QC-PRO Statistical Process Control

User Guide

The Pister Group, Inc.

Version 9.0

Table of Contents

Table of Contents

Overview

The software offers a complete system for:

- Data entry while viewing the control chart in real time
- Provides key SPC charts and calculations

The approach taken is consistent with those outlined in well-established quality system requirements including ISO 9000 and TS 16949 as well as six sigma programs.

Set Up Information

Practical information is recorded during the initial product set up process. Some of the key elements include:

- Engineering specifications for each characteristic measured
- Picture of each characteristic measured
- Procedure on how to measure characteristic
- Settings to capture data from external measurement tools
- Custom fields that are user defined

Reports

The following is a partial list of available reports:

- Control charts (XBar/R, X/MR, MA/MR and XBar/Sigma)
- Capability analysis with histogram
- Cpk summary report for different products
- Data table
- Pareto analysis of defects

Reporting Flexibility

The criteria for identifying the products to be included in the selected report are user determined. Filtering and ordering the report can be based on:

- Date range
- User defined fields (eg. shift, lot, operator, machine etc.
- Selected products

General Elements

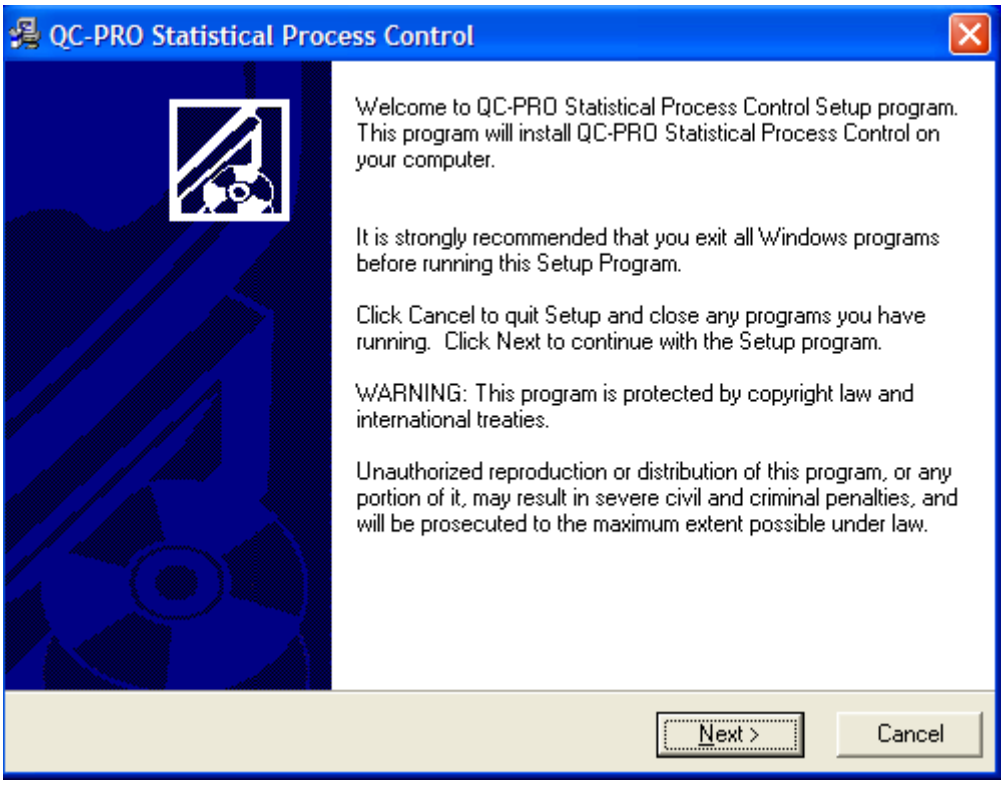
Other useful features include:

- Excel import/export data
- E Mail report as .pdf file attachment
- Password protection for the system
- Language or terminology considerations for screens and reports

Procedure to Install

To install the software run the **QCProSPCSetup.exe** file.

A screen similar the one shown below will appear.



It is highly recommended that all default settings be kept.

Follow the screen instructions by pressing the **Next** button until the installation is complete and then press the **Finish** button.

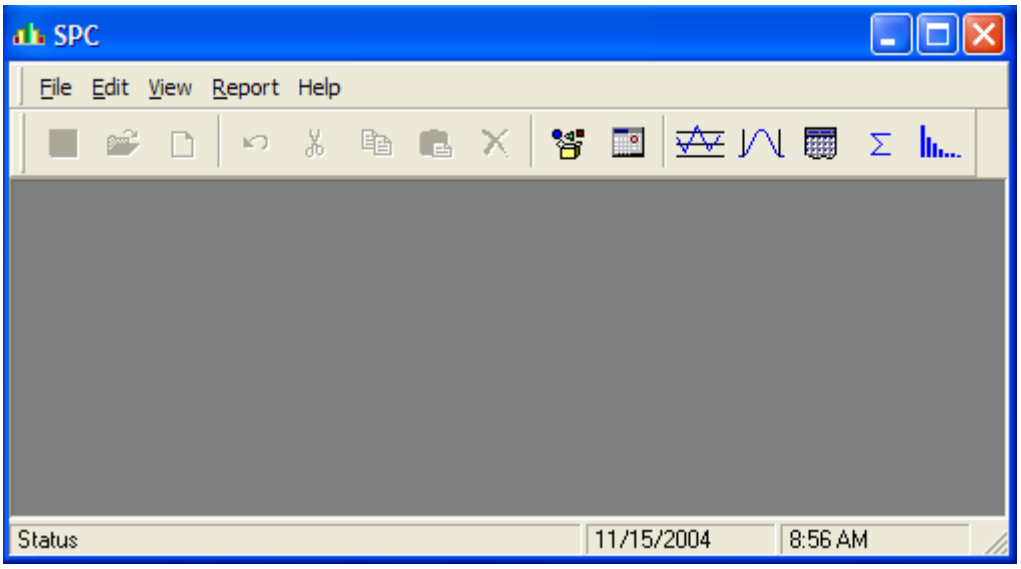
Start Program

Click the **Start** button on the Windows task bar.

Point to **All Programs** and select the **QC-Pro** folder.

In the **QC-PRO** folder, double click on the **SPCV9** icon.

The main screen is similar to:

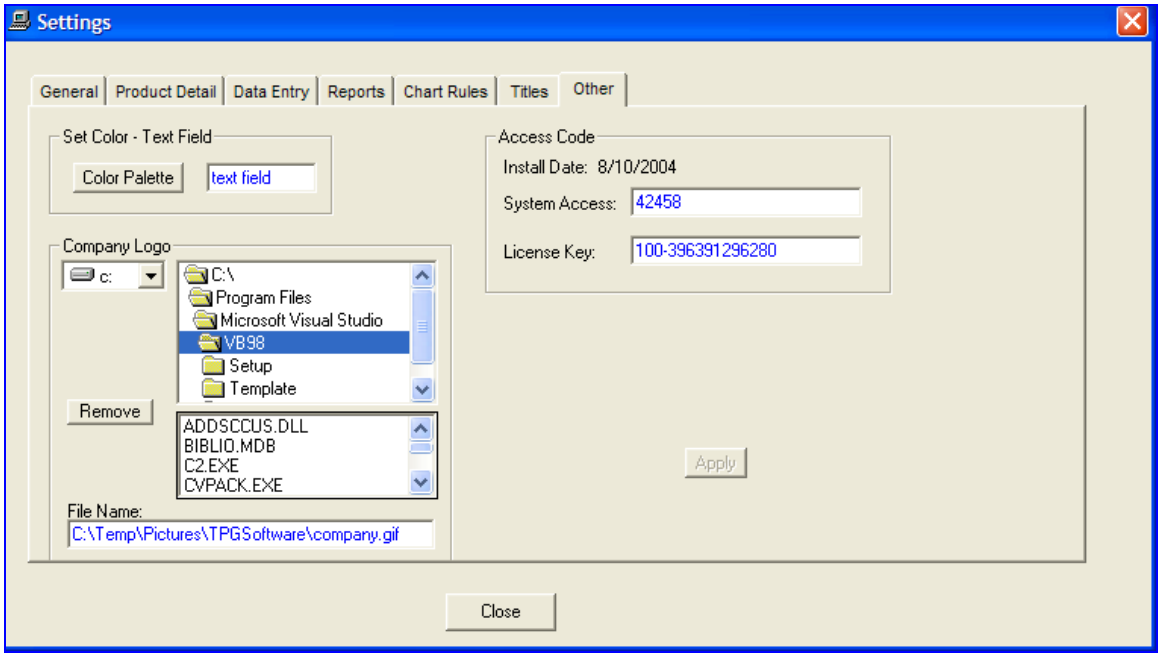


Access Code and License Key

The software is fully functional, however it remains a restricted (time and number of records) use version until it is unprotected.

To remove the protection, click on the **View** menu item. From the pull down menu, select **Settings**.

In the settings screen, click on the tab titled **Other**.

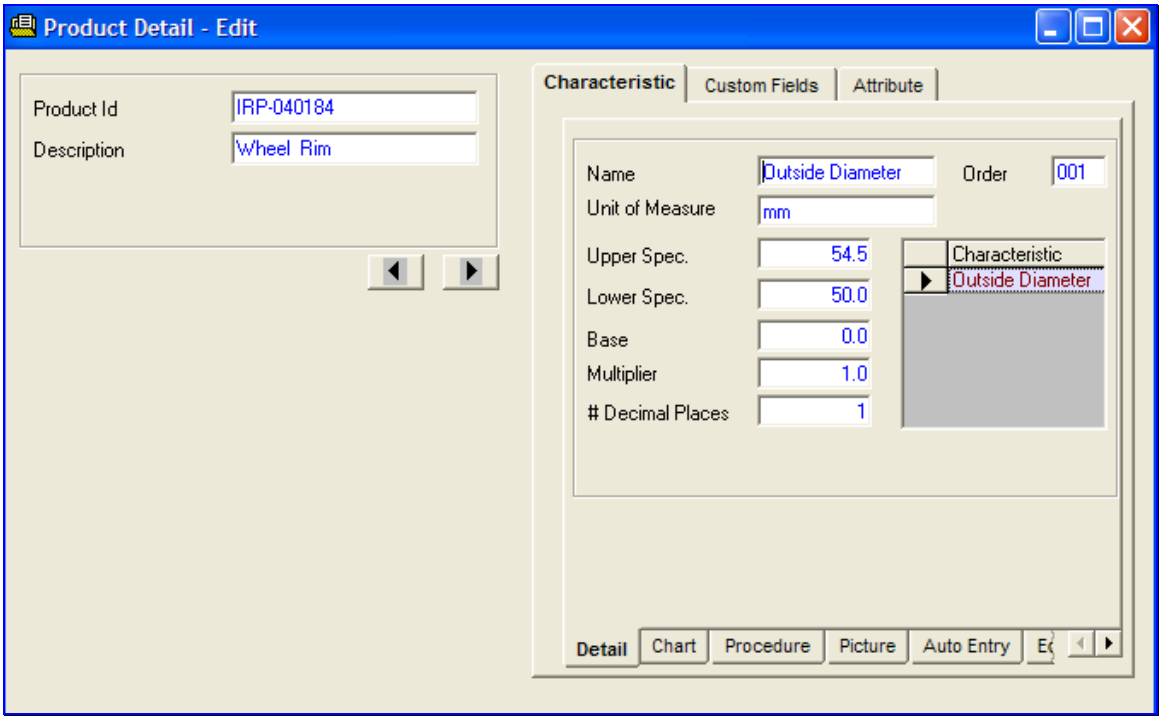


In the top left segment of the access code frame an **Install Date** is displayed.

Please provide this install date to us by e-mail to ***support@pister.com*** or calling at **(905) 886-9470**. We will then provide you with the appropriate license key.

Add/Edit Product Detail

To setup or edit product information, click on the menu item **File** and from the pull down menu select Product or click on the tool bar icon



Enter a Product Id and click on the save button. After saving all the other elements of the product record become available.

The elements in the product detail record window are described below. All field entries are optional with the exception of those shown in italics.

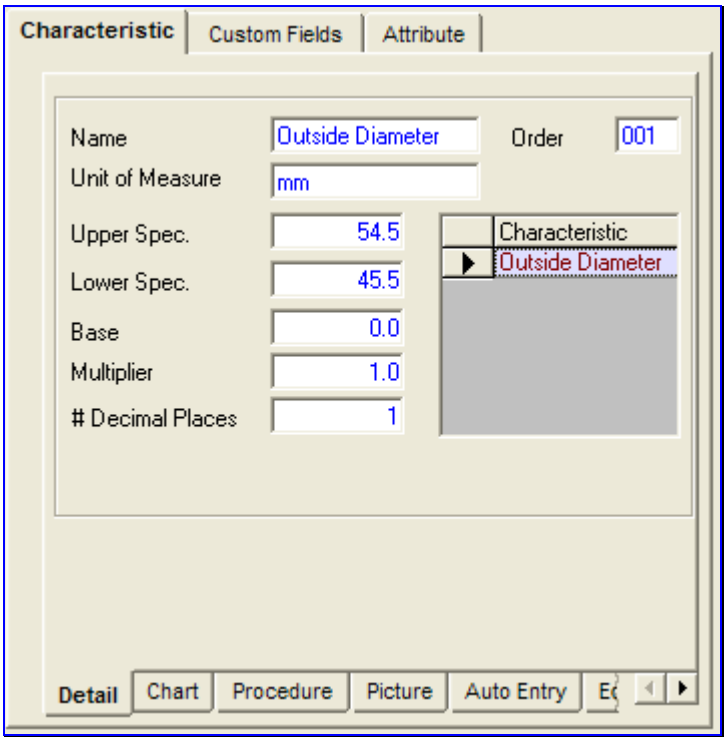
Fields- Buttons -Tabs	***Description***
Product Id	Each product requires a unique product id – can be alpha/numeric
Description	Product description or name
Characteristic Tab	Each characteristic measured details are recorded here
Custom Fields Tab	Additional field titles to record company specific information
Attribute Tab	Defect names for Pareto analysis

Characteristic - Detail

The characteristic tab is the place where details about each characteristic measured are recorded. Clicking on the Detail tab at the bottom, provides a window to add/edit characteristics.

