
QC-PRO Gage Management

User Guide



www.pister.com

Version 9.1

Table of Contents

Introduction	1-1
Overview	1-1
Set Up Information	1-1
Skip Holidays	1-1
Calibration Reports	1-2
Measurement System Analysis Reports	1-2
General Elements	1-2
Installation	2-1
Start Program	2-2
Access Code	2-2
Set Up Gage Information	3-1
Add/Edit Gage Detail	3-1
Gage Picture	3-2
Assign Calibration Procedure	3-3
Assign Standards (targets with +/- tolerances)	3-4
Parts Using Current Gage	3-5
Saving Gage Set Up Information	3-6
Gage Detail Report	3-6
Copy Current Set Up to a New Gage	3-6
Tool Bar Buttons	3-7
Calibration Procedure Set Up	3-8
Recording Activities	4-1
Transactions	4-1
Targets (before/after calibration)	4-2
Delete Transaction	4-3
Measurement System Analysis	4-4
GRR - Range Method	4-4
GRR – Average and Range Method	4-8
GRR – ANOVA Method	4-11
Gage Bias	4-12
Gage Linearity	4-15
Gage Stability Analysis	4-18
Attribute Gage Study	4-21
Gage Usage	4-27
Audit Trail – Transaction Edits	4-28

Table of Contents

Reports	5-1
Report Options	5-1
Gages Due Report	5-2
Calibration Work Order	5-3
Gage List	5-4
Gage History	5-5
GRR Summary	5-6
Calibration Labels	5-7
Other Features	6-1
Skip Days	6-1
General Settings	6-2
Gage Detail Settings	6-3
Report Settings	6-4
Calibration Label Settings	6-5
Language Settings	6-6
Other Settings	6-7
Repair DataBase	6-8
Move a Gage	6-9
Gage History Purge	6-11
Purge Records From Cpk Summary	6-13
Appendix A – Brother P-touch label printer	A-1
Calibration Label Settings	A-2

Overview

The software offers a complete system for:

- Scheduling calibrations and statistical studies
- Maintaining historical records of all gage activities
- Measurement system error analysis (GRR, Bias etc.)

The approach taken is consistent with those outlined in well-established quality system requirements including ISO 9001 and TS 16949 as well as six sigma programs. In addition the FDA's standard 21 CFR Part 11 is incorporated with an audit trail for edited gage calibration records.

Set Up Information

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

- Interval between calibrations/statistical studies
- Picture of measurement tool
- Target values along the gage operating range
- Procedure on how to calibrate the gage
- Custom fields that are user defined

Skip Holidays

The due dates for calibrations and statistical studies can skip user-identified periods. This can include weekends and specific dates during the year.

Reporting Flexibility

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

- Date range or overdue
- Gage Id, Description, Location
- User defined fields

Calibration Reports

A number of highly focused reports can be generated:

- Work order with calibration procedures, before/after values etc.
- Gages due for calibration list
- Gage History
- Calibration labels

Measurement System Error Reports

Statistical studies on the measurement system provide an understanding of the inherent gage error. The following methods (based on AIAG / QS-9000) are supported:

- Gage Repeatability and Reproducibility (GRR)
- Gage Bias
- Gage Stability
- Gage Linearity
- Attribute Gage Study

General Elements

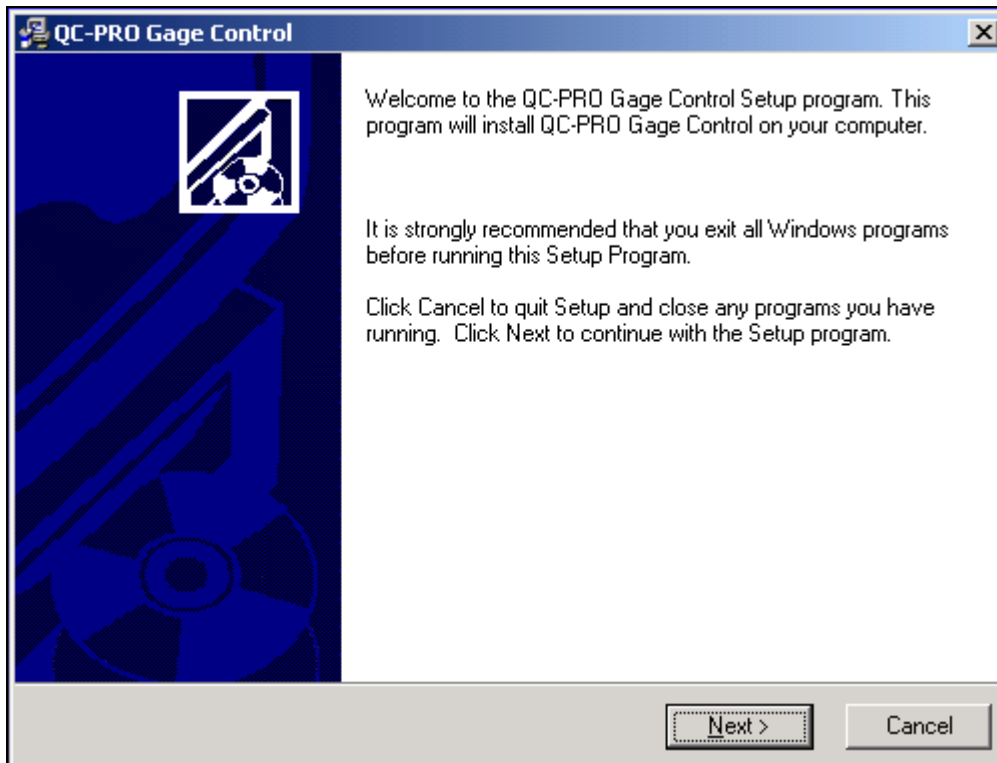
Other useful features include:

- Password protection for the system
- Language considerations for screens and reports
- E-Mail reports
- Export reports to external files (word processor, spreadsheet etc.)

Procedure to Install

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

A screen similar to 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.

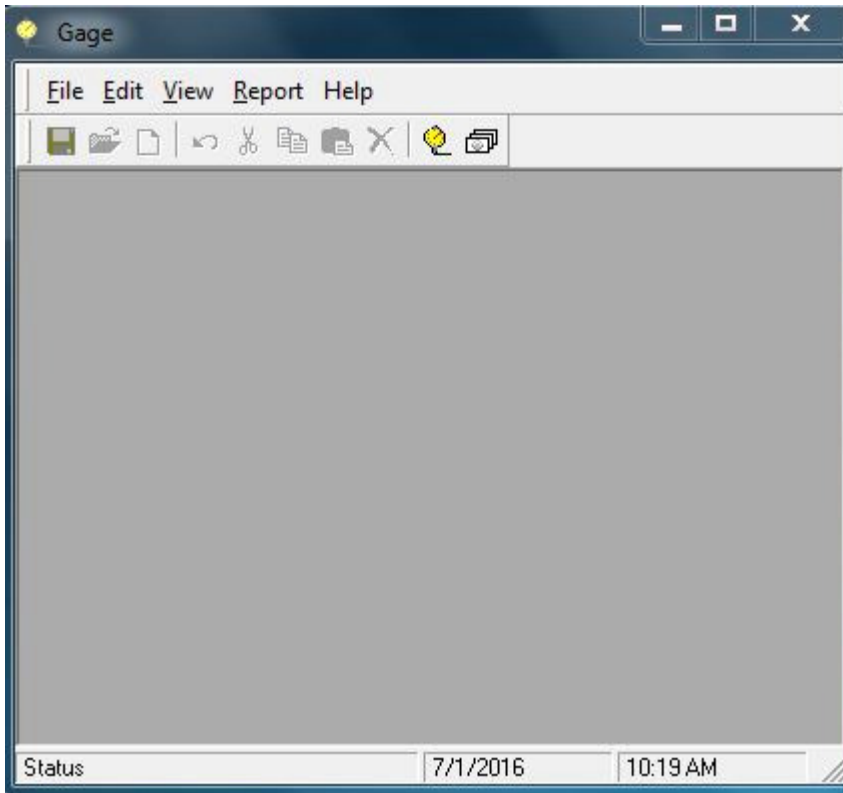
Start Program

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

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

In the **QC-PRO** folder, click on the **Gage V9** control icon.

The main screen is similar to:

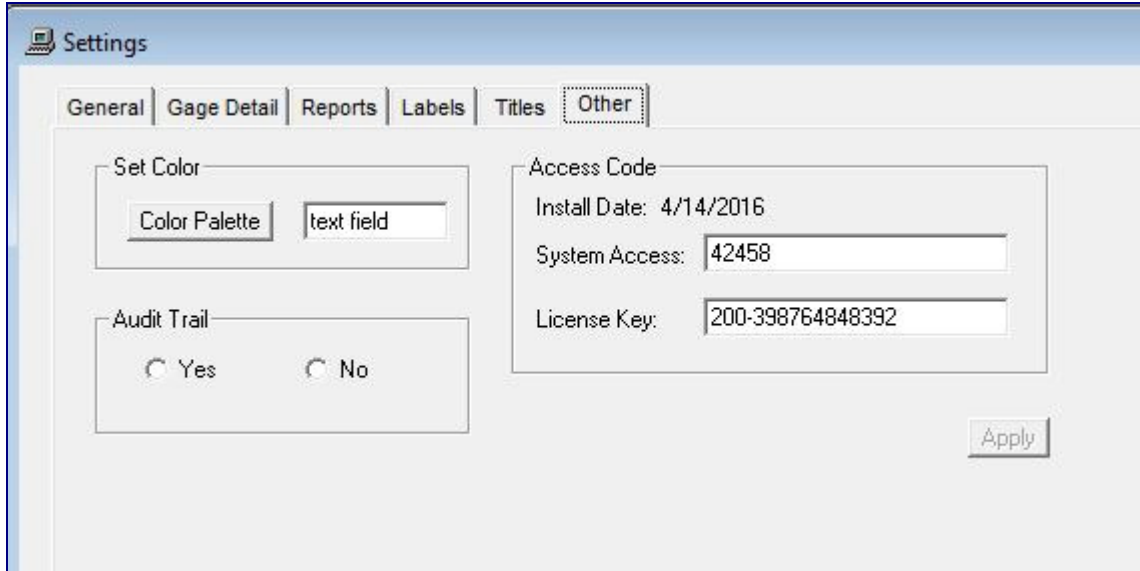


Access Code

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**.



The screenshot shows a 'Settings' window with a blue header bar. Below the header is a tabbed interface with six tabs: 'General', 'Gage Detail', 'Reports', 'Labels', 'Titles', and 'Other'. The 'Other' tab is selected and highlighted with a dotted border. The 'Other' tab contains three main sections: 'Set Color' with a 'Color Palette' button and a 'text field'; 'Audit Trail' with two radio buttons labeled 'Yes' and 'No'; and 'Access Code' with three text fields: 'Install Date: 4/14/2016', 'System Access: 42458', and 'License Key: 200-398764848392'. An 'Apply' button is located at the bottom right of the 'Other' tab's content area.

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 system access code and license key.

Add/Edit Gage Detail

To set up or edit gage information, click on the menu item **File** and from the pull down menu select **Gage**.

Gage Detail - Edit

Gage Profile

Gage Id: BGP-011693

Description: Vernier Caliper

Location: QC

Available for Use: ☒

Control Settings

Startup Date: 6/15/2016

Calibration Interval: 30 Day

Measurement Error Interval:

Verification Interval:

Comment

Used for production line A

Custom Fields | Picture | Procedure | Standard | Stability | Parts

Field Name	Field Content
Manufacturer	Mitutoyo
Graduation	0.001 inch
Size	0 to 6 inch

Calibration Due Date: 7/15/2016

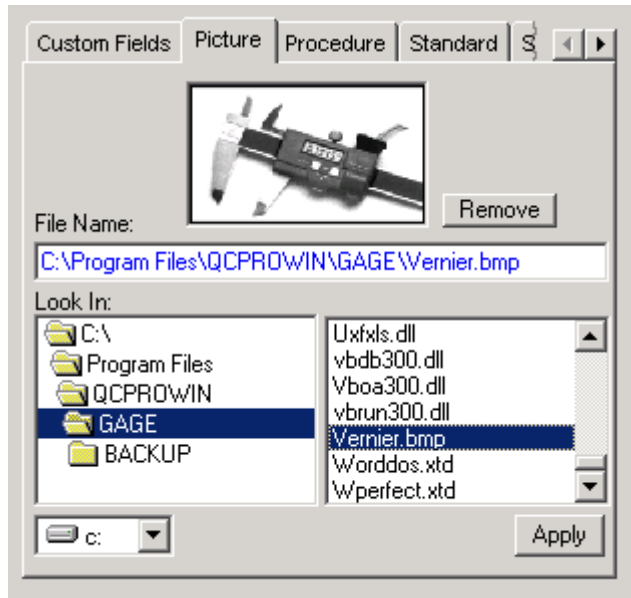
Navigation: Gage Record

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

<i>Fields- Buttons -Tabs</i>	<i>Description</i>
<i>Gage Id</i>	Each gage requires a unique gage id – can be alpha/numeric
<i>Description</i>	Usually the type of measurement tool
<i>Location</i>	The place where the gage is used and kept
<i>Available for Use</i>	The gage is active and will be included in reports like due etc. If not available for use, reason codes can be assigned
<i>Startup Date</i>	If no gage history exists, the calibration interval is added to this date to produce the next calibration date
<i>Interval Units</i>	Calibration interval units can be set to day, week, month or year Usage option: units are in days
<i>Calibration Interval</i>	The time period between calibrations – day, week, month or year Usage: days of actual usage before calibration needed
<i>Measurement Error Int.</i>	The time period between measurement error analysis (GRR etc.)
<i>Comment</i>	Free format text information
<i>Custom Fields Tab</i>	There are 5 user defined fields that can be set up either globally for all gages or uniquely for each gage
Field Name	This is the title of the field
Field Content	This is the content of the field

Gage Picture

A picture of the measurement tool can be displayed on various reports. Click on the **Picture** tab to identify the picture file information.



Fields- Buttons -Tabs	Description
File Name	Location of picture file (many graphic formats supported)
Apply Button	Save picture file information
Remove Button	Removes picture file from current gage record

Calibration Procedure

Calibration procedures can be unique to the measurement tool or generic. Click on the **Procedure** tab to identify the procedure.

Custom Fields | Picture | Procedure | Standard | S | < | >

Global Procedure Link: List

Details:

- Visually check all working surfaces for nicks.
- Check condition of jaws for flatness.
- Use gage block GB-0424

Apply

Fields- Buttons	Description
List Button	Provides a list of existing calibration procedures
Global Procedure Link	Procedure ID that will be linked with this gage
Details	Instructions for calibrating the gage
Apply Button	Finalizes the assignment of this procedure to the gage

Standards

Targets with plus/minus tolerances can be set up to be used during the calibration process in conjunction with before/after measurements. Click on the tab **Standards**.

#	Del	Target	Tol +	Tol -
1	<input type="checkbox"/>	1.25	.001	.001
2	<input type="checkbox"/>	2.50	.001	.001
3	<input type="checkbox"/>			
4	<input type="checkbox"/>			
5	<input type="checkbox"/>			
6	<input type="checkbox"/>			
7	<input type="checkbox"/>			
8	<input type="checkbox"/>			
9	<input type="checkbox"/>			
10	<input type="checkbox"/>			

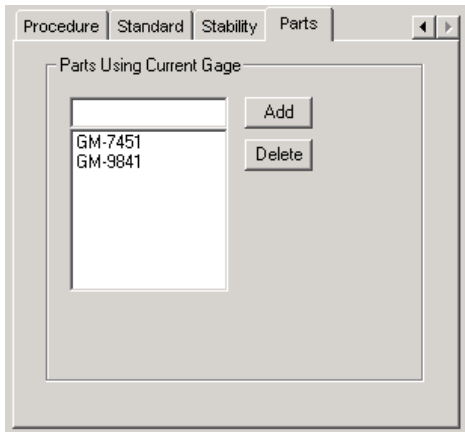
Apply

Fields- Buttons	Description
Target	The expected reading on the measurement tool
Tol+	Allowable plus tolerance from the target
Tol-	Allowable minus tolerance from the target
Del Check Box	To remove a Target/Tolerance, click the check box
Description	Any text descriptive information
Standard Id	Standard used to calibrate gage, example. gage block id etc.
Uncertainty	Measurement uncertainty for the standard (option must be enabled)
Apply Button	Finalizes the assignment of targets and tolerances

Parts Using Gage


The production parts that will be using the measurement tool can be identified.

To add/delete parts for the current measurement tool click on the **Parts** tab.



