Universal Gage Interface

LMI Corporation
101 N. Alloy Dr.
www.lmicorporation.com
Phone 810.714.5811 • Fax 810.714.5711

Updated 3/13/2018

Table of Contents

TABLE OF CONTENTS **2**

WARRANTY **6**

SUPPORT **7**

CUSTOMER SERVICE 7
LMI ON-SITE TRAINING & PHONE SUPPORT 7
RETURNS FOR SERVICE 7

SYSTEM OVERVIEW **8**

ABOUT THIS MANUAL 8

UGI SOFTWARE REQUIREMENTS **9**

SOFTWARE INSTALLATION **10**

SECTION I. STANDARD DATA COLLECTION **13**

SECTION 1A. STANDARD DATA COLLECTION MODE 14
Masterfile Setup *14*
Partfile Name and Save *14*
Partfile Defaults *15*
Partfile Gages *15*
Partfile Graphics *18*
Partfile Inputs *19*
Partfile Exports *22*
SECTION 1B. AUTOMATED DATA COLLECTION USING A BARCODE 24
Masterfile Setup *24*

SECTION II. AUTOGAGE SYSTEM CONFIGURATION **26**

Masterfile Setup *26*
Partfile Name and Save *28*
Partfile Defaults *29*
Partfile Gages *29*
Partfile Graphics *31*
Partfile Inputs *32*
Partfile Exports *35*
Calibration *37*

SECTION III. SEALGAP SYSTEM CONFIGURATION **38**

Masterfile Setup *39*
Partfile Name and Save *39*
Partfile Defaults *40*
Partfile Gages *40*
Partfile Graphics *42*
Partfile Inputs *44*
Partfile Exports *46*

SECTION IV. ADDITIONAL PARTFILE CONFIGURATION **49**

CALCULATIONS 49
ATTRIBUTES 49
KEYBOARD ENTRIES 50
Entering Keyboard points in the runtime: *50*

SECTION V. MASTER SETTINGS **51**

Global Master Settings *51*
Initial Partfile Settings *52*
Default Settings *53*
Gage Settings *54*
Graphic Settings *55*
Sequence Settings *55*
Attributes *56*
Printer Settings *57*
Shift Settings *58*
MUX Settings *59*
Serial Automation *60*
BPI MUX Box Setup *61*
Work Insts *62*
User Defined Input Settings *63*
Export Settings *64*
Optional Step Settings *64*
Runtime Settings *65*
Calibration *65*
Charting *66*

ADDENDUM: OPTIONAL STEPS 67

REASONABLE LIMITS 67
RATE OF CHANGE 67
NULL INDICATOR 69
SUMMARY SCREEN 69
SEQUENCE EDITOR 70
Sequence Editor – Toolbar *76*
Sequence Editor – Navigation *76*

User License Agreement

PLEASE READ CAREFULLY: THE USE OF THIS SOFTWARE IS SUBJECT TO THE SOFTWARE LICENSE TERMS OF LMI Corporation, INC. AND OTHER LICENSORS WHO'S SOFTWARE MAY BE BUNDLED WITH THIS PRODUCT.BY YOUR USE OF THE SOFTWARE INCLUDED WITH THIS PRODUCT YOU AGREE TO THE LICENSE TERMS REQUIRED BY THE LICENSOR OF THAT SOFTWARE, AS SET FORTH BELOW. IF YOU DO NOT AGREE TO THE LICENSE TERMS APPLICABLE TO THE SOFTWARE, YOU MAY RETURN THE ENTIRE UNUSED PRODUCT TO THE SOURCE FROM WHICH YOU OBTAINED IT.

LMI Corporation Software License Agreement
(Single User, Non-Networked Applications)

In return for acquiring a license to use the LMI Corporation software, which may include software from third party licensors and patches made available by LMI Corporation ("Software"), and the related documentation, you agree to the following terms and conditions:

1. License. This Agreement grants you ("Licensee") a license to:
(a) use the Software on a single computer system, which is not intended for use by more than five (5) users; and (b) make one copy of the Software in machine readable form solely for back-up purposes, provided you reproduce LMI Corporation's copyright proprietary legends. As used in this license, the Software is "in use" when it is either loaded into RAM or installed on a hard disk or other permanent memory device. The Software may be "in use" on only one computer at any given time. (Different license terms and fees are applicable for networked or multiple user applications.) Notwithstanding the foregoing, the Software may be used on the home, laptop or other secondary computer of the principal user of the Software, and an additional copy of the Software may be made to support such use. As a specific condition of this license, you agree to use the Software in compliance with all applicable laws, including copyright laws, and that you will not copy, transmit, perform or distribute any audio or other content using the Software without obtaining all necessary licenses or permissions from the owner of the content.

2. Restrictions. You may not distribute copies of the Software to others or electronically transfer the Software from one computer to another over a network. You are not authorized to use any licensed codecs in the Software or the Software itself in real time broadcasting (terrestrial, satellite, cable or other media) or broadcasting via the Internet or other networks such as, but not limited to, intranets, etc. An independent license for any such use is required. You may not post or otherwise make available the Software, or any portion thereof, in any form, on the Internet. You may not use the Software in a computer service business, including in time sharing applications. The Software contains trade secrets and, in order to protect them, you may not decompile, reverse engineer, disassemble, or otherwise reduce the Software to a human-perceivable form. YOU MAY NOT MODIFY, ADAPT, TRANSLATE, RENT, LEASE, LOAN, RESELL FOR PROFIT, DISTRIBUTE, NETWORK OR CREATE DERIVATIVE WORKS BASED UPON THE SOFTWARE OR ANY PART THEREOF.

3. Ownership of Software. As Licensee, you own the media upon which the software is recorded or fixed, but LMI Corporation and its licensors retain title and ownership of the Software recorded on the original media and all subsequent copies of the Software, regardless of the form or media in which or on which the original and other copies may exist. This license is not a sale of the Software or any copy.

4. Confidentiality. You agree to maintain the Software in confidence and that you will not disclose the Software to any third party without the express written consent of LMI Corporation. You further agree to take all reasonable precautions to preclude access of unauthorized persons to the Software.

5. Term. This license is effective until January 1, 2045, unless terminated earlier. You may terminate the license at any time by destroying the Software (including the related documentation) together with all copies or modifications in any form. LMI Corporation will have the right to terminate our license immediately if you fail to comply with any term or condition of this Agreement. Upon any termination, including termination by you, you must destroy the Software (including the related documentation), together with all copies or modifications in any form.

6. Limited Warranty. LMI Corporation and its Licensors warrants only that the Software will perform substantially in accordance with the accompanying written documentation for a period of thirty (30) days from the date of your purchase receipt. LMI CORPORATION AND ITS LICENSORS DO NOT AND CANNOT WARRANT THE RESULTS YOU MAY OBTAIN BY USING THE SOFTWARE OR DOCUMENTATION. THE FOREGOING STATES THE SOLE AND EXCLUSIVE REMEDIES LMI CORPORATION AND ITS LICENSORS WILL PROVIDE FOR BREACH OF WARRANTY. EXCEPT FOR THE FOREGOING LIMITED WARRANTY, LMI CORPORATION AND ITS LICENSORS MAKE NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED, AS TO NON-INFRINGEMENT OF THIRD PARTY RIGHTS, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow the exclusion of implied warranties or limitations on how long an implied warranty may last, so the above limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

The entire liability of LMI Corporation and its Licensors, and your exclusive remedy for a breach of this warranty, shall be: (a) the replacement of any Software not meeting the above limited warranty which is returned by you; or (b) if LMI Corporation or its distributor is unable to deliver replacement Software you may terminate this Agreement by returning the Software and your money will be refunded. If you have purchased this Software bundled with a computer hardware product, you must return the Software to the computer hardware manufacturer.

8. Limitation of Liability. IN NO EVENT WILL LMI CORPORATION OR ITS LICENSORS BE LIABLE TO YOU FOR ANY INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR LOSS OF DATA, EVEN IF LMI CORPORATION OR A LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY. Some states do not allow the exclusion or limitation of special, incidental, or consequential damages, so the above limitation or exclusion may not apply to you.

9. Export. You acknowledge that the laws and regulations of the United States and other countries may restrict the export and re-export of the Software. You agree that you will not export or re-export the Software or documentation in any form in violation of applicable United States and foreign law.

10. Indemnity. You agree that LMI Corporation shall have no liability whatsoever for any use you make of the Software. You shall indemnify and hold harmless LMI Corporation from any third party claims, damages, liabilities, costs and fees (including reasonable attorney fees) arising from your use of the Software as well as from your failure to comply with any term of this Agreement.

11. Government Restricted Rights. The Software is subject to restricted rights as follows. If the Software is acquired under the terms of a GSA contract: use, reproduction or disclosure is subject to the restrictions set forth in the applicable ADP Schedule contract. If the Software is acquired under the terms of a DoD or civilian agency contract, use, duplication or disclosure by the Government is subject to the restrictions of this Agreement in accordance with 48 C.F.R. 12.212 of the Federal Acquisition Regulations and its successors and 49 C.F.R. 227.7202-1 of the DoD FAR Supplement and its successors

12. General. You acknowledge that you have read this Agreement, understand it, and that by using the Software you agree to be bound by its terms and conditions. You further agree that it is the complete and exclusive statement of the agreement between LMI Corporation and you, and supersedes any proposal or prior agreement, oral or written, and any other communication between LMI Corporation and you relating to the subject matter of this Agreement. No additional or any different terms will be enforceable against LMI Corporation unless LMI Corporation gives its express consent, including an express waiver of the terms of this Agreement, in writing signed by an officer of LMI Corporation. You assume full responsibility for the use of the Software and agree to use the Software legally and responsibly. This Agreement shall be governed by California law, except as to copyright matters, which are covered by Federal law. This Agreement is deemed entered into at Milpitas, California by both parties. Should any provision of this Agreement be declared unenforceable in any jurisdiction, then such provision shall be deemed severable from this Agreement and shall not affect the remainder hereof. All rights in the Software not specifically granted in this Agreement are reserved by LMI Corporation.

Should you have any questions concerning this Agreement, you may contact LMI Corporation by writing to:

LMI Corporation
101 N. Alloy Dr
Fenton, Michigan 48430

Warranty

LMI *hardware* is warranted by LMI against defects in materials and workmanship for 12 months from date of original purchase. If you transfer ownership, the warranty is automatically transferred to the new owner and remains in effect for the original 12-month period. During the warranty period we will repair or, at our option, replace at no charge product that proves to be defective, provided it is returned, shipping prepaid, to LMI.

LMI *software and firmware* are warranted by LMI against defects in materials and workmanship for 60 days from date of original purchase, when the software and firmware is used in accordance with published or other written specifications prepared, approved, and issued by LMI and when used with specifically identified hardware. In any event, LMI makes no representation or warranty, express or implied, that the operation of the software or firmware will be uninterrupted or error free, or that the functions contained in the software or firmware will meet or satisfy the Distributor's intended use or license agreement or LMI extended support agreement. Software and firmware corrections are warranted for a period of thirty (30) days from the date shipped by LMI, or the remainder of the original warranty term, whichever is longer.
If you transfer ownership, the warranty is automatically transferred to the new owner and remains in effect for the original 60-day period.

LMI *interface accessories*, such as cords and connectors are warranted by LMI against defects in materials and workmanship for 30 days from date of original purchase. Repaired or replacement cords or connectors are warranted for a period of 30 days from the date of shipment by LMI.

This warranty does not apply if the product has been damaged by accident or misuse or as a result of service or modification by other than LMI, or by hardware, software, interfacing or peripherals not provided by LMI.

This is your warranty.

Please retain this document for your records.

No other express warranty is given. The repair or replacement of a product is your exclusive remedy. Any implied warranty of merchantability or fitness is limited to the duration of this written warranty. Some States do not allow the exclusion or limitations of incidental or consequential damages, so the above exclusion or limitations may not apply to you.

Support

LMI Customer Service and Technical Support can be reached at **810-714-5811** Monday through Friday between 8:00 a.m. and 5:00 p.m. Eastern Standard Time or fax anytime at **810-714-5711.** Support can also be reached via email at customerservice@lmicorporation.com **or** techsupport@lmicorporation.com.

Customer Service

Contact LMI Customer Service to:

- Request quotations
- Inquire about the status of an order or repair
- Return LMI equipment for service
- Upgrade LMI equipment

LMI On-Site Training & Phone Support

LMI Technical Support can provide on-site training or phone support for LMI equipment and support software. Contact LMI Customer Service for pricing and scheduling information.

Contact LMI Technical Support to:

- Assist in installing and configuring LMI equipment
- Help setup and configure gages, multiplexers, and accessories
- Troubleshoot LMI equipment or LMI support software

Returns for Service

To expedite your service order:

- Contact Customer Service to obtain a Return Materials Authorization (RMA) number.
- Complete the RMA form provided and return the form, along with the unit, to LMI's repair department at the following address:
  LMI
  Attn: Repair Department
  101 N. Alloy Dr.
  Fenton, MI 48430
- Pack the equipment properly, using the original shipping container if possible. LMI cannot assume responsibility for damage caused by improper packaging.
- LMI will evaluate the unit and supply an evaluation and quotation for the necessary repairs.
- Upon receipt of a purchase order, LMI will repair and return the unit.

System Overview

Universal Gage Interface is a highly configurable, partfile driven data collection system that works hand-in-hand with industry-standard LMI gauging and metrology tools.

UGI's flexible configuration allows the operator to create easy-to-use routines complete with a graphical interface that makes data collection a fast and simple process, saving the customer both time and money.

UGI supports:

- LMI Wireless data collection gages
- PLC-driven automated events (please consult with LMI for more details)
- Traceable data inputs
- Integration with barcode scanners
- User-defined input options
- User-defined export formatting

About this manual

This manual is divided into five sections. The first three sections cover the primary applications of UGI (Data Collection, AutoGage, and SealGap). The last two sections cover additional configurable options found within the Partfile Gages screen and the UGI Masterfile, respective. **Note: Many of these items are "project dependent" so please consult LMI with any questions about selections contained within the masterfile.**

UGI Software Requirements

Below are the **minimum** and **recommended** specifications in order to run the Universal Gage Interface (UGI) software effectively on any local computer.

Minimum Computer Specifications:

- Screen Resolution: 1280x800
- Memory needed: 4GB
- Processor Speed needed: Intel i3 1.8GHz
- Serial COM Port: 1 (1 COM Port/ LMI System)
- USB Ports: minimum 2 USB 2.0
- Operating System: Windows 7 Home Basic (32 Bit/64 Bit)

Recommended Computer Specifications:

- Screen Resolution: 1280x800
- Memory: 8GB +
- Processor Speed: Intel i7 3.4GHz
- Serial COM Port: 2 (1 COM Port/ LMI System)
- USB Ports: 4 USB 2.0
- Operating System: Windows 10 Professional (32 Bit/64 Bit)

Installation and Runtime User Requirements:

- Administrative rights are necessary for installation purposes.
- Basic user rights are necessary for application use.
- For Windows 10 System Administrative rights are required.

Note: For optimal performance **Recommended Specifications** should be followed.

Software Installation

This chapter will step through the installation process of the software

1. Make sure proper administrative or user rights are available in order to install software on the computer.

2. Place the Universal Gage Interface installation CD in the CD ROM Drive.
   (Drive D:\ will be used for this example)

   The CD should automatically enter the setup. In the case that this does not occur, follow the next two steps.

