PC. This module, when connected to a two color light stack can be used as an external indicator to signal when a part under test is within measurement tolerance. In this case, VDRO is used as a Go/No Go gauge.

Installation of this module only requires connection to a USB port on the host computer. The module provides two outputs, one for the Red indicator, one for the Green indicator.

**Output 1** is for Red, **output 2** is for Green. When the current live measurement is outside the part tolerances as defined in the part database record, the Red light output is active. If the current live measurement is within the associated part tolerances, the Green light output goes active.

If no part is selected, the Red light output is active. Closing the VDRO application turns both outputs off.

The form C output relays are rated at 250 VAC/6 amp and 60 VDC/5 amp.

To connect the module, simply plug it into a USB port on the host PC. No addition configuration is required. Each form C relay has a common, normally open and normally closed connection via an unpluggable terminal strip. Connect each of the lights colors to the associated module output relay connections using the Common and Normally Open contacts. The relay can switch either the positive or negative sides of the circuit depending on the configuration of the light. See the connection documentation furnished with the light.

**Version 1.1.1.2** now supports an external input that is used to remotely activate the "Save Measurement" button on the VDRO application. **Input 1** on the USB module is used for this function.

The inputs are optically isolated and require an external power supply to activate. To connect the external input, wire as follows:

1. Connect the C terminal for inputs 1 and 2 to an external 24 VDC power supply negative.
2. Connect one side of the normally open momentary switch to the input 1 terminal.
3. Connect the other side of the switch to the 24 VDC power supply positive.

NOTE: For either the on screen Save Measurement button or the external button to operate and save a measurement sample, an active part record must be selected.

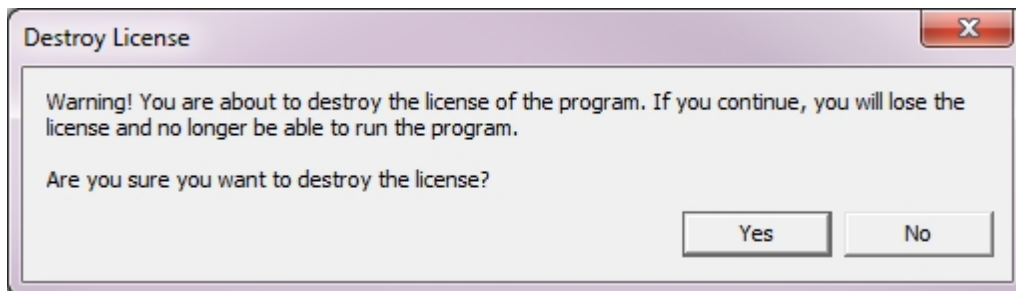
## Appendix D - Deactivate Product

---

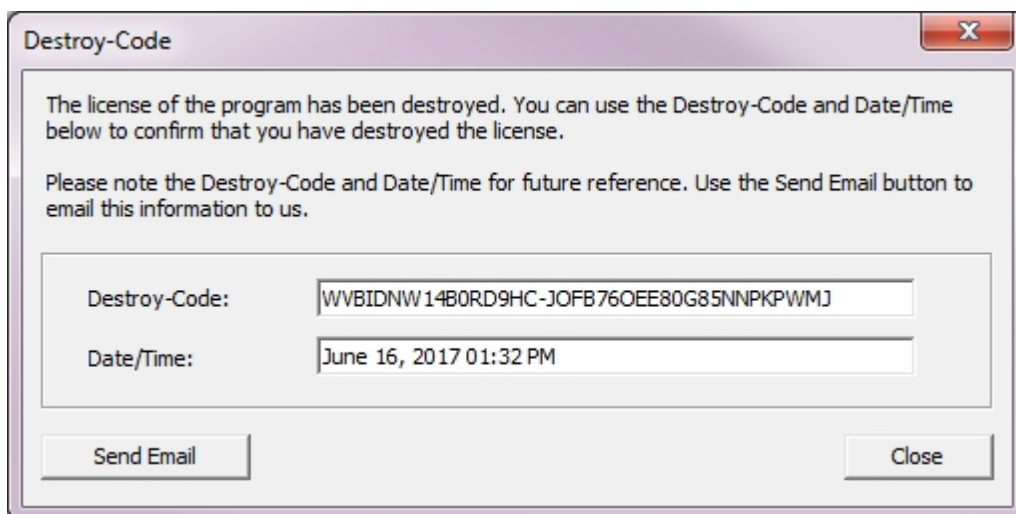
The VDRO application is hardware locked to a particular PC once the product has been purchased and installed. The security feature of the software does allow the application to be deactivated on the current machine and reinstalled on another machine. **Note that once the application is deactivated, it cannot be executed on the original machine without reactivating the product.**

To deactivate the product, complete the following:

1. Open a File Explorer window and navigate to the folder: C:\Accurate Technology\ProScale VDRO.
2. Locate the executable Destroy.exe and double click on it.
3. The dialog below will be displayed:



4. If you want to continue to remove the license, click Yes. To cancel the operation, click No.
5. Clicking Yes, the dialog below will be displayed.



6. Copy the Destroy Code to a document to be saved or click Send Email. This code must be presented to Accurate Technology as proof that the license has

been removed from the machine. You will now be able to install VDRO on another machine. Providing the destroy code to Accurate Technology will allow a new license code to be created for the new computer installation.

**IF YOU CANNOT PROVIDE THIS CODE, YOU WILL BE REQUIRED TO PURCHASE  
ANOTHER COPY OF THE SOFTWARE FOR INSTALLATION ON ANOTHER MACHINE!**