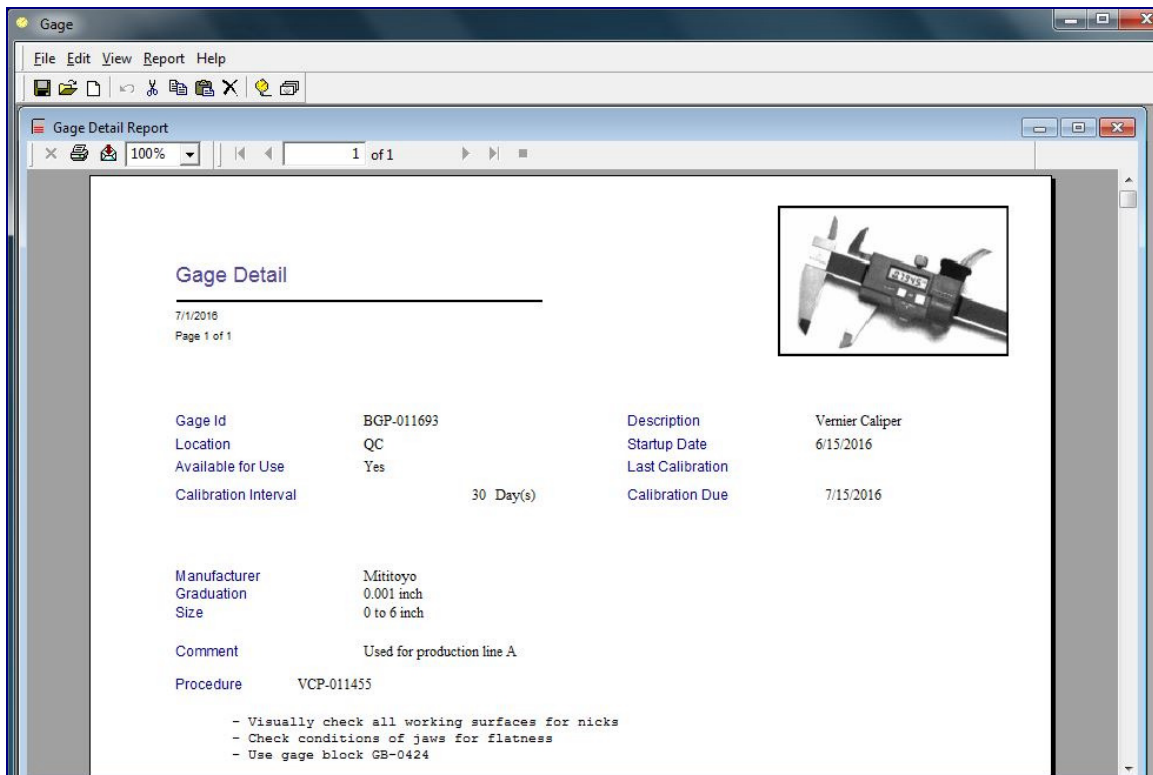
Fields- Buttons	Description
Add Button	Adds typed in part number to list of parts
Delete Button	Removes highlighted part number from list of parts

Saving Information

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

Gage Detail Report

To obtain a formatted report of the gage detail click on the menu item **Report** and from the pull down click on **Gage Detail Report**.



The report can be sent to an external file, e-mailed or printed.

Gage Copy











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

Tool Bar Buttons

A number of tool bar buttons are displayed at the top.



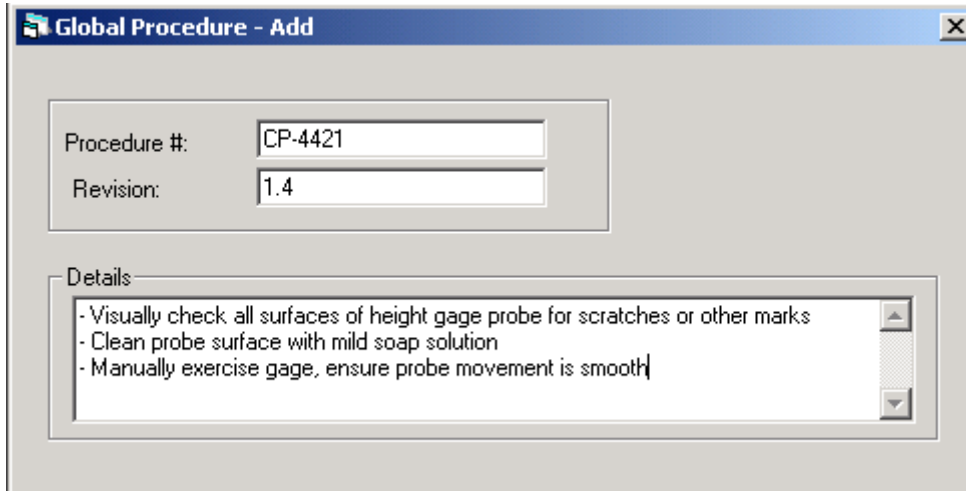
If the buttons are not grayed out then they are available for the active window.

Tool Bar Buttons	Description
 Save	Saves elements related to the current open window
 Find	Find a gage either by typing in the id or picking from a list
 New	Clears out field contents, and allows new information to be entered
 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	Deletes the current record
 Gage Detail	Advances to the gage detail window
 Transaction	Advances to the transaction window where calibration and MSA information is recorded

Calibration Procedure - Setup


To setup/edit a global calibration procedure, click on the menu item **File** and from the pull down menu select **Procedures**.

Click on the **New**  button to start a new procedure.



The image shows a dialog box titled "Global Procedure - Add". It contains two input fields: "Procedure #:" with the value "CP-4421" and "Revision:" with the value "1.4". Below these fields is a section labeled "Details" containing a list of instructions: "- Visually check all surfaces of height gage probe for scratches or other marks", "- Clean probe surface with mild soap solution", and "- Manually exercise gage, ensure probe movement is smooth".


Fields- Buttons	Description
Procedure #	Alpha/Numeric procedure identification
Revision	Alpha/Numeric revision level
Details	Free format text – procedure details

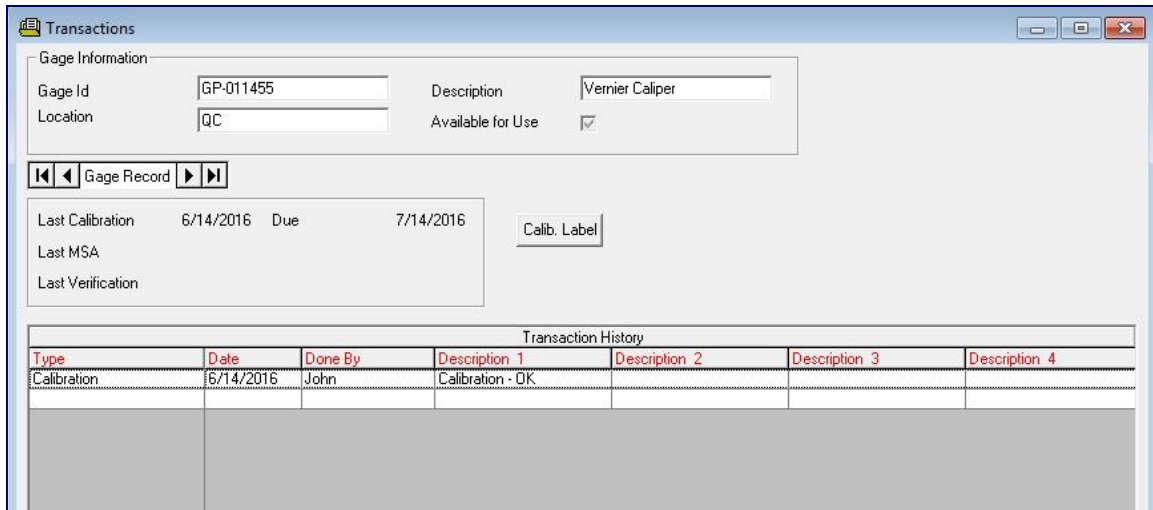
To store the procedure information, click on the **Save**  tool bar button.

Transactions

The transaction system provides the mechanism to record any activity on a particular gage.

If the transaction type is a calibration the next calibration date is reset or if set for gage usage the number of usage days left is reset.


Click on the menu item **File** and from the pull down select **Transactions**. An alternate method is to click on the **Transaction**  tool bar button.



The screenshot shows the 'Transactions' window. It has a title bar with standard window controls. Inside, there's a 'Gage Information' section with fields for 'Gage Id' (GP-011455), 'Location' (QC), 'Description' (Vernier Caliper), and a checked 'Available for Use' checkbox. Below this is a 'Gage Record' section with navigation buttons (first, previous, next, last) and a 'Calib. Label' button. The 'Transaction History' section contains a table with columns: Type, Date, Done By, Description 1, Description 2, Description 3, and Description 4. The first row shows a 'Calibration' transaction on '6/14/2016' by 'John' with 'Calibration - OK' in Description 1.

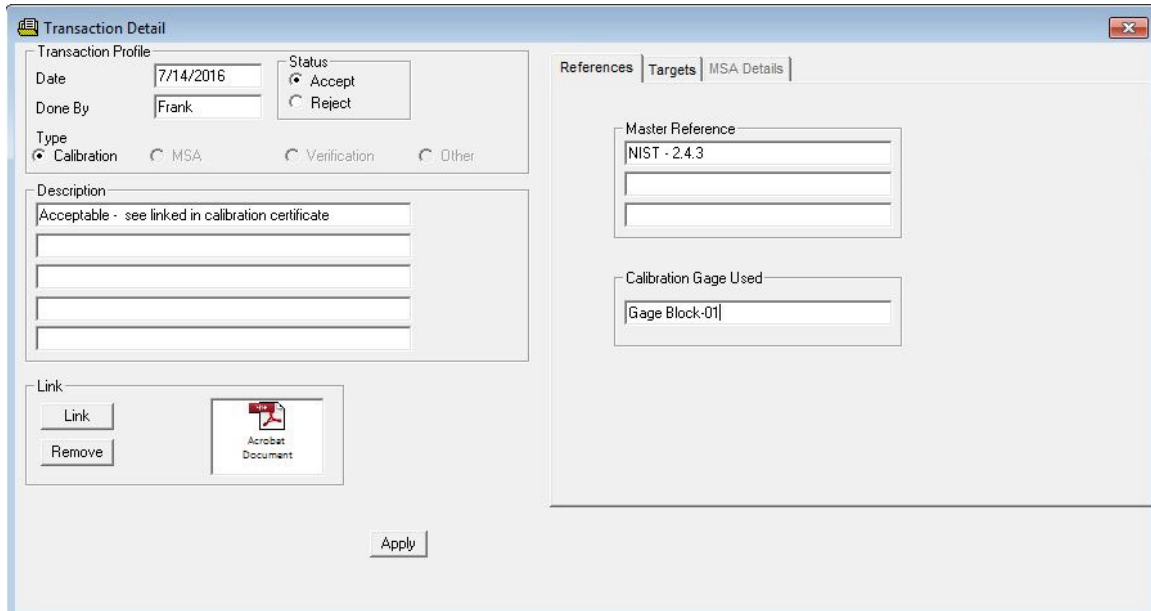
Type	Date	Done By	Description 1	Description 2	Description 3	Description 4
Calibration	6/14/2016	John	Calibration - OK			

Fields- Buttons	Description
Gage Information	Displays general gage information – cannot be altered
Gage Record	Moves forward/backward one gage record at a time
Calib. Label	Print calibration label
Transaction History	Summary of activities performed on gage

To view another gage id - transaction, click on the **Find**  tool bar button.

Add Transaction

To begin a new transaction for this gage click on the **New**  tool bar button.



The Transaction Detail window is a software interface for recording calibration transactions. It features a 'Transaction Profile' section on the left with fields for Date (7/14/2016), Done By (Frank), Status (Accept/Reject), Type (Calibration/MSA/Verification/Other), and Description (Acceptable - see linked in calibration certificate). Below this is a 'Link' section with 'Link' and 'Remove' buttons and an 'Acrobat Document' icon. An 'Apply' button is at the bottom. On the right, there are tabs for 'References', 'Targets', and 'MSA Details'. The 'References' tab is active, showing 'Master Reference' (NIST - 2.4.3) and 'Calibration Gage Used' (Gage Block-01).

Fields- Buttons	Description
Date	Date calibration performed
Done By	Person who did the calibration
Status	Result of calibration – accept or reject
Type	Type of transaction can be calibration, measurement error analysis
Master Reference	Reference material for calibration
Calibration Gage Used	Master Gage(s) used during calibration
Targets	Before and after calibration measurement results
Link	Connect to external files like certifications
Apply	Save the calibration record

To record before/after values, click the **Targets** tab.




The Targets tab window displays a table for recording calibration targets. The table has columns for Target, Tol +, Tol -, Before, and After. Two rows of data are shown: Target 1.250 with Tolerances of .001, Before 1.249, and After 1.25; and Target 2.500 with Tolerances of .001, Before 2.501, and After 2.500. A scroll bar is visible at the bottom.

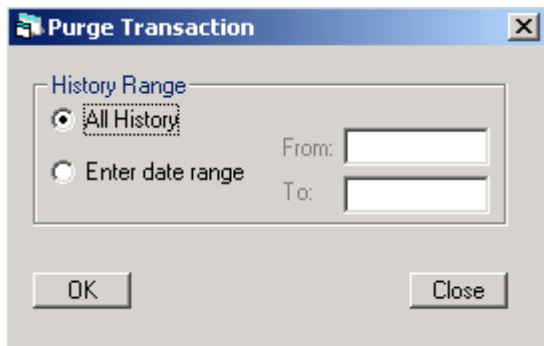
Target	Tol +	Tol -	Before	After
1.250	.001	.001	1.249	1.25
2.500	.001	.001	2.501	2.500

Click on the **Apply** button to save the calibration transaction detail record.

Delete Transaction

To delete a specific transaction, call it up on the screen and click on the **Delete**  tool bar button.

If a range of transactions are to be removed, then the purge option is more efficient. Ensure the main transaction window is active. Click on the menu item **Edit** and from the pull down, click on **Purge**.



Options -Fields	Description
All History option	Removes all transactions for selected gage
Enter date range option	Removes transactions in specified From/To date range
From field	Start date for range
To field	End date for range

Copy Calibration Transaction

To copy a specific calibration transaction, call it up on the screen. Click on the menu item **Edit – Transaction Copy**. The date field will clear. Enter a new date and click the **Apply** button. All elements will be copied from the original calibration transaction to the new transaction record.

Copy General Transactions

To copy any type of transaction (MSA study or calibration) for the same or different gage id call up the transaction list window for the desired gage id. Click on the menu item **Edit – Transaction Copy**. Select the gage id from the list where the desired transaction to be copied is located. Select the transaction to be copied from the list displayed.


Measurement System Analysis

The information entered includes the general transaction information (date, description etc.) as well as the MSA study data.

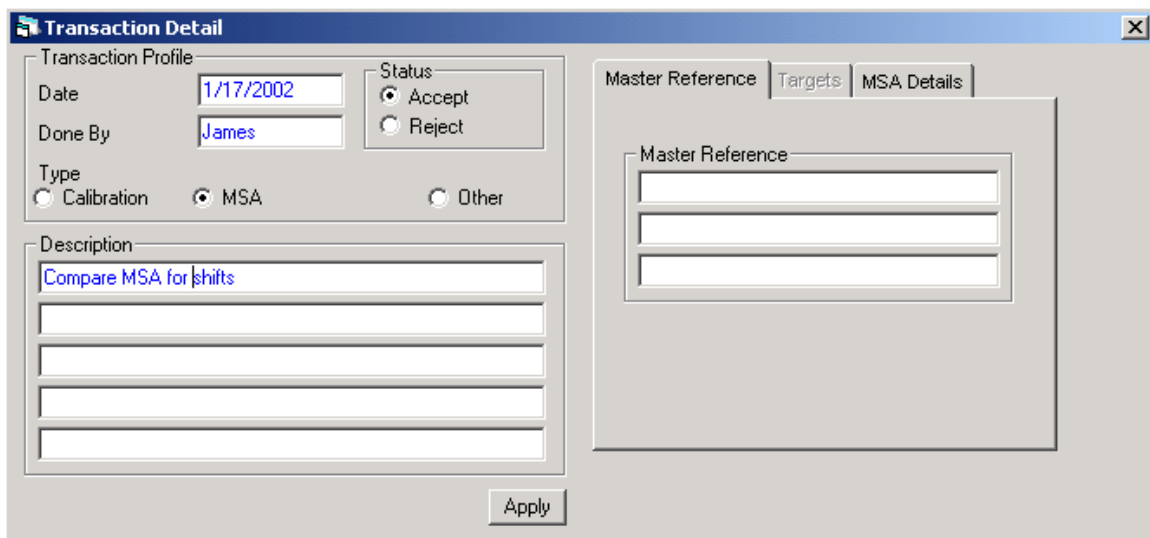
There are six types of MSA studies available:

- GRR Range Method (Short)
- GRR Average and Range (Long)
- Gage Bias
- Gage Linearity
- Stability Analysis
- Gage Attribute (Short Method)

GRR Range Method

If the main Transaction window is displayed click on the **New**  tool bar button to start a new Transaction Detail record.

Set the **Type** of Transaction to **MSA** by enabling the option button.