3. Click the **Start** button and select the **Run** Option.

4. Type D:\Setup and click Enter.

5. Click **Next** as shown in Figure 3.1 B.

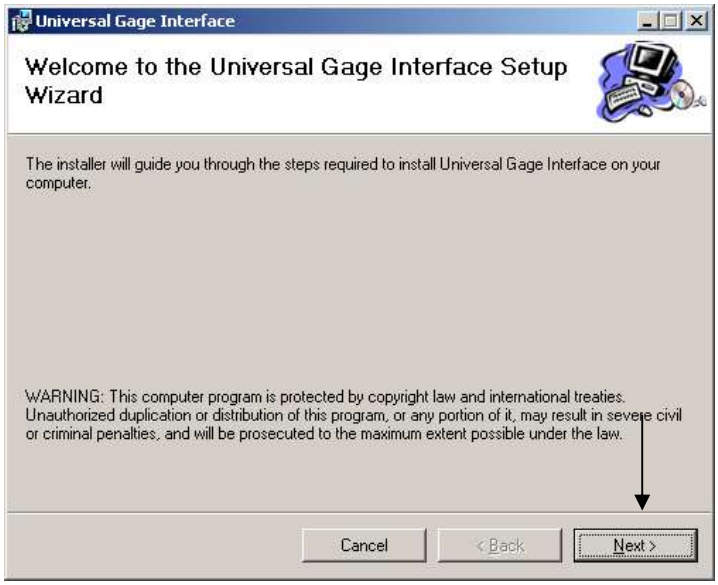


FIGURE 3.1 B – **Install Wizard**

6. Select the Installation Folder. You should keep the installation folder set to the default.

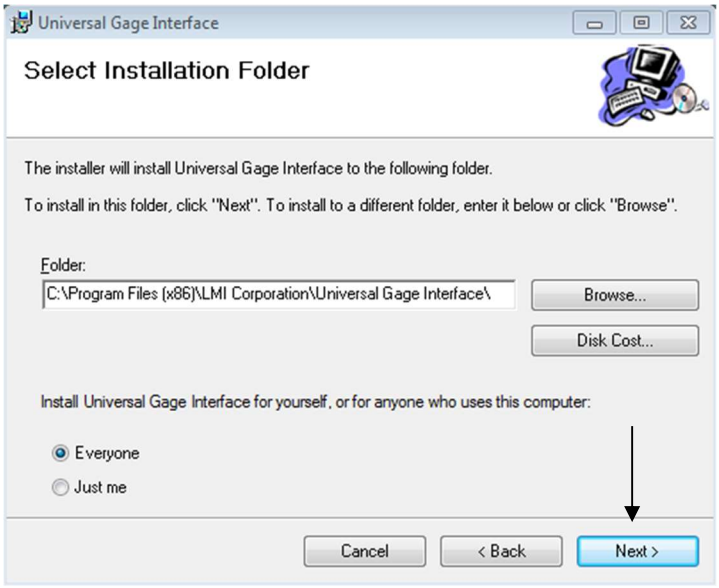


FIGURE 3.1 D – Customer Information

7. Click the **Next** button to start the installation

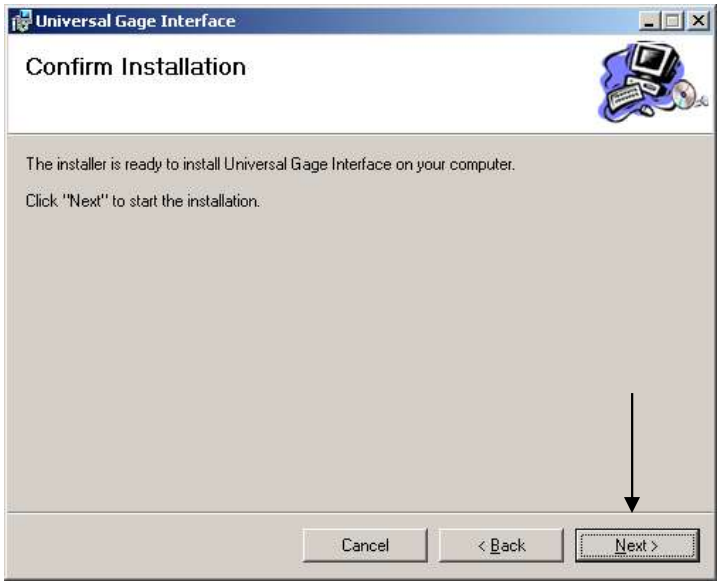


FIGURE 3.1 E – **Installation status.**

8. Click **Close** when the installation is complete.

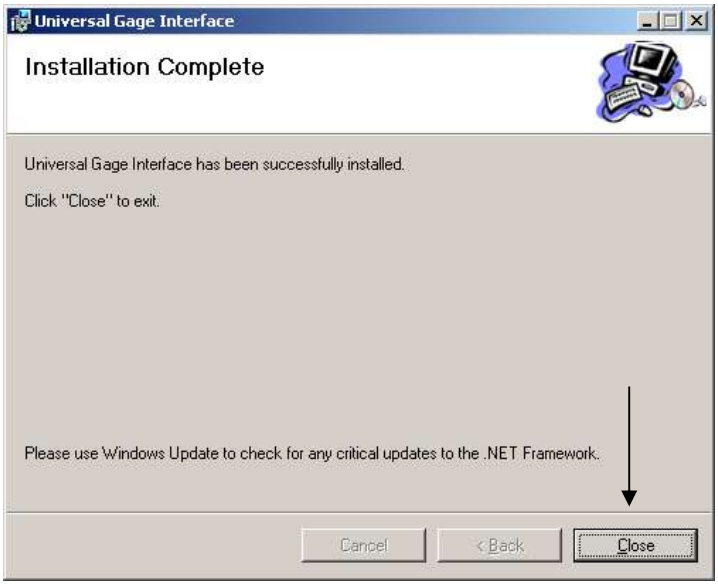


FIGURE 3.1 G – **Install Complete**

Section I. Standard Data Collection

To create a new part file or edit an existing partfile, double-click on the Universal Gage Interface icon on the desktop. Click on **Create a Partfile** to start a new partfile from scratch. To edit an existing partfile, choose **Edit a Partfile**.

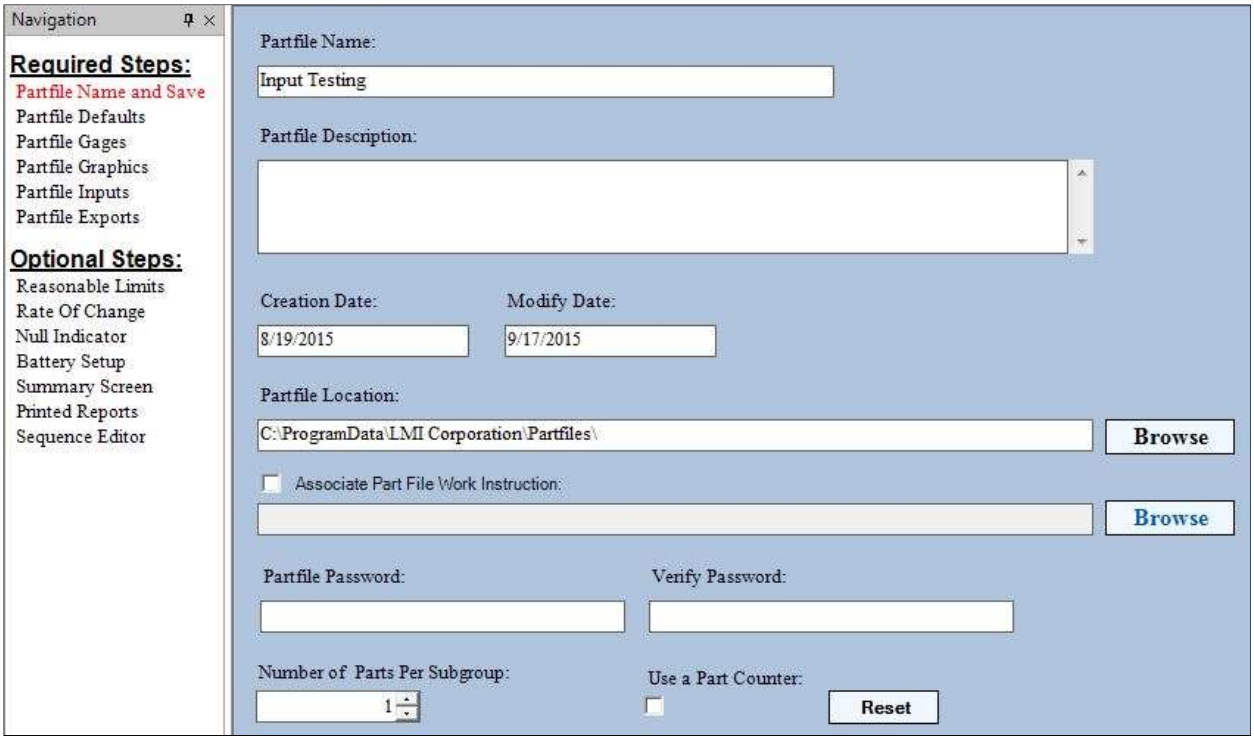
When creating a partfile, you must go through the six required steps in order from top to bottom before saving your partfile. If you are editing a partfile, you can click on whichever step you desire. Navigate to different steps using the Back and Next buttons at the top of the window.

Section 1a. Standard Data Collection mode

Masterfile Setup

No setup needed.

Partfile Name and Save



- **Partfile Name (required):** Give the .ugi file a name. Generally, the name should be the same as the part you are running.
- **Partfile Description:** This field is used for entering any notes about the partfile, such as who created it, what was changed in the last revision, etc.
- **Creation Date:** Date when the partfile was created.
- **Modify Date:** Date when the partfile was last modified and saved.
- **Partfile Location (required):** This is where the .ugi partfile will be stored on your hard drive. The default location is C:\Program Data\LMI Corporation\Partfiles
- **Associate Partfile Work Instruction:** Option used to pull up a .pdf or .doc/.docx containing work instructions for the fixture/cell.
- **Partfile Password and Verify Password:** Used to password protect the partfile. If entered, the password will be required to edit the partfile.
- **Number of Parts Per Subgroup:** Used if subgroups are desired; generally this will be left at 1.
- **Use a Part Counter:** If checked, the partfile will display the total amount of times the file has been ran. To reset the counter, click on the Reset button to the right of the checkbox.

Partfile Defaults

Not applicable to data collect.

Partfile Gages

This section is the heart and soul of the partfile. In this screen you can add new measurement points, delete unused measurement points, change limiting specifications, create component screens, and set cautionary limits. Each row represents one measurement.

Menu Buttons:

Cut – Cuts a currently selected line.
Copy – Copies the currently selected line.
Paste – Pastes the copied or cut lines to a new location.
Insert – Adds a new row to the grid. The new line will appear above the selected row in the grid.
Delete – Deletes the selected line from the grid.

Number of Gages Points: Use either the up and down arrows or enter the total number of measurement points and calculations your partfile requires (minimum of 1 and maximum of 999) and press Enter on the keyboard. A grid will appear where each row represents one measurement. For TP and 241 measurements, you will need to enter a line for both the A-axis and B-axis or the flush and the gap measurement (two lines per measurement point).

The Grid contains the following columns by default. Additional columns can be turned on in the Masterfile (see Section V).

- **Characteristic** – The user generated alpha-numeric name for the point to be measured.
- **Description** – Place the Wireless ID of the probe that will be used to measure the point in this field.
- **Component** – If you have a large number of points to measure, the Component column allows the user to break up the part file into more than one screen. For example, the user can assign all depth measurements to one component and all hole location measurements to another.

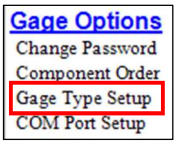
Note: After the initial partfile creation, you can rearrange the component order using the **Component Order** link under the Gage Options on the left hand side of the screen.

- **Gage Type** – Select the LMI gage required to measure the point here. The following is a brief description of each gage type found within the dropdown menu:

  - *5200/5300* – used with AutoGage systems
  - *237* – legacy type used with 2300 SealGap system
  - *238* – legacy type used with 2300 SealGap system
  - *DAI Flush* – legacy type used with dual-analog interface flush
  - *DAI Gap* – legacy type used with dual-analog interface gap
  - *DAI Point* – legacy type used with dual-analog interface point
  - *DSI Flush* – used with 595 Wireless and Mobile Collect Mobile Modules for 241 Flush and TP A-Axis
  - *DSI Gap* – used with 595 Wireless and Mobile Collect Mobile Modules for 241 Gap and TP B-Axis
  - *DSI Point* – used with 595 Wireless for 200 single-point readings
  - *501/440 Port* – legacy type used with 501/440 Data Collectors
  - *Keyboard* – used to hand-key numerical entries into the measurement field
  - *Sony* – legacy type used with Sony products
  - *Attributes* – used to attach attribute checks to a partfile; see Section IV for detailed instructions on setting up attributes
  - *Tesa Probe GT62* – legacy type for Tesa GT62
  - *Tesa Probe FMS132* – legacy type for Tesa FMS132
  - *Tesa Probe GT22* – legacy type for Tesa GT22
  - *Diamondback* – used with a cabled Diamondback digital indicator
  - *Wireless Dback* – used with a wireless Diamondback digital indicator
  - *Wireless SealGap* – used with wireless SealGap gages such as the 237W and 238W
  - *Wireless SealGap A* – used with the “A” reading of a Dual SealGap gage
  - *Wireless SealGap B* – used with the “B” reading of a Dual Seal Gap gage
  - *Wireless 200* – used with 200W
  - *Wireless Flush* – used for the flush reading of a 241W/241W-BW.
  - *Wireless Gap* – used for the gap reading of a 241W/241W-BW.
  - *Wireless TP A-Axis* – used for the A-Axis reading of a wireless TP probe.
  - *Wireless TP B-Axis* – used for the B-Axis reading of a wireless TP probe.
  - *Wireless Calc Point* – used with wireless TP probes to input TP calculation point (wireless TP must be set-up to broadcast TP only)
  - *Keyence* – used with some models of Keyence lasers
  - *G-300 Flush* – legacy type used for G-300 Flush
  - *G-300 Gap* – legacy type used for G-300 Gap
  - *G-241 Flush* – legacy type used for G-241 Flush
  - *G-241 Gap* – legacy type use for G-241 Gap
  - *G-WHIZ-1* – used with G-WHIZ sending one measurement type
  - *G-WHIZ-2* – used with G-WHIZ sending two measurement types

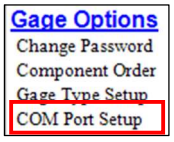
- *N/A* – used in conjunction with Calculations; see Section IV for detailed instructions on setting up calculations

Note*:** You can set the Gage Type for every row at once by clicking on the ***Gage Type Setup link on the left hand side of the window under **Gage Options**.



- **Association** – If using a True Position, 241W, 241W-BW, G-WHIZ, or Dual SealGap gage sending two measurements at once, you will need to associate each row with one another so that both readings are captured at the same time. For example, to capture both Flush and Gap set up on Rows 1 and 2, the user would choose to associate Row 2 for the Flush and Row 1 for the Gap.
- **Calculation** – Used to perform simple calculations between points in the partfile. Calculations must appear after all points have been entered. See Section IV for more details.
- **Mux Port** – Used only with LMI Autogage systems and 5200/5300 probes.
- **COM Port** – Sets the port that UGI uses for communication with the MicroRidge USB Base.

Note: You can set the COM Port for every row at once by clicking on the ***COM Port Setup*** link at the left hand side of the window under **Gage Options**.

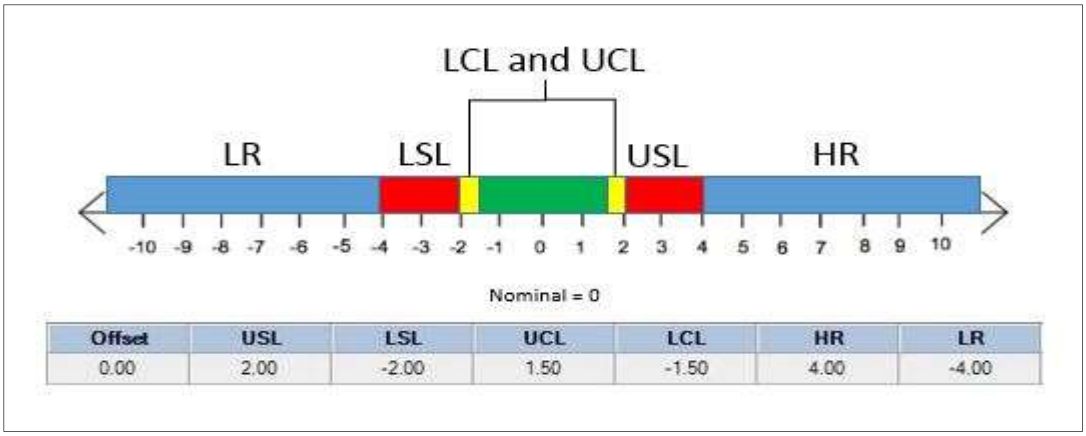


- **Span** – Sets the span for each measurement point; not used with wireless gages.
- **Offset** – Adds or subtracts a constant offset to the measured data.

Note: Offset will be applied before inversion if Invert Sign is active.

- **USL** – The Upper Spec Limit determines the high acceptable tolerance for a point. Measurements higher than this will result in a red measurement box on the screen.
- **LSL** – The Lower Spec Limit determines the low acceptable tolerance for a point. Measurements lower than this will result in a red measurement box on the screen.
- **UCL** – The Upper Cautionary Limit determines a boundary below the USL that is usually 10 percent *less* than the USL. Measurements higher than the UCL but lower than the USL will result in a yellow measurement box on the screen.
- **LCL** – The Lower Cautionary Limit determines a boundary above the LSL that is usually 10 percent *more* than the LSL. Measurements lower than the LCL but higher than the LSL will result in a yellow measurement box on the screen.

- **HR** – High Reasonable will turn the measurement box blue if the measurement exceeds the HR limit.
- **LR** – Low Reasonable will turn the measurement box blue if the measurement is lower than the LR limit.
- **Invert Sign** – Makes a negative reading a positive reading and make a negative reading positive.
- **Active** – Determines whether or not the point will be active or absent from the routine.
- **Frequency** – Not applicable to standard data collect systems. Only used with LMI Autogage systems.



Offset	USL	LSL	UCL	LCL	HR	LR
0.00	2.00	-2.00	1.50	-1.50	4.00	-4.00

If the user only wants to see green and red (pass and fail), set the UCL and LCL to match the USL and LSL and keep the HR and LR at 100 and -100.