After entering the characteristic details, click on the save button to save the information.

To set up additional characteristics, click on the new button, enter the new characteristic details and then click on the save button.

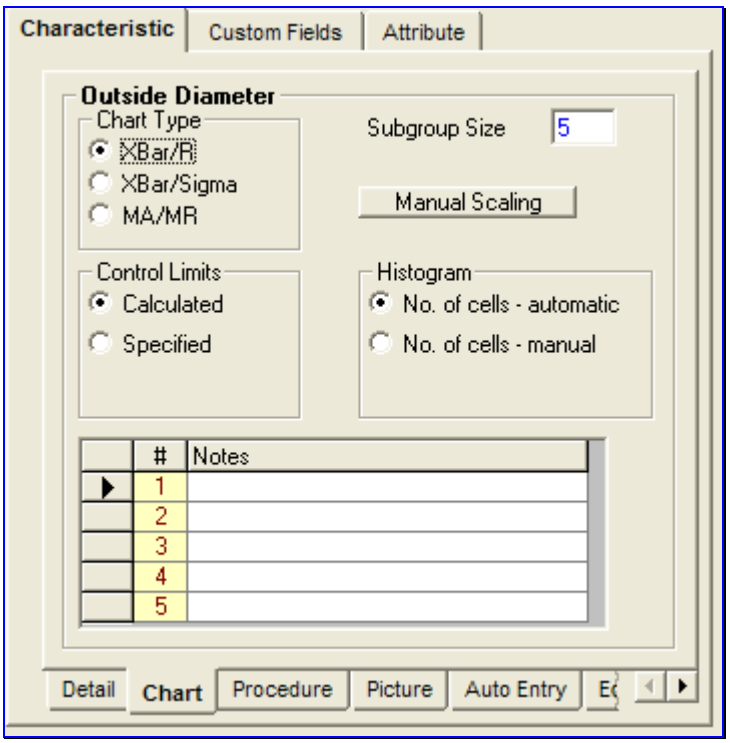


Fields- Buttons -Tabs	***Description***
Name	Characteristic name
Base and Multiplier	Used to ease data entry. For example if all measurements are 5.00X then setting the base to 5 and the multiplier to .001 you need only enter 3 and the system would convert this to 5.003
# of Decimal Places	Decimal places are automatically set based on the data unless specified by the user here
Order	The sequence in which multiple characteristics appear in data entry
Characteristic	Click on the desired characteristic from list to display details

Characteristic - Chart

The chart tab at the bottom, provides the options for identifying the type of control chart and other relevant chart details.

The subgroup size and other elements can be different for each characteristic

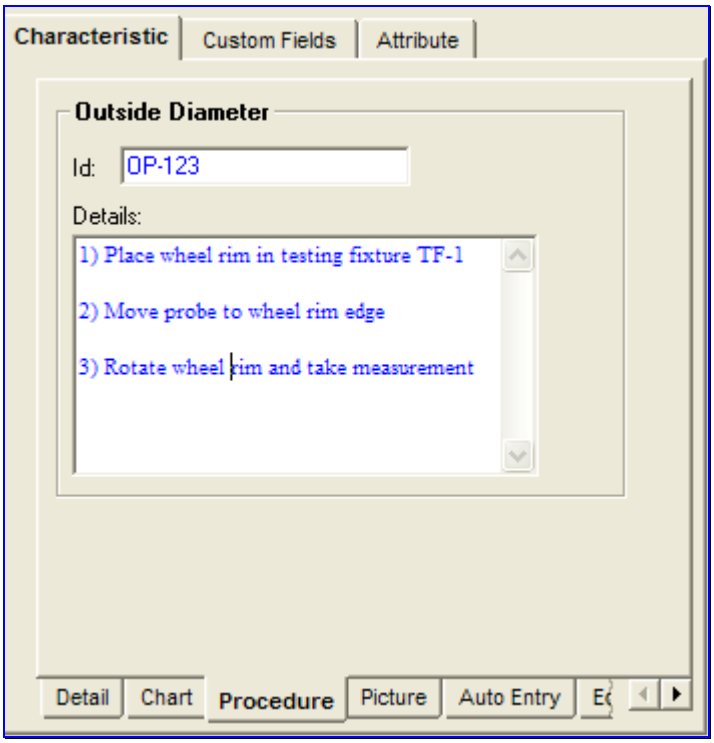


Fields- Buttons -Tabs	***Description***
Chart Type	Data will be analyzed based on the chart type
Subgroup Size	Data will be organized based on subgroup size
Control Limits	Automatically calculated unless manually specified
Manual Scaling	Manual scale the vertical axis of control chart
Notes	These notes will appear on the control chart in the notes section
Histogram	Number of cells in histogram can be manually set

Characteristic - Procedure

It is possible to add both a procedure number and instructions on how to measure the product feature. The details can be typed in or pasted in from Windows clipboard.

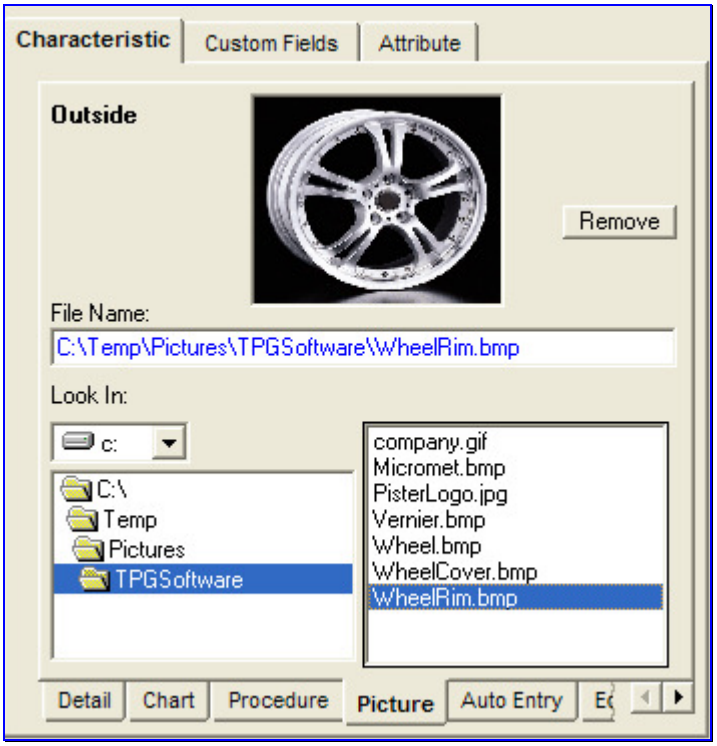
Click on the Procedure tab at the bottom



Fields- Buttons -Tabs	***Description***
Id	Procedure Id can be alphanumeric
Details	Free format procedure details

Characteristic - Picture

A picture of the product characteristic measured can be added if desired. This picture will be displayed on various screens and reports. To add a picture, click on the Picture tab at the bottom.



Fields- Buttons -Tabs	***Description***
File Name	Graphic file name (.jpg, .bmp etc.) with full path details
Look In	Identifies drive, folder and file
Remove	Deletes picture

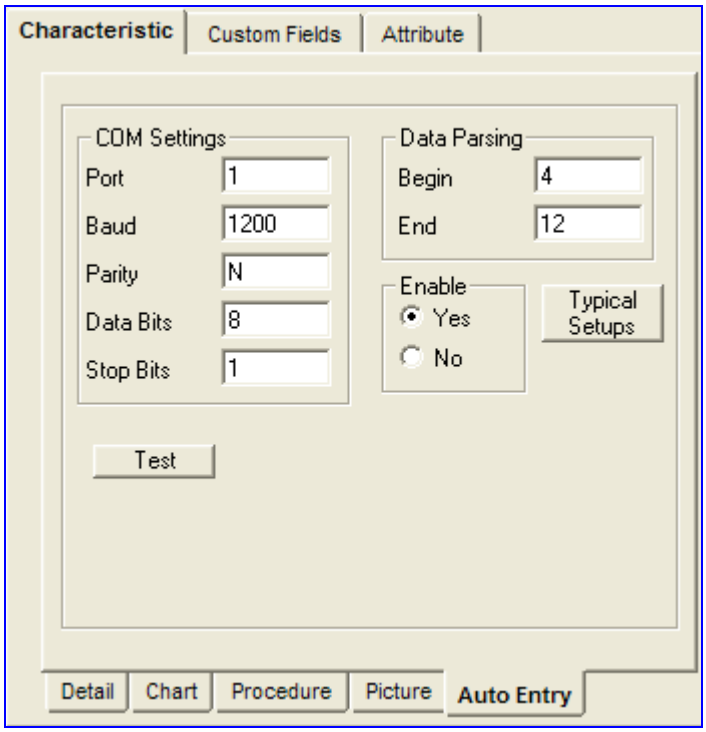
Characteristic – Auto Entry

This function is used to set the communication parameters in order to connect to an external measurement instrument.

The measurement instrument will need to initiate the measurement transfer. This may be through a data button on the instrument, foot switch or other method.

The communication protocol is serial RS232.

To set up the characteristic so that measurements come from a measurement instrument, click on the **Auto Entry** tab at the bottom.

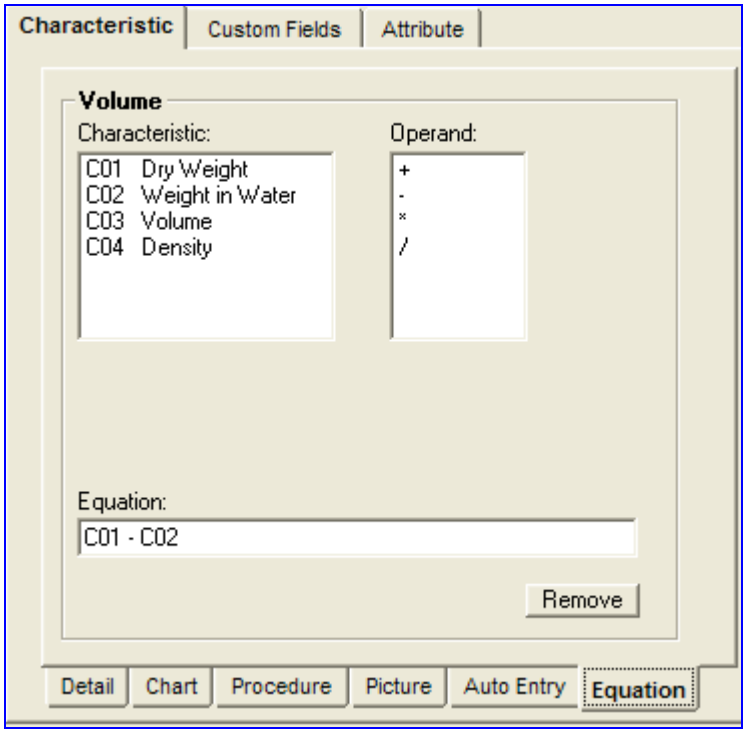


Fields- Buttons -Tabs	***Description***
COM Settings	Serial communication settings
Data Parsing	Identifies the start and end characters positions of measurement
Typical Setups	Settings for some popular devices
Test Button	Sample output string of characters from instrument
Enable	Activates input from the serial port to the data entry cell

Characteristic – Equation

A characteristic value can be calculated based on an algebraic equation of two other characteristics.

To set up a characteristic so that it is calculated, click on the Equation tab at the bottom.



Fields- Buttons -Tabs	***Description***
Characteristic	To form the equation, double click on the characteristic
Operand	To identify the arithmetic operation, double click the desired operand
Equation	The equation is displayed in this area
Remove button	Erases the equation

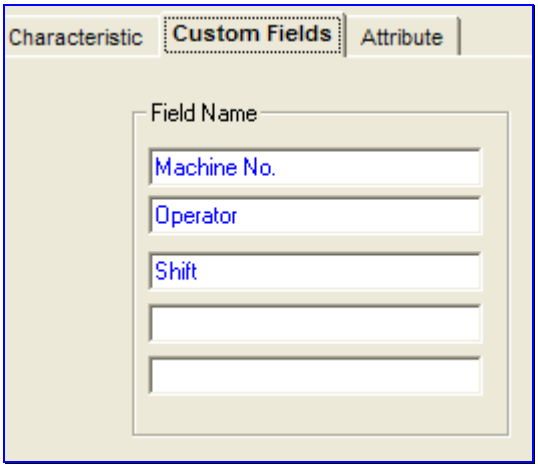
Custom Fields

The custom fields option allow you to add up to five user defined fields unique to your operations.

These fields can then be used to filter the data. As an example if you were interested in analyzing the data for a particular shift, then you would specify the shift and the resulting report would be based on the selected shift.

The fields can be defined for each product or can be set globally to apply to all products.

To define it locally for each product, click on the Custom Fields tab.