The screenshot shows the 'Transaction Detail' window. On the left, the 'Transaction Profile' section contains fields for 'Date' (1/17/2002), 'Done By' (James), and 'Type' (with radio buttons for Calibration, MSA, and Other; MSA is selected). A 'Status' section has radio buttons for 'Accept' (selected) and 'Reject'. Below is a 'Description' field with the text 'Compare MSA for shifts'. On the right, there are tabs for 'Master Reference', 'Targets', and 'MSA Details'. The 'Master Reference' tab is active, showing three empty input fields. An 'Apply' button is at the bottom center.

MSA Details

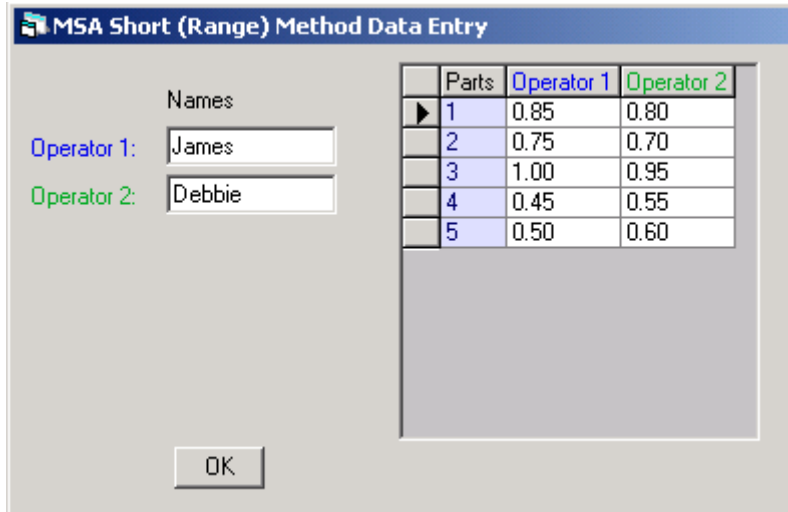
Click the **MSA Details** tab and select the **GRR – Range** method from the **Type** list.

The screenshot shows a software interface with three tabs: 'Master Reference', 'Targets', and 'MSA Details'. The 'MSA Details' tab is active. It contains several input fields and a dropdown menu. The fields are labeled as follows: 'Part Id' with value 'TP-012588', 'Characteristic' with value 'Coating Thick', 'Unit of Measure' with value 'mm', 'Tolerance Band' with value '0.45', 'Process Std. Dev.' with value '0.07', 'Operators (2-3):' with value '2', and 'Parts (2-30):' with value '5'. There is a 'Type' dropdown menu with 'GRR - Range' selected. A 'Data' button is located at the bottom right of the form.

Fields - Buttons	Description
Part Id	Parts being used in GRR short study
Characteristic	Feature being measured on the part
Unit of Measure	Free format for example inch, mm etc.
Tolerance Band	Range between plus and minus part feature tolerance
Process Std. Dev.	Standard deviation of part feature (if not known leave blank)
Operators	Number of operators participating in the study
Parts	Number of parts used in the study
Type	Type of MSA study (GRR, Bias, Linearity etc.)
Data Button	Measurement entry screen

Measurement Entry

To enter the measurements, click on the **Data** button.



The dialog box titled "MSA Short (Range) Method Data Entry" contains two input fields for operator names and a table for measurement data. The "Operator 1" field is labeled "James" and the "Operator 2" field is labeled "Debbie". The table has three columns: "Parts", "Operator 1", and "Operator 2". It contains five rows of data, with the first row highlighted in blue. An "OK" button is located at the bottom left of the dialog box.

Parts	Operator 1	Operator 2
1	0.85	0.80
2	0.75	0.70
3	1.00	0.95
4	0.45	0.55
5	0.50	0.60

Fields - Buttons	Description
Names	Operators participating in the study
Operator 1, 2 column	Measurements taken by corresponding operator
OK button	After all measurements entered, returns to MSA detail screen

Save Information

Once the measurements have been entered and the **OK** button pressed click on the **Apply** button.

GRR Range Method Report

To view the GRR range method report, click the **Analysis** button on the MSA detail screen.

Your Company Name

GRR - Range (Short) Method

7/16/2002

Gage Id	BGP-011693	Description	Vernier Caliper
Location	QC	Part Id	TP-012588
Characteristic	Coating Thick	Unit of Measure	mm
Tolerance Band	0.45	Process Std. Dev.	0.0777
Date	7/16/2002	Done By	George
Manufacturer	Mitutoyo		
Graduation	0.001 inch		
Size	0 to 6 inch		
Average Range	0.07		


Variation Source	GRR Std. Deviation	% Tolerance Band	% Process Variation
Gage R & R	0.0588	78.4	75.7

Several options are available for this report. The tool bar buttons at the top of the report permit the report to be sent to a printer, exported to a file or e-mailed.

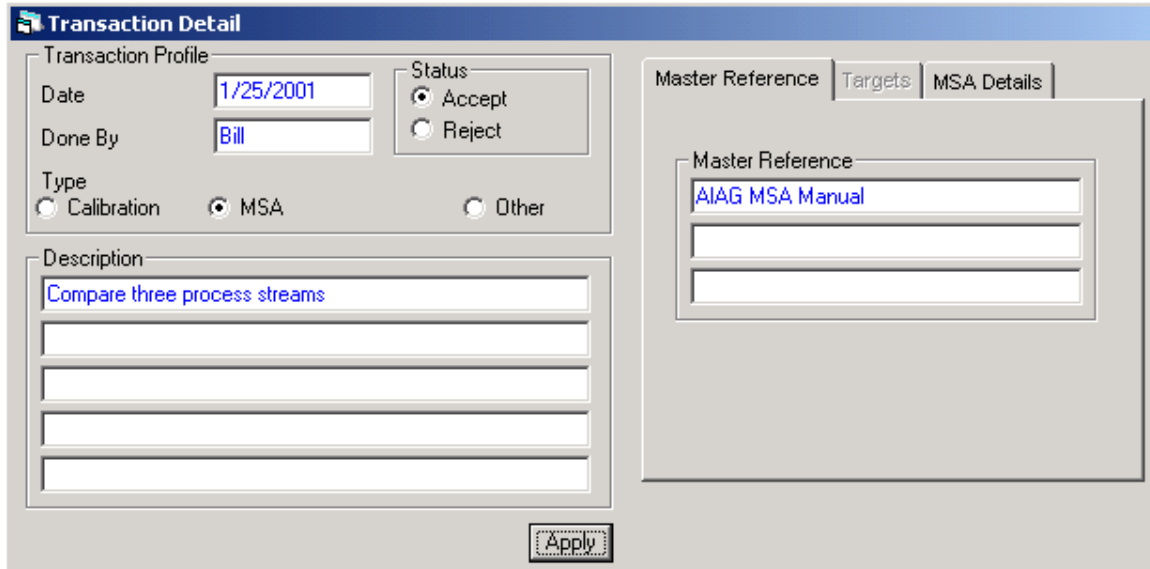


Fields - Buttons	Description
Print Button	Send report to the printer
Export Button	Export report to a file or e-mail
Report Size	Adjust the size of the report on screen

GRR Average and Range Method

If the main Transaction window is displayed click on the **New**  tool bar button to start a new Transaction Detail record.

Set the **Type** of Transaction to **MSA** by enabling the option button.



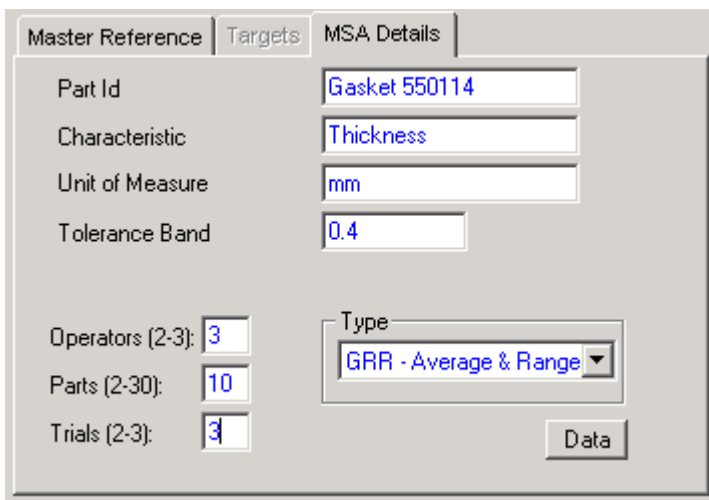
The Transaction Detail window is shown with the following fields and values:

- Transaction Profile**
 - Date: 1/25/2001
 - Done By: Bill
 - Type: ☒ Calibration, ☒ MSA, ☐ Other
 - Status: ☒ Accept, ☐ Reject
- Description**
 - Compare three process streams
- Master Reference** (tabbed view)
 - Master Reference: AIAG MSA Manual

An **Apply** button is located at the bottom right of the window.

MSA Details

Click the **MSA Details** tab and select the **GRR – Average and Range** method from the **Type** list.



The MSA Details window is shown with the following fields and values:

- Master Reference** (tabbed view)
 - Part Id: Gasket 550114
 - Characteristic: Thickness
 - Unit of Measure: mm
 - Tolerance Band: 0.4
- Operators** (2-3): 3
- Parts** (2-30): 10
- Trials** (2-3): 3
- Type**: GRR - Average & Range

A **Data** button is located at the bottom right of the window.

Fields - Buttons	Description
Part Id	Parts being used in GRR long study
Characteristic	Feature being measured on the part
Unit of Measure	Free format for example inch, mm etc.
Tolerance Band	Range between plus and minus part feature tolerance
Operators	Number of operators participating in the study
Parts	Number of parts used in the study
Trials	Number of times same part measured
Type	Type of MSA study (GRR, Bias, Linearity etc.)
Data Button	Measurement entry screen

Measurement Entry

To enter the measurements, click on the **Data** button.

MSA Long (Average & Range) Method Data Entry

Names

Operator 1: Don

Operator 2: Linda

Operator 3: Susan

Parts	Trial 1	Trial 2	Trial 3	Trial 1	Trial 2	Trial 3
1	0.29	0.41	0.64	0.08	0.25	0.00
2	-0.56	-0.68	-0.58	-0.47	-1.22	-0.01
3	1.34	1.17	1.27	1.19	0.94	1.30
4	0.47	0.50	0.64	0.01	1.03	0.20
5	-0.80	-0.92	-0.84	-0.56	-1.20	-1.00
6	0.02	-0.11	-0.21	-0.20	0.22	0.00
7	0.59	0.75	0.66	0.47	0.55	0.60
8	-0.31	-0.20	-0.17	-0.63	0.08	-0.01
9	2.26	1.99	2.01	1.80	2.12	2.10
10	-1.36	-1.25	-1.31	-1.68	-1.62	-1.00

OK

Fields - Buttons	Description
Operator 1, 2 and 3	Names of operators participating in the study
Trial 1,2 - column	Measurements taken by corresponding operator (color coded)
OK button	After all measurements entered, returns to MSA detail screen

Save Measurements

Once the measurements have been entered and the **OK** button pressed click on the **Apply** button.

Export MSA Data to Excel

A study of GRR data can be exported to an Excel spreadsheet. The transaction detail screen contains a button titled EXCEL. Clicking this button will begin the Excel export process.

GRR Average and Range Method Report

To view the GRR Average and Range Method report, click the **Analysis** button on the MSA detail screen.

The screenshot shows a window titled "GRR Report" with a toolbar at the top. The main content area displays the following information:

Your Company Name - GRR Report

Date: 7/16/2002

Gage Id	BGP-011693	Description	Vernier Caliper
Location	QC	Part Id	Gasket 550114
Characteristic	Thickness	Unit of Measure	mm
Tolerance Band	0.4	Done By	Bill
Manufacturer	Mittoyo	Graduation	0.001 inch
Size	0 to 6 inch		

From Data Sheet: $\bar{R} = 0.3417$ $\bar{X}_{diff} = 0.4446$ $R_p = 3.511$

Measurement Unit Analysis			% Total Variation (TV)
Repeatability - Equipment Variation (EV)			% EV = 100 (EV / TV)
EV	$= \bar{R} \times K_1$		= 100 (0.20188 / 1.14610)
	= 0.3417 x 0.5908		= 17.61 %
	= 0.20188		
		Trials	K ₁
		2	0.8862
		3	0.5908
Reproducibility - Appraiser Variation (AV)			% AV = 100 (AV / TV)

The window also shows a status bar at the bottom with "x1", "1 / 1", and "Ready".

Fields - Buttons	Description
Print Button	Print hard copy of report
E-Mail Button	Send the report as an attachment to e-mail
Full Page Button	Displays full page report

Note: To save the report as a .PDF file, click on FILE – PDF FILE

Data Sheet

To view the corresponding data set, click the **Data Sheet** button.

APPRAISER/ TRIAL #		PART										AVERAGE
		1	2	3	4	5	6	7	8	9	10	
1. A	1	0.29	-0.56	1.34	0.47	-0.80	0.02	0.59	-0.31	2.26	-1.36	0.194
2.	2	0.41	-0.68	1.17	0.50	-0.92	-0.11	0.75	-0.20	1.99	-1.25	0.166
3.	3	0.64	-0.58	1.27	0.64	-0.84	-0.21	0.66	-0.17	2.01	-1.31	0.211
4.	Average	0.447	-0.607	1.260	0.537	-0.853	-0.100	0.667	-0.227	2.087	-1.307	$\bar{X}_A = 0.1903$
5.	Range	0.35	0.12	0.17	0.17	0.12	0.23	0.16	0.14	0.27	0.11	$\bar{R}_A = 0.184$
6. B	1	0.08	-0.47	1.19	0.01	-0.56	-0.20	0.47	-0.63	1.80	-1.68	0.001
7.	2	0.25	-1.22	0.94	1.03	-1.20	0.22	0.55	0.08	2.12	-1.62	0.115
8.	3	0.07	-0.68	1.34	0.20	-1.28	0.06	0.83	-0.34	2.19	-1.50	0.089


ANOVA - GRR

To perform a GRR using ANOVA methods, click the **ANOVA** button.

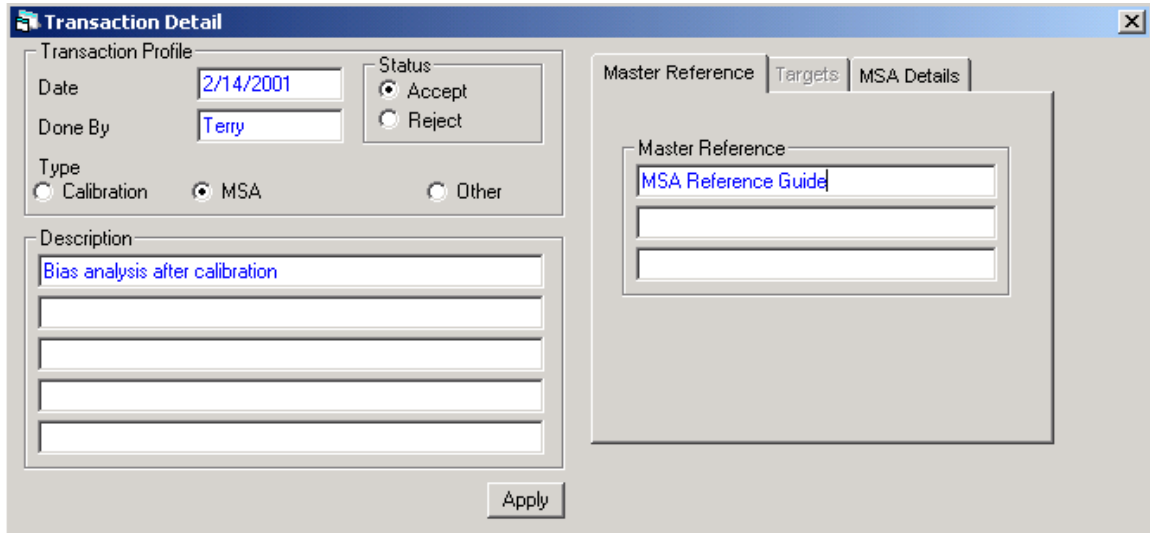
ANOVA Table				
Source	DF	SS	MS	F
Appraiser	2	3.1673	1.58363	34.44 *
Parts	9	88.3619	9.81799	213.52 *
Appraiser by Parts	18	0.3590	0.01994	0.43
Equipment	60	2.7589	0.04598	
Total	89	94.6471		

* Significant at alpha = 0.05 level

Gage Bias

If the main Transaction window is displayed click on the **New**  tool bar button to start a new Transaction Detail record.