Partfile Graphics

UGI allows the user to import and perform basic editing of images to make the data collection process as easy and straight-forward to the user as possible. UGI can import .png, .bmp, and .jpg files.

Menu buttons:

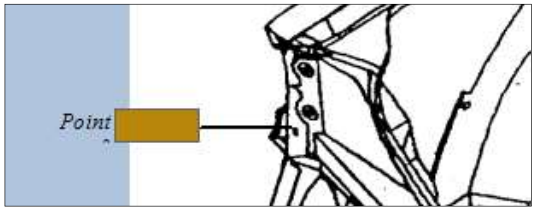
Image – Opens the Graphics folder where the user can select an image to use in the partfile.
Font – Allows the user to increase or decrease font size.
Lines – Allows the user to draw “leader lines” that connect the measurement boxes to particular points on the image.
Circles – Allows the user to put “dots” on the image to specify particular points of measurement.
Limits – Displays the USL and LSL next to each measurement box.

Delete – When the graphic is selected, this will delete the graphic from the screen.
Null Ind. – Not used with UGI Data Collect.
Arrows – When selected, arrows will be displayed indicating whether the reading is high or low of the tolerances.
VIN# – Not used with UGI Data Collect
ROT# – Not used with UGI Data Collect

Graphics Setup Walkthrough:

1. Move the image file into the Graphics folder found at C:\Program Data\LMI Corporation\Graphics.
2. Click on the Image icon, select the graphic you wish to use, and click *Open*.
3. Double-click on the image. There will be a thin black frame around the image. When this frame is around the image, you can resize the image by clicking and dragging the corners of the image. Clicking and dragging on the center of the image will allow you to reposition the image on the screen.
4. When you have the image sized and placed in the middle of the screen, click and drag one of the measurement point boxes to the corresponding point on your graphic. **Double-clicking the box will flip the characteristic name from one side of the box to the other.**

   Alternatively, if a particular spot on your graphic is congested with several measurement points, use the Lines tool to extend more precise points to the boxes. With the Lines tool activated, click and drag on the point you wish to measure, then drag your mouse to the corresponding measurement box. When you have the box selected, it will turn brown and the characteristic name will be italicized. Double-click on the box to anchor the line to the box. After you do this, the line will follow the box.



   To remove an unwanted line, de-select the Lines tool, and then click and drag to make a "box" around the line you wish to delete. If you are successful, the line will become dotted. Press the Delete key on your keyboard to permanently remove the line from the image.
5. If needed, click on the Limits and/or Arrows buttons to add these two features to your partfile.
6. If your partfile has more than one component, repeat the process until images are associated with all component screens.

Partfile Inputs

Partfile inputs are used to collect non-measurement trace data from the user. Some of the most common partfile input fields are Operator Name/ID, Shift, and Serial/Part Number.

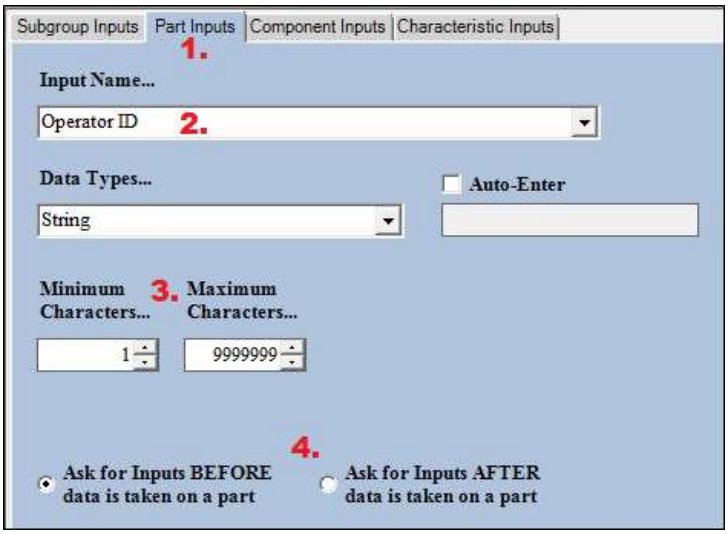
There are four tabs at the top of the window that will determine how often and when each input is asked for as the partfile runs.

> **Subgroup Inputs** are asked for every time a new subgroup is started. This means that if the user has a subgroup size of three, the user will only be asked for the input data on the first run of the three. *If the user has a subgroup of one, then Subgroup Inputs behave exactly the same as Part Inputs.*
> **Part Inputs** are asked for every time the partfile finishes one round. This is the most common input type. If the user has a subgroup of three, then the user will be required to enter the Part Input data three times – once each time the partfile finishes.
> **Component Inputs** are asked for whenever a partfile switches from one component to another. Generally, this type of input is used when the user has a left hand subassembly that is joined with a right hand subassembly and each piece has a unique serial number that needs to be captured.
> **Characteristic Inputs** can follow one particular characteristic point or need to be input for every characteristic point. In the latter case, if the user has a part with 10 measurement points, the user will be asked to input data either before or after every single measurement. Unless you have a *very* specific reason for using this input type, it is best to avoid using it.

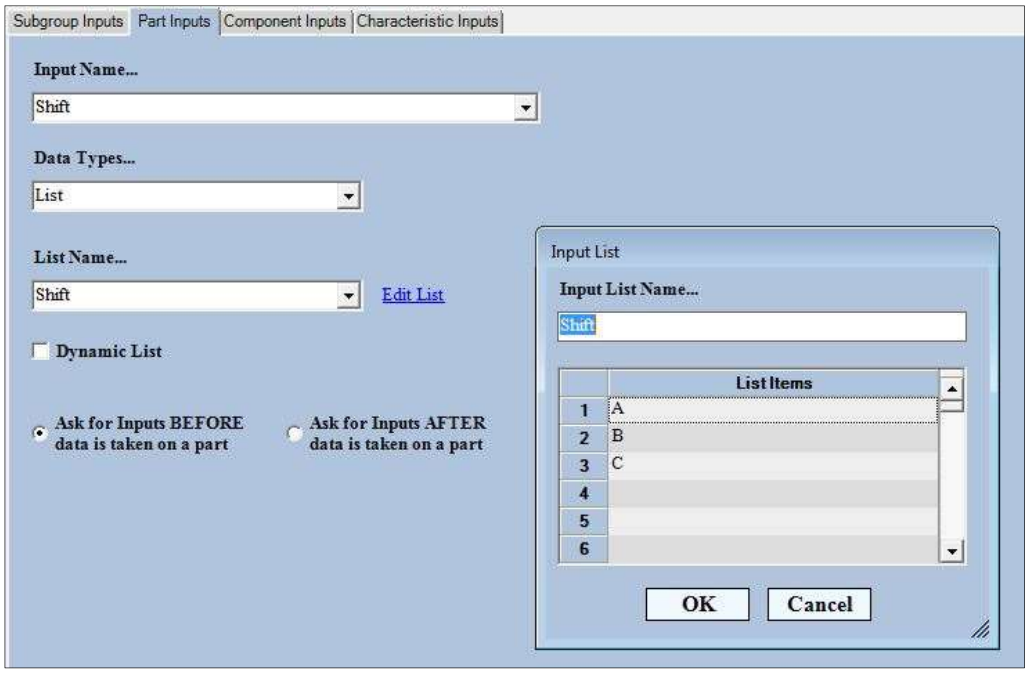
There are several data types to choose from, with the two most common being the String and the List types.

- String – Users can enter alphanumeric characters into the text box. The "Auto-Enter" box allows data to be written to the output file without the user having to enter any data. This is useful if you need to capture data that will not change such as building number or model identifier.
- Integer – Users can only enter whole numbers into the text box.
- Single – Users can enter whole and decimal numbers into the text box.
- True/False – Users will be presented with a choice between two user defined states (yes/no, true/false, etc.).
- Date – Users will be able to select a date from a calendar. This is different than the date that UGI will append to the output file that shows when the measurement data was taken. This type is used when parts will be measured on a date that differs from the build date (e.g., parts built on Monday, but not measured until Friday). The build date can be captured using this feature.
- Time – Users will be able to enter the current time or a selected time. The selected time will be different than the date that UGI will append to the output file that shows when the measurement data was taken. This type is used when parts will be measured at a time that differs from the build time (e.g., parts built on first shift and measured on second shift). The build time can be captured using this feature.
- List – Users will be able to choose from a selection of pre-defined choices. This is useful for entries that will not change, such as shift or sub-assembly variation.

How to create inputs for Operator ID and Shift



1. Click on the Part Inputs tab.
2. To create a string input, the user must first give the input a name. In the **Input Name…** box, type the words *Operator ID*.
3. If needed, the user then has a choice to limit the amount of characters that can be entered in this field using the Minimum and Maximum Character boxes.
4. Next, choose whether or not the operator will be asked for this information before or after the data is collected. **NOTE: If Automatic Write is implemented in the partfile, all user input data must occur <u>BEFORE</u> measurement data is taken.**
5. To finalize the input, click on the **Add** button in the lower right hand corner of the window.

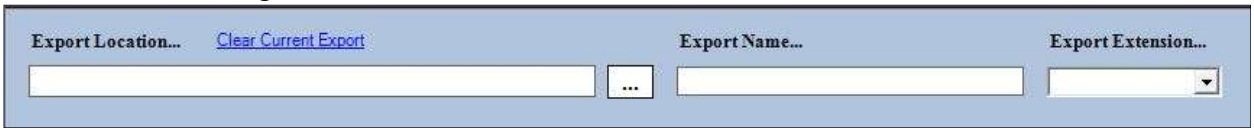


1. To create a list, start by selecting List from the **Data Types…** dropdown menu.
2. Click on the link for Edit List.
3. The Input List window will appear. Type in *Shift* under the **Input List Name…** field and then enter *A* for List Item 1, *B* for List Item 2, and *C* for List Item 3. Click OK.
4. Under the **Input Name…** field, enter the word *Shift*.
5. Click on **Add** in the lower right hand corner of the window to finalize the input.

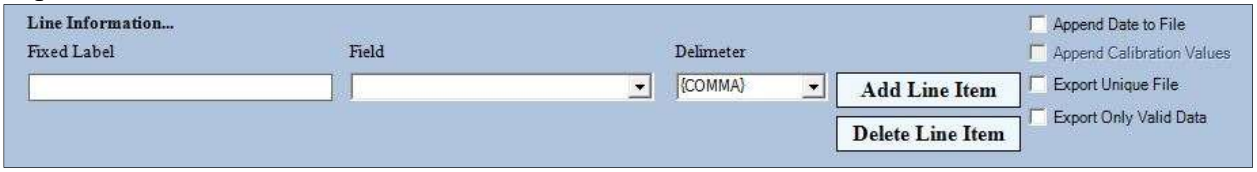
Partfile Exports

The Partfile Exports section allows the user to configure the collected traceability and input data into a format of his/her liking. The screen can be divided into three distinct sections:

Name and formatting:



Export attributes:



Finished Exports:

Naming and Formatting – This is where the user will give the export a name, extension, and storage location. Click on the ellipsis to navigate to the location where you want to store the export data. By default, the storage location is C:\Program Data\LMI Corporation\Partfiles; however, the user can choose to store the data anywhere on the PC or network as long as admin read/write privileges have been granted to that location. Give the export a name in the **Export Name…** field. **The Export Extension…** will be attached to the end of the **Export Name…** and can be any three or four alphabetical characters preceded by a period. If choosing something other than .CSV or .XLS (or other Excel extension), you will need to tell your computer what program to use to open the file.

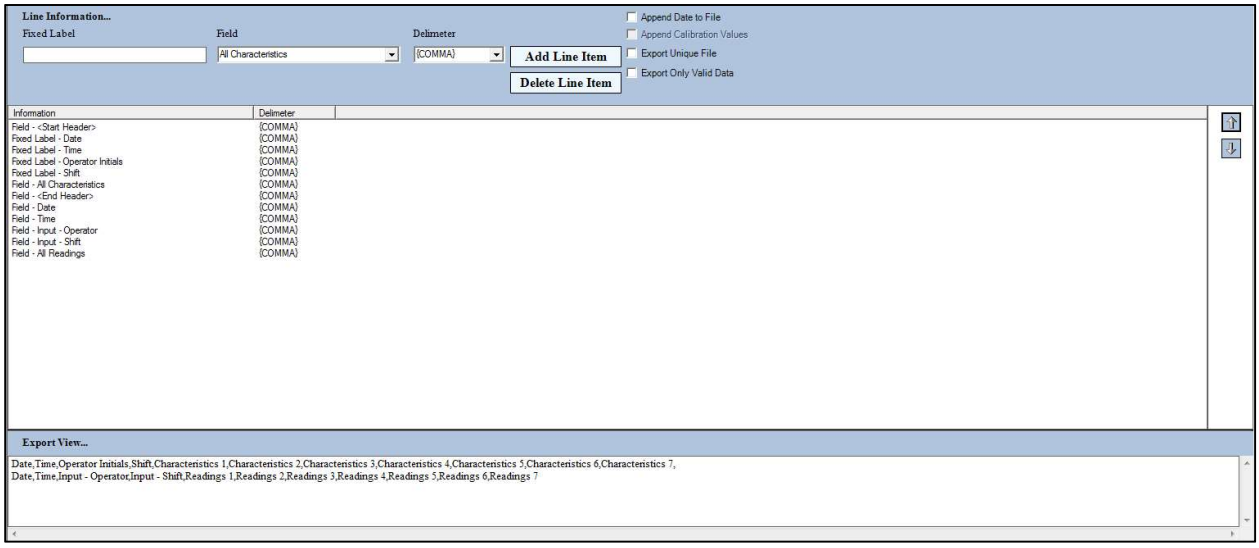
Export Attributes – Export attributes are the items that you wish to see on your export file. Just about any field in UGI can be added to the export.

Fixed Label – Anything input as a Fixed Label will be static in the export, such as header information. Type the name of the attribute in the white box.
Field – Most of the items in the Field dropdown are dynamic, such as readings, trace input data, and date/time. Trace input data (set up on the Partfile Input page) will be prefixed with the word INPUT (e.g. – INPUT – Operator ID)
Delimiter – The delimiter is what separates each field and fixed label from one another. If you are using .CSV as your export, your primary delimiter should be a comma. If you are using any type of Excel-specific extension (.XLS, .XLM, .XLSX), use tab as your primary delimiter.
Append Date to File – Adds the date to end of Export Name.
Export Unique File – Adds the Julian date to the end of the Export Name. This is based off of the "system time" on the PC.
Export Only Valid Data – Will only write data to the file if all fields have been entered during the data collection process.

Example Export Setup

1. Click in the white box below **Fixed Label** and type the word *Date*, then click the **Add Line Item** button. *Fixed Label - Date* will appear in the Information list.
2. Repeat this process for the words *Time*, *Operator Initials*, and *Shift*.
3. Click on the drop down menu below **Field**. Using the down arrow on the menu, scroll until you see *All Characteristics*. Click on this and then **Add Line Item**.
4. Click on the drop down menu below Field, scroll up, and click on <*Start Header*>. Click **Add Line Item**.
5. From the list in the Information window, click on *Field* - <*Start Header*>. Once highlighted, use the up arrow on the right hand side of the screen to move the *Field* - <*Start Header*> to the top of the list. Anything that appears between the *Field* - <*Start Header*> and *Field* <*End Header*> will be static. This will be the first row of the Excel sheet.

6. From the drop down menu, select and **Add Line Item** to the following fields: *Date*, *Time*, *Input – Operator*, *Input – Shift*, and *All Readings*. These items are dynamic, meaning that this is the actual data that will be collected when running the part file. These fields should be in the same top-down order that the header information is in so that each column lines up correctly with each row of collected data.



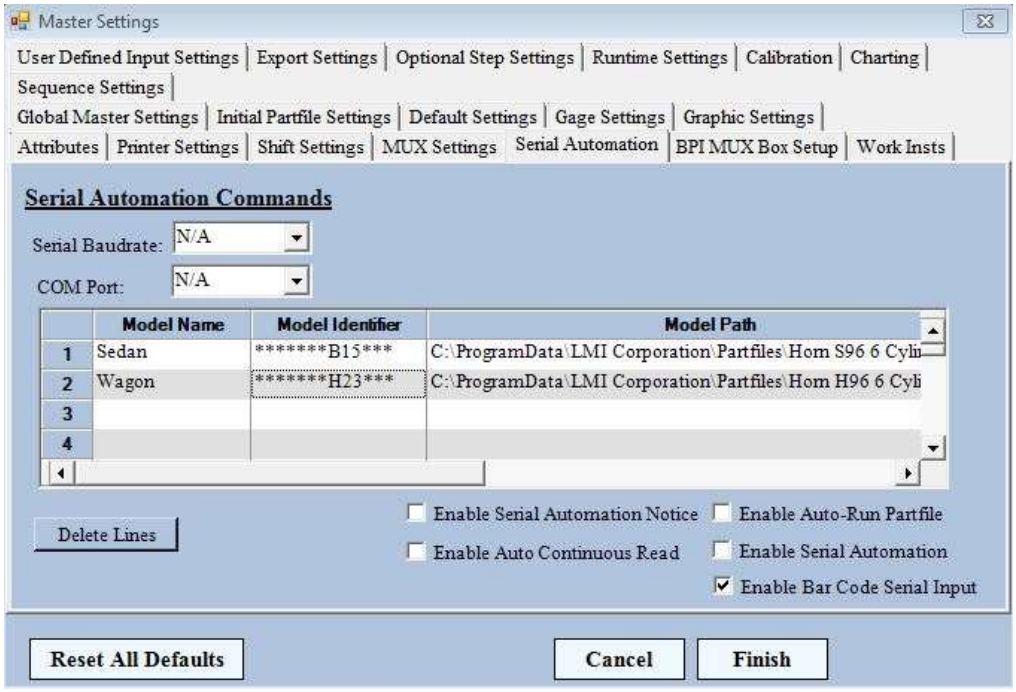
After you have finished saving your export, click on the *Finish* button in the upper left hand corner of the window and click *YES* to save your partfile.