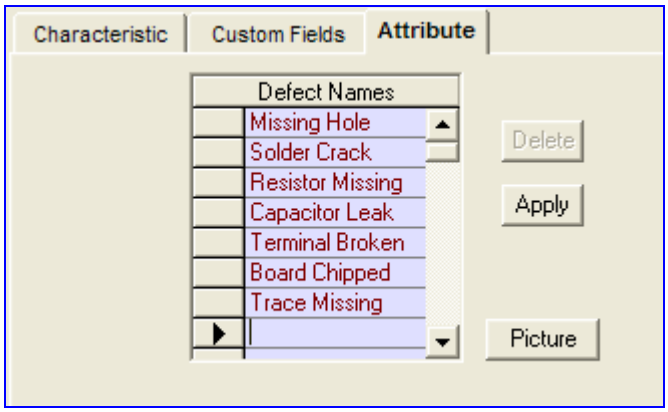
Fields- Buttons -Tabs	***Description***
Field Name	Field titles

Attribute Data

There are instances where it is desired to monitor defect categories. After collecting such information, a Pareto analysis can be performed.

The defect names can be defined for each product or can be set globally to apply to all products

To set up defect names, click on the Attribute tab.



Fields- Buttons -Tabs	***Description***
Defect Names	Defect category description
Delete Button	Deletes highlighted defect name
Apply Button	Saves current set of defect names
Picture Button	Set location of product image file

Saving Information

In order to retain all the product detail information click on the **Save** tool bar button.

Product Copy

It is possible to use an existing product setup to create a new product. This avoids having to key in similar information. With the desired product detail displayed and the cursor in the Product Id field, click on the menu item **Edit** and from the pull down click on **Product Copy**. A pop up window will appear. Enter the new product id. All the existing product detail will be assumed by the new product id.

Characteristic Copy

It is possible to use an existing characteristic setup to create a new characteristic. This avoids having to key in similar information. With the desired characteristic detail displayed and the cursor in the characteristic name field, click on the menu item **Edit** and from the pull down click on **Characteristic Copy**. A pop up window will appear. Enter the new characteristic name. All the existing characteristic detail will be assumed by the new characteristic name.

Tool Bar Buttons

There are several useful functions that are detailed below.

Fields- Buttons -Tabs	***Description***
Save Button	Saves all the product details entered
Find Button	Find and retrieve desired product
New Button	Provides an empty product or characteristic to set up depending on where the cursor is located
Undo	Field contents reverts back to original content
Cut	The highlighted text is cut and placed in windows clipboard
Copy	The highlighted text is copied and placed in windows clipboard
Paste	The contents of the clipboard are pasted in the active field
Delete Button	Removes product or characteristic from database depending on where the cursor is located
Previous/Next	Advance to next/previous product id

Introduction

There are two methods of entering measurements:

- Real time with control chart
- Power spread sheet entry

The real time entry expects the data to be entered as a subgroup and then plotted on a control chart for immediate viewing and action.

The power entry mode is for mass data input. It also provides for import/export capabilities with an MS Excel spreadsheet.

Real Time Measurement Entry

To launch this mode of entry, click on the data entry tool bar button. An alternate method is to click on the **File – Data Entry** menu items.

The data for each characteristic is entered in subgroup format.

If the characteristics have different subgroup sizes, then the number of measurements that can be entered is adjusted accordingly.

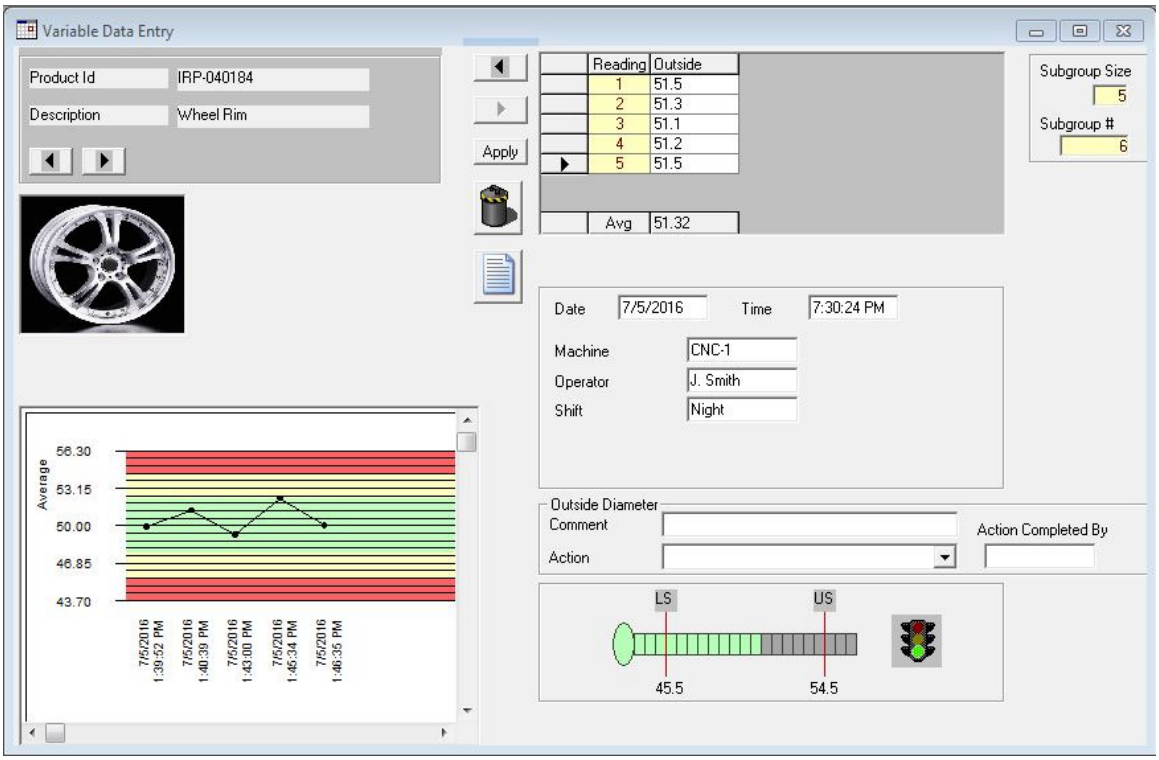
Each time a measurement is keyed in and the enter key pressed a visual indication of the measurement is displayed at the bottom.

The stoplight indicates where the measurement falls relative to the specifications. If the measurement is in the middle of the specification range the light is green. As the measurement approaches the specification limit the light turns yellow. If the measurement is beyond the specification, the light turns red.

The gauge indicator displays the measurement relative to the specifications.

The control chart is updated with the latest plot points when the Apply button is clicked. The chart provides color zone analysis visually. A set of rules are also applied and if violated displays a message. If a corrective action is recorded the plot point will appear as a green dot.

It is possible to display a non statistical target chart (pre-control) in place of the control chart. This chart divides the characteristic specification into color zones and plots the measurements relative to the specifications.



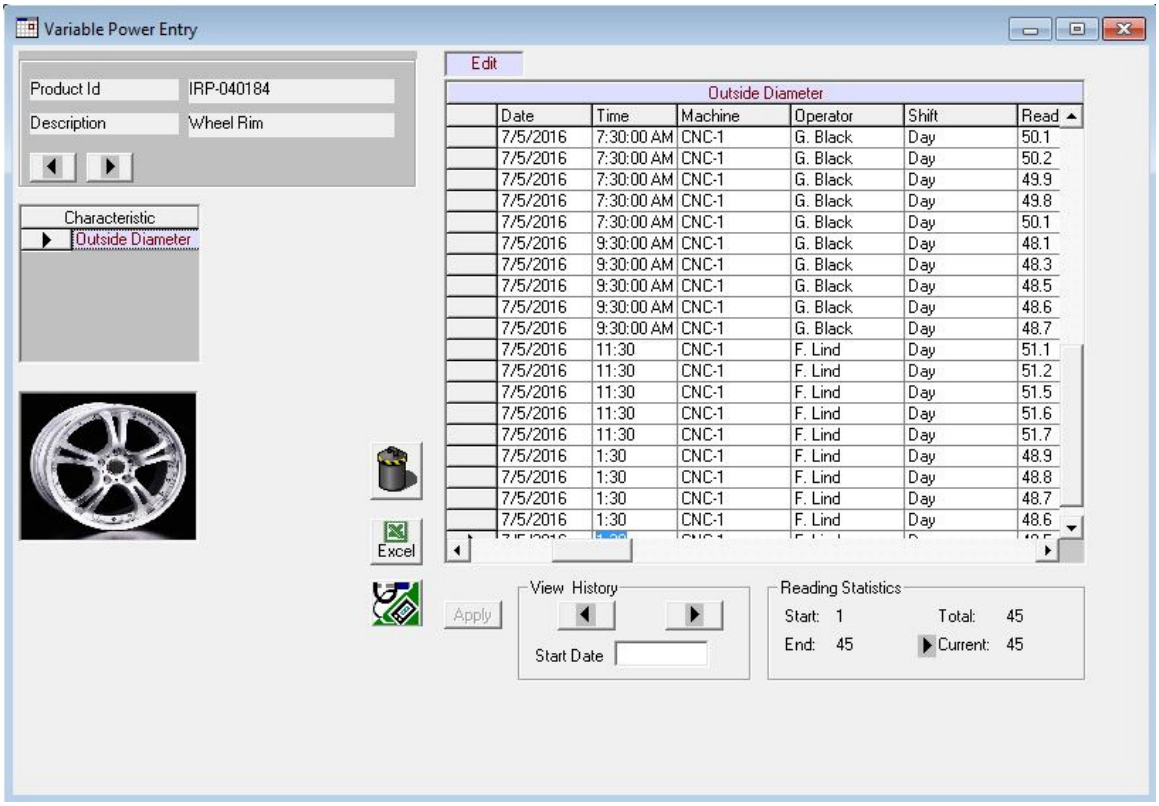
Fields- Buttons -Tabs	***Description***
Product	Advance to the next/previous product id
Subgroup	Advance to the next/previous subgroup of measurements
Apply	Saves current subgroup of measurements
Purge	Purge a range of subgroups – based on date range
Procedure	Display inspection procedure for the current characteristic
Comment Field	Free format comment, relevant to current subgroup
Action List	Corrective action pull down list if a problem exists
Delete	Deletes current subgroup, provided cursor is on a measurement

Power Entry

To launch this mode of entry, click on the **File – Power Entry** menu items.

The layout is spreadsheet format. Each row contains the following:

- Date / Time
- User defined field contents
- Measurement for current characteristic



A maximum of 50 rows can be entered / modified before the matrix of information needs to be saved.

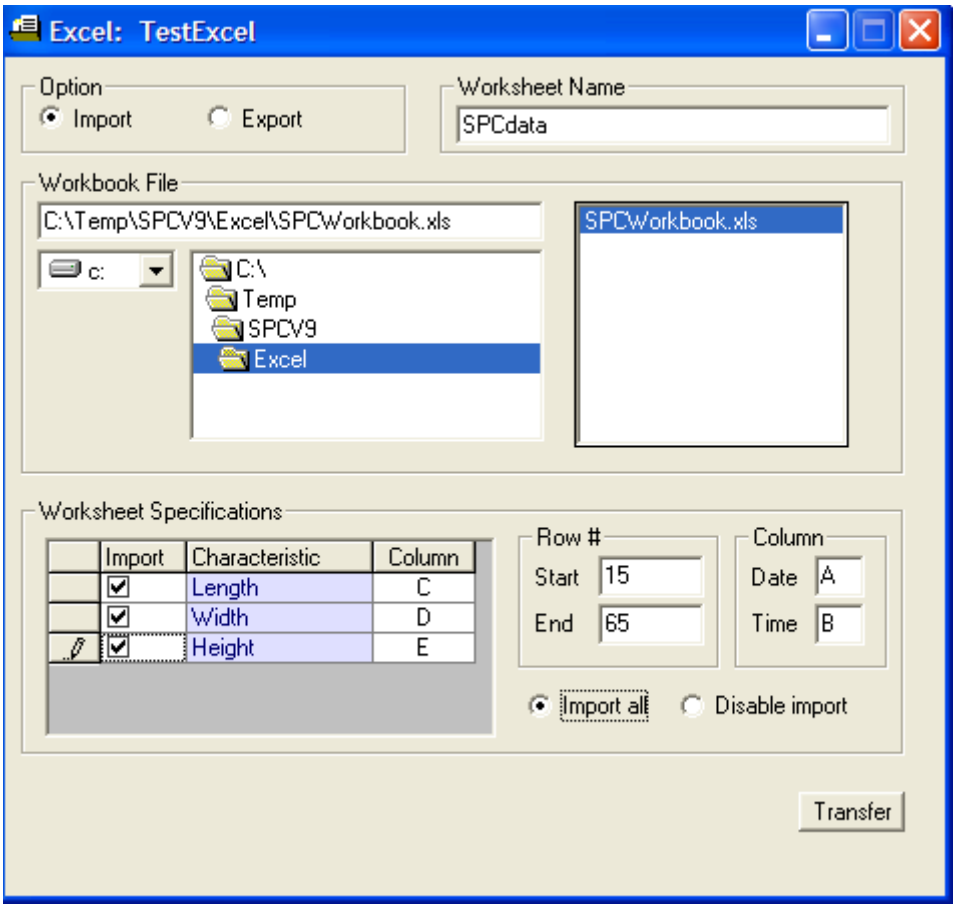
Fields- Buttons -Tabs	***Description***
Apply	Saves the currently displayed rows of information
Product	Advance to the next/previous product id
View History	Advance to next/previous set of 50 measurements
Reading Statistics	Identifies start/end measurement number for currently displayed rows Total number of measurements in the database is displayed
Characteristic	Identifies currently active characteristic

MS Excel Data Import

Measurements can be imported from an MS Excel workbook into multiple characteristics. The data will be appended to the end.

To activate this, click on the 

button.