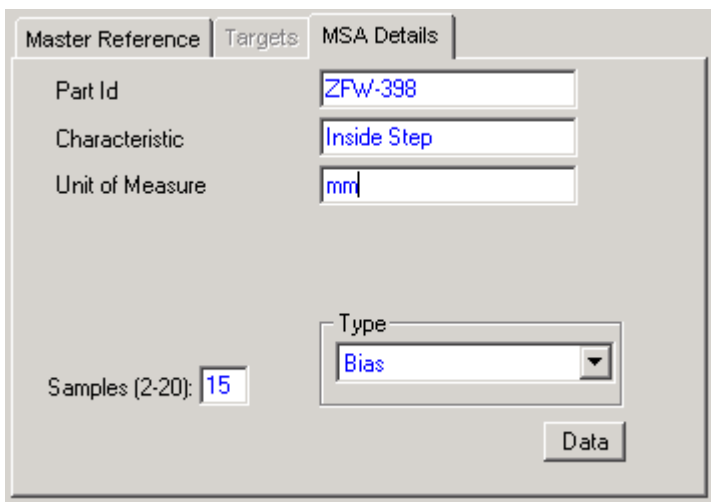
Set the **Type** of Transaction to **MSA** by enabling the option button.



The **Transaction Detail** window is shown with the **MSA** option selected under the **Type** section. The **Date** is 2/14/2001, **Done By** is Terry, and **Status** is Accept. The **Description** field contains "Bias analysis after calibration". The **Master Reference** tab is selected, showing a list with "MSA Reference Guide". An **Apply** button is at the bottom right.

Bias Details

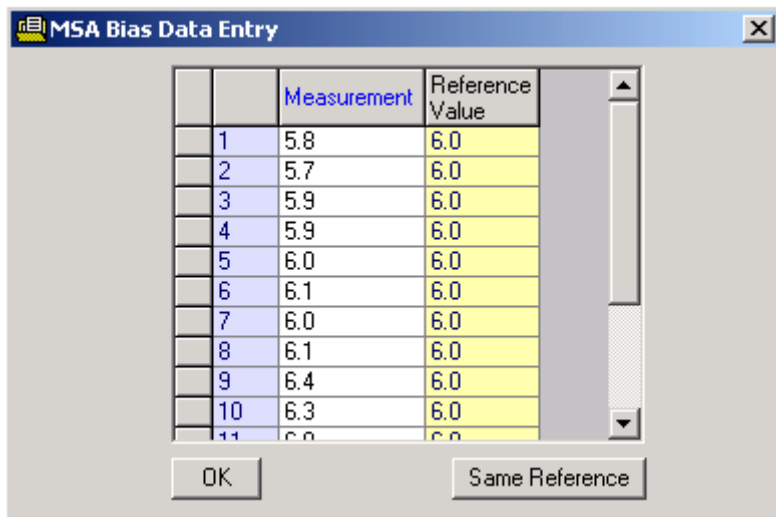
Click the **MSA Details** tab and select **Bias** from the **Type** list.



The **MSA Details** tab is selected. Fields include **Part Id** (ZFW-398), **Characteristic** (Inside Step), and **Unit of Measure** (mm). The **Samples (2-20)** field is 15. The **Type** dropdown is set to **Bias**. A **Data** button is at the bottom right.

Measurement Entry

To enter the measurements, click on the **Data** button.



The image shows a software dialog box titled "MSA Bias Data Entry". It contains a table with two columns: "Measurement" and "Reference Value". The table has 11 rows, numbered 1 to 11. The "Measurement" column contains values: 5.8, 5.7, 5.9, 5.9, 6.0, 6.1, 6.0, 6.1, 6.4, 6.3, and 6.0. The "Reference Value" column contains the value 6.0 for all rows. Below the table are two buttons: "OK" and "Same Reference".

	Measurement	Reference Value
1	5.8	6.0
2	5.7	6.0
3	5.9	6.0
4	5.9	6.0
5	6.0	6.0
6	6.1	6.0
7	6.0	6.0
8	6.1	6.0
9	6.4	6.0
10	6.3	6.0
11	6.0	6.0

Fields - Buttons	Description
Measurement	Measurements taken by operator
Reference Value	Determined by best measurement tools available
OK button	After all measurements entered, returns to MSA detail screen
Same Reference Button	Enter reference value in first row, press button to repeat for all rows

Save Bias Information

Once the measurements have been entered and the **OK** button pressed click on the **Apply** button.

Bias Report

To view the Bias report, click the **Analysis** button on the MSA detail screen.

Your Company - Gage Bias Report

Date 07/16/10

Gage Id	BGP-011693	Description	AIAG Samples
Location	QC	Part Id	ZFVW-398
Characteristic	Inside Step	Unit of Measure	mm
Manufacturer	Mitutoyo	Graduation	0.001 inch
Size	0 to 6 inch		

Trial	Measurement	Bias	Trial	Measurement	Bias
1	5.8	-0.2	11	6.0	0.0
2	5.7	-0.3	12	6.1	0.1
3	5.9	-0.1	13	6.2	0.2
4	5.9	-0.1	14	5.6	-0.4
5	6.0	0.0	15	6.0	0.0
6	6.1	0.1			
7	6.0	0.0			
8	6.1	0.1			
9	6.4	0.4			
10	6.3	0.3			


	n (m)	Mean	Std. Dev. Repeatability	Std. Error of Mean
Measured Value	15	6.0067	0.2120	0.0547

	Reference Value = 6.00, Alpha = 0.05					
	t statistic	df	Significant t value (2-tailed)	Average Bias	95% Confidence Interval of the Bias	
					Lower	Upper
Measured Value	0.12	14	2.145	0.0067	-0.1107	0.1241

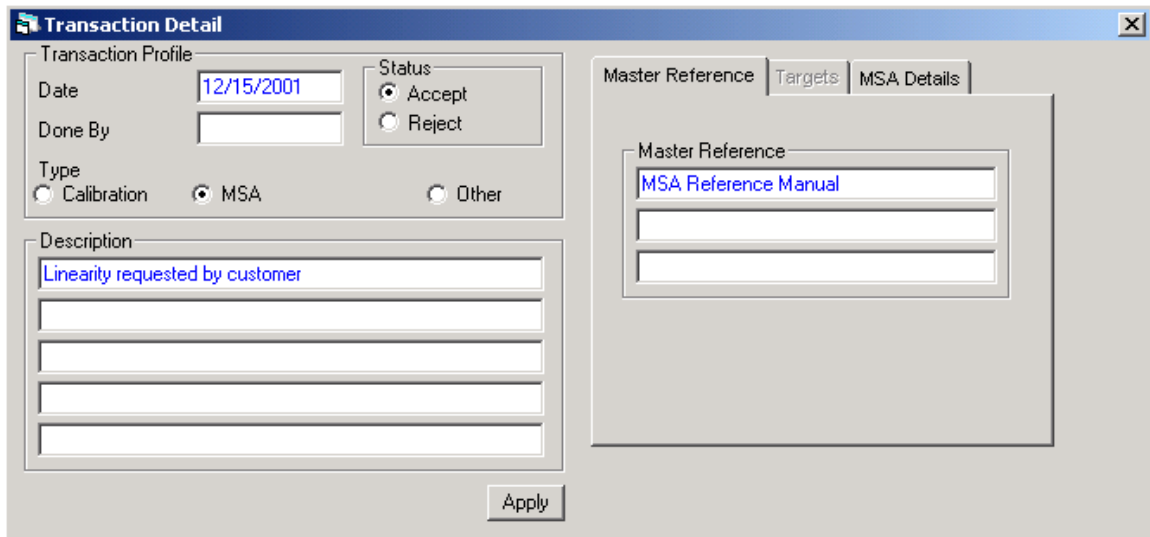
GUIDELINE

Measurement system bias is acceptable.

Gage Linearity

If the main Transaction window is displayed click on the **New**  tool bar button to start a new Transaction Detail record.

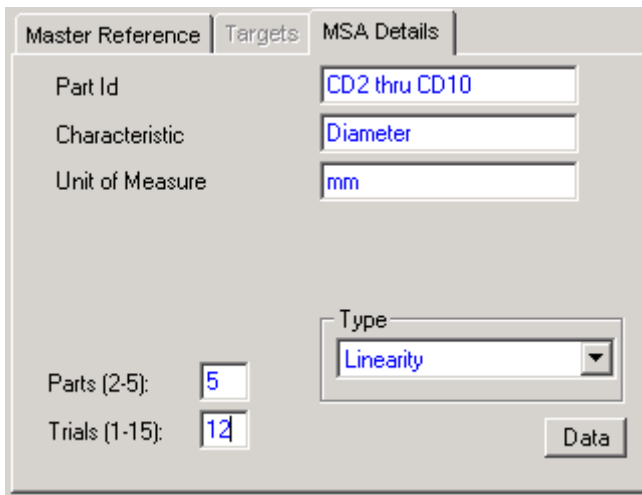
Set the **Type** of Transaction to **MSA** by enabling the option button.



The **Transaction Detail** window is shown with the **MSA** option selected under the **Type** section. The **Date** is set to 12/15/2001, and the **Status** is set to **Accept**. The **Description** field contains "Linearity requested by customer". The **Master Reference** tab is selected, showing a list with "MSA Reference Manual". An **Apply** button is at the bottom right.

Linearity Details

Click the **MSA Details** tab and select **Linearity** from the **Type** list.



The **MSA Details** tab is selected. The **Part Id** is "CD2 thru CD10", the **Characteristic** is "Diameter", and the **Unit of Measure** is "mm". The **Type** dropdown menu is set to "Linearity". The **Parts (2-5)** field is "5" and the **Trials (1-15)** field is "12". A **Data** button is at the bottom right.

Measurement Entry

To enter the measurements, click on the **Data** button.

The screenshot shows a software window titled "MSA Linearity Data Entry". It contains a table with 10 columns: "Parts", "Trial 1", "Trial 2", "Trial 3", "Trial 4", "Trial 5", "Trial 6", "Trial 7", "Trial 8", and an empty column. There are 5 rows of data. The "Parts" column has values 1 through 5. The "Trial" columns contain numerical values. The values for each part are: Part 1 (2.70, 2.50, 2.40, 2.50, 2.70, 2.30, 2.50, 2.50), Part 2 (5.10, 3.90, 4.20, 5.00, 3.80, 3.90, 3.90, 3.90), Part 3 (5.80, 5.70, 5.90, 5.90, 6.00, 6.10, 6.00, 6.10), Part 4 (7.60, 7.70, 7.80, 7.70, 7.80, 7.80, 7.80, 7.70), and Part 5 (9.10, 9.30, 9.50, 9.30, 9.40, 9.50, 9.50, 9.50). Below the table is a horizontal scrollbar and an "OK" button.

	Parts	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6	Trial 7	Trial 8
	1	2.70	2.50	2.40	2.50	2.70	2.30	2.50	2.50
	2	5.10	3.90	4.20	5.00	3.80	3.90	3.90	3.90
	3	5.80	5.70	5.90	5.90	6.00	6.10	6.00	6.10
	4	7.60	7.70	7.80	7.70	7.80	7.80	7.80	7.70
	5	9.10	9.30	9.50	9.30	9.40	9.50	9.50	9.50

Fields - Buttons	Description
Parts	Parts throughout the operating range of measurement tool
Trial	Number times the part is measured
Reference Value	Measurement derived for each part using the best gage available
OK button	After all measurements entered, returns to MSA detail screen

Save Linearity Information

Once the measurements have been entered and the **OK** button pressed click on the **Apply** button.

Linearity Report

To view the Linearity report, click the **Analysis** button on the MSA detail screen.

Gage Id BGP-011693
Location QC
Characteristic Diameter
Manufacturer Mitutoyo
Size 0 to 6 inch

Description Vernier Caliper
Part Id CD2 thru CD10
Unit of Measure mm
Graduation 0.001 inch

Part	1	2	3	4	5
Reference Value	2.00	4.00	6.00	8.00	10.00
1	2.70	5.10	5.80	7.60	9.10
2	2.50	3.90	5.70	7.70	9.30
3	2.40	4.20	5.90	7.80	9.50
T 4	2.50	5.00	5.90	7.70	9.30
R 5	2.70	3.80	6.00	7.80	9.40
I 6	2.30	3.90	6.10	7.80	9.50
A 7	2.50	3.90	6.00	7.80	9.50
L 8	2.50	3.90	6.10	7.70	9.50
S 9	2.40	3.90	6.40	7.80	9.60
10	2.40	4.00	6.30	7.50	9.20
11	2.60	4.10	6.00	7.60	9.30
12	2.40	3.80	6.10	7.70	9.40


Part	1	2	3	4	5
Reference Value	2.00	4.00	6.00	8.00	10.00
1	0.70	1.10	-0.20	-0.40	-0.90
2	0.50	-0.10	-0.30	-0.30	-0.70
3	0.40	0.20	-0.10	-0.20	-0.50
B 4	0.50	1.00	-0.10	-0.30	-0.70
I 5	0.70	-0.20	0.00	-0.20	-0.60
A 6	0.30	-0.10	0.10	-0.20	-0.50
S 7	0.50	-0.10	0.00	-0.20	-0.50
8	0.50	-0.10	0.10	-0.30	-0.50
9	0.40	-0.10	0.40	-0.20	-0.40
10	0.40	0.00	0.30	-0.50	-0.80
11	0.60	0.10	0.00	-0.40	-0.70
12	0.40	-0.20	0.10	-0.30	-0.60
Bias Avg.	0.492	0.125	0.025	-0.292	-0.617

Slope a = -0.132	$t_a = 12.043$	$t_{SS,0.975} = 2.002$	Reject hypothesis that slope = 0
Intercept b = 0.737	$t_b = 10.158$	$t_{SS,0.975} = 2.002$	Reject hypothesis that intercept = 0

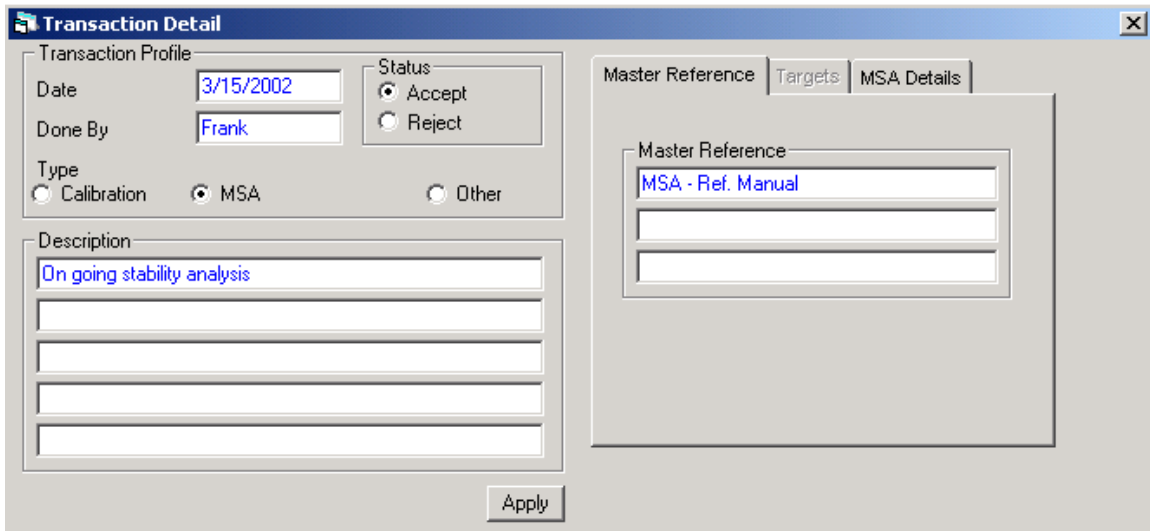
GUIDELINE

Measurement system linearity needs improvement.

Gage Stability Analysis

If the main Transaction window is displayed click on the **New**  tool bar button to start a new Transaction Detail record.

Set the **Type** of Transaction to **MSA** by enabling the option button.

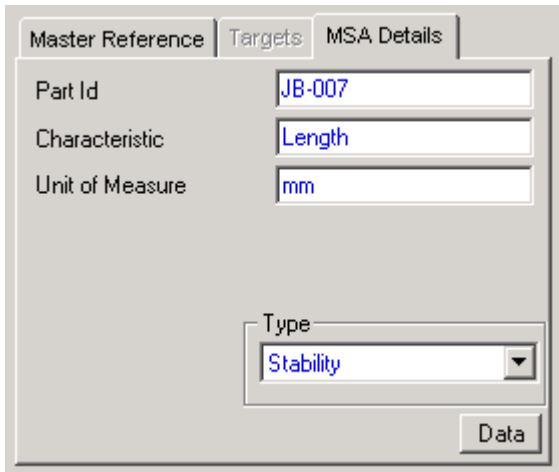


The Transaction Detail window is shown with the following fields and options:

- Transaction Profile**
 - Date: 3/15/2002
 - Done By: Frank
 - Type: ☒ Calibration, ☒ MSA, ☐ Other
 - Status: ☒ Accept, ☐ Reject
- Description**
 - On going stability analysis
- Master Reference** (tabbed view)
 - Master Reference: MSA - Ref. Manual
- Apply** button

Stability Details

Click the **MSA Details** tab and select **Stability** from the **Type** list.