Section 1b. Automated Data Collection using a barcode

Masterfile Setup

UGI has the ability to open up partfiles via barcode seen as keyboard entry. This is useful on an assembly line when combined with LMI gages such as the 241W-BW, G-300 series, and G-WHIZ. In order to use UGI in this way, the UGI Masterfile must be properly configured. When setting up UGI as an automated system, the partfiles to be used with the system must be created beforehand, using the steps found in Section 1a.

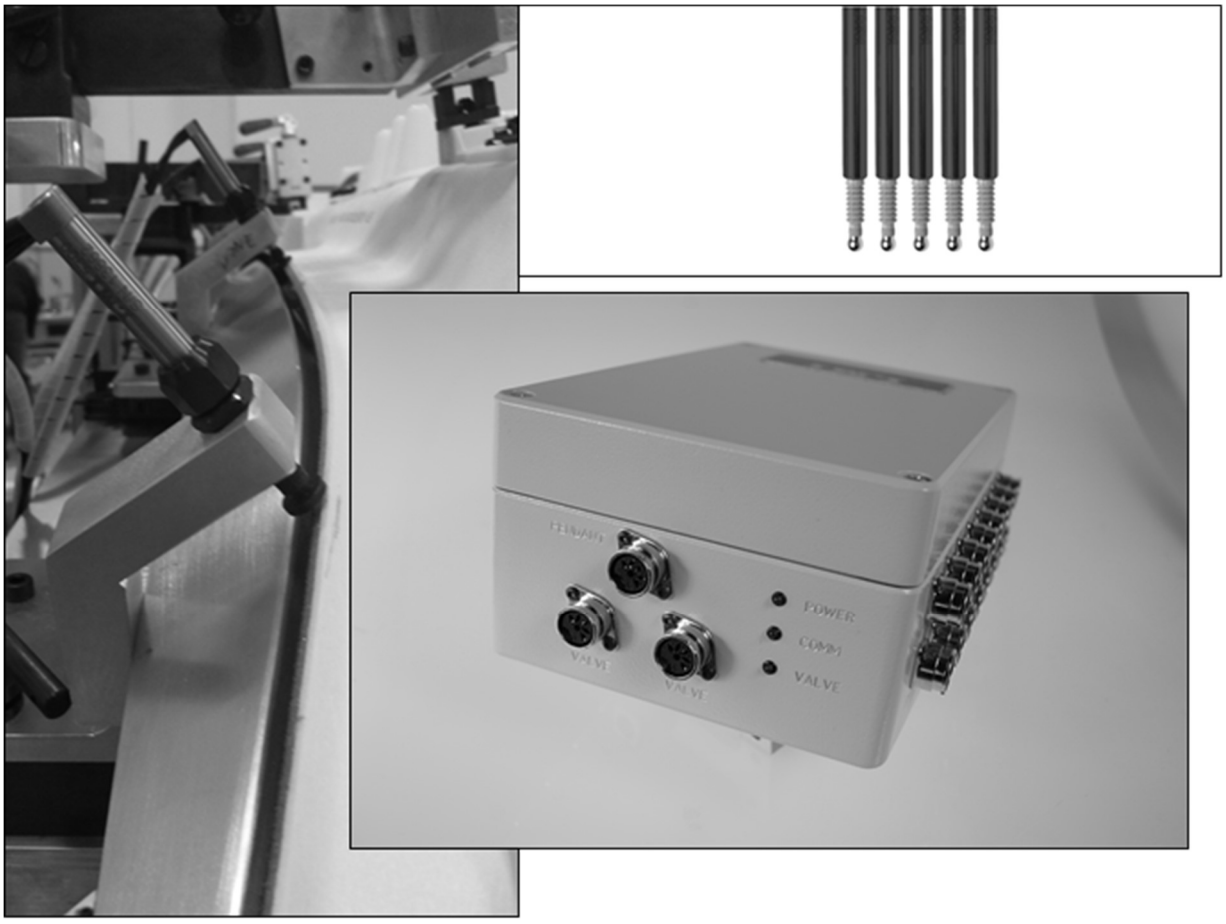
1. Open UGI and click on **Tools>Preferences** from the upper ribbon of the window. Enter the password *admin* to get access to the Masterfile.
2. Click on the *Serial Automation* tab.
3. Click on the box labeled *Bar Code Serial Input*.
4. Enter the Model Name for each vehicle type you will be measuring.



5. Enter the Model Identifier for each model under the Model Identifier column. Any variables in the VIN/part number should be entered as asterisks. The example above demonstrates a 13-digit VIN with a three character Model Identifier.
6. Click on each cell under the Model Path to select the partfile you wish to open with each Model Identifier.
7. Click on Finish and then restart UGI.

Individual partfiles are created/edited exactly as they are for a regular Data Collect set-up. Please refer to pages 15-25 for instructions on partfile creation.

Section II. AutoGage System Configuration

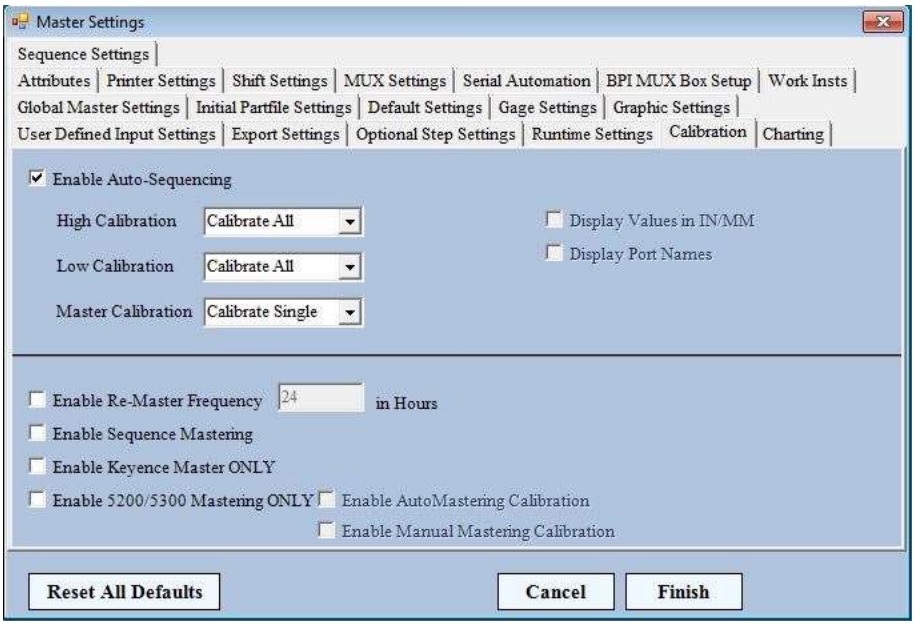


Masterfile Setup

Before creating an AutoGage partfile, you will need to set up the calibration method in the Master Settings.

1. Open UGI and click on **Tools>Preferences** from the upper ribbon of the window. Enter the password *admin* to get access to the Masterfile.
2. Check the *Enable Auto-Sequencing* box.
3. Set your High, Low, and Master Calibration choices as needed. If choosing Calibrate All, UGI will sample all probes at once. If choosing Calibrate Single, UGI will sample each probe one at a time. Whether you choose All or Single largely depends on which type of probe your fixture uses and whether you are using a "master part" or have a "zero cap" for individual probes. The most common settings are listed below:

Probe Type	Zeroing Method	High Calibration	Low Calibration	Master Calibration
5200	Master Part	Calibrate All	Calibrate Single	Calibrate All
5200	Zero Cap	Calibrate All	Calibrate Single	Calibrate Single
5300	Master Part	Calibrate All	Calibrate All	Calibrate All
5300	Zero Cap	Calibrate All	Calibrate All	Calibrate Single



Note: If using Digiprobes, click on *Runtime Settings* and place a checkmark in the box labelled *DIGI-Probe Communication*.

4. When finished, click on the Finish tab and restart UGI.

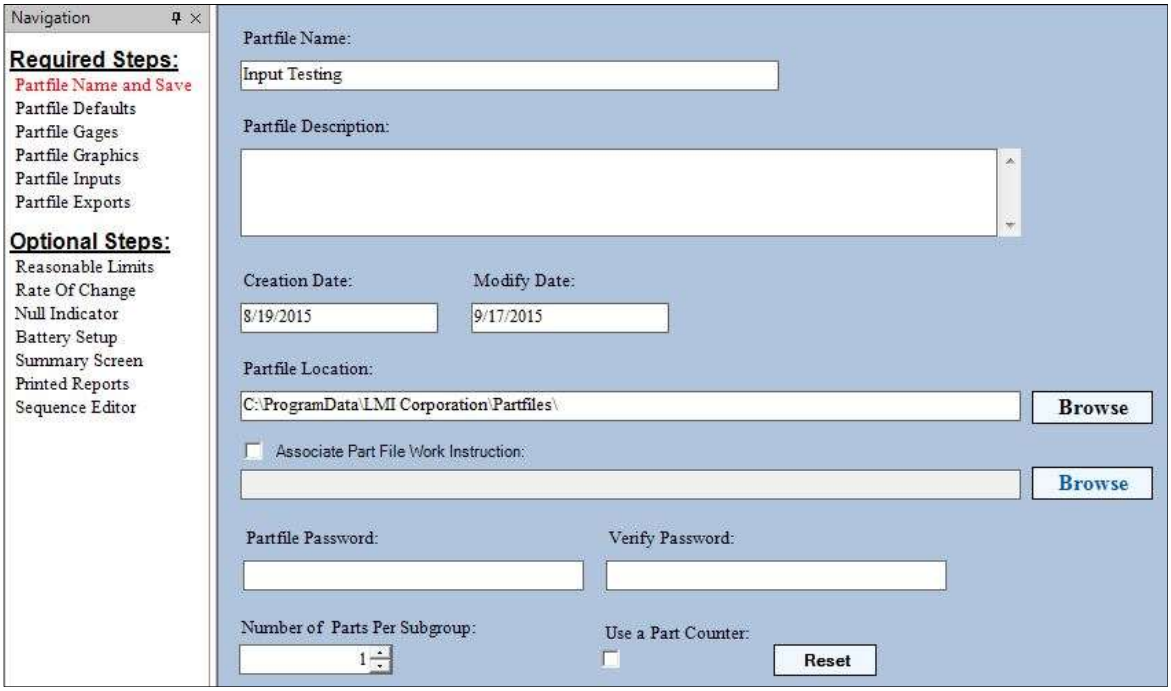
Note: In additional to setting up Enable Auto-Sequencing, you may want/need to set up the additional check-box options in the bottom half of the Calibration window:

Enable Re-Master Frequency – This will force the user to calibrate every *x* number of hours.
Enable Sequence Mastering – Used only if running a fully automated system where calibration has been programmed into a runtime sequence in UGI. (Contact LMI for more details on this setting)
Enable Keyence Master ONLY – Used only if a fixture contains Keyence part-present sensors approved by LMI.
Enable 5200/5300 Mastering ONLY – Enables a "Quick Zero" button in the UGI runtime ribbon menu.

To create a new part file or edit an existing partfile, double-click on the Universal Gage Interface icon on the desktop. Click on **Create a Partfile** to start a new partfile from scratch. To edit an existing partfile, choose **Edit a Partfile**.

When creating a partfile, you must go through the six required steps in order from top to bottom before saving your partfile. If you are editing a partfile, you can click on whichever step you desire. Navigate to different steps using the Back and Next buttons at the top of the window.

Partfile Name and Save



- **Partfile Name (required):** Give the .ugi file a name. Generally, the name should be the same as the part you are running.
- **Partfile Description:** This field is used for entering any notes about the partfile, such as who created it, what was changed in the last revision, etc.
- **Creation Date:** Date when the partfile was created.
- **Modify Date:** Date when the partfile was last modified and saved.
- **Partfile Location (required):** This is where the .ugi partfile will be stored on your hard drive. The default location is C:\Program Data\LMI Corporation\Partfiles
- **Associate Partfile Work Instruction:** Used to pull up a pdf containing work instructions for the fixture/cell.
- **Partfile Password and Verify Password:** Used to password protect the partfile. If entered, the password will be required to edit the partfile.
- **Number of Parts Per Subgroup:** Used if subgroups are desired; generally this will be left at 1.
- **Use a Part Counter:** If checked, the partfile will display the total amount of times the file has been ran. To reset the counter, click on the Reset button to the right of the checkbox.

Partfile Defaults

Not used in AutoGage data collection.

Partfile Gages

This section is the heart and soul of the AutoGage partfile. In this screen you can add new measurement points, delete unused measurement points, change limiting specifications, create component screens, and set cautionary limits. Each row represents one measurement.

Menu Buttons:

Cut – Cuts a currently selected line.
Copy – Copies the currently selected line.
Paste – Pastes the copied or cut lines to a new location.
Insert – Adds a new row to the grid. The new line will appear above the selected row in the grid.
Delete – Deletes the selected line from the grid.

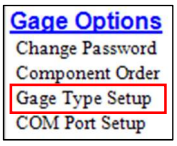
Number of Gages Points: Use either the up and down arrows or enter the total number of measurement points your partfile requires and press Enter on the keyboard. A grid will appear where each row represents one probe.

The Grid contains the following columns by default. Additional columns can be turned on in the Masterfile (see Section V).

- **Characteristic** – The user generated name for the point to be measured.
- **Description** – Not used with AutoGage systems.
- **Component** – Not used with AutoGage systems.
- **Gage Type** – While there are many choices within this dropdown, AutoGage systems utilize only one of two possible types:

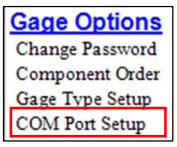
  - *5200/5300* – most commonly used probes with AutoGage systems
  - *DSI Point* – select if using LMI 5200 or 5300 Digiprobes

  Note*:** You can set the Gage Type for every row at once by clicking on the ***Gage Type Setup link on the left hand side of the window under **Gage Options**.



- **Association** – Not used with AutoGage systems.
- **Calculation** – Used to perform simple calculations between points in your partfile. Calculations must appear after all points have been entered. Typically not used within AutoGage applications.
- **Mux Port** – This is the physical port on the AutoGage Multiplexor that is connected to each unique probe. As an example, Mux Port 5 refers to the probe plugged into the fifth socket on the multiplexor.
- **COM Port** – Sets the port that UGI uses for communication with the Multiplexor. The majority of the time, this will be COM 1.

  Note: You can set the COM Port for every row at once by clicking on the ***COM Port Setup*** link at the left hand side of the window under **Gage Options**.

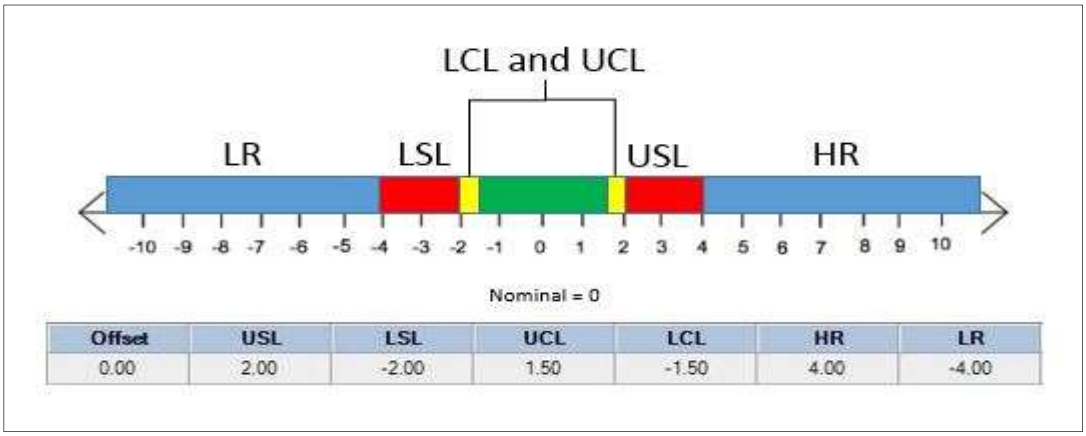


- **Span** – Not applicable with AutoGage systems.
- **Offset** – Adds or subtracts a constant offset to the measured data.