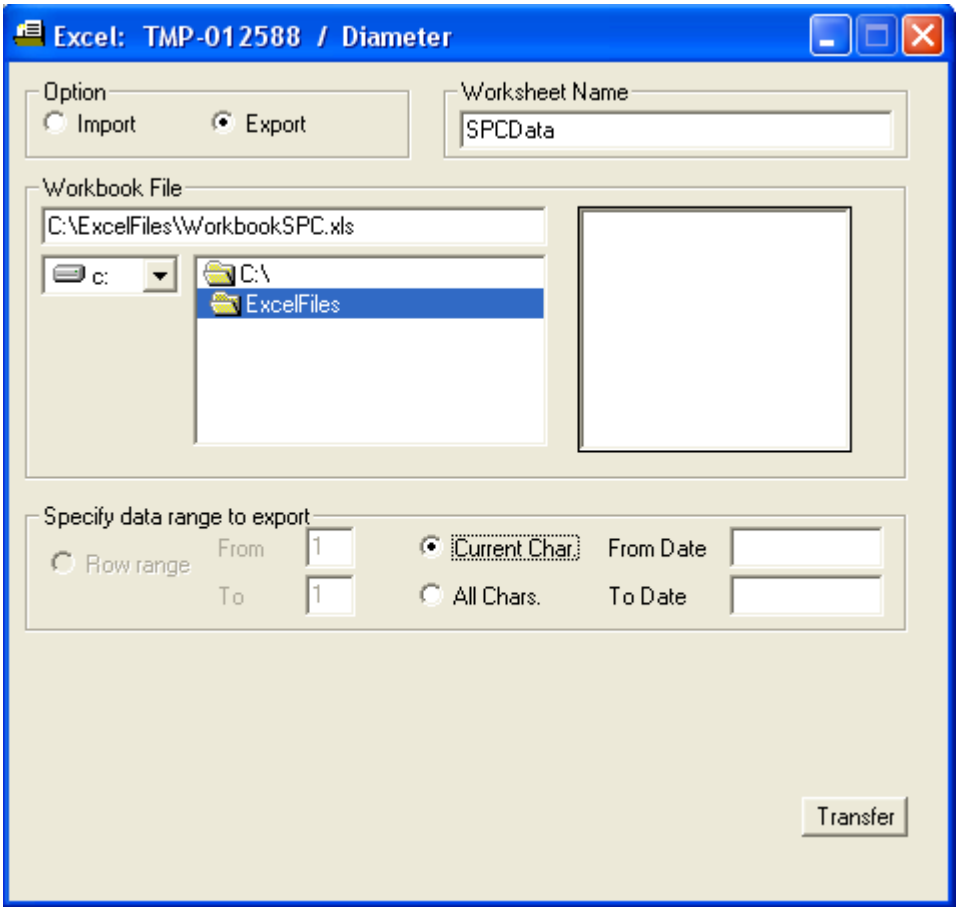
Fields- Buttons -Tabs	***Description***
Option Button	Set to import to retrieve measurements from workbook
Worksheet Name	Default is Sheet1 unless otherwise defined
Workbook File	Identify location and name of workbook file
Workbook Specifications	Identify characteristics and corresponding columns in worksheet
Row #	Identify starting row and ending row
Column Date - Time	If date and time to be imported, identify worksheet columns
Disable Import	Uncheck all characteristics for import – manually pick
Transfer	Initiates the transfer of measurements from the worksheet

MS Excel Data Export

Measurements can be exported from the currently active characteristic into a MS Excel workbook. It is also possible to export all measurements for all characteristics for the current product.

To activate this, click on the 

button.



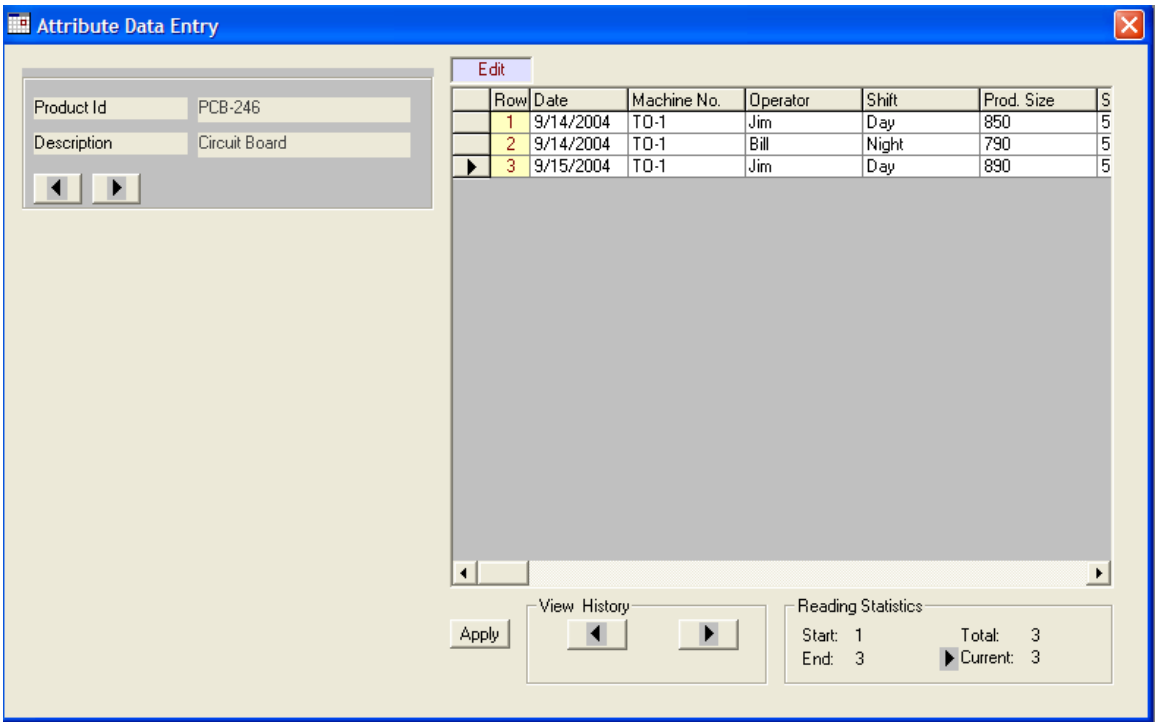
Fields- Buttons -Tabs	*Description*
Option Button	Set to export measurements into a workbook
Worksheet Name	Default is SPCData unless otherwise defined
Workbook File	Identify location and name of workbook file
Specify data range	Row Range - identify rows to export to worksheet Current Char. - identify date range for current characteristic All Chars. – identify date range for all characteristics
Transfer	Initiates the transfer of measurements to worksheet

Attribute Data Entry

Click on the **File – Attribute Entry** menu items.

The layout is spreadsheet format. Each row contains the following:

- Date and user defined field contents
- Production size (total number units produced)
- Sample size (number of units taken to evaluate)
- Number of Defective (number of bad units)
- Number of Defects (count total for all defects)
- Defects (number of occurrences for each defect)



A maximum of 50 rows can be entered / modified before the matrix of information needs to be saved.

Fields- Buttons -Tabs	***Description***
Apply	Saves the currently displayed rows of information
Product	Advance to the next/previous product id
View History	Advance to next/previous set of 50 rows of information
Reading Statistics	Identifies start/end data set for currently displayed rows Total number of data sets in the database is displayed

Report Overview

There are two ways to generate a report.

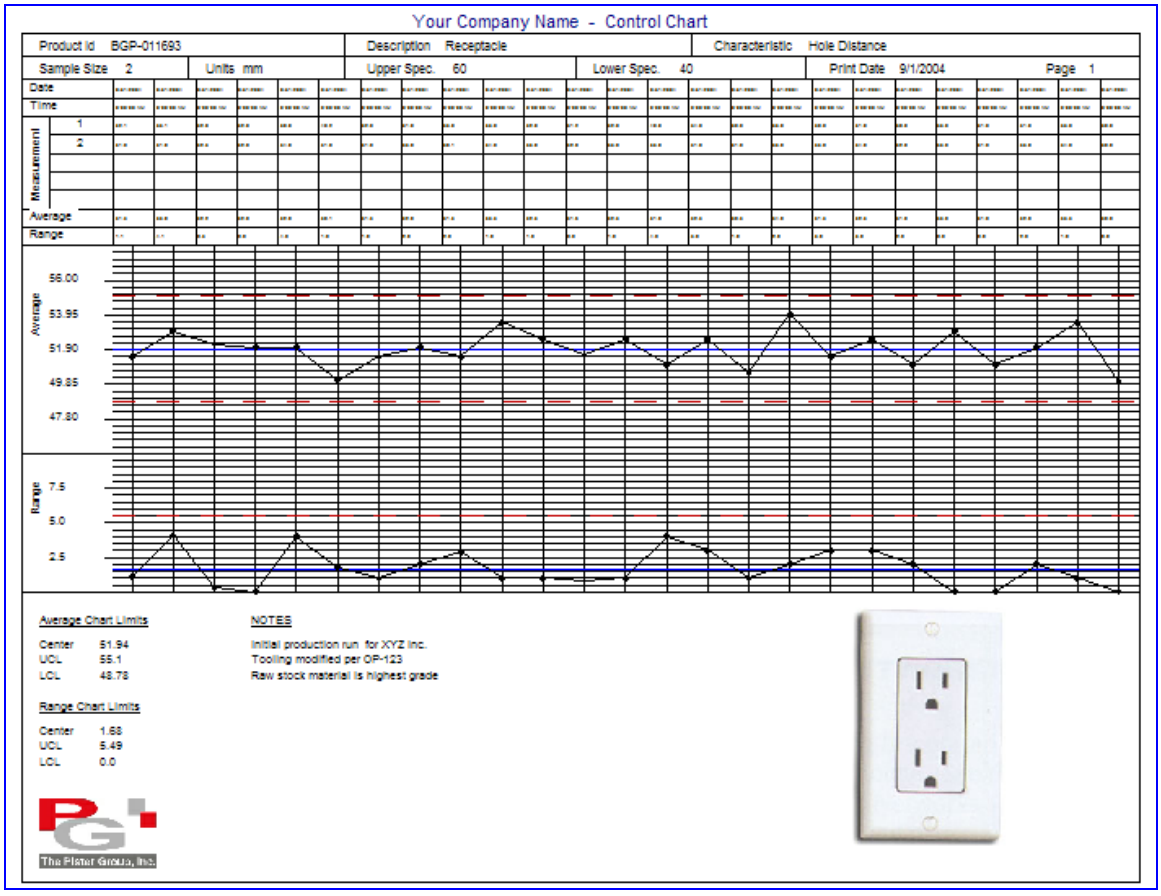
- Tool bar button
- Menu selection

The more common reports can be accessed by clicking on the appropriate tool bar button.

The menu approach provides access to all reports as well as the option to manipulate what data is presented.

Control Chart

To display the control chart for the current product, click on the button.



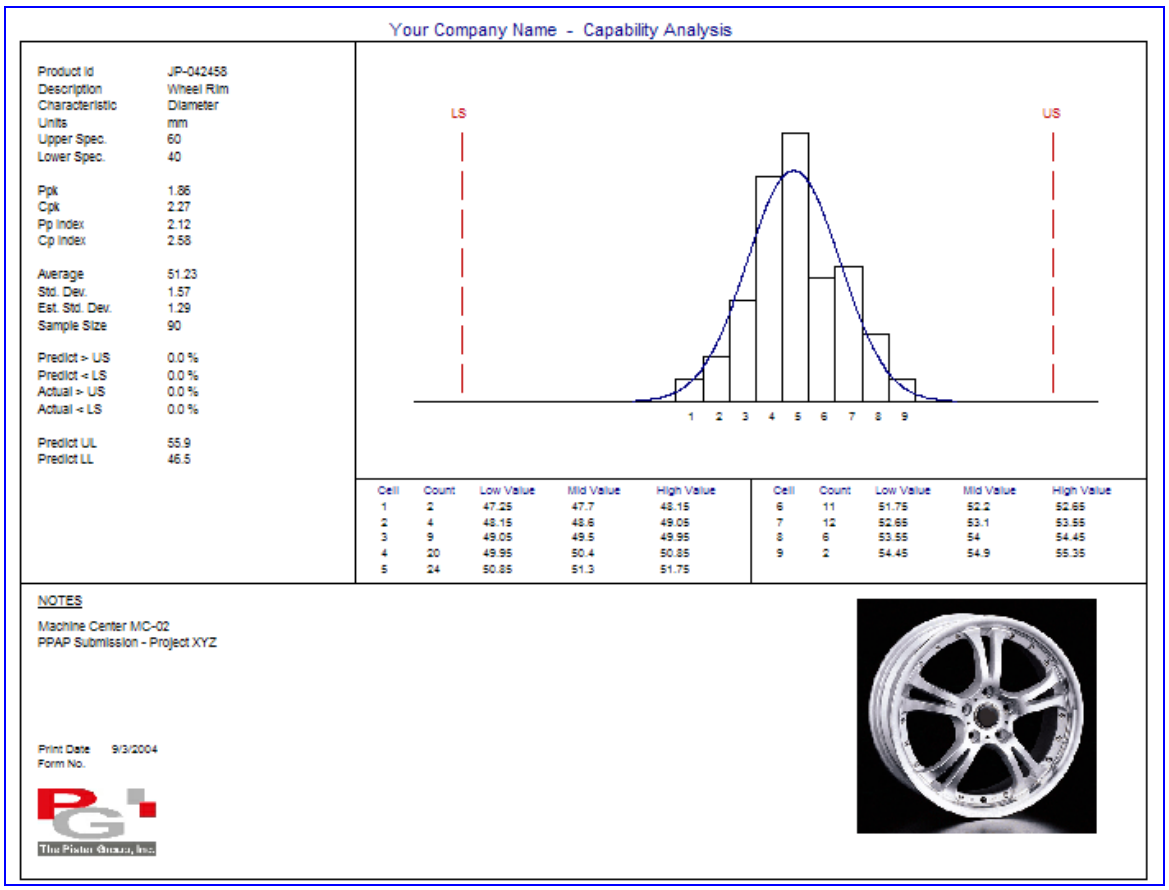
Blank Control Chart

A blank control chart provides the same output as a regular control chart less the plot points and measurements. An operator on the shop floor uses it for manual recording of measurements and plot points.