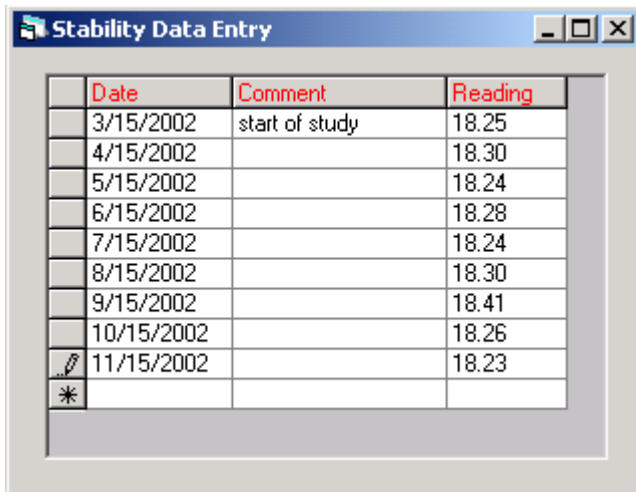


The MSA Details window is shown with the following fields and options:

- Master Reference** (tabbed view)
 - Part Id: JB-007
 - Characteristic: Length
 - Unit of Measure: mm
 - Type: Stability (dropdown menu)
 - Data** button

Measurement Entry

To enter the measurements, click on the **Data** button.



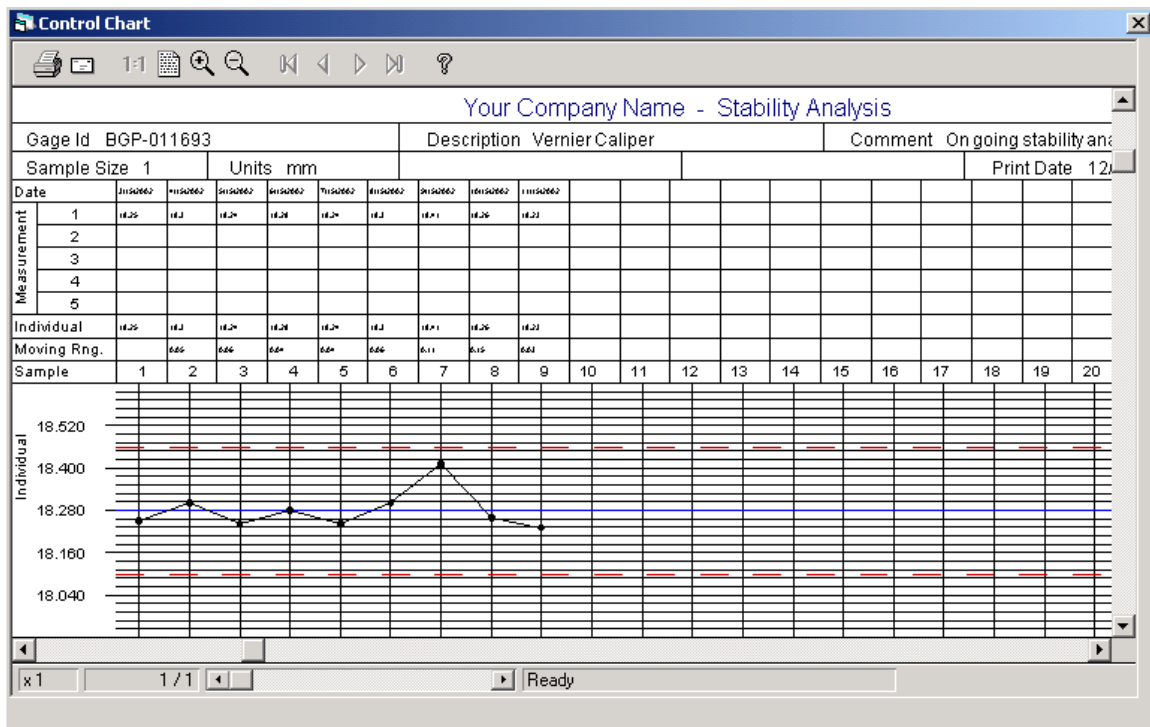
	Date	Comment	Reading
	3/15/2002	start of study	18.25
	4/15/2002		18.30
	5/15/2002		18.24
	6/15/2002		18.28
	7/15/2002		18.24
	8/15/2002		18.30
	9/15/2002		18.41
	10/15/2002		18.26
	11/15/2002		18.23
	*		

Save Stability Information


Once the measurements have been entered, press the down arrow key so the cursor is flashing in a blank cell. All data above the blank row is saved automatically.

Stability Report

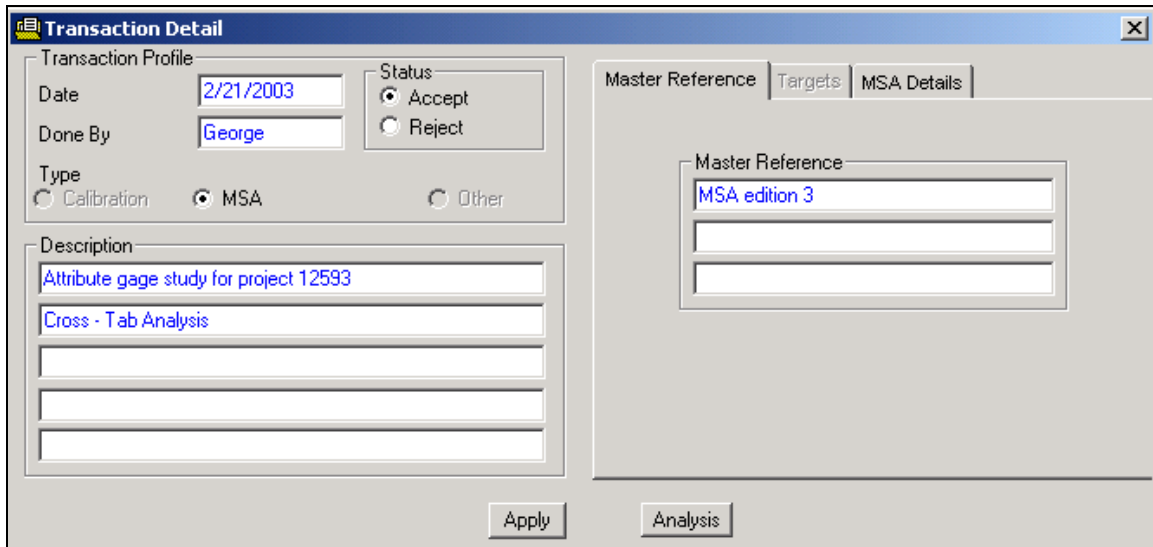
To view the Stability report, click the **Analysis** button on the MSA detail screen.



Attribute Gage Cross-Tab Study

If the main Transaction window is displayed click on the **New**  tool bar button to start a new Transaction Detail record.

Set the **Type** of Transaction to **MSA** by enabling the option button.



The **Transaction Detail** window is shown. The **Transaction Profile** section includes:

- Date:** 2/21/2003
- Done By:** George
- Status:** ☒ Accept, ☐ Reject
- Type:** ☐ Calibration, ☒ MSA, ☐ Other

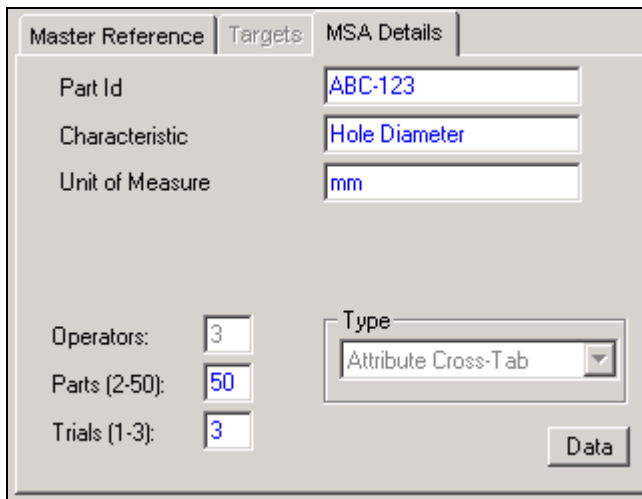
The **Description** section contains:

- Attribute gage study for project 12593
- Cross - Tab Analysis

The **Master Reference** section on the right has tabs for **Master Reference**, **Targets**, and **MSA Details**. The **Master Reference** tab is active, showing a list with "MSA edition 3". At the bottom are **Apply** and **Analysis** buttons.

Attribute Gage Study Details

Click the **MSA Details** tab and select **Attribute Cross-Tab** from the **Type** list.

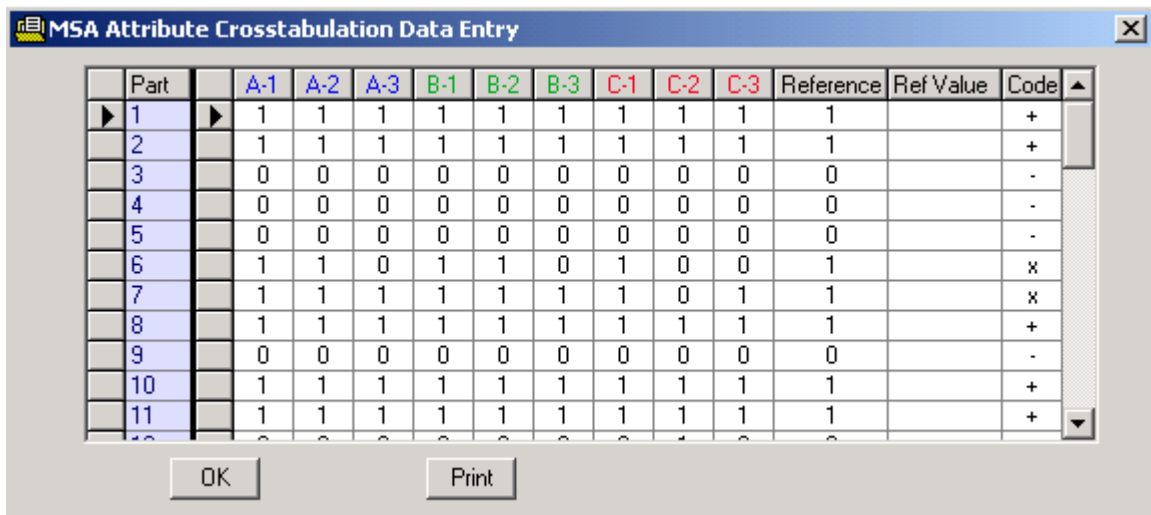


The **MSA Details** tab is active in the **Master Reference** section. It contains the following fields:

- Part Id:** ABC-123
- Characteristic:** Hole Diameter
- Unit of Measure:** mm
- Operators:** 3
- Parts (2-50):** 50
- Trials (1-3):** 3
- Type:** Attribute Cross-Tab (selected from a dropdown menu)
- Data** button

Result Entry

To enter the results, click on the **Data** button.



The image shows a software window titled "MSA Attribute Crosstabulation Data Entry". It contains a table with 13 columns: Part, A-1, A-2, A-3, B-1, B-2, B-3, C-1, C-2, C-3, Reference, Ref Value, and Code. The table has 11 rows of data. The first column (Part) is numbered 1 through 11. The next three columns (A-1, A-2, A-3) are labeled "Appraiser A Trial 1, Appraiser A Trial 2 etc.". The next three columns (B-1, B-2, B-3) are labeled "Appraiser B Trial 1, Appraiser B Trial 2 etc.". The next three columns (C-1, C-2, C-3) are labeled "Appraiser C Trial 1, Appraiser C Trial 2 etc.". The Reference column contains the value 1 for all rows. The Ref Value column contains the value 0 for all rows. The Code column contains the values +, -, ., and x for different rows. At the bottom of the window are two buttons: "OK" and "Print".

Part	A-1	A-2	A-3	B-1	B-2	B-3	C-1	C-2	C-3	Reference	Ref Value	Code
1	1	1	1	1	1	1	1	1	1	1		+
2	1	1	1	1	1	1	1	1	1	1		+
3	0	0	0	0	0	0	0	0	0	0		-
4	0	0	0	0	0	0	0	0	0	0		-
5	0	0	0	0	0	0	0	0	0	0		-
6	1	1	0	1	1	0	1	0	0	1		x
7	1	1	1	1	1	1	1	0	1	1		x
8	1	1	1	1	1	1	1	1	1	1		+
9	0	0	0	0	0	0	0	0	0	0		-
10	1	1	1	1	1	1	1	1	1	1		+
11	1	1	1	1	1	1	1	1	1	1		+

Fields - Buttons	Description
A-1, A-2 and A-3	Appraiser A Trial 1, Appraiser A Trial 2 etc.
Reference	True status is 1 (go) or 0 (no go)
Reference Value	Actual dimensional value
Code	True status is 1 and all trials show 1 gives code of + etc.
OK Button	After all results entered, returns to MSA detail screen
Print	Hard copy of data sheet





Save Attribute Study Information

Once the Go / No Go results have been entered and the **OK** button pressed click on the **Apply** button.

Attribute Cross-Tab Study Report

To view the Attribute report, click the **Analysis** button on the MSA detail screen.

Attribute Gage Crosstabulation



1:1



A x B Crosstabulation			B		Total
			0	1	
A	0	Count	44	6	50
		Expected Count	15.7	34.3	50.0
	1	Count	3	97	100
		Expected Count	31.3	68.7	100.0
Total	Count		47	103	150
	Expected Count		47.0	103.0	150.0

B x C Crosstabulation			C		Total
			0	1	
B	0	Count	42	5	47
		Expected Count	16.0	31.0	47.0
	1	Count	9	94	103
		Expected Count	35.0	68.0	103.0
Total	Count		51	99	150
	Expected Count		51.0	99.0	150.0

A x C Crosstabulation			C		Total
			0	1	
A	0	Count	43	7	50
		Expected Count	17.0	33.0	50.0
	1	Count	8	92	100
		Expected Count	34.0	66.0	100.0
Total	Count		51	99	150
	Expected Count		51.0	99.0	150.0

Kappa	A	B	C
A	-	.86	.78
B	.86	-	.79
C	.78	.79	-


GUIDELINE

Appraiser By Appraiser agreement is good

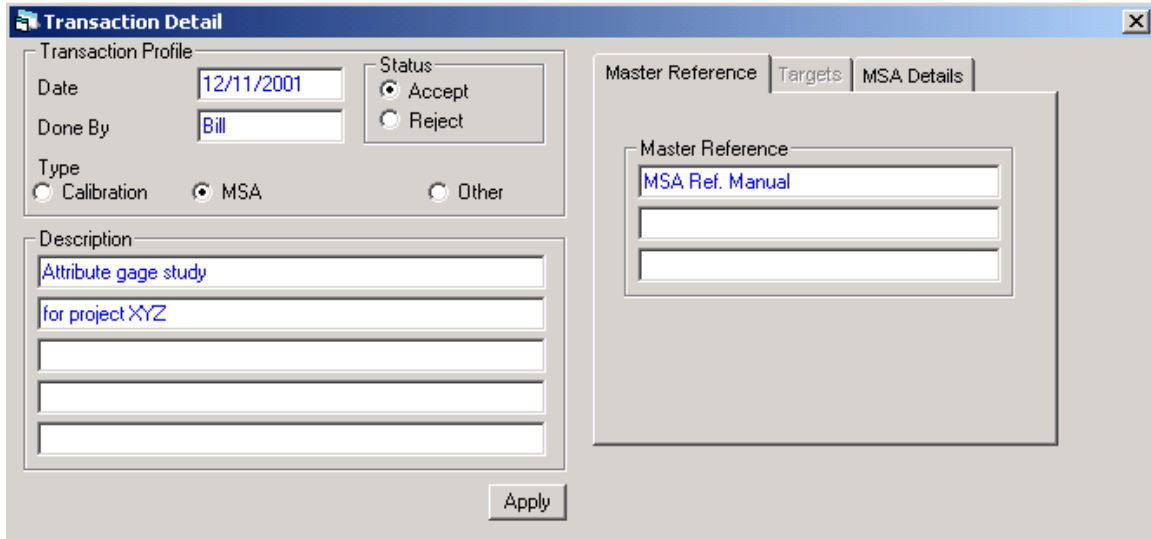
A x Ref Crosstabulation			Ref		Total
			0	1	

B x Ref Crosstabulation			Ref		Total
			0	1	

Attribute Gage Short Method Study

If the main Transaction window is displayed click on the **New**  tool bar button to start a new Transaction Detail record.

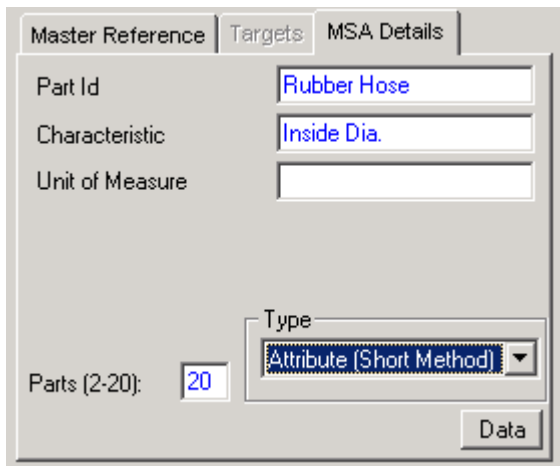
Set the **Type** of Transaction to **MSA** by enabling the option button.