  Note: Offset will be applied before inversion if Invert Sign is active.

- **USL** – The Upper Spec Limit determines the high acceptable tolerance for a point. Measurements higher than this will result in a red measurement box on the screen.
- **LSL** – The Lower Spec Limit determines the low acceptable tolerance for a point. Measurements lower than this will result in a red measurement box on the screen.
- **UCL** – The Upper Cautionary Limit determines a boundary below the USL that is usually 10 percent *less* than the USL. Measurements higher than the UCL but lower than the USL will result in a yellow measurement box on the screen.
- **LCL** – The Lower Cautionary Limit determines a boundary above the LSL that is usually 10 percent *more* than the LSL. Measurements lower than the LCL but higher than the LSL will result in a yellow measurement box on the screen.
- **HR** – High Reasonable will turn the measurement box blue if the measurement exceeds the HR limit.
- **LR** – Low Reasonable will turn the measurement box blue if the measurement is lower than the LR limit.
- **Invert Sign** – Makes a negative reading a positive reading and make a negative reading positive.
- **Active** – Determines whether or not the point will be active or absent from the routine.

- **Frequency** – Entering a number other than zero will force a recalibration of the probes on a "per-hour" basis (e.g., entering 24 would force the operator to recalibrate the probes once a day, entering 168 would force calibration once a week, etc.).

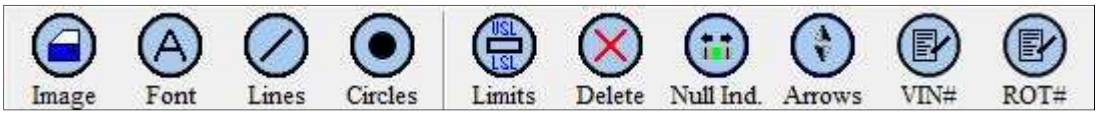


Offset	USL	LSL	UCL	LCL	HR	LR
0.00	2.00	-2.00	1.50	-1.50	4.00	-4.00

If the user only wants to see green and red (pass and fail), set the UCL and LCL to match the USL and LSL and keep the HR and LR at 100 and -100.

Partfile Graphics

UGI allows the user to import and perform basic editing of images to make the data collection process as easy and straight-forward to the user as possible. UGI can import .png, .bmp, and .jpg files.



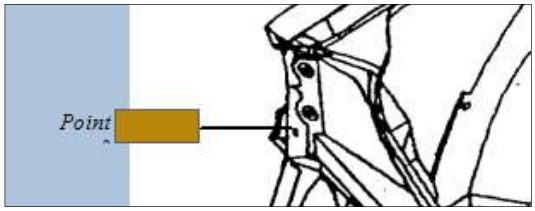
Menu buttons:

Image – Opens the Graphics folder where the user can select an image to use in the partfile.
Font – Allows the user to increase or decrease font size.
Lines – Allows the user to draw "leader lines" that connect the measurement boxes to particular points on the image.
Circles – Allows the user to put "dots" on the image to specify particular points of measurement.
Limits – Displays the USL and LSL next to each measurement box.
Delete – When the graphic is selected, this will delete the graphic from the screen.
Null Ind. – Not used with UGI Data Collect.
Arrows – When selected, arrows will be displayed indicating whether the reading is high or low of the tolerances.
VIN# – Not used with UGI Data Collect
ROT# – Not used with UGI Data Collect

Graphics Setup Walkthrough:

1. Move the image file into the Graphics folder found at C:\Program Data\LMI Corporation\Graphics.
2. Click on the Image icon, select the graphic you wish to use, and click Open.
3. Double-click on the image. There will be a thin black frame around the image. When this frame is around the image, you can resize the image by clicking and dragging the corners of the image. You can also move the image by clicking in the center of it and dragging it to your desired location on the screen.
4. When you have the image sized and placed in the middle of the screen, click and drag one of the measurement point boxes to the corresponding point on your graphic. **Double-clicking the box will flip the characteristic name from one side of the box to the other.**

   Alternatively, if a particular spot on your graphic is congested with several measurement points, use the Lines tool to extend more precise points to the boxes. With the Lines tool activated, click on the point you wish to measure, then drag your mouse to the corresponding measurement box. When you have the box selected, it will turn brown and the characteristic name will be italicized. Double-click on the box to anchor the line to the box. After you do this, the line will follow the box.



   To remove a box, de-select the Lines tool, and then click and drag to make a "box" around the line you wish to delete. If you are successfully, the line will become dotted. Press the Delete key on your keyboard to permanently remove the line from the image.
5. If needed, click on the Limits and/or Arrows buttons to add these two features to your graphic.

Partfile Inputs

Partfile inputs are used to collect non-measurement trace data from the user. Some of the most common partfile input fields are Operator Name/ID, Shift, and Serial/Part Number.

There are four tabs at the top of the window that will determine how often and when each input is asked for as the partfile runs.

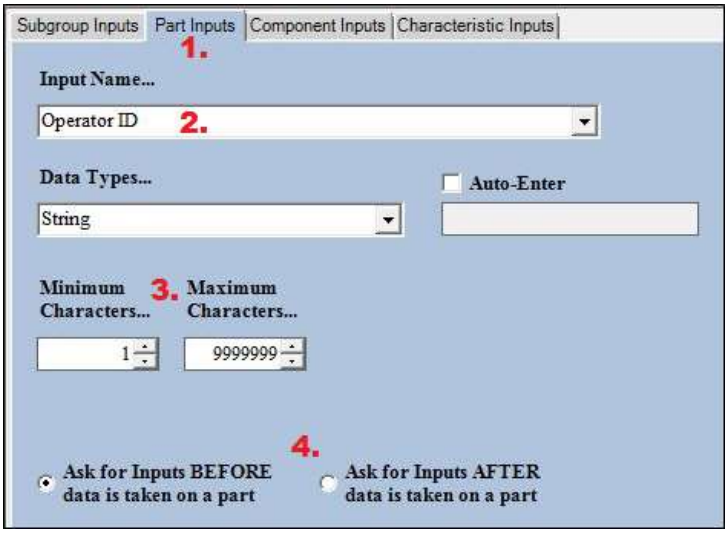
Subgroup Inputs are asked for every time a new subgroup is started. This means that if the user has a subgroup size of three, the user will only be asked for the input data on the first run of the three. *If the user has a subgroup of one, then Subgroup Inputs behave exactly the same as Part Inputs.*

Part Inputs are asked for every time the partfile finishes one round. This is the most common input type. If the user has a subgroup of three, then the user will be required to enter the Part Input data three times – once each time the partfile finishes.
Component Inputs are asked for whenever a partfile switches from one component to another. Generally, this type of input is used when the user has a left hand subassembly that is joined with a right hand subassembly and each piece has a unique serial number that needs to be captured.
Characteristic Inputs can follow one particular characteristic point or need to be input for every characteristic point. In the latter case, if the user has a part with 10 measurement points, the user will be asked to input data either before or after every single measurement. Unless you have a *very* specific reason for using this input type, it is best to avoid using it.

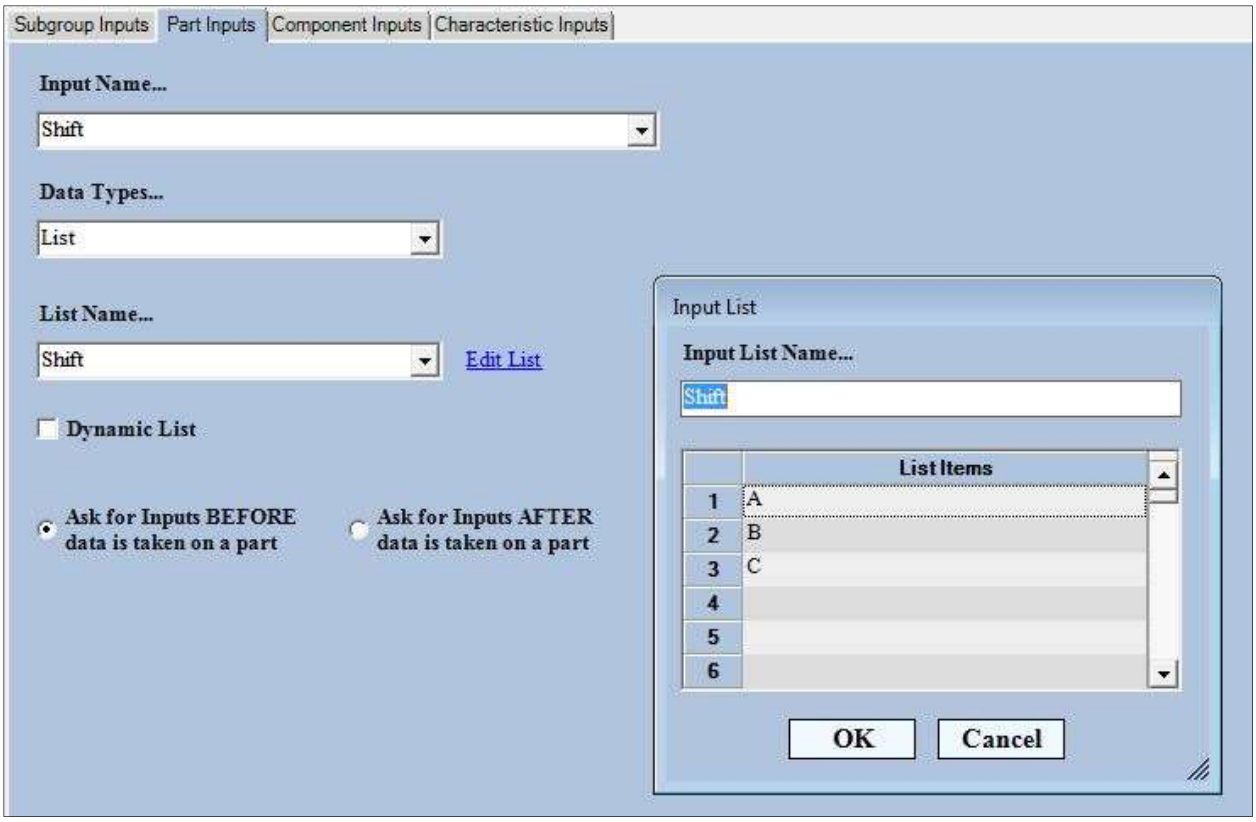
There are several data types to choose from, with the most common being the String and the List types.

- String – Users can enter alphanumeric characters into the text box. The "Auto-Enter" box allows data to be written to the output file without having the user enter any data. This is useful if you need to capture data that will not change such as building number or model identifier.
- Integer – Users can only enter whole numbers into the text box.
- Single – Users can enter whole and decimal numbers into the text box.
- True/False – Users will be presented with a choice between two user defined states (yes/no, true/false, etc.).
- Date – Users will be able to select a date from a calendar. This is different than the date that UGI will append to the output file that shows when the measurement data was taken. This type is used when parts will be measured on a date that differs from the build date. The build date can be captured using this feature.
- Time – Users will be able to enter the current time or a selected time. The selected time will be different than the date that UGI will append to the output file that shows when the measurement data was taken. This type is used when parts will be measured on a date that differs from the build date. The build time can be captured using this feature.
- List – Users will be able to choose from a selection of pre-defined choices. This is useful for entries that will not change, such as shift or model variation (e.g. Right Hand or Left Hand).

How to create inputs for Operator ID and Shift



1. Click on the Part Inputs tab.
2. To create a string input, the user must first give the input a name. In the **Input Name…** box, type the words *Operator ID*.
3. If needed, the user then has a choice to limit the amount of characters that can be entered in this field using the Minimum and Maximum Character boxes.
4. Next, choose whether or not the operator will be asked for this information before or after the data is collected. **NOTE: If Automatic Write is implemented in the partfile, all user input data must occur <u>BEFORE</u> measurement data is taken.**
5. To finalize the input, click on the **Add** button in the lower right hand corner of the window.

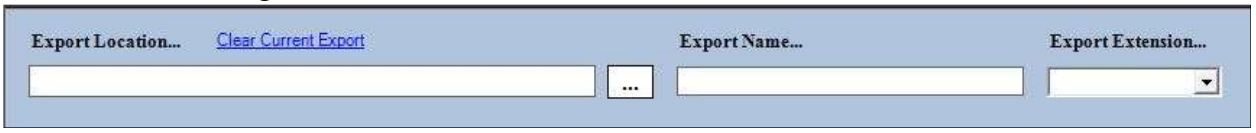


1. To create a list, start by selecting List from the **Data Types…** dropdown menu.
2. Click on the link for Edit List.
3. The Input List window will appear. Type in *Shift* under the **Input List Name…** field and then enter *A* for List Item 1, *B* for List Item 2, and *C* for List Item 3. Click OK.
4. Under the **Input Name…** field, enter the word *Shift*.
5. Click on **Add** in the lower right hand corner of the window to finalize the input.

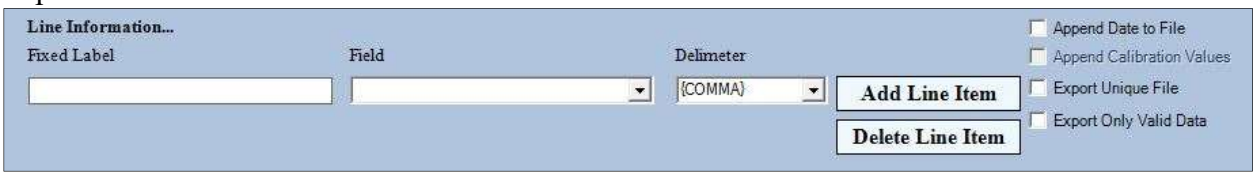
Partfile Exports

The Partfile Exports section allows the user to configure the collected traceability and input data into a format of his/her liking. The screen can be divided into three distinct sections:

Name and formatting:



Export attributes:



Finished Exports:

Naming and Formatting – This is where the user will give the export data file(s) a name, extension, and storage location. Click on the ellipsis to navigate to the location where you want to store the export data. By default, the storage location is C:\Program Data\LMI Corporation\Partfiles; however, the user can choose to store the data anywhere on the PC or network as long as admin read/write privileges have been granted to that location. Give the export a name in the **Export Name…** field. **The Export Extension…** will be attached to the end of the **Export Name…** and can be any three or four alphabetical characters preceded by a period. If choosing something other than .CSV or .XLS (or other Excel extension), you will need to tell your computer what program to use to open the file.

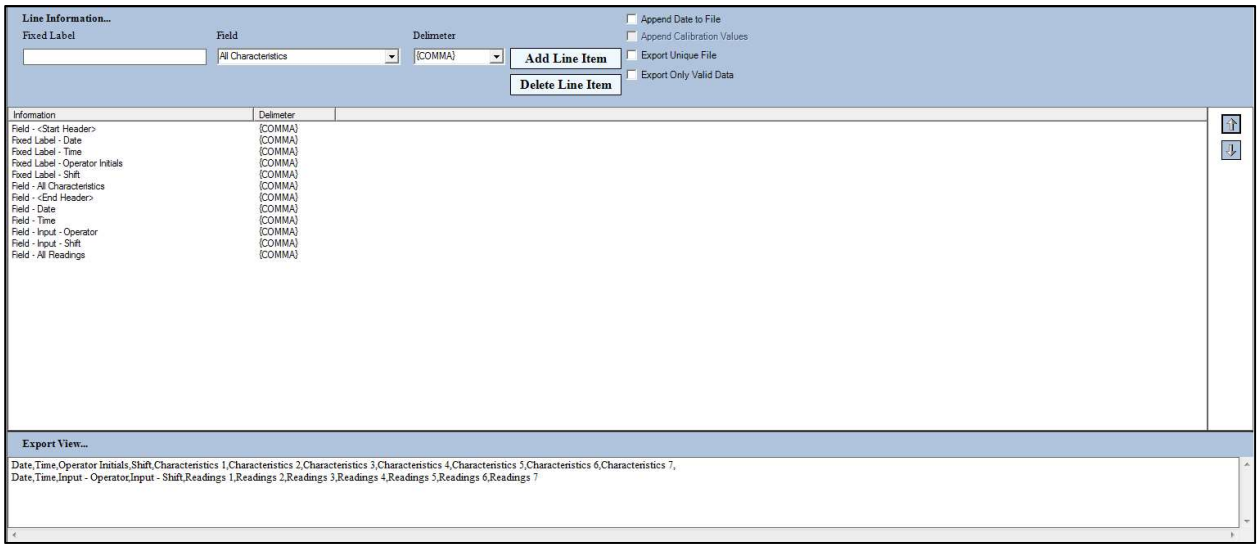
Export Attributes – Export attributes are the items that you wish to see on your export file. Just about any field in UGI can be added to the export.