To display the blank chart, click on the **Report** menu and from the pull down list, click on **Blank Control Chart.**

Process Capability Analysis

To display the process capability for the current product, click on the button.



Your Company Name - Capability Analysis

Product Id	JP-042458
Description	Wheel Rim
Characteristic	Diameter
Units	mm
Upper Spec.	60
Lower Spec.	40
Ppk	1.86
Cpk	2.27
Pp Index	2.12
Cp Index	2.58
Average	51.23
Std. Dev.	1.57
Est. Std. Dev.	1.29
Sample Size	90
Predict > US	0.0 %
Predict < LS	0.0 %
Actual > US	0.0 %
Actual < LS	0.0 %
Predict UL	55.9
Predict LL	46.5

Cell	Count	Low Value	Mid Value	High Value
1	2	47.25	47.7	48.15
2	4	48.15	48.6	49.05
3	9	49.05	49.5	49.95
4	20	49.95	50.4	50.85
5	24	50.85	51.3	51.75

Cell	Count	Low Value	Mid Value	High Value
6	11	51.75	52.2	52.65
7	12	52.65	53.1	53.55
8	6	53.55	54	54.45
9	2	54.45	54.9	55.35

NOTES

Machine Center MC-02
PPAP Submission - Project XYZ

Print Date 9/3/2004
Form No.

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Data Table

To display the data table for the current product, click on the button

Your Company Name - Data Table

Product Id	TMP-012588			Description	Pin		Characteristic	Length		
Units	Inch			Upper Spec.	2.550		Lower Spec.	2.450		
0001 - 0010	2.501	2.499	2.498	2.502	2.503	2.499	2.497	2.496	2.498	2.495
0011 - 0020	2.494	2.496	2.498	2.499	2.495	2.499	2.498	2.501	2.497	2.496
0021 - 0030	2.495	2.498	2.496	2.499	2.501	2.501	2.502	2.501	2.503	2.505
0031 - 0040	2.503	2.501	2.502	2.495	2.492	2.495	2.493	2.499	2.298	2.497
0041 - 0050	2.459	2.465	2.464	2.466	2.467	2.468	2.469	2.550	2.495	2.501
0051 - 0060	2.501	2.499	2.498	2.497	2.492	2.488	2.487	2.485	2.486	2.488
0061 - 0070	2.476	2.478	2.475	2.485	2.484	2.483	2.476	2.471	2.479	2.476
0071 - 0080	2.475	2.471	2.466	2.465	2.463	2.461	3.569	2.465	2.463	2.467
0081 - 0090	2.468	2.461	2.465	2.459	2.458	2.457	2.461	2.464	2.465	2.463
0091 - 0100	2.467	2.469	2.471	2.474	2.473	2.477	2.478	2.479	2.478	2.475

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Page No. 1
Period All Measurements

Form No. DT001 - Rev. 1.0

Capability Summary Report

This report tabulates capability indicators for the current part or for a selected list of parts.

To display the capability summary for all products, click on the Σ button.

Your Company Name - Capability Summary

Product Id	Characteristic	Cpk	Cp Index	Ppk	Pp Index	Average	Std. Dev.	Notes
PP-040723	Thickness	1.85	1.85	2.38	2.38	0.2	0.007	
	Height	1.45	1.52	1.78	1.85	3.02	0.09	
	Length	1.45	1.52	1.78	1.85	5.02	0.09	
	Hole Diameter	1.85	1.85	2.38	2.38	2.0	0.07	
EP-120122	Length	1.42	1.52	1.74	1.85	7.03	0.09	
	Diameter	1.42	1.52	1.74	1.85	0.203	0.009	
GP-011455	Width	1.81	1.85	2.33	2.38	3.01	0.07	
	Thickness	.98	.98	1.11	1.11	0.45	0.015	
	Height	.62	.64	.73	.76	1.24	0.11	
TP-053156	Length	2.01	2.57	.89	1.14	4.891	0.1458	
	Diameter	.96	1.11	.96	1.11	0.193	0.015	
AP-052658	Outside Diameter	1.19	1.28	1.41	1.52	4.54	0.11	
	Inside Diameter	.81	.88	.85	.93	2.9996	0.0018	
	Groove Width	1.18	1.28	1.39	1.52	0.7446	0.0011	
	Thickness	.88	.98	.94	1.04	0.2455	0.0016	

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Page No. 1
Period All Measurements

Form No. CS001 - Rev. 1.0

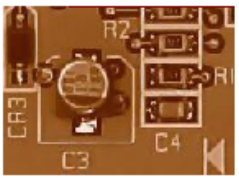
Items shown in red identify an index below the user set threshold (default 1.33)

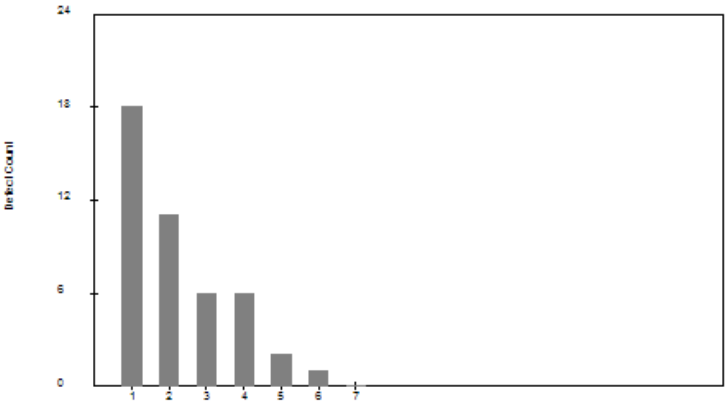
Pareto Analysis

To display the Pareto analysis for the current product, click on the button.

Your Company Name - Pareto Defect Analysis

Product Id PCB-246 Description Circuit Board





Total Defects 44
Total Sampled 150
Total Produced 2,530

Cell	Defect Name	Count	Percent Out Of Total Defects	Sampled	Produced	PPM Out Of Total Defects	Sampled	Produced
1	Solder Crack	18	40.91	12.00	0.71	409,091	120,000	7,115
2	Trace Missing	11	25.00	7.33	0.43	250,000	73,333	4,348
3	Missing Hole	6	13.64	4.00	0.24	136,364	40,000	2,372
4	Board Chipped	6	13.64	4.00	0.24	136,364	40,000	2,372
5	Resistor Missing	2	4.55	1.33	0.08	45,455	13,333	791
6	Capacitor Leak	1	2.27	0.67	0.04	22,727	6,667	395
7	Terminal Broken	0	0.00	0.00	0.00	0	0	0

The Pinter Group, Inc.

Period All Measurements

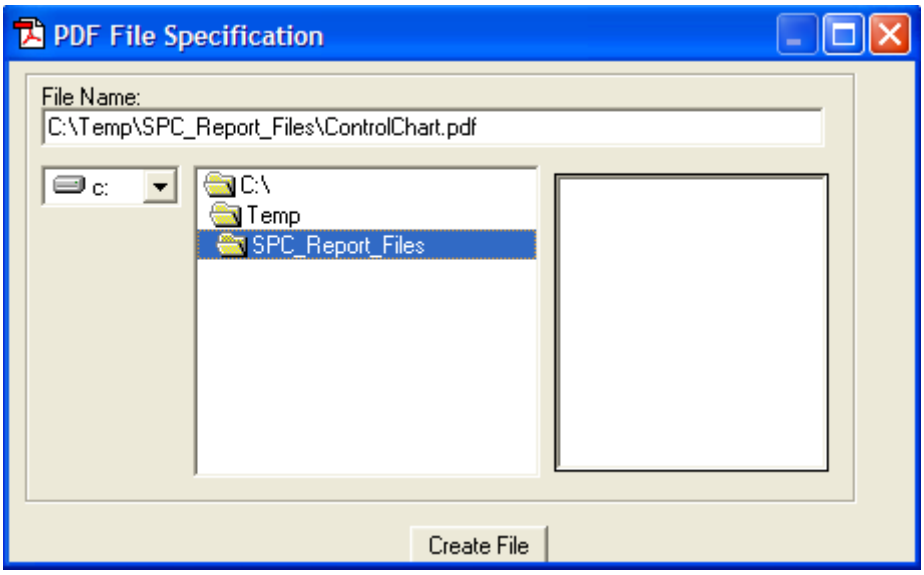
Form No. PC001 - Rev. 1.0

Export Reports

Each report can be exported to an Adobe Acrobat ***.PDF*** file.

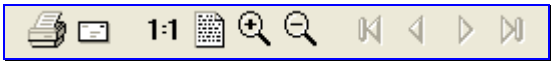
Once the report is displayed, click on the menu item **FILE** and from the pull down click on the item **PDF FILE**. Identify the drive and folder where the exported .pdf file should be stored.

Click on the Create File button to save the report as a .pdf file.



Report Tool Bar

Across the top of the report there is a set of tool bar buttons.



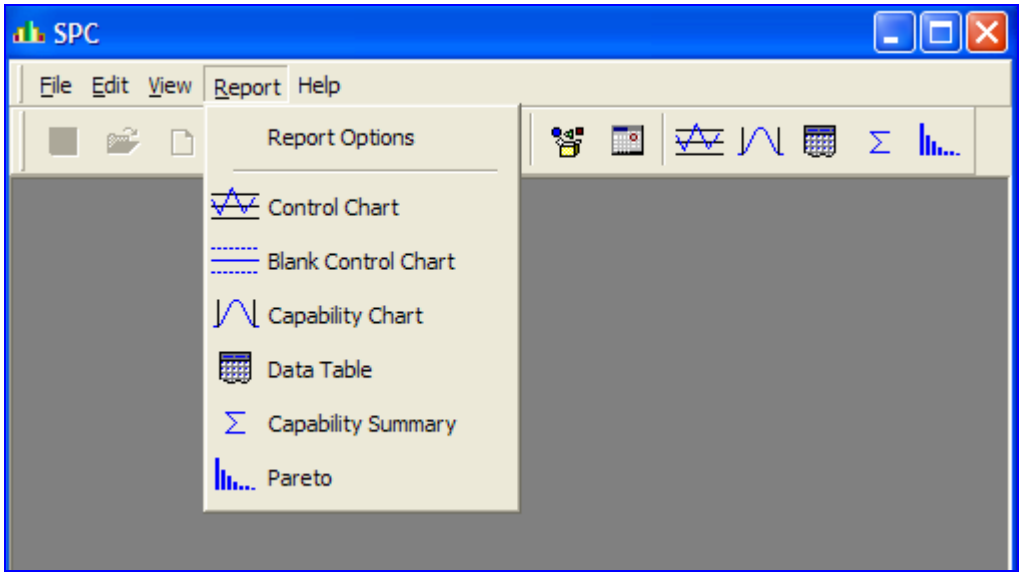
Buttons	***Description***
Print	Prints full page hard copy
E Mail	Activate email, and attach report as .pdf file
Full Page	Displays natural page size
Zoom	Enlarge or shrink the report
Paging	Page forward/back for multipage report

Report Options

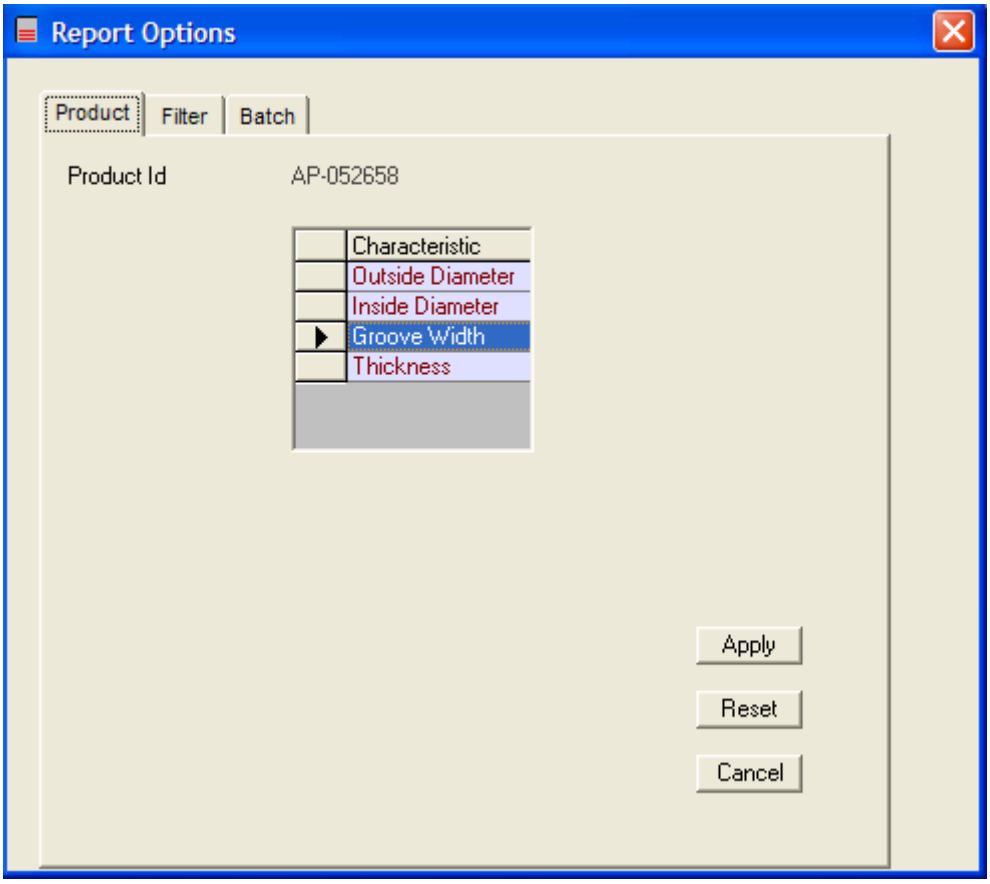
This segment describes how to identify a specific range of data based on:

- Selecting a product and characteristic
- Filtering on dates and user fields
- Selecting multiple products

To begin, click on the **Report** menu and then **Report Options** from the pull down.