The **Transaction Detail** window is shown. The **Transaction Profile** section includes fields for **Date** (12/11/2001), **Done By** (Bill), and **Status** (Accept/Reject). The **Type** is set to **MSA**. The **Description** field contains "Attribute gage study for project XYZ". The **Master Reference** section shows "MSA Ref. Manual". An **Apply** button is at the bottom.

Attribute Gage Study Details

Click the **MSA Details** tab and select **Attribute (Short Method)** from the **Type** list.



The **MSA Details** tab is selected. Fields include **Part Id** (Rubber Hose), **Characteristic** (Inside Dia.), and **Unit of Measure**. The **Type** dropdown is set to **Attribute (Short Method)**. The **Parts (2-20):** field shows 20. A **Data** button is at the bottom right.

Result Entry

To enter the **go** / **no go** results, click on the **Data** button.

Parts	Trial 1	Trial 2	Trial 1	Trial 2
1	G	G	G	G
2	G	G	G	G
3	NG	G	G	G
4	NG	NG	NG	NG
5	G	G	G	G
6	G	G	G	G
7	NG	NG	NG	NG
8	NG	NG	G	G
9	G	G	G	G
10	G	G	G	G
11	G	G	G	G

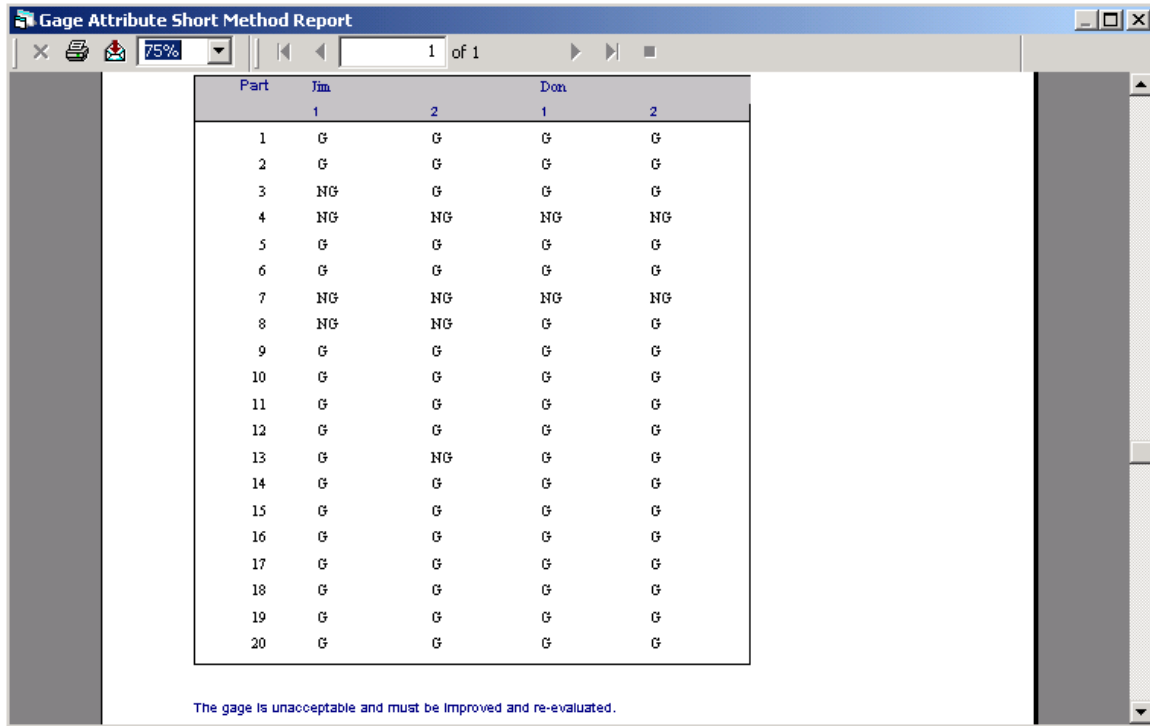
Fields - Buttons	Description
Operator	Name of operator – color coded
Part – Trial Content	Default set to G (go), to change enter NG (no go)
OK Button	After all G/NG results entered, returns to MSA detail screen

Save Attribute Study Information

Once the Go / No Go results have been entered and the **OK** button pressed click on the **Apply** button.

Attribute Short Method Study Report

To view the Attribute report, click the **Analysis** button on the MSA detail screen.



Part	Jim 1	Jim 2	Don 1	Don 2
1	G	G	G	G
2	G	G	G	G
3	NG	G	G	G
4	NG	NG	NG	NG
5	G	G	G	G
6	G	G	G	G
7	NG	NG	NG	NG
8	NG	NG	G	G
9	G	G	G	G
10	G	G	G	G
11	G	G	G	G
12	G	G	G	G
13	G	NG	G	G
14	G	G	G	G
15	G	G	G	G
16	G	G	G	G
17	G	G	G	G
18	G	G	G	G
19	G	G	G	G
20	G	G	G	G

The gage is unacceptable and must be improved and re-evaluated.

Gage Usage

In order to monitor the usage for a gage that is calibrated based on usage, click on **FILE – GAGE USAGE**. Only those gages that have been set up in gage detail to be calibrated by usage will be available on this screen.

Gage Usage

Gage Information

Gage Id: VC-007 Description: Vernier Caliper
Location: Tool Crib Available for Use: ☒

Gage Disposition

☒ IN Date In: 9-26-07 Available Days: 60
☐ OUT

Apply

Navigation: [Previous] [Next] Gage Record [Previous] [Next]

Fields - Buttons	Description
IN Option Button	Gage is currently in – not being used
Date In	Date gage brought in and no longer being used
OUT Option Button	Gage is currently out – being used - Date gage taken out needs to be entered
Available Days	Number of usage days available before calibration required
Apply Button	Stores settings and updates Available Days

Audit Trail

If the audit trail option is enabled, each time a transaction is edited, the pre-edit field contents are recorded.

The Transactions window displays Gage Information for Gage Id G-001, Location QC, and Description Micrometer. It includes fields for Last Calibration (7/25/2019), Due (8/26/2019), Last MSA, and Last Verification. Buttons for Calib. Label and Audit Trail are present. Below is a Transaction History table.

Type	Date	Done By	Description 1	Description 2	Description 3	Description 4
Calibration	6/10/2019	GP	Gage appears to be in good			
Calibration	7/25/2019	JP	Gage in good condition			

Click on the Audit Trail button

The Audit Trail dialog box shows options for History Range: All History (selected) and Enter date range. It includes From and To date fields, and OK and Close buttons.

At this point, one can retrieve all audit trail history or a specific date range.

The resulting Audit Trail report details the pre-edit field contents each time a Transaction is edited.

Transaction Audit Trail Report

1 of 1

The Pister Group

Transaction Audit Trail

Page 1 of 1
7/31/2019

Gage Id	G-001	Description	Micrometer
Location	QC		

Revision Date	Date	Status	Done By	Description
7/31/2019 11:28:03AM	7/25/2019	A	JP	Gage in good condition
	Before: 2.005			
	After: 2.000			
	Master Ref.: ASTM-001			
	Gage Used: GB-001			
7/31/2019 11:27:24AM	6/10/2019	A	GP	Gage appears to be in good condition
	Before: 2.003			
	After: 2.000			
	Master Ref.: ASTM-001			
	Gage Used: GB-001			

Report Options

It is possible to manipulate what is retrieved from the database prior to generating a report. For example the gages due for calibration could be filtered to include only gages of a certain type or for a particular date range etc.

If the data set is to include all gages, then the report options can be bypassed.

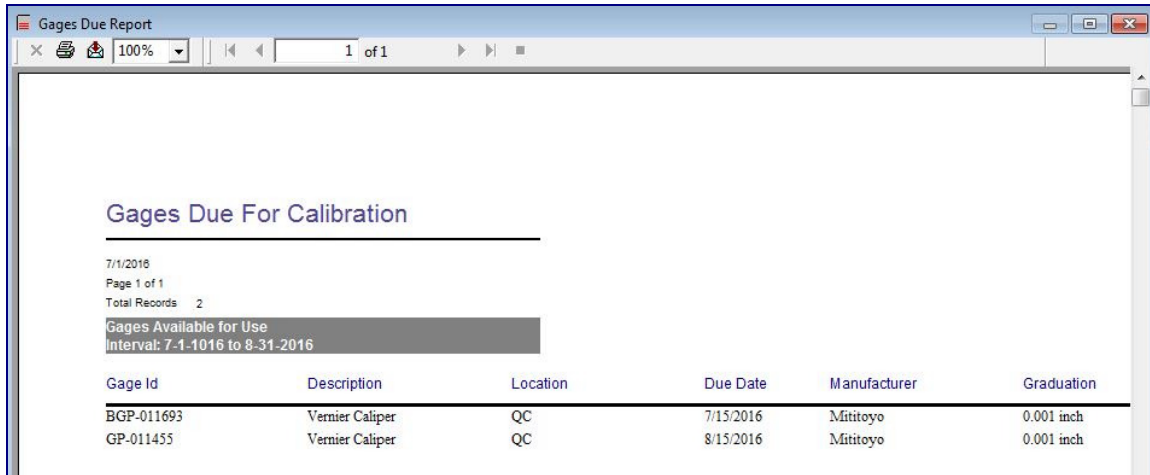
From the menu options at the top, click on the menu item **Report** and from the pull down, click on **Report Options**.

The screenshot shows a software window titled "Report Options". It features a tabbed interface with tabs for "Filter", "Sort", "Range", "Which", "Parts", and "GRR". The "Filter" tab is active, displaying a table with three columns: "Field Name", "From", and "To". The table contains three rows with pre-filled field names: "Gage Id", "Description", and "Location", followed by several empty rows. Below the table is a "Pick Gages" button. At the bottom of the window are "OK", "Reset", and "Cancel" buttons.



Tab - Buttons	Description
Filter Tab	Enter a from/to range for selected field name
Sort Tab	Sort list on desired field
Range Tab	Due by date: retrieve data set for a selected date range Due by gage usage: enter desired available days left
Which Tab	Data set to include gages available – not available or both If not available selected, reason codes can be identified
Parts Tab	Data set to include gages for specific part(s)
GRR	Specify criteria for GRR Summary report, eg. GRR<10%
Pick Gages Button	Data set to include only gages selected from a list
Reset Button	Default settings restored
OK Button	Accepts all the selected report options

Gages Due Report

This report lists gages due for calibration. The criteria can be as simple as those gages due currently or based on the various selection elements detailed in the report options segment.



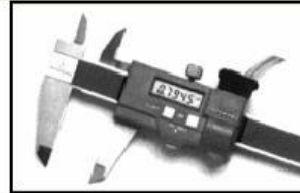
Gage Id	Description	Location	Due Date	Manufacturer	Graduation
BGP-011693	Vernier Caliper	QC	7/15/2016	Mitutoyo	0.001 inch
GP-011455	Vernier Caliper	QC	8/15/2016	Mitutoyo	0.001 inch

Buttons	Description
 Print Button	Prints full page hard copy
 Export Report	Send report to an external file / e-mail the report

Calibration Work Order

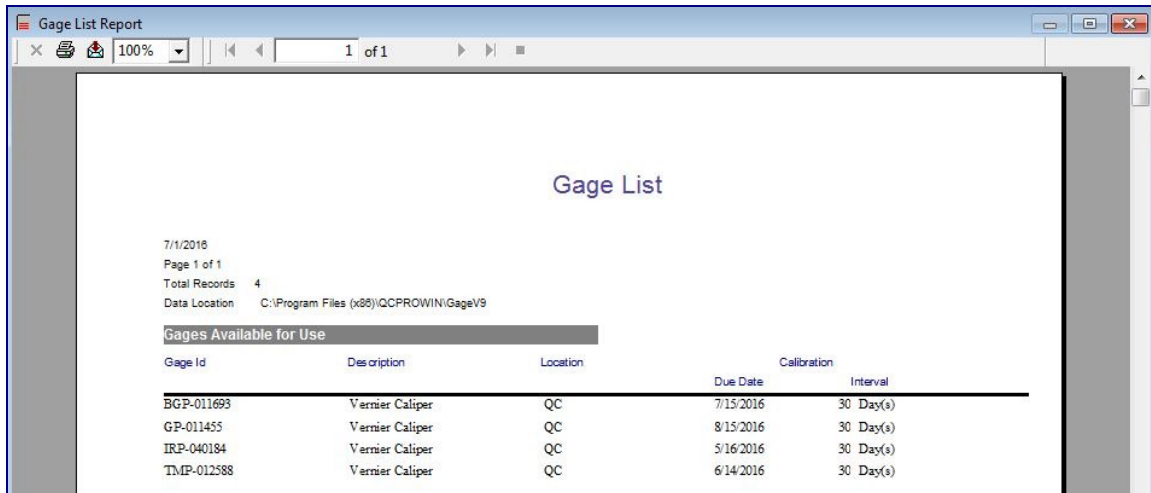
This report includes all the calibration details for the specific gage. Space is provided to enter Before/After values, signatures and other key items. The calibration procedure is printed out in full as well.

Calibration Work Order			
2/5/2014 Page 1 of 1			
Please be advised that the following gage is due for calibration on:		2/5/2015	
Gage Id	BGP-011693	Description	Vernier Caliper
Location	QC	Startup Date	7/16/2002
Calibration Interval	1 Year(s)	Last Calibration	2/5/2014
Manufacturer	Mititoyo		
Graduation	0.001 inch		
Size	0 to 6 inch		
Standard			
Description	1 inch GB	2 inch GB	
Std. Id.	GB-01	GB-02	
Target	1.000	3.000	
Tol +	0.001	0.001	
Tol -	0.001	0.001	
Before			
After			
Procedure P-01			
1) Check jaws for any nicks or burrs			
2) Ensure smooth movement of caliper jaws			
3) Complete steps detailed in document W-01			
Comment			
Calibration Gage Used			



Gage List Report

This report lists all gages that fall into the specified criteria set up in the report options segment.



The screenshot shows a software window titled "Gage List Report". The window has a standard toolbar with icons for print, save, and zoom, along with a "100%" zoom level and a "1 of 1" page indicator. The main content area displays the title "Gage List" in a large, bold font. Below the title, the following information is shown:

- 7/1/2016
- Page 1 of 1
- Total Records: 4
- Data Location: C:\Program Files (x86)\QCPROWIN\GageV9

A section titled "Gages Available for Use" is highlighted with a grey background. Below this section is a table with the following columns: Gage Id, Description, Location, Due Date, and Interval. The table contains four rows of data:

Gage Id	Description	Location	Due Date	Interval
BGP-011693	Vernier Caliper	QC	7/15/2016	30 Day(s)
GP-011455	Vernier Caliper	QC	8/15/2016	30 Day(s)
IRP-040184	Vernier Caliper	QC	5/16/2016	30 Day(s)
TMP-012588	Vernier Caliper	QC	6/14/2016	30 Day(s)

Gage History

This report provides a summary of all activities performed on the gage.

Gage History Report

7/1/2016
Page 1 of 1

Gage Id GP-011455 Description Vernier Caliper
Location QC Startup Date 7/1/2016
Calibration Interval 30 Day(s) Last Calibration 7/14/2016 Due 8/15/2016
Last MSA

Comment

Manufacturer Mitutoyo
Graduation 0.001 inch
Size 0 to 6 inch

Standard		
Target	2.000	4.000
Tol +	.001	.001
Tol -	.001	.001

Type	Date	Status	Done By	Description
CAL	6/14/2016	A	John	Calibration - OK
	Before:	2.001	3.999	
	After:	2.000	4.000	

GRR Summary

This report provides a tabulation of GRR results.

The information displayed can be filtered to show only gages with a GRR of 10% or less or other criteria.

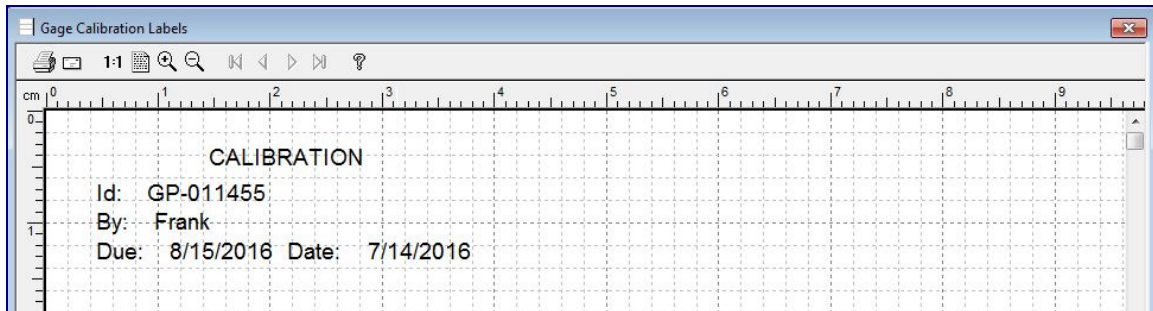
100% 1 of 1					
Your Company Name					
MSA GRR Summary					
9/26/2007					
Page 1 of 1					
Gage Id	Description	Date	Study Description	Part Id	GRR
BGP-011693	Micrometer	9/26/2007	Toyota job - T019	Gasket 550114	4.59 %
TM-012588	Vernier Caliper	12/6/2007	GM pilot project part G-001	Shaft	6.84 %

Gage Calibration Labels

There is a one-time label layout setup required prior to generating calibration labels. Refer to the **Other Features** section of this manual for setup instructions.