Fixed Label – Anything input as a Fixed Label will be static in the export, such as header information. Type the name of the attribute in the white box.
Field – Most of the items in the Field dropdown are dynamic, such as readings, trace input data, and date/time. Trace input data (set up on the Partfile Input page) is prefixed with the word INPUT (e.g., INPUT – Operator ID).
Delimiter – The delimiter is what separates each field and fixed label from one another. If you are using .CSV as your export, your primary delimiter should be a comma. If you are using any type of Excel-specific extension (.XLS, .XLM, .XLSX), use tab as your primary delimiter.
Append Date to File – Adds the date to end of Export Name.
Export Unique File – Adds the Julian date to the end of the Export Name. This is based off of the "system time" on the PC.
Export Only Valid Data – Will only write data to the file if all fields have been entered during the data collection process.

Example Export Setup

1. Click in the white box below **Fixed Label** and type the word *Date*, then click the **Add Line Item** button. *Fixed Label - Date* will appear in the Information list.
2. Repeat this process for the words *Time*, *Operator Initials*, and *Shift*.
3. Click on the drop down menu below **Field**. Using the down arrow on the menu, scroll until you see *All Characteristics*. Click on this and then **Add Line Item**.
4. Click on the drop down menu below Field, scroll up, and click on <*Start Header*>. Click **Add Line Item**.

5. From the list in the Information window, click on *Field - <Start Header>*. Once highlighted, use the blue and silver up arrow on the right hand side of the screen to move the *Field - <Start Header>* to the top of the list. Anything that appears between the *Field - <Start Header>* and *Field <End Header>* will be static. This will be the first row of the Excel sheet.
6. From the drop down menu, select and **Add Line Item** to the following fields: *Date*, *Time*, *Input – Operator*, *Input – Shift*, and *All Readings*. These items are dynamic, meaning that this is the actual data that will be collected when running the part file. These fields should be in the same top-down order that the header information is in so that each column lines up correctly with each row of collected data.



After you have finished saving your export, click on the *Finish* button in the upper left hand corner of the window and click *YES* to save your partfile.

Calibration

The first time you run your partfile, you will be asked to calibrate the probes. Calibration is a three-step mastering process in which the user defines a high, a low, and a master (zero) position along the travel limit of each probe (see the table on page 28 for the various calibration configurations that can be implemented within UGI). For example, if calibrating 5300 probes using a master part, you would extend the probes and sample CAL HIGH; retract the probes and sample CAL LO; and then place the master part on the fixture, extend the probes again, and sample the CAL MASTER with the master part on the probes. To exit calibration, press the EXIT button on the right hand side of the window.

You can also enter calibration mode at any time by clicking on the Calibration button while the partfile is running.

Section III. SealGap System Configuration

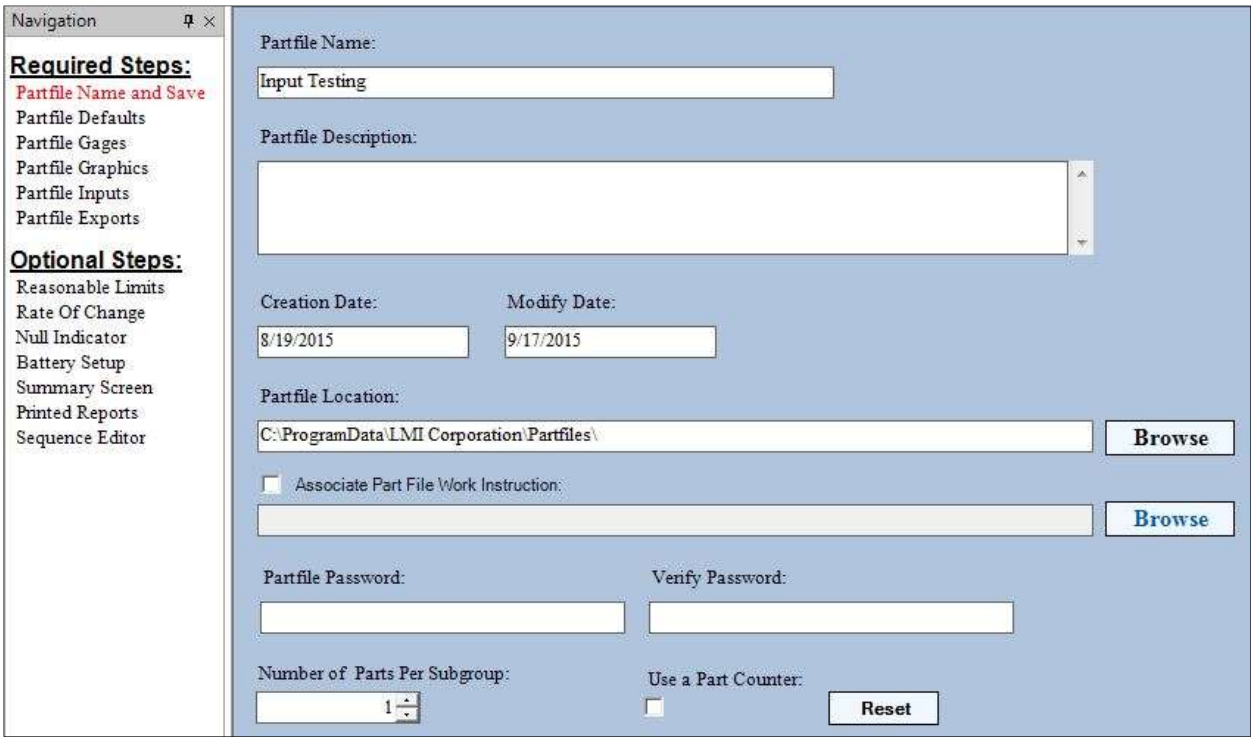
To create a new partfile or edit an existing partfile, double-click on the Universal Gage Interface icon on the desktop. Click on **Create a Partfile** to start a new partfile from scratch. To edit an existing partfile, choose **Edit a Partfile**.

When creating a partfile, you must go through the six required steps in order from top to bottom before saving your partfile. If you are editing a partfile, you can click on whichever step you desire. Navigate to different steps using the Back and Next buttons at the top of the window.

Masterfile Setup

No setup needed.

Partfile Name and Save



- **Partfile Name (required):** This will be the name of the .ugi file you will run. Generally, it should be named the same as the part you are running.
- **Partfile Description:** This field is used for entering any notes about the partfile, such as who created it, what was changed in the last revision, etc.
- **Creation Date:** Date when the partfile was created.
- **Modify Date:** Date when the partfile was last modified and saved.
- **Partfile Location (required):** This is where the .ugi partfile will be stored on your hard drive. The default location is C:\Program Data\LMI Corporation\Partfiles
- **Associate Partfile Work Instruction:** Used to pull up a pdf containing work instructions for the fixture/cell.
- **Partfile Password and Verify Password:** Used to password protect the partfile. If entered, the password will be required to edit the partfile.
- **Number of Parts Per Subgroup:** Used if subgroups are desired; generally this will be left at 1.
- **Use a Part Counter:** If checked, the partfile will display the total amount of times it has been ran. To reset the counter, click on the Reset button to the right of the checkbox.

Partfile Defaults

Not applicable to SealGap systems.

Partfile Gages

This screen is the heart and soul of the partfile. In this screen you can add new measurement points, delete unused measurement points, change limiting specifications, create component screens, and set cautionary limits. Each row represents one measurement.

Menu Buttons:

Cut – Cuts a currently selected line.
Copy – Copies the currently selected line.
Paste – Pastes the copied or cut lines to a new location.
Insert – Adds a new row to the grid. The new line will appear above the selected row in the grid.
Delete – Deletes the selected line from the grid.

Number of Gages Points: Use either the up and down arrows or enter the total number of measurement points your partfile requires and press Enter on the keyboard. A grid will appear where each row represents one measurement. Normally, a SealGap system will include all doors of the vehicle, so the total amount of gage points is usually greater than 40.

The Grid contains the following columns by default. Additional columns can be turned on in the Masterfile (see Section V).

- **Characteristic** – The user generated name for the point to be measured.
- **Description** – Place the Wireless ID of the probe that will be used to measure the point in this field. In a SealGap system, the Wireless IDs of a gage set will be "reused" on each unique *component*. The user will use the same gages on the driver's side door as the passenger side door.
- **Component** – If you have a large number of points to measure, the Component column allows the user to break up the part file into more than one screen. Each door should have its own component screen of approximately 10 points (more or less, depending on how many gages the user has). For example, a four-door car with deck lid might have a total

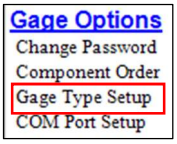
of 48 points. This would be broken down into five components – 10 points for each of the four doors and 8 points for the deck lid.

> **Note:** After the initial partfile creation, you can rearrange the component order using the **Component Order** link under the Gage Options on the left hand side of the screen.

- **Gage Type** – While there are several selections within this drop-down menu, only three are used in conjunction with capturing SealGap measurements:

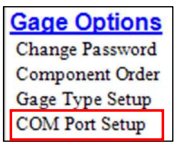
  - *237* – legacy type used with the wired 2300 SealGap system (discontinued)
  - *238* – legacy type used with the wired 2300 SealGap system (discontinued)
  - *Wireless SealGap* – used with wireless SealGap gages such as the 237W and 238W
  - *Wireless SealGap A* – used exclusively with SK Dual SealGap gages
  - *Wireless SealGap B* – used exclusively with SK Dual SealGap gages

  Note*:** You can set the Gage Type for every row at once by clicking on the ***Gage Type Setup link on the left hand side of the window under **Gage Options**.



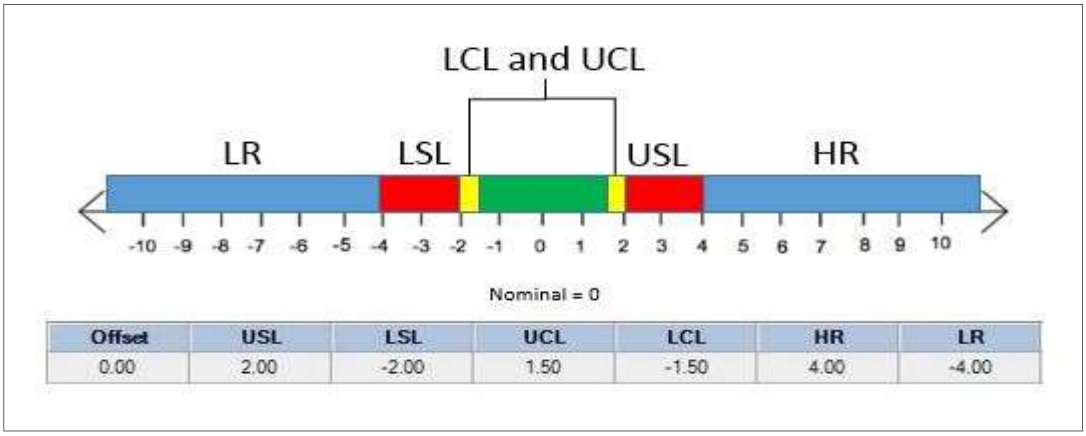
- **Association** – Applicable only to SK Dual SealGap data collection.
- **Calculation** – Used to perform simple calculations between points within the partfile. Calculations must appear after all points have been entered. Typically not used in SealGap data collection.
- **Mux Port** – Only applicable to the wired 2300 SealGap system. Sets which hub port will be used with each row. Not applicable if using wireless SealGap gages.
- **COM Port** – Sets the port that UGI uses for communication with the MicroRidge USB Base.

> **Note**: You can set the COM Port for every row at once by clicking on the ***COM Port Setup*** link at the left hand side of the window under **Gage Options**.



- **Span** – Sets the span for each measurement point; not used with wireless gages.
- **Offset** – Adds or subtracts a constant offset to the measured data.
- **USL** – The Upper Spec Limit determines the high acceptable tolerance for a point. Measurements higher than this will result in a red measurement box on the screen.

- **LSL** – The Lower Spec Limit determines the low acceptable tolerance for a point. Measurements lower than this will result in a red measurement box on the screen.
- **UCL** – The Upper Cautionary Limit determines a boundary below the USL that is usually 10 percent *less* than the USL. Measurements higher than the UCL but lower than the USL will result in a yellow measurement box on the screen.
- **LCL** – The Lower Cautionary Limit determines a boundary above the LSL that is usually 10 percent *more* than the LSL. Measurements lower than the LCL but higher than the LSL will result in a yellow measurement box on the screen.
- **HR** – High Reasonable will turn the measurement box blue if the measurement exceeds the HR limit.
- **LR** – Low Reasonable will turn the measurement box blue if the measurement is lower than the LR limit.
- **Invert Sign** – Makes a negative reading a positive reading and make a negative reading positive.
- **Active** – Determines whether or not the point will be active or absent from the routine.
- **Frequency** – Only used with LMI Autogage systems.

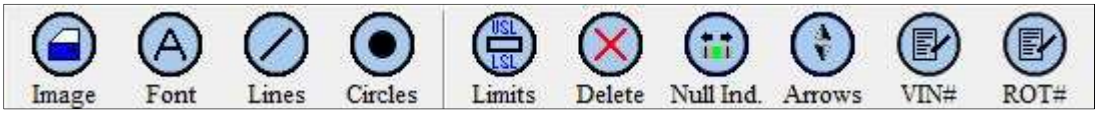


Offset	USL	LSL	UCL	LCL	HR	LR
0.00	2.00	-2.00	1.50	-1.50	4.00	-4.00

If the user only wants to see green and red (pass and fail), set the UCL and LCL to match the USL and LSL and keep the HR and LR at 100 and -100.

Partfile Graphics

UGI allows the user to import and perform basic editing of images to make the data collection process as easy and straight-forward to the user as possible. UGI can import .png, .bmp, and .jpg files. As a SealGap system relies on Components, UGI allows the user to select a different image for each unique component within the partfile.



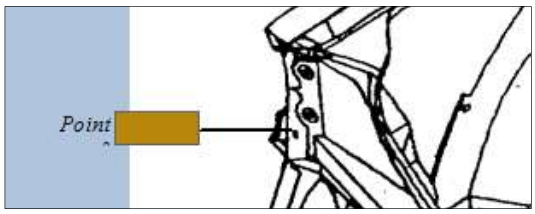
Menu buttons:

Image – Opens the Graphics folder where the user can select an image (or images) to use in the partfile.
Font – Allows the user to increase or decrease font size.
Lines – Allows the user to draw "leader lines" that connect the measurement boxes to particular points on the image.
Circles – Allows the user to put "dots" on the image to specify particular points of measurement.
Limits – Displays the USL and LSL next to each measurement box.
Delete – When the graphic is selected, this will delete the graphic from the screen.
Null Ind. – Not used with UGI SealGap.
Arrows – When selected, arrows will be displayed indicating whether the reading is high or low of the tolerances.
VIN# – Not used with UGI SealGap.
ROT# – Not used with UGI SealGap.

Graphics Setup Walkthrough:

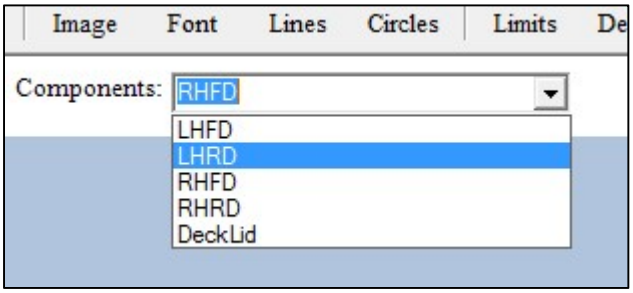
1. Move the image file into the Graphics folder found at C:\Program Data\LMI Corporation\Graphics.
2. Click on the Image icon, select the graphic you wish to use, and click Open.
3. Double-click on the image. There will be a thin black frame around the image. When this frame is around the image, you can resize the image by clicking and dragging the corners of the image. You can also move the image by clicking in the center of it and dragging it to your desired location on the screen.
4. When you have the image sized and placed in the middle of the screen, click and drag one of the measurement point boxes to the corresponding point on your graphic. **Double-clicking the box will flip the characteristic name from one side of the box to the other.**

   Alternatively, if a particular spot on your graphic is congested with several measurement points, use the Lines tool to extend more precise points to the boxes. With the Lines tool activated, click and drag on the point you wish to measure, then drag your mouse to the corresponding measurement box. When you have the box selected, it will turn brown and the characteristic name will be italicized. Double-click on the box to anchor the line to the box. After you do this, the line will follow the box.



   To remove an unwanted line, de-select the Lines tool, and then click and drag to make a "box" around the line you wish to delete. If you are successfully, the line will become dotted. Press the Delete key on your keyboard to permanently remove the line from the image.

5. If needed, click on the Limits and/or Arrows buttons to add these features to your partfile.
6. Select a different component from the Component drop-down menu and repeat the process above until graphics are associated with all components.



Partfile Inputs

Partfile inputs are used to collect additional non-measurement trace data from the user. Some of the most common partfile input fields are Operator Name/ID, Shift, and Serial/Part Number.

There are four tabs at the top of the window that will determine how often and when each input is asked for as the partfile runs.

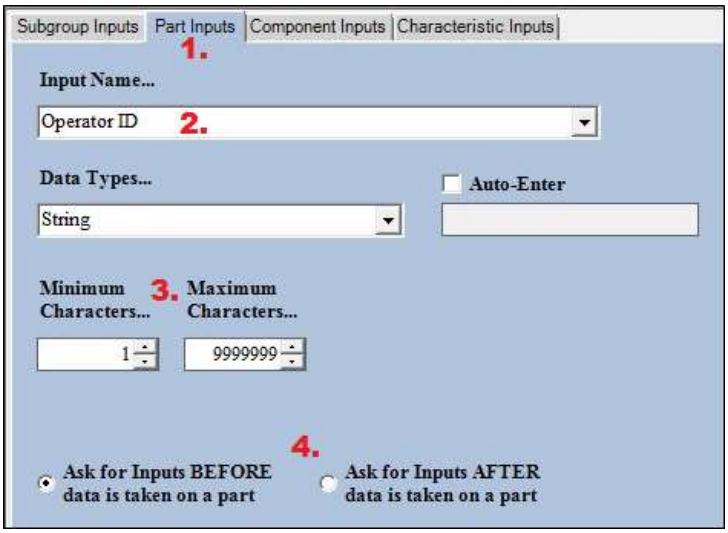
Subgroup Inputs are asked for every time a new subgroup is started. This means that if the user has a subgroup size of three, the user will only be asked for the input data on the first run of the three. *If the user has a subgroup of one, then Subgroup Inputs behave exactly the same as Part Inputs.*
Part Inputs are asked for every time the partfile finishes one round. This is the most common input type. If the user has a subgroup of three, then the user will be required to enter the Part Input data three times – once each time the partfile finishes.
Component Inputs are asked for whenever a partfile switches from one component to another. Generally, this type of input is used when the user has a left hand subassembly that is joined with a right hand subassembly and each piece has a unique serial number.
Characteristic Inputs can follow one particular characteristic point or need to be input for every characteristic point. In the latter case, if the user has a part with 10 measurement points, the user will be asked to input data either before or after every single measurement. Unless you have a *very* specific reason for using this input type, it is best to avoid using it.

There are several **Data Types** to choose from, with the most common being the String and the List types.

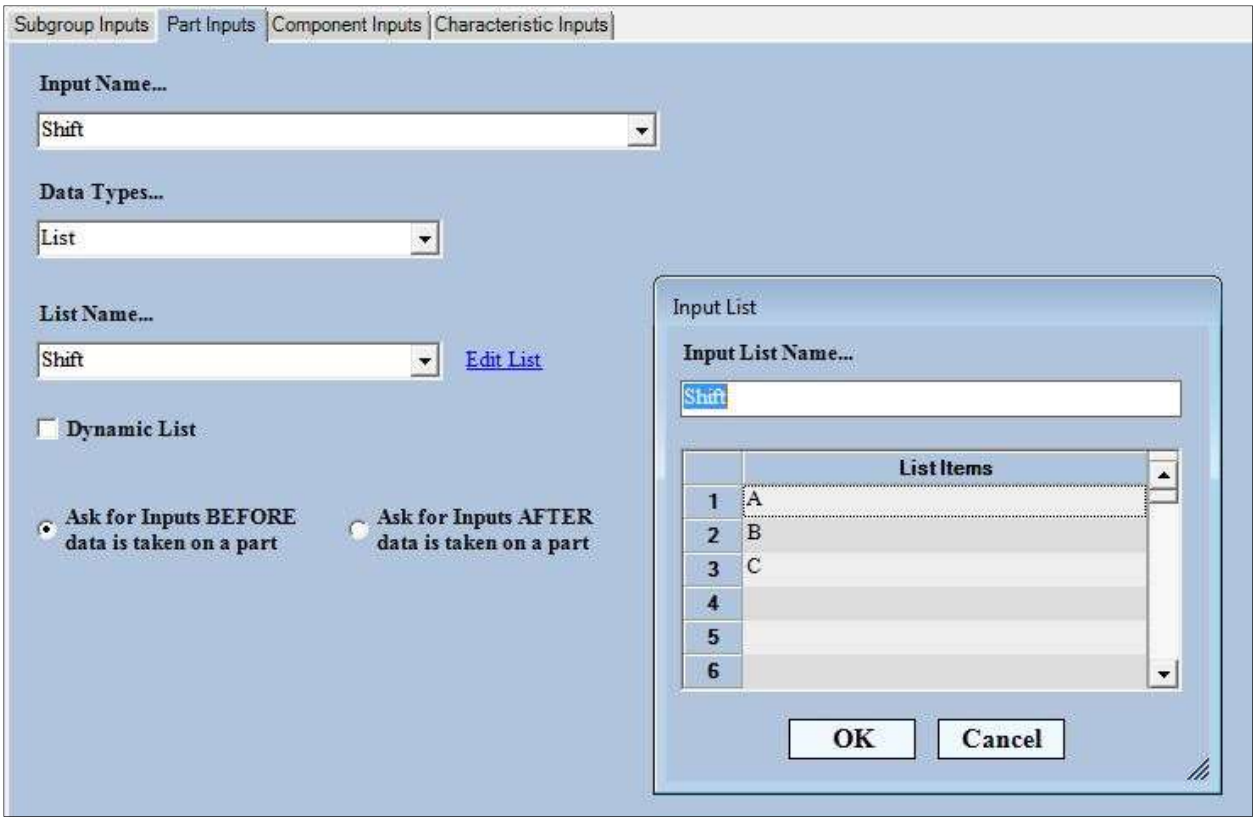
- String – Users can enter alphanumeric characters into the text box. The "Auto-Enter" box allows data to be written to the output file without the user having to enter any data. This is useful if you need to capture data that will not change such as building number or model identifier.
- Integer – Users can only enter whole numbers into the text box.
- Single – Users can enter whole and decimal numbers into the text box.

- True/False – Users will be presented with a choice between two user defined states (yes/no, true/false, etc.).
- Date – Users will be able to select a date from a calendar. This is different than the date that UGI will append to the output file that shows when the measurement data was taken. This type is used when parts will be measured on a date that differs from the build date. The build date can be captured using this feature.
- Time – Users will be able to enter the current time or a selected time. The selected time will be different than the date that UGI will append to the output file that shows when the measurement data was taken. This type is used when parts will be measured on a date that differs from the build date. The build time can be captured using this feature.
- List – Users will be able to choose from a selection of pre-defined choices. This is useful for entries that will not change, such as shift or part number.

How to create inputs for Operator ID and Shift



1. Click on the Part Inputs tab.
2. To create a string input, the user must first give the input a name. In the **Input Name…** box, type the words *Operator ID*.
3. If needed, the user then has a choice to limit the amount of characters that can be entered in this field using the Minimum and Maximum Character boxes.
4. Next, choose whether or not the operator will be asked for this information before or after the data is collected. **NOTE: If Automatic Write is implemented in the partfile, all user input data must occur <u>BEFORE</u> measurement data is taken.**
5. To finalize the input, click on the **Add** button in the lower right hand corner of the window.

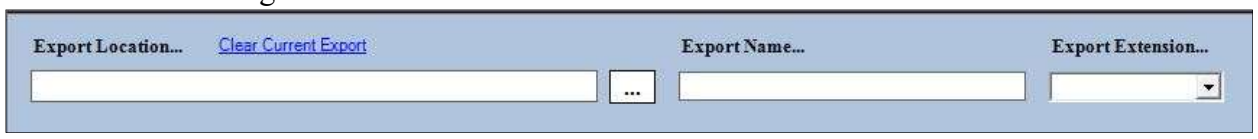


1. To create a list, start by selecting List from the **Data Types…** dropdown menu.
2. Click on the link for Edit List.
3. The Input List window will appear. Type in *Shift* under the **Input List Name…** field and then enter *A* for List Item 1, *B* for List Item 2, and *C* for List Item 3. Click OK.
4. Under the **Input Name…** field, enter the word *Shift*.
5. Click on **Add** in the lower right hand corner of the window to finalize the input.

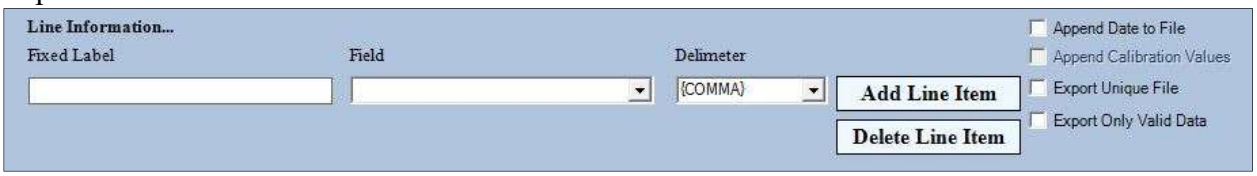
Partfile Exports

The Partfile Exports section allows the user to configure the collected traceability and input data into a format of his/her liking. The screen can be divided into three distinct sections:

Name and formatting:



Export attributes:



Finished Exports:

Naming and Formatting – This is where the user will give the export a name, extension, and storage location. Click on the ellipsis to navigate to the location where you want to store the extension. By default, the storage location is C:\Program Data\LMI Corporation\Partfiles; however, the user can choose to store the data anywhere on the PC or network as long as admin read/write privileges have been granted to that location. Give the export a name in the **Export Name…** field. **The Export Extension…** will be attached to the end of the Export Name… and can be any three or four alphabetical characters preceded by a period. If choosing something other than .CSV or .XLS (or other Excel extension), you will need to tell your computer what program to use to open the file.

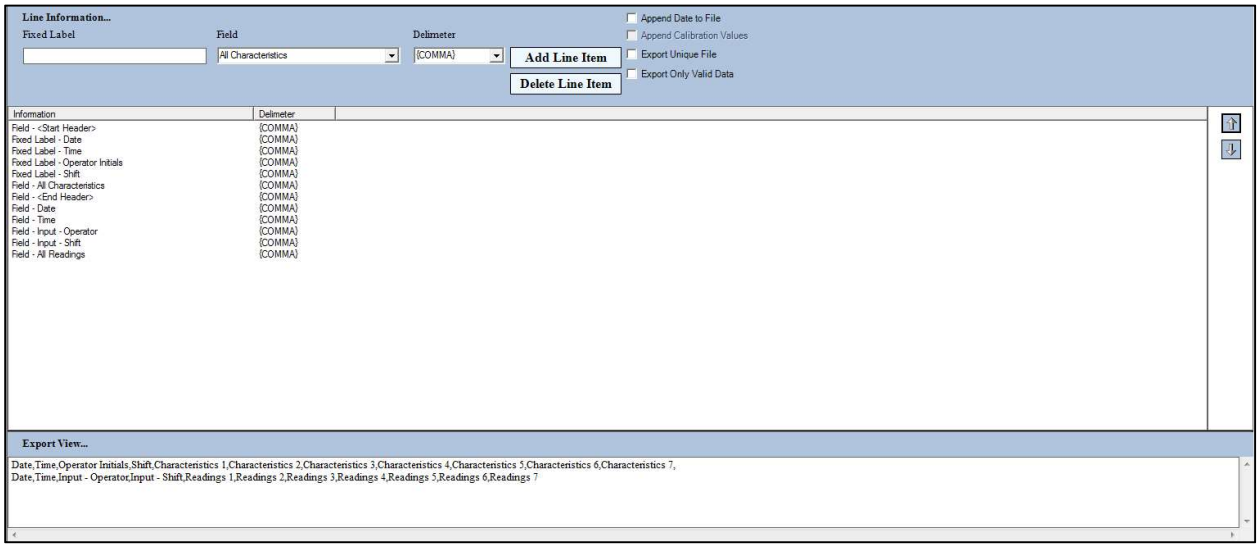
Export Attributes – Export attributes are the items that you wish to see on your export file. Just about any field in UGI can be added to the export.

Fixed Label – Anything input as a Fixed Label will be static in the export, such as header information. Simply type the name of the attribute in the white box.
Field – Most of the items in the Field dropdown are dynamic, such as readings, trace input data, and date/time. Trace input data (set up on the Partfile Input page) will be prefixed with the word INPUT (e.g. – INPUT – Operator ID)
Delimiter – The delimiter is what separates each field and fixed label from one another. If you are using .CSV as your export, your primary delimiter should be a comma. If you are using any type of Excel-specific extension (.XLS, .XLM, .XLSX), you should use tab as your primary delimiter.
Append Date to File – Adds the date to end of Export Name.
Export Unique File – Adds the Julian date to the end of the Export Name. This is based off of the "system time" on the PC.
Export Only Valid Data – Will only write data to the file if all fields have been entered during the data collection process.

Example Export Setup

1. Click in the white box below **Fixed Label** and type the word *Date*, then click the **Add Line Item** button. *Field - Date* will appear in the Information list.
2. Repeat this process for the words *Time*, *Operator Initials*, and *Shift*.
3. Click on the drop down menu below **Field**. Using the down arrow on the menu, scroll until you see *All Characteristics*. Click on this and then **Add Line Item**.

4. Click on the drop down menu below Field, scroll up, and click on <*Start Header*>. Click **Add Line Item**.
5. From the list in the Information window, click on *Field* - <*Start Header*>. Once highlighted, use the up arrow on the right hand side of the screen to move the *Field* - <*Start Header*> to the top of the list. Anything that appears between the *Field* - <*Start Header*> and *Field* <*End Header*> will be static. This will be the first row of the Excel sheet.
6. From the drop down menu, select and **Add Line Item** to the following fields: *Date*, *Time*, *Input – Operator*, *Input – Shift*, and *All Readings*. These items are dynamic, meaning that this is the actual data that will be collected when running the part file. These fields should be in the same top-down order that the header information is in so that each column lines up correctly with each row of collected data.

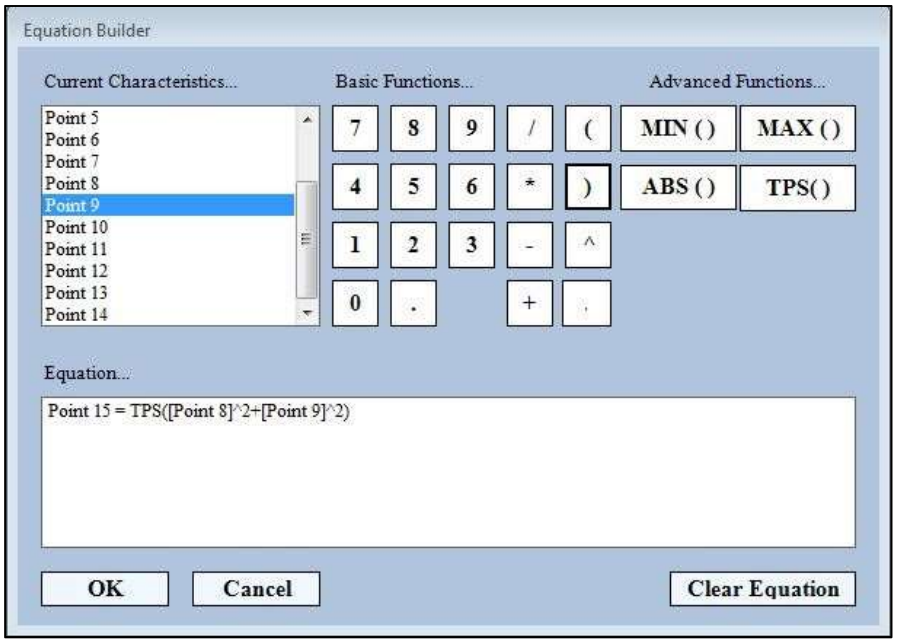


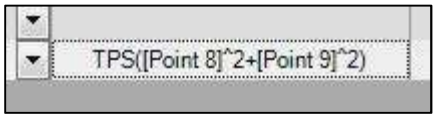
After you have finished saving your export, click on the *Finish* button in the upper left hand corner of the window and click *YES* to save your partfile.

Section IV. Additional Partfile Configuration

Calculations

Calculations can be added to your partfile by adding additional rows *after* your measurements in the Partfile Gages section of UGI. Once the row(s) have been added, click on the Calculation cell for that row. This will bring up the Equation Builder window. Choose the measurements you want to calculate from the **Current Characteristics…** window, then use the **Basic Functions…** and **Advanced Functions…** options just like you would on a handheld calculator. The example below shows how a True Position calculation would look:





Attributes

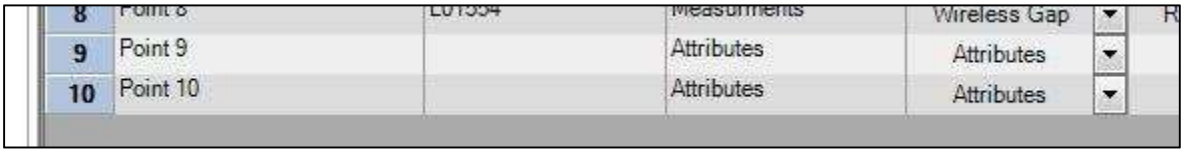
Attributes are simple Go/No Go checks. UGI gives you the ability to assign attribute points to things like pin or feeler checks that are part of the gauging process, but are not necessarily required for SPC data collection.