Several tab indexes are displayed at the top and facilitate the process of narrowing down the range of data to retrieve.



Product Tab

The Product tab displays the current product id. If a different product id is required, click on the find button and select the product id from the list.

To select a particular characteristic, click on the desired characteristic.

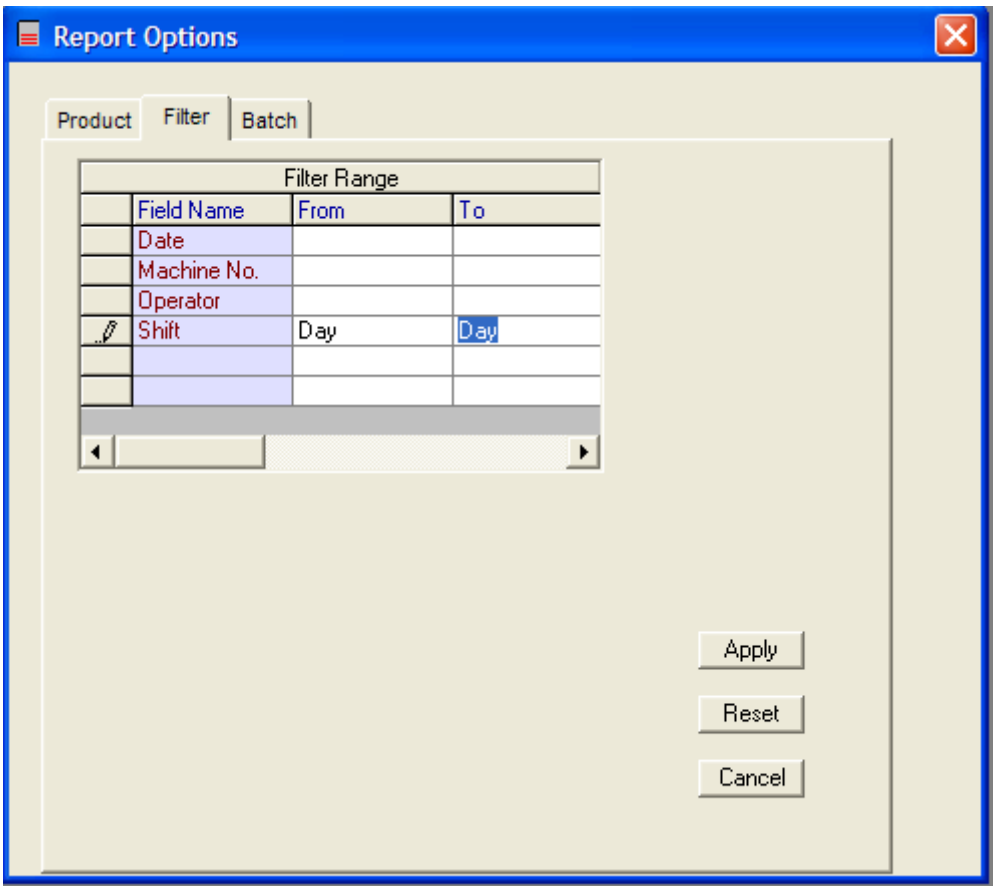
At this point all data recorded is available for analysis.

Fields- Buttons -Tabs	***Description***
Apply Button	Retrieves data for displayed product and characteristic
Reset Button	Restores default settings and removes the selected product

The desired report can be displayed by clicking on the report tool bar button or by selecting the report from the pull down report menu.

Filter Tab

To narrow down the data set, click on the Filter tab.



It is possible to filter based on a date range and any of the user fields.

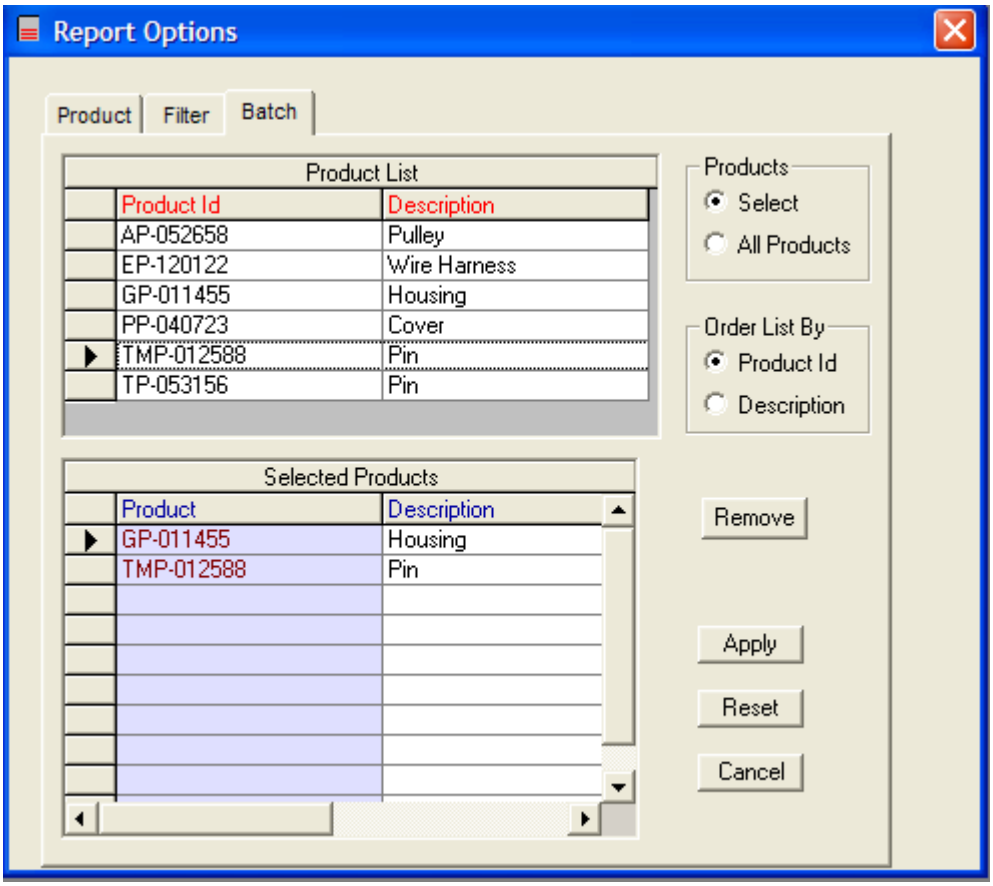
To filter on a particular field, enter the desired range in the From / To cells.

Fields- Buttons -Tabs	***Description***
Apply Button	Retrieves data based on filter criteria
Reset Button	Restores default settings and removes any displayed filter criteria

The desired report can be displayed by clicking on the report tool bar button or by selecting the report from the pull down report menu.

Batch Tab

The batch tab is used to select the products that will appear on the capability summary report.



To generate a capability summary report for all products, leave the option button set to **All Products**.

To select products for the capability summary report, choose the **Select** option button. To identify the products that will be used in the capability summary report double click on the products displayed in the product list table. The product should appear in the selected products table.

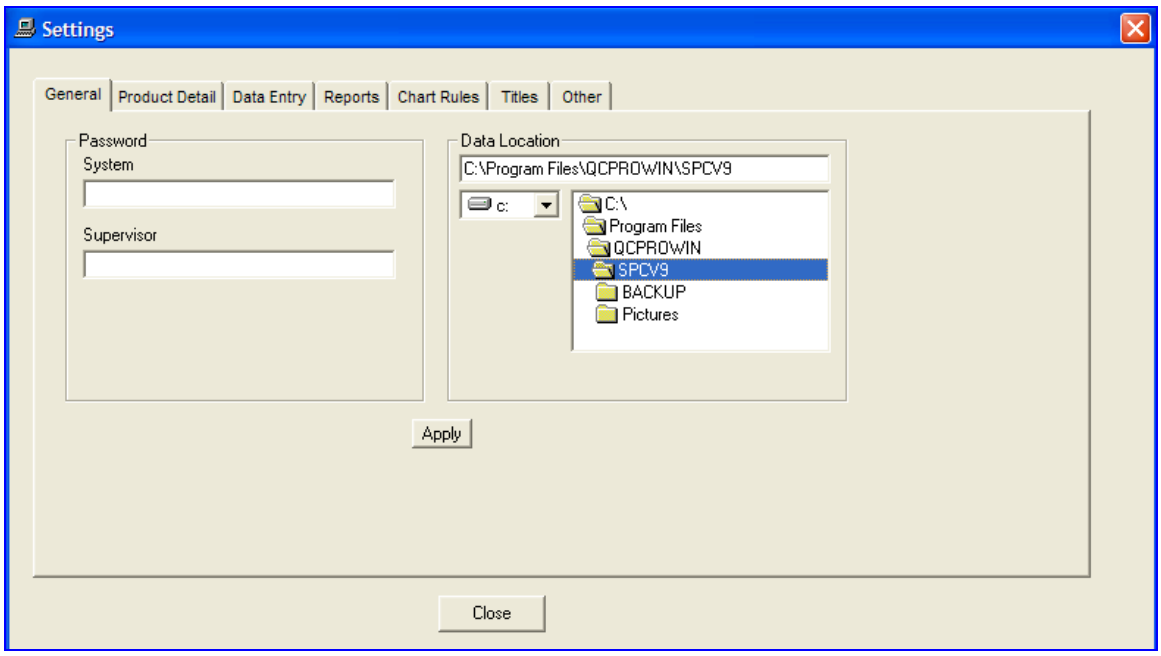
Fields- Buttons -Tabs	***Description***
Apply Button	Retrieves data for all selected products
Reset Button	Restores default settings and clears selected products table
Remove Button	Removes highlighted product from selected product table

To generate the report based on the above settings, click **Reports – Capability Summary**.

General Settings

The location of the database, optional password setup and other elements are modified by clicking on the menu item **View** and from the pull down **Settings**.

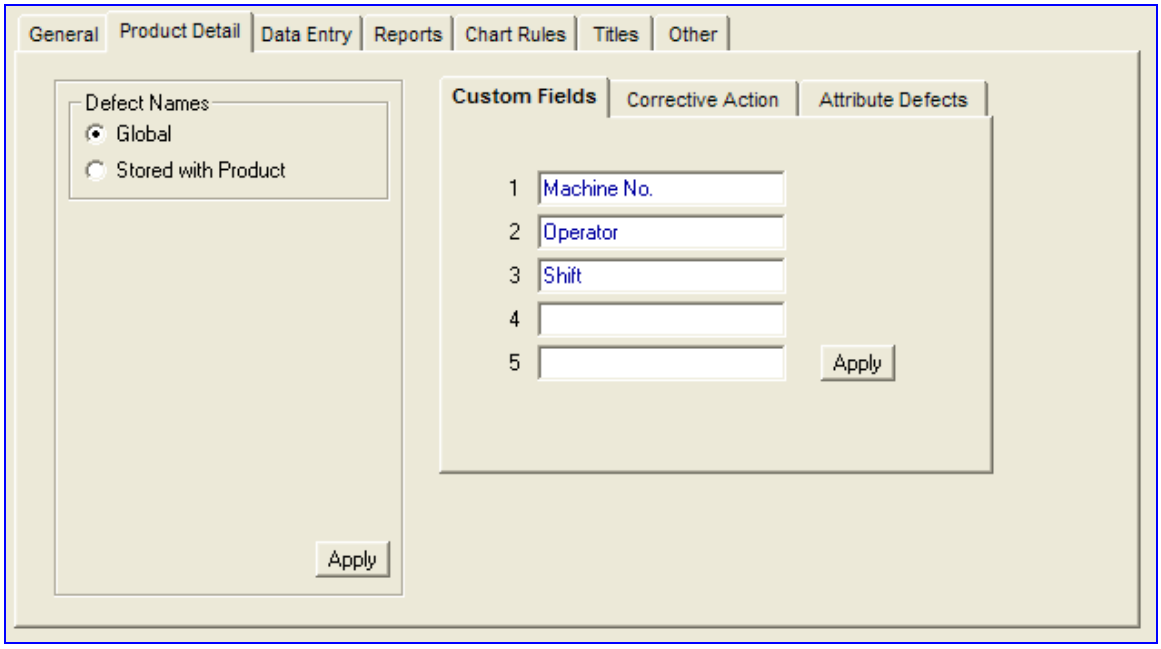
Click on the **General** tab.