The label fields, text font, size of label and other elements are set up by the user.

Using the **Report Options** settings, it is possible to get labels for a single gage or a set of gages.

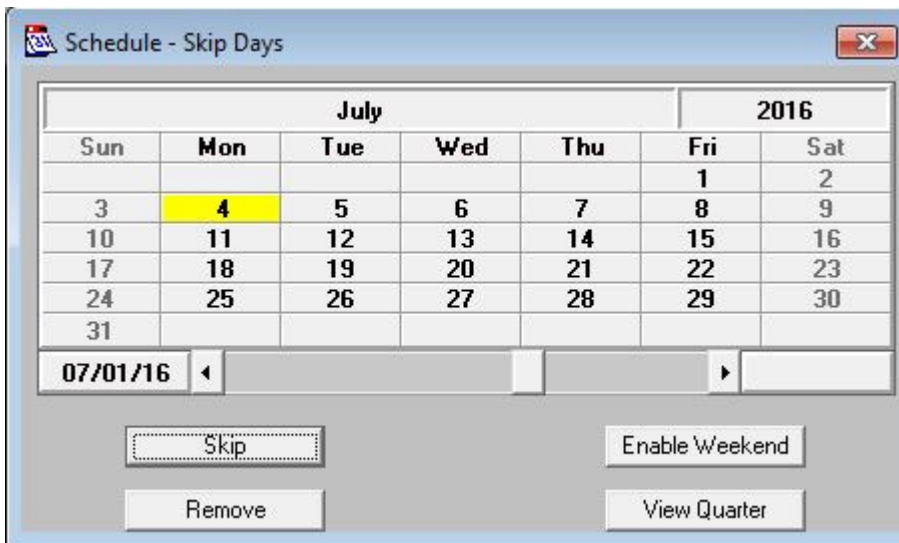


Note: If the length / height exceed right / bottom margins fields will be blank

Skip Days

This feature lets you block off days such as vacation and plant shut downs so that gage activity will not be due on these days.

To set up this feature, click on the menu item **View** and from the pull down click on **Skip Days**.

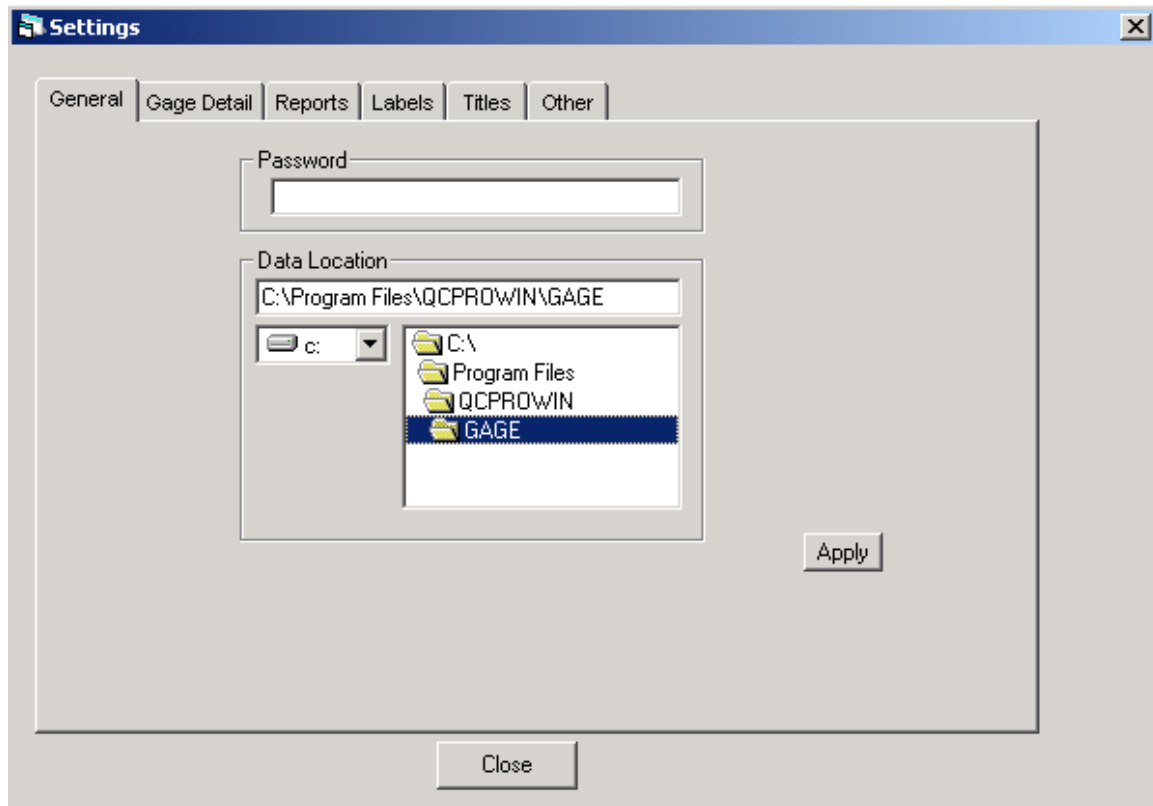


Buttons	Description
Skip	Click the day and then Skip button – skipped day in yellow highlight
Enable Weekend	Toggle between enable/disable calibrations on weekends
View Quarter	View a 3 month calendar
Remove	Click the day and then Remove button – return day to regular

General Settings

The location of the data base, 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
Password	Restricts access to gage system - optional
Data Location	Identify drive and folder where data base is located
Apply Button	Saves the settings

Gage Detail Settings

The default settings for items such as the type of procedure, calibration interval, custom field titles, additional fixed gage fields and other elements are modified by clicking on the menu item **View** and from the pull down **Settings**.

Click on the **Gage Detail** tab.

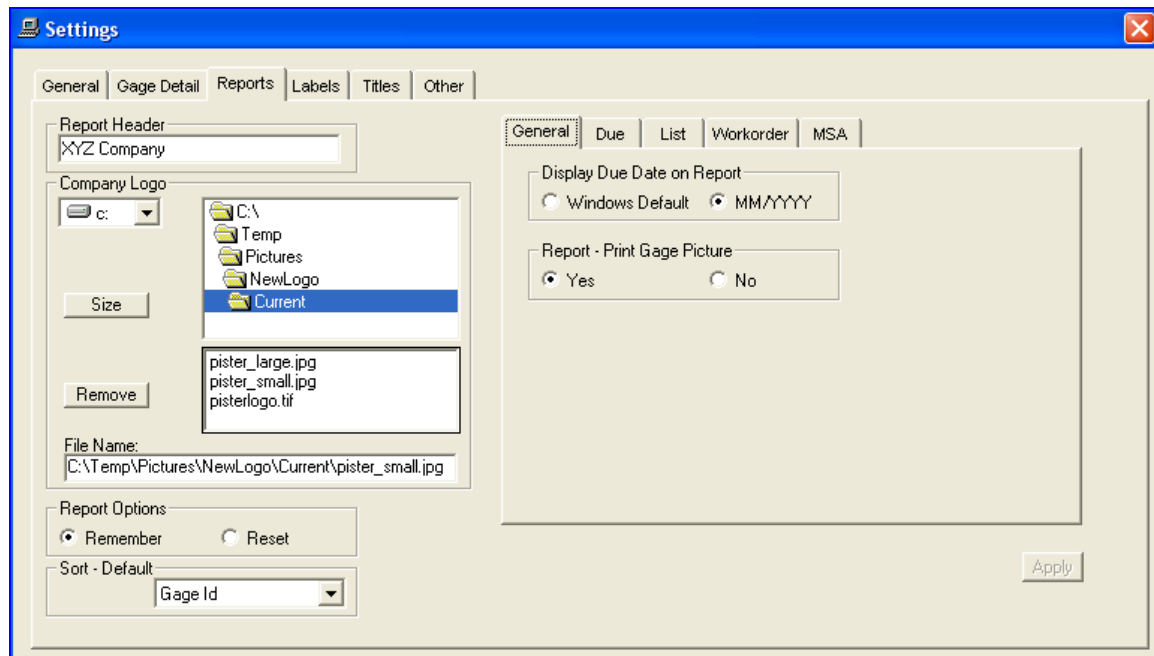
The screenshot shows the 'Settings' application window with the 'Gage Detail' tab selected. The 'Defaults' section includes options for Procedure (Global), Calibration Interval (30), Interval Unit (Day), Uncertainty (Disabled), Use Additional Gage Fields (No), Show Standard Range as (+/- Tol), Transaction: Check for Incomplete Data (No), and Audit Trail (Disabled). The 'Custom Field Names' section shows a list of 5 fields: 1 Manufacturer, 2 Graduation, 3 Size, 4, and 5. The 'Unavailable Reasons' section shows a table with a 'Reason' column and a list of reasons: Lost, Out for Calibration, and Out for Repair. There are 'Apply' buttons at the bottom of the Defaults and Custom Field Names sections.

Fields - Buttons	Description
Procedure Type	Generic global or unique procedure for each gage
Calibration Interval	Period between calibrations
Interval Unit	Days, week, month, year or usage
Uncertainty	Measurement uncertainty calculations for standards
Custom Field Names	Titles for each custom field, applied to all gages
Additional Gage Fields	3 more fields can be added: part, revision and customer no.
Standard Range	Before/After tolerance range – either +/- from nominal or actual upper/lower
Transaction Check	Option to inform user that all fields must have an entry
Audit Trail	Option to record and report on transaction edits
Unavailable Reasons	User defined reasons for a gage being unavailable
Apply Button	Save gage detail settings

Report Settings

The default settings for items such as report header, GRR comparison basis, how due dates are displayed and other elements are modified by clicking on the menu item **View** and from the pull down **Settings**.

Click on the **Reports** tab.



Fields - Buttons	Description
Report Header	Typically company name – will appear on all reports at top
Report Options	Filter settings can be retained for reporting
Company Logo	Identify drive and file location for company logo - appears at bottom
General - Tab	Format of due date - show gage picture on report
Due - Tab	Gages due form no. – fields to appear – due gages on program start
List - Tab	Gage list form no. – fields to appear – optional titles etc.
Work order - Tab	Gage work order form no. – submitted by etc.
MSA - Tab	Display guidelines –GRR percent based on TV or tolerance
Apply Button	Saves report settings

Calibration Label Settings

The settings for calibration label elements are modified by clicking on the menu item **View** and from the pull down **Settings**.

Click on the **Labels** tab.

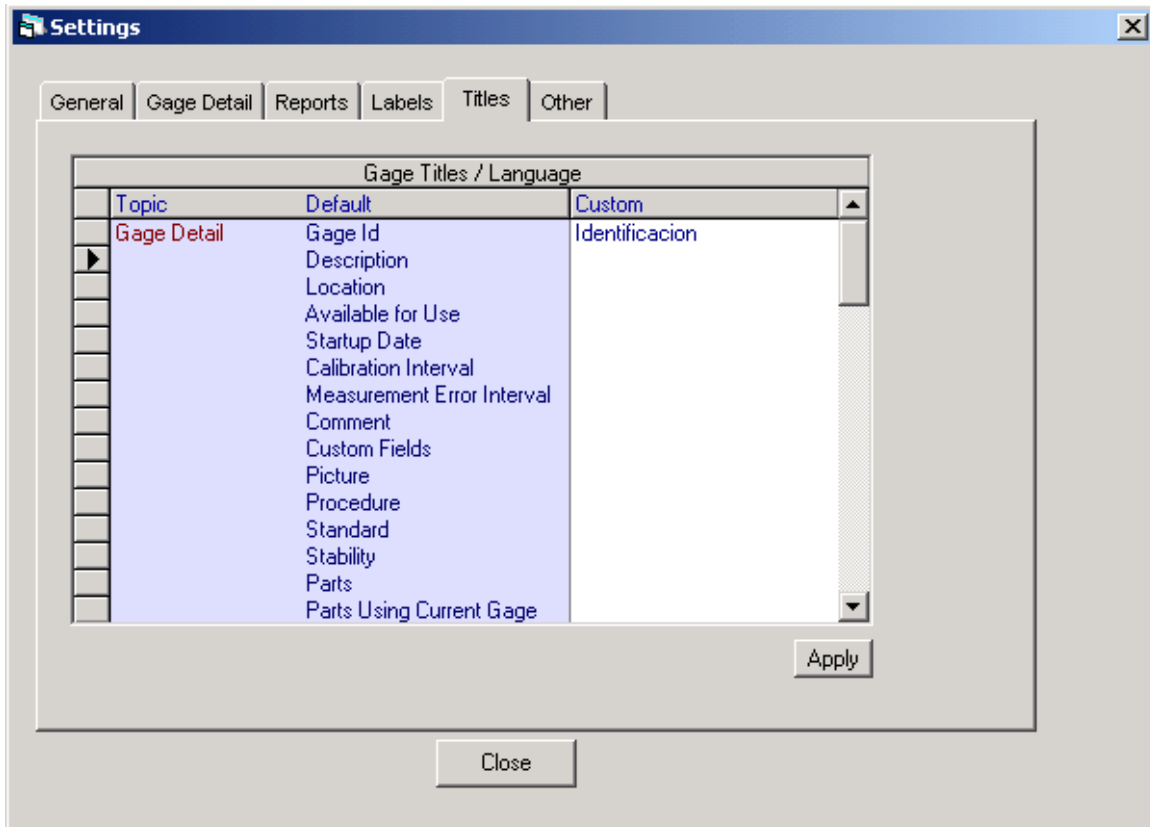
The screenshot shows the 'Settings' dialog box with the 'Labels' tab selected. The dialog has several sections: 'Label Specifics' with fields for # Rows (4), # Cols (4), Font Size (6), Font (Arial), Units (Inches), Length (1.75), Width (0.5), Top 1st label (0.5), Left Edge Col. 1 (0.31), 2 (2.36), 3 (4.37), 4 (6.44), 5 (), Start Print Row (1), and Col (1). 'Label Contents' has three rows of fields for Title Field 1 (Id), 2 (By), and 3 (Due), each with a dropdown menu. 'Label Appearance' has Orientation (Portrait), Title Background (White), and Label Title (CALIBRATION). There are 'Apply' and 'Close' buttons at the bottom.

Fields - Buttons	Description
# Rows	For a page, how many rows of labels
# Columns	For a page, how many columns of labels
Length	Length of individual label
Width	Width of individual label
Top 1 st label	Distance from top of page to top of first label
Left Edge Col. 1	Distance from left edge of page to left edge of first column of labels
Title Field 1	Title for first field on label
Label Content	Select field content from drop down list
Title Background	Default is white background black print for title
Label Title	Title can be changed, default title is CALIBRATION
Apply Button	Saves calibration label settings

Language Settings

The text labels displayed on various windows can be modified (different language) by clicking on the menu item **View** and from the pull down **Settings**.

Click on the **Titles** tab.



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

Other Settings

Access code, text color and other elements can be modified by clicking on the menu item **View** and from the pull down **Settings**.

Click on the **Other** tab.

The screenshot shows a 'Settings' window with the 'Other' tab selected. The 'Set Color' section includes a 'Color Palette' button and a 'text field'. The 'Audit Trail' section has 'Yes' and 'No' radio buttons. The 'Access Code' section displays 'Install Date: 4/14/2016', 'System Access: 42458', and 'License Key: 200-398764848392'. An 'Apply' button is located at the bottom right.

Fields - Buttons	Description
Color Palette	Changes the text color
Access Code Key	Code value to give full rights to the software
Apply Button	Saves the settings

Repair Data Base

It is possible for the database **GAGES.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 **GAGES.MDB** database file to avoid loss of information.

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

Compact Data Base

When gages or transactions are deleted, they are only marked as deleted but remain physically in the database. The compact option will compress the database and physically remove any deleted gages and transactions.

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

The compact option should be used every few months to clean up the database and **not** each time you delete a gage or transaction.