Attributes must first be defined in the UGI masterfile. After opening UGI, click on Tools and then Preferences. Enter the password *admin*. Click on the Attributes tab and follow the instructions below:

1. In the first row, enter GO under the **List Item** column.

2. Under the **Condition** column, choose Green.
3. In the second row, enter NO GO under the **List Item** column.
4. Under the **Condition** column, choose Red.
5. Click on Finish, OK, and then close UGI.

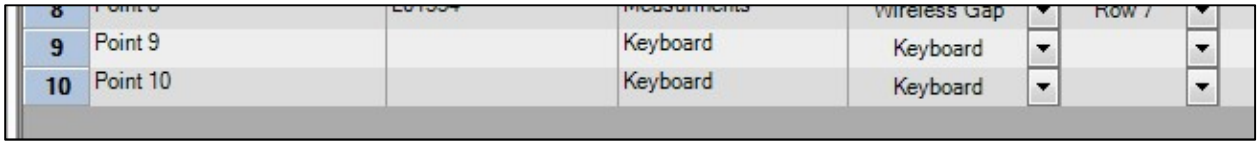
Reopen UGI, then add rows for as many attributes as needed at the bottom of your partfile. Choose *Attributes* as the **Gage Type**, and create a separate **Component** for the attribute points. Save your partfile and exit the program.



When you run the partfile, take the SPC measurements first. When you finish the last SPC point, the screen with the attributes will appear. Use the mouse to choose either GO or NO GO for each point. When you are finished, press the Enter key on the keyboard.

Keyboard Entries

If you have a partfile that requires hand-keyed numerical entries, you can set up a component screen for points that will be typed in by the user. These inputs must appear at the bottom of the measurement points list, after all other measurement data has been collected.



1. Add a new row(s) to the bottom of the Partfile Gages grid.
2. Enter a name in the Component column for every keyboard entry (e.g., Keyboard).
3. Choose *Keyboard* as your gage type from the Gage Type dropdown menu.
4. Configure the rest of each row by setting USL/LSL, UCL/LCL, and HR/LR limits.
5. Click on Finish, then “yes” to save the partfile.

Entering Keyboard points in the runtime:

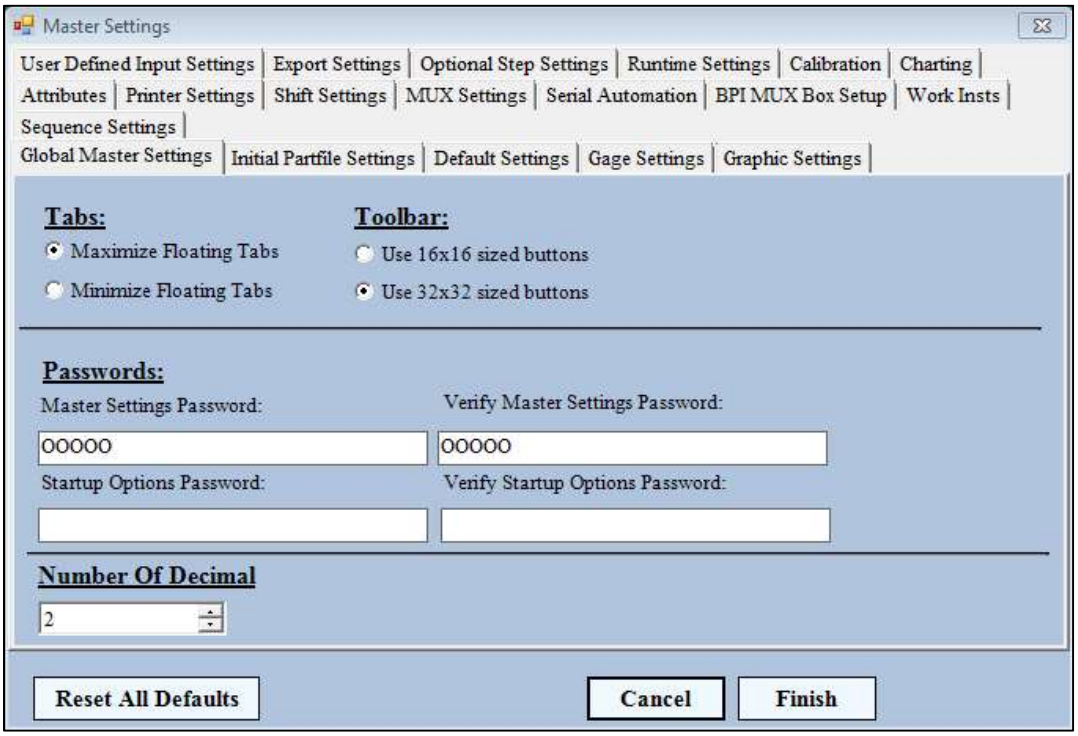
Run the partfile and collect all SPC data using the LMI gages your partfile requires. After you take the last of these points, the component screen with the keyboard entries will appear. The first keyboard point will be denoted by a tan-colored leader box. Enter the numerical value required for this point, then click and enter data on each subsequent point. When you have entered the last keyboard entry, press the Enter button on the keyboard.

Section V. Master Settings

Generally speaking, you should only get into the master settings if it is absolutely necessary (e.g., you have a special application that has been approved for use with UGI by LMI Corporation). For most applications, UGI will work as it should "out of the box." Again – only enter the Master Settings if you have a specific reason for doing so.

Click on Tools, then Preferences. Type in the password *admin*.

Global Master Settings



Tabs: Choose between minimized or maximized floating tabs with the UGI editing environment.
Toolbar: Choose between two sizes of menu buttons. Default is 32x32.

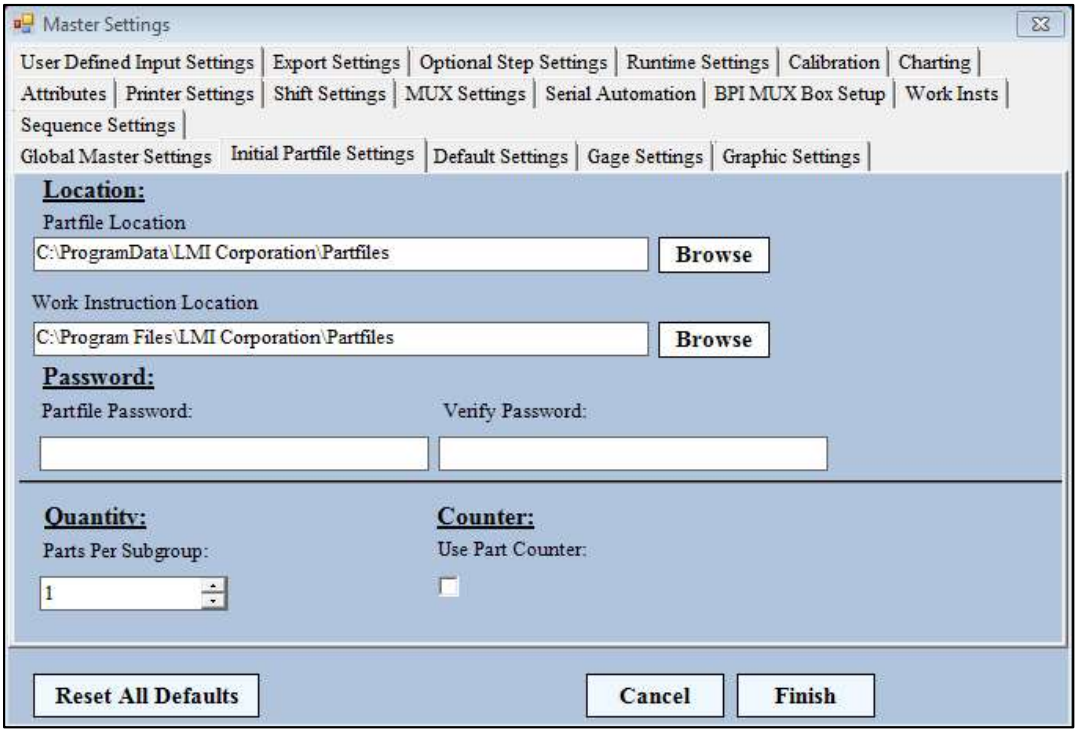
Passwords:

Master Settings Password – This is the password used to access UGI's Master Settings. The default password is *admin*.

Startup Options Password – Used in an automated system to

Number of decimals places: Used to select the amount of decimal places UGI displays on the screen. For mm, set this to 2. For inches, set this to 4.

Initial Partfile Settings



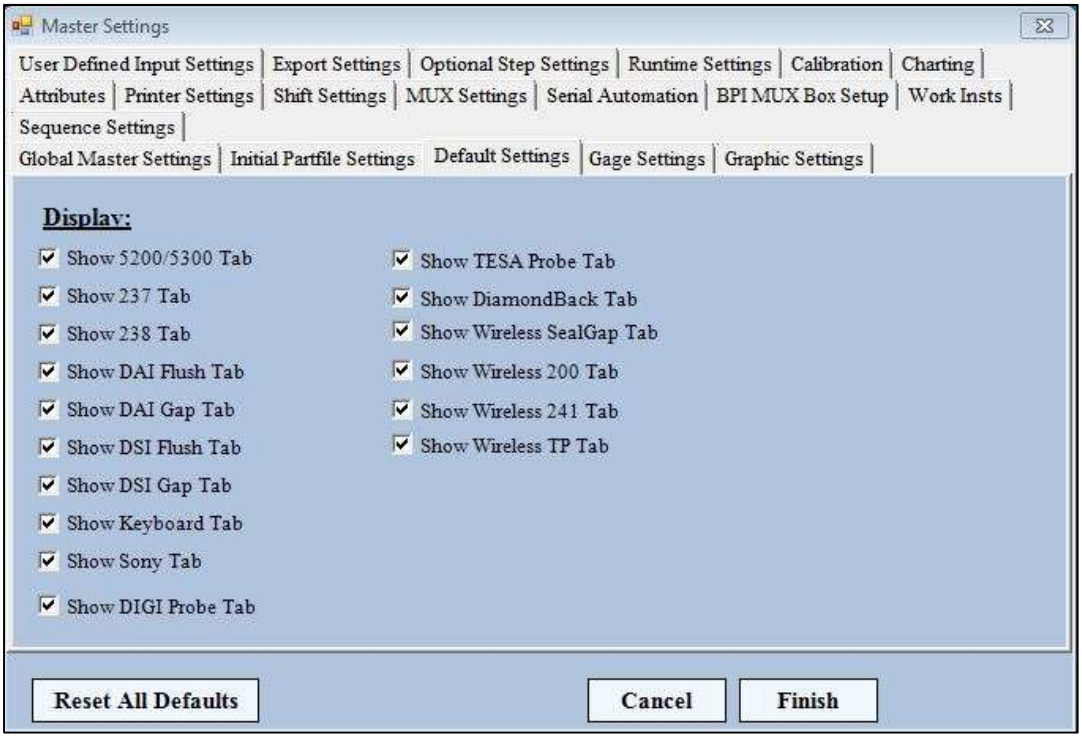
Location: Determines where the default Partfile and Work Instruction Locations will be when creating new partfiles.

Password: Entering a password here will mean that users must enter a password before editing a partfile.

Quantity: Defines the default number of parts per subgroup listed when creating a new partfile.

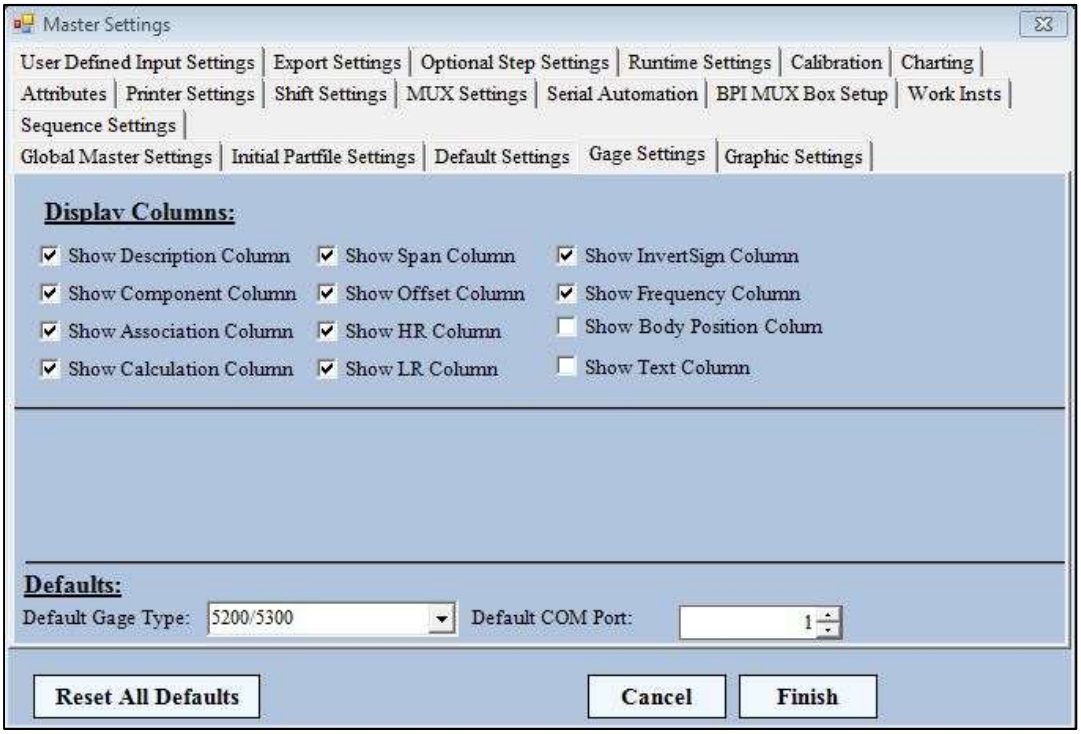
Counter: Used to enable the Parts Counter option by default when creating a new partfile.

Default Settings



Display: Choose whether or not particular gage-types are displayed in the Partfile Defaults page.

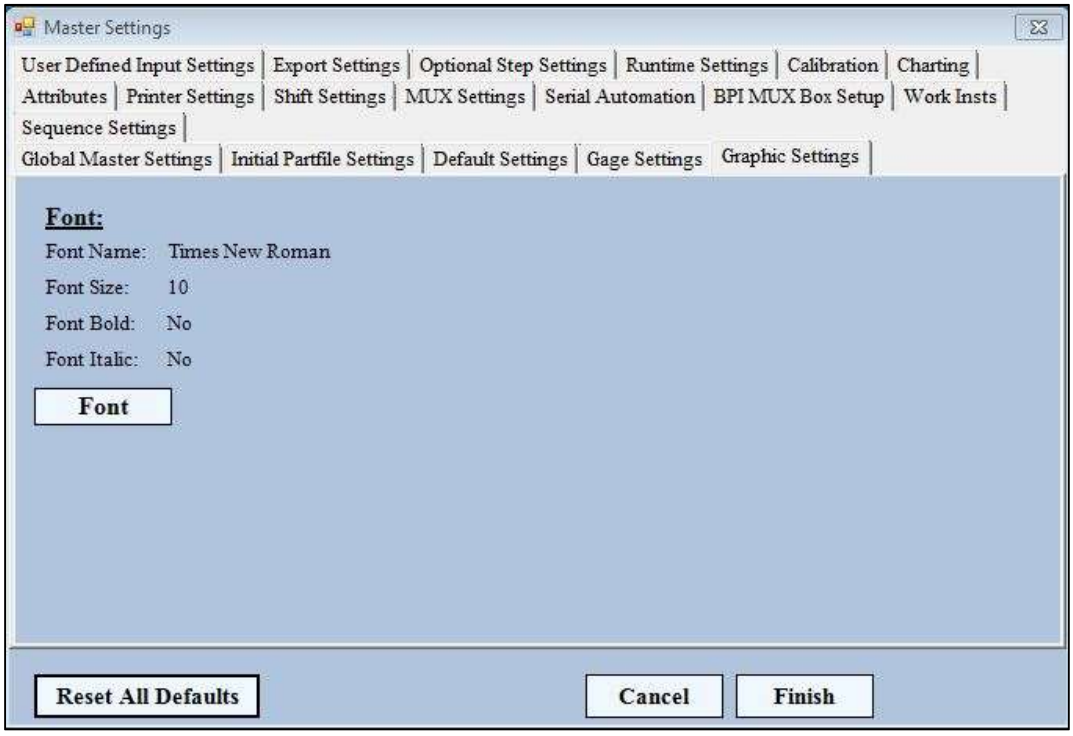
Gage Settings



Display Columns: Shows what columns will be shown in the Partfile Gages screen when creating or editing a partfile.