Fields - Buttons	***Description***
System Password	Restricts access to SPC system - optional
Supervisor Password	If set up, needed to purge data/edit part info
Data Location	Identify drive and folder where data base is located
Apply Button	Saves the settings

Product Detail Settings

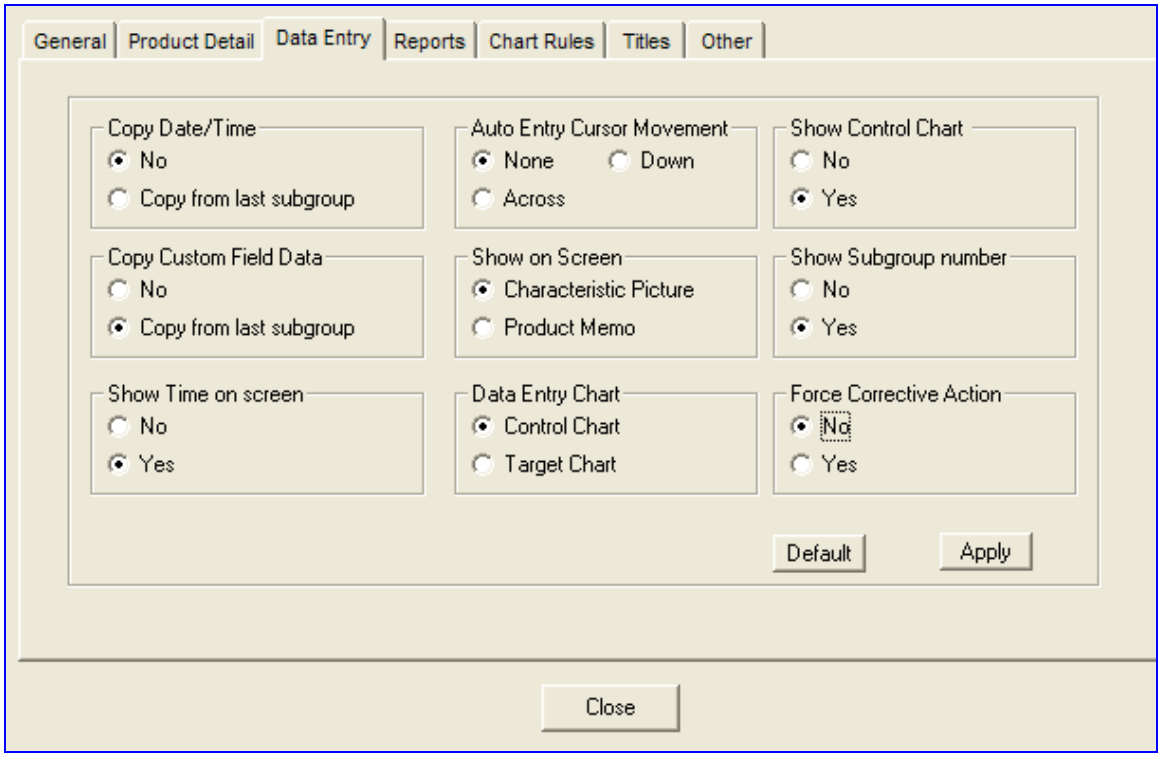
The Product Detail tab is the place to set up global custom fields, corrective action list and global defect names.



Fields - Buttons	***Description***
Defect Names Option	Global – defect names same across all products Stored with Product – defect names unique to product
Custom Fields Tab	Custom field titles used for all products - global
Corrective Action Tab	Add, edit , delete corrective action list
Attribute Defects	Add, edit, delete global defect names
Apply Button	Save product detail settings

Data Entry Settings

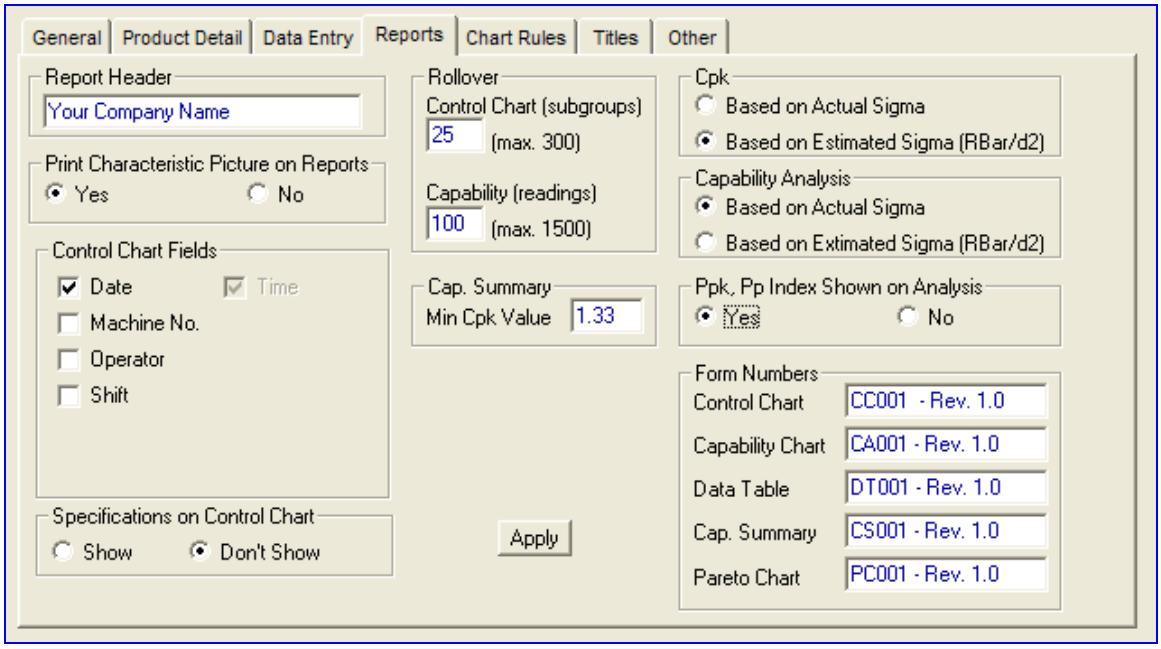
The Data Entry tab provides for settings related to the operator data entry screen. Items such as whether to show a characteristic picture / text memo, control chart or target chart (precontrol) are selected.



Fields - Buttons	***Description***
Copy Date/Time Option	Previous subgroup/row date/time copied to current subgroup/row
Copy Custom Field	Previous subgroup/row custom field copied to current subgroup/row
Show Time Option	Enable the display of time
Auto Entry Cursor	Direction of cursor movement when external instrument connected
Show on Screen	Picture of characteristic or text free format memo
DataEntry Chart	Control chart or nonstatistical target chart (precontrol)
Show Control Chart	Real time chart update when subgroup entry completed
Show subgroup number	Displays current subgroup number and subgroup size
Force Corrective Action	Operator must select corrective action if chart rule violated
Apply Button	Save data entry settings

Report Settings

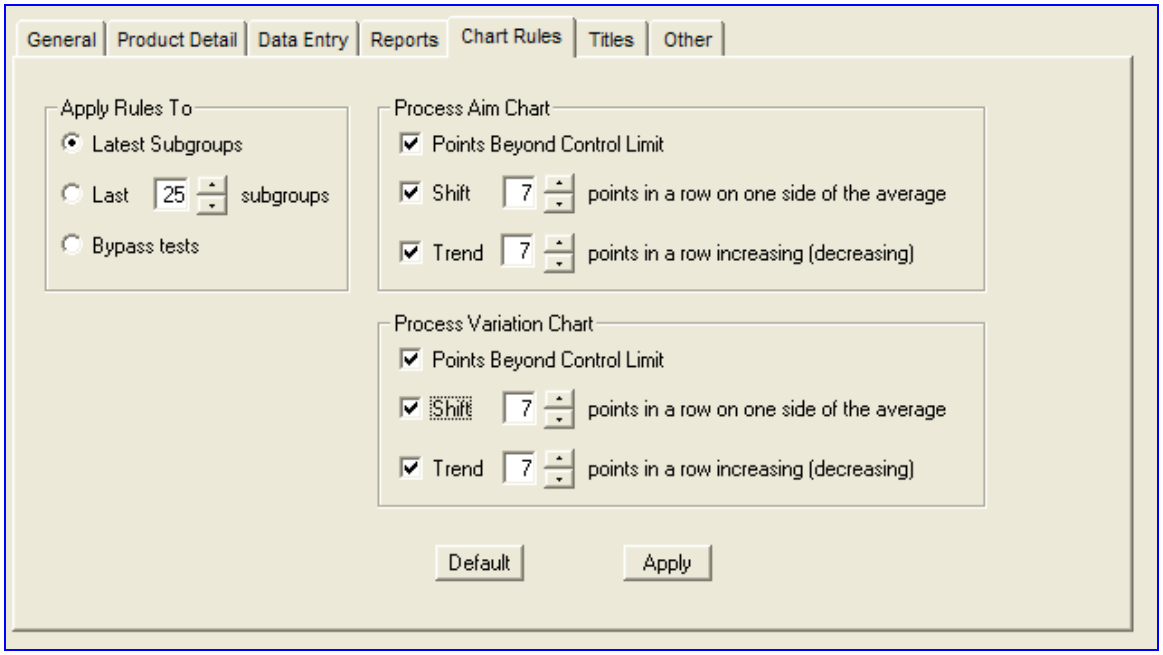
The Reports tab provides settings for items such as report header, capability calculations, form numbers and other elements.



Fields - Buttons	***Description***
Report Header	Typically company name – will appear on all reports at top
Print Picture	Picture of characteristic measured appears on report
Control Chart Fields	Select two fields to appear on control chart for each plot point
Spec. on Control Chart	Display upper/lower spec. on control chart
Rollover	Control chart – number of subgroups used in calculations Capability – number of readings used in calculations
Capability Summary	Threshold for acceptable Cpk
Cpk option	Method used to determine standard deviation in Cpk calculation
Capability Analysis	Method used to determine standard deviation in Capability Analysis
Ppk / Pp Index option	Displays Ppk and Pp index on report
Form Numbers	Report form numbers - optional
Apply Button	Saves report settings

Chart Rules Settings

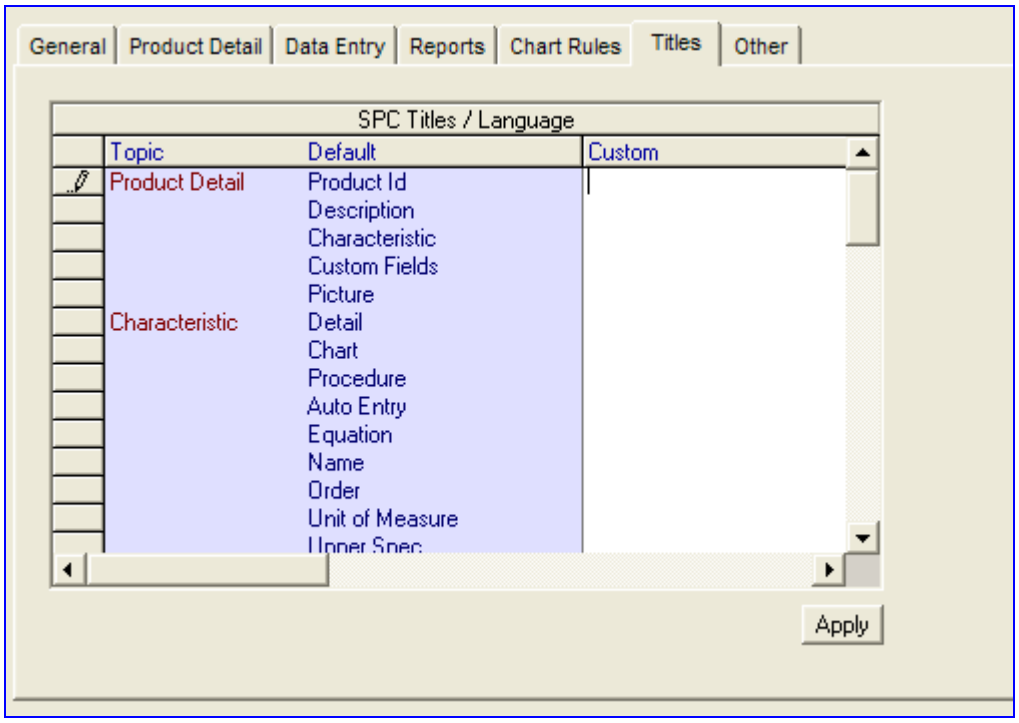
The Chart Rules tab is where the statistical rules used to identify out of control conditions are set. These rules can be disabled if desired.



Fields - Buttons	***Description***
Apply Rules To	Latest Subgroups – example, last 7 plot points to identify a shift Bypass Tests – does not show rule violations
Default	Resets rules to generally accepted values
Apply	Saves chart rules settings

Titles Settings

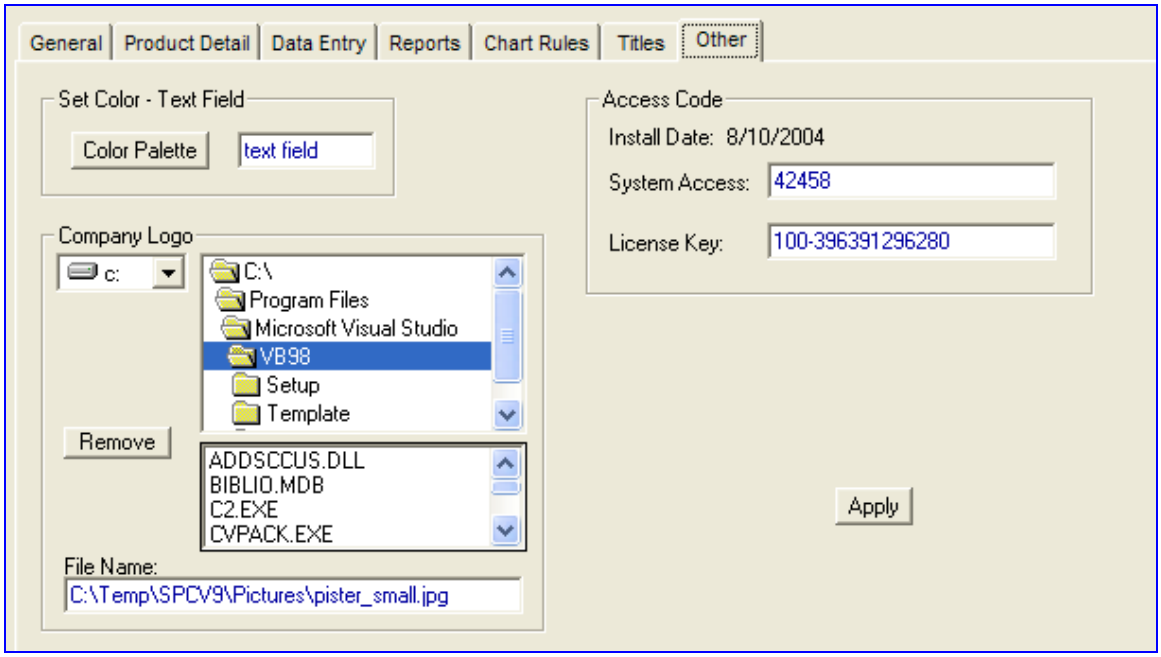
The Titles tab allows the text labels displayed on various windows to be modified for different languages or terminology.



Fields - Buttons	***Description***
Custom	Replaces current label title with user entered label
Apply Button	Saves title label settings

Other Settings

The Other tab is the screen where a license key is entered, company logo identified and other elements setup



Fields - Buttons	***Description***
Color Palette	Changes the text color
Access Code Key	Code value to give full rights to the software
Company Logo	Identify company logo file name
Apply Button	Saves the settings

Page Setup

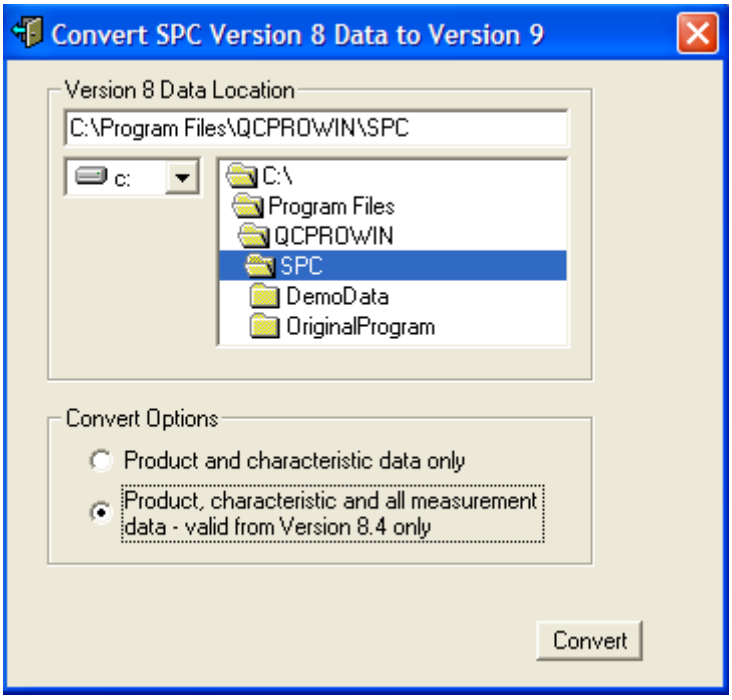
This feature is used to modify printer related items such as default printer, printer preferences and other elements.

To use this feature, click on the menu item **File** and from the pull down click on **Page Setup**.

Convert

This is a utility to convert the QC-PRO SPC version 8 database to the version 9 format.

To use this feature, click on the menu item **File** and from the pull down click on **Accessories – Convert**



Fields - Buttons	*Description*
Version 8 Location	Identify where the version 8 SPCDB.MDB database is
Convert Options	Convert only product set ups or everything including measurements
Convert	Begins the conversion process

Repair Data Base

It is possible for the database ***SPCV9.MDB*** file to become damaged. The repair data base function will attempt to correct a corrupt database.

Regular back ups should be done on the ***SPCV9.MDB*** database file to avoid loss of information.

A copy of MS Access 2000 or later is required to attempt a repair.

Purge Data

This function will remove all measurements for all products for a specified date range.

To activate this click on ***FILE – ACCESSORIES – PURGE*** and enter the desired date range.

Add Field to Data Base

When we modify elements of the program, the database tables/fields may be affected. The add field option will add the necessary information to the database.

To use this feature, click on the menu item **File** and from the pull down click on **Accessories – Add Field**.

You do not need to run this option unless instructed to by us.

ASD GageMux Overview

This appendix describes the steps needed to simultaneously transfer multiple channel measurements from the GageMux into the corresponding QC-Pro characteristics.

The QC-Pro software will request measurements from the appropriate GageMux channels by sending commands through the serial port.

Foot Switch Setup

The “Foot Switch Triggered Mode” should be the setting selected.

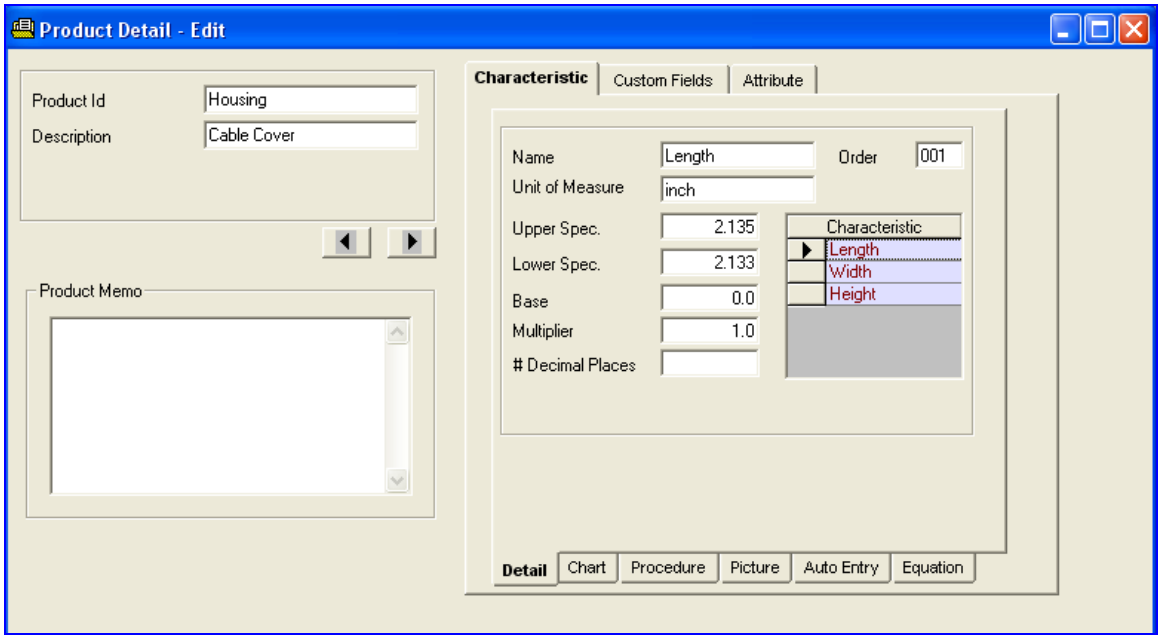
Please refer to the ASD GageMux operating manual page 15. The dip switch settings for DIPSW1 should be:

- Switch 1: Open
- Switch 2: Closed
- Switch 3: Closed
- Switch 4: Open

One foot switch should be connected to the GageMux channel 1 port.

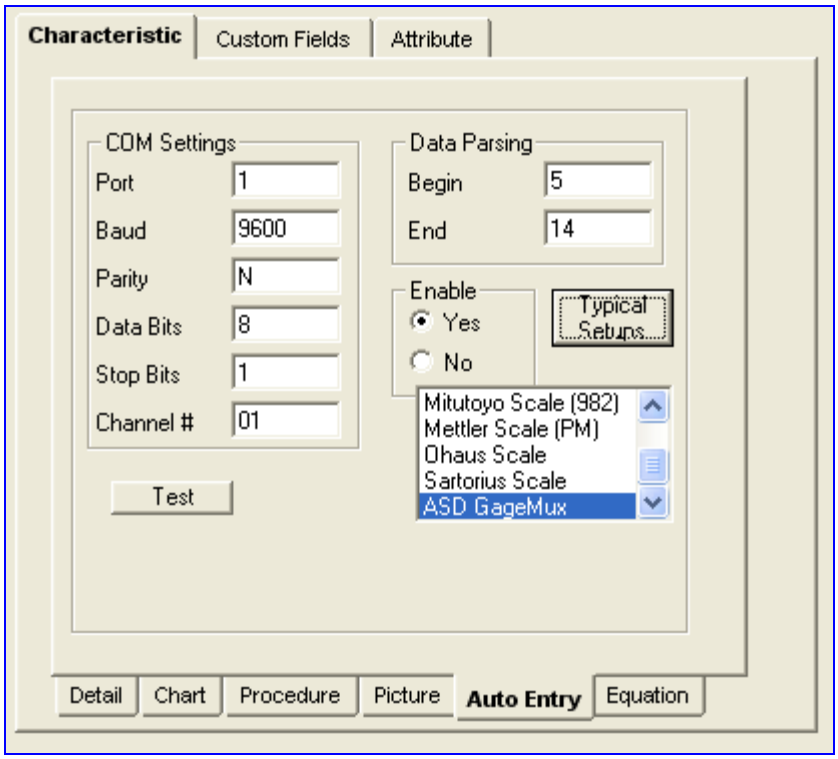
QC-Pro Auto Entry Setup

The product detail window includes an Auto Entry tab.



In order to setup the current characteristic to accept measurements from the GageMux, click on the **Auto Entry** tab.

Click on the **Typical Setups** button and choose the *ASD GageMux*.



For the current characteristic, enter the corresponding ASD GageMux channel. The channel number should be two digits, for example 01 represents channel 1. Click on the **Save** button to store this information.

The above procedure needs to be repeated for each characteristic.

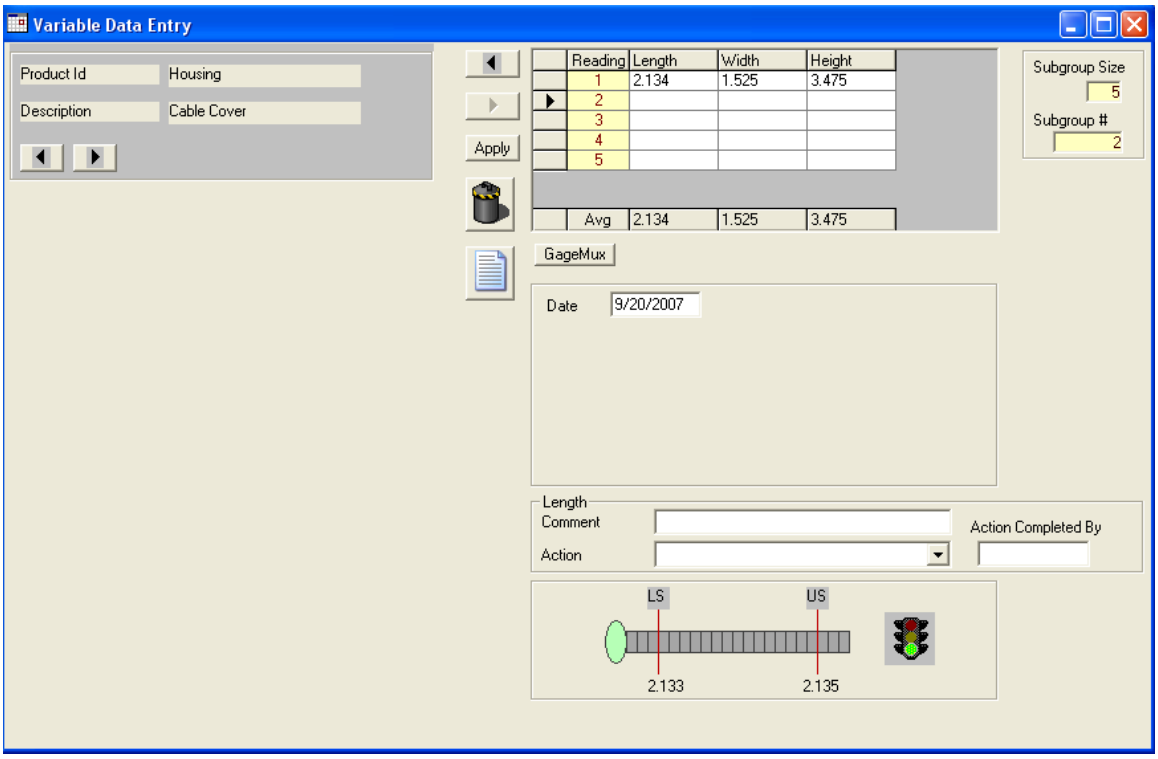
Data Entry

The cursor should be active in the top left cell in the data entry grid.

When the foot switch is pressed the QC-Pro software will request the measurements from the appropriate GageMux channels and then display the measurements in the corresponding characteristics cells.

As measurements are being transferred from the GageMux the corresponding channel LED will turn on for a short duration.

The cursor will automatically advance to the next row - first column if the subgroup size is greater than one. Pressing the foot switch will repeat the above process.



It is also possible to initiate measurement transfer by clicking on the **GageMux** button displayed at the bottom of the data entry grid.

Once the data entry grid is populated with all the readings then it must be saved in the usual manner by clicking on the **Apply** button.