Add Field to Data Base

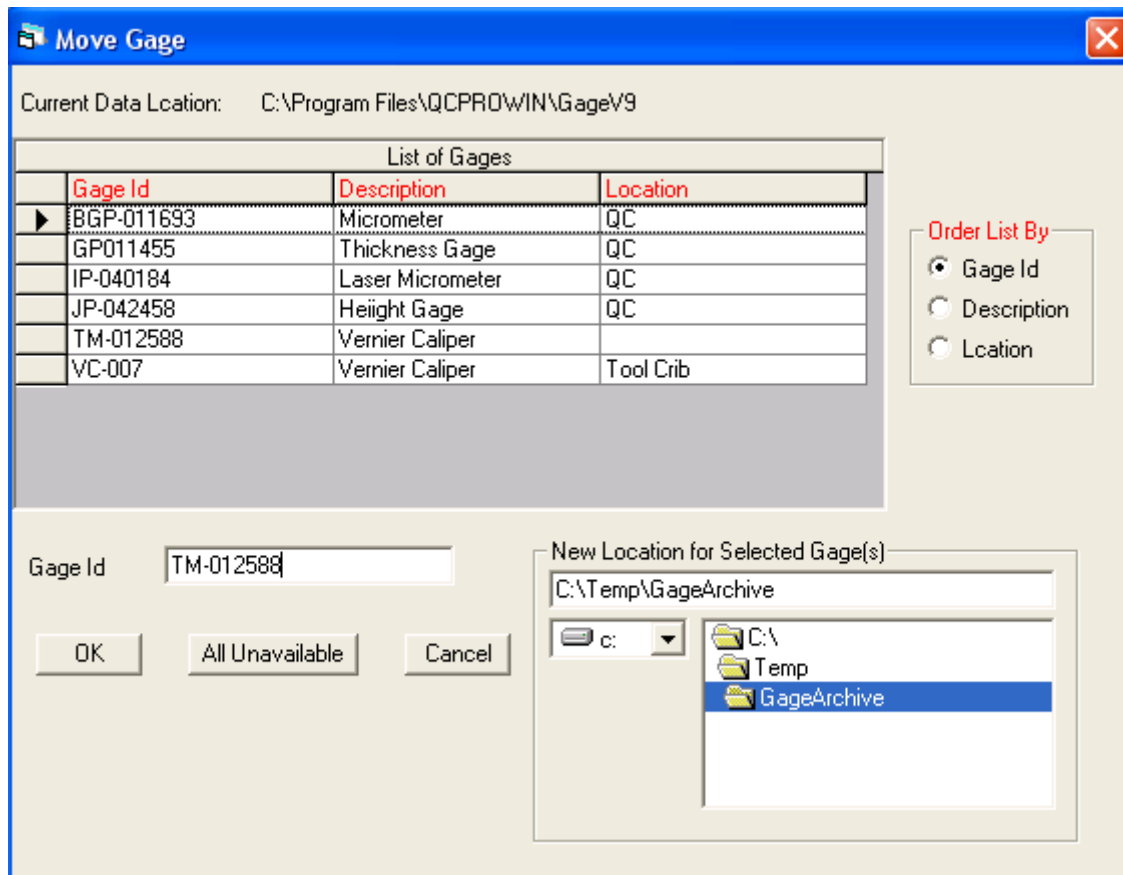
When we modify elements of the program, the database tables/fields may be affected. The add field option will add the necessary information to the database.

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.

Move a Gage

When you work with multiple gage databases, it can be helpful to be able to move a gage from one database to another. To access this feature click File, Accessories, Move Gage from the startup screen. A sample Move Gage screen follows:



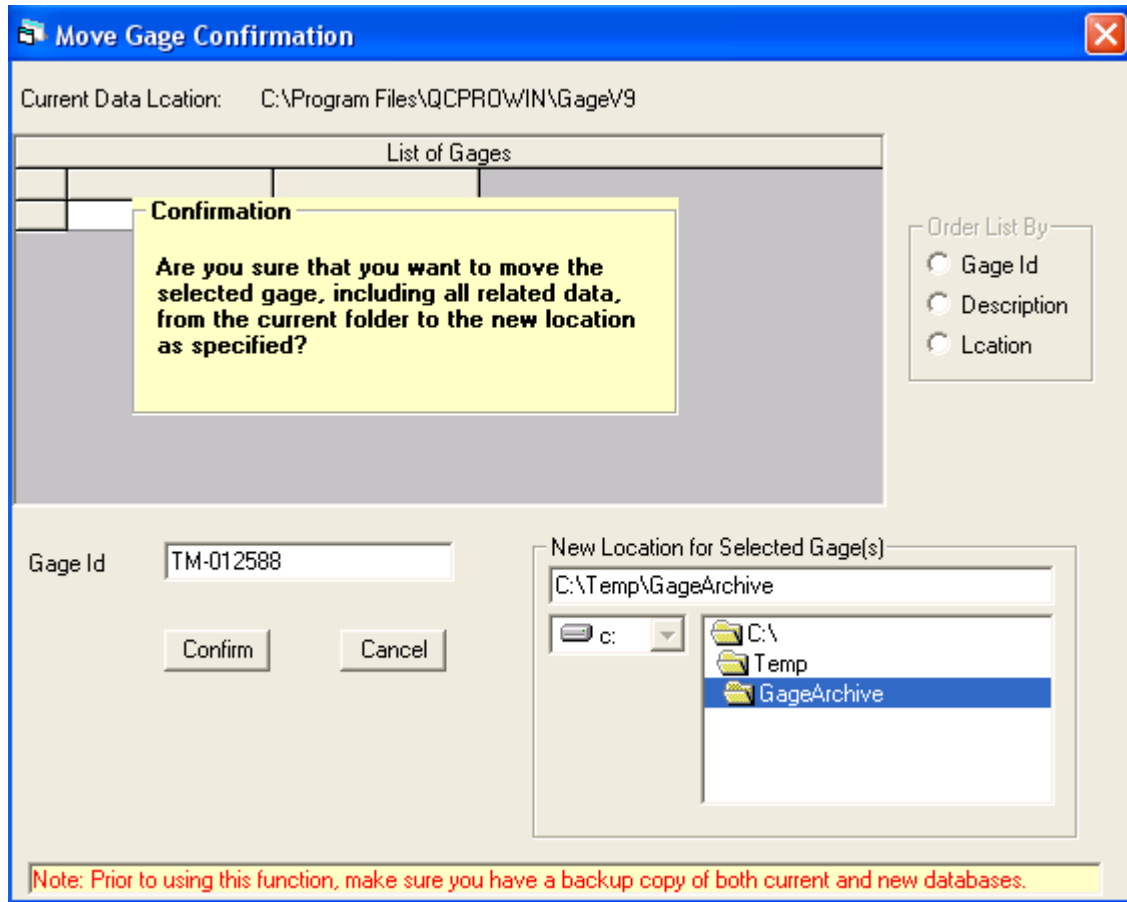
To select the gage to move, double click from the list or type in the gage id. The list can be sorted by gage id (default) or description, or location.

All unavailable for use gages can be moved in bulk if desired by clicking on the button **All Unavailable**.

In order to move a gage, the new data location must be specified. This location must be different from the current location. A Gages.mdb file must exist in this new location. This file can be empty or already contain gages.

If the selected gage id already exists in the new data location, an error message is given and the move function does not take place.

Once the gage id is selected and a new data location is specified, click OK. A confirmation screen is provided as shown in the following example:



As indicated on the confirmation screen, it is strongly suggested that you have a backup copy of both the current and new databases prior to using this function. If there is a failure during the move function, it is possible to incur some data loss.

Click  to complete the move.

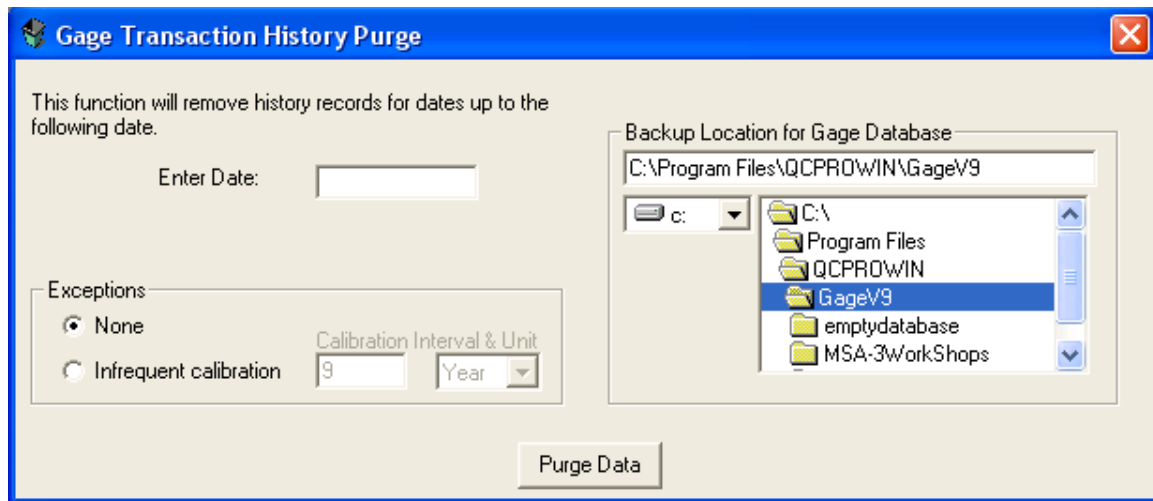
The gage with all associated data will first be copied to the new location. Once this completes, it will be deleted from the current location.

Gage History Purge

This function enables you to delete old transaction history for all the gages in the database.

To remove transaction history for only one gage, a function is available from the transaction screen using the Edit pull down menu.

Click on FILES – ACCESSORIES – GAGE HISTORY PURGE



Prior to purging data, a backup copy of the database is made. This file is named GagesBeforePurge.MDB. You can specify the location of this backup file. The default location is the current data location. If the purge function fails or it is found that wrong data was removed, you can rename this file back to Gages.MDB and place it in the current data location to restore your data.


Each time the purge function is performed, the backup file is replaced.

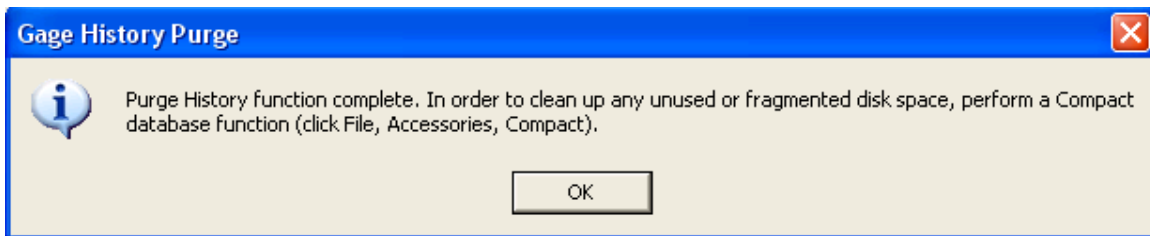
If it is not possible to make a backup copy, the purge function is unable to complete.

Enter the date you want to purge data up to. For example, if you want to remove all transactions up to the beginning of 2003, enter a date of 12/31/2002.

If you want to exclude some gages that have an infrequent calibration interval, you can click "Infrequent Interval" and specify the calibration interval and unit. The default is 9 years. For example, if you specify 3 years then any gages that are calibrated every 3 or more years will be excluded from the purge function and their history will be retained.

Note: If you specify 6 months as the interval and unit, gages with a calibration interval of 6 or more months will be excluded BUT gages calibrated in any other unit (days, years) will be included in the purge.

To complete the purge, click . A popup screen will be displayed at completion:



As noted, a compact function will clean up the database file, especially if many records are deleted.

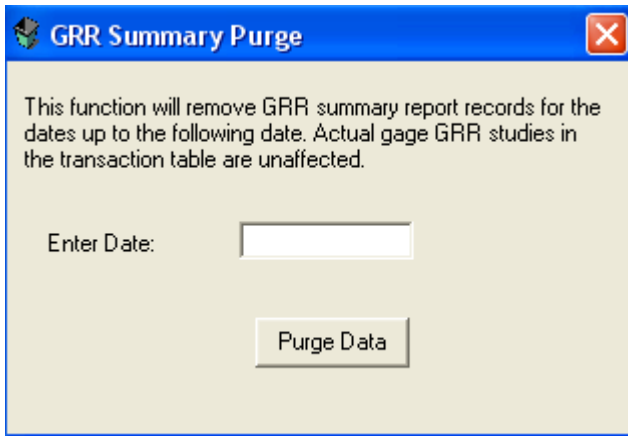
The purge function will take some time to complete if there are many gage records and large volume of transactions.

Purge Records from Summary Table

Over time, the GRR summary table will become large.

A function is available to remove old records.

To access this click on FILE – ACCESSORIES – GRR SUMMARY PURGE.



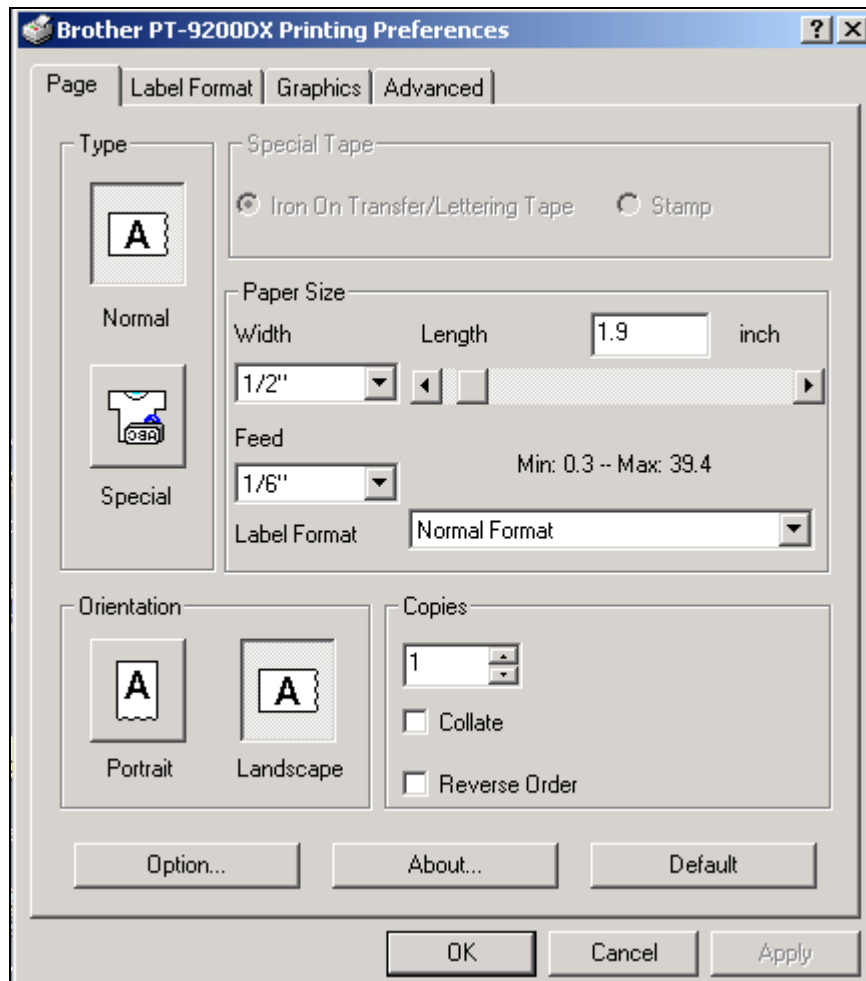
All records up to and including the entered date will be removed.

Brother P-Touch Printer Driver

Install the printer driver for the Brother model PT-9200DX and set it as the default printer driver.

Printing Preferences

The following page printing preferences should be set.



Fields - Buttons	Description
Page Size - Width	Set the label width to 1/2"
Page Size - Length	Set the label length to 1.9 inches
Orientation	Set the direction of printing to landscape
Apply	Saves the settings

Calibration Label Settings

The settings for calibration label elements are modified by clicking on the menu item **View** and from the pull down **Settings**.

Click on the **Labels** tab.

Enter the settings detailed below to configure the calibration label to work with the P-touch printer.

The screenshot shows a 'Settings' dialog box with the 'Labels' tab selected. The dialog is divided into several sections: 'Label Specifics', 'Label Appearance', and 'Label Contents'. In 'Label Specifics', '# Rows' is 1, '# Cols' is 1, 'Font Size' is 6, 'Font' is Arial, 'Units' are set to Inches, 'Length' is 1.8, 'Width' is 0.5, 'Top 1st label' is 0.01, 'Left Edge Col. 1' is 0.1, and 'Start Print Row' and 'Col' are both 1. In 'Label Appearance', 'Orientation' is Landscape and 'Title Background' is Black. In 'Label Contents', 'Title Field 1' is 'Id', 'Gage Id' is selected, and 'Date' is selected for the last field. The 'Label Title' is 'CALIBRATION'. An 'Apply' button is at the bottom right.

Fields - Buttons	Description
# Rows	Set number of rows to 1
# Columns	Set number of columns to 1
Length	Set length of label to 1.8 inches
Width	Set width of label to 0.5 inches
Top 1 st label	Set distance from top of label to start of printing at 0.01 inch
Left Edge Col. 1	Set distance from left edge of label to start of printing at 0.1 inch
Title Field 1	Title for first field on label
Label Content	Select field content from drop down list
Orientation	Set to landscape printing for lettering on tape
Title Background	Set to black background, white text for label title
Apply Button	Saves calibration label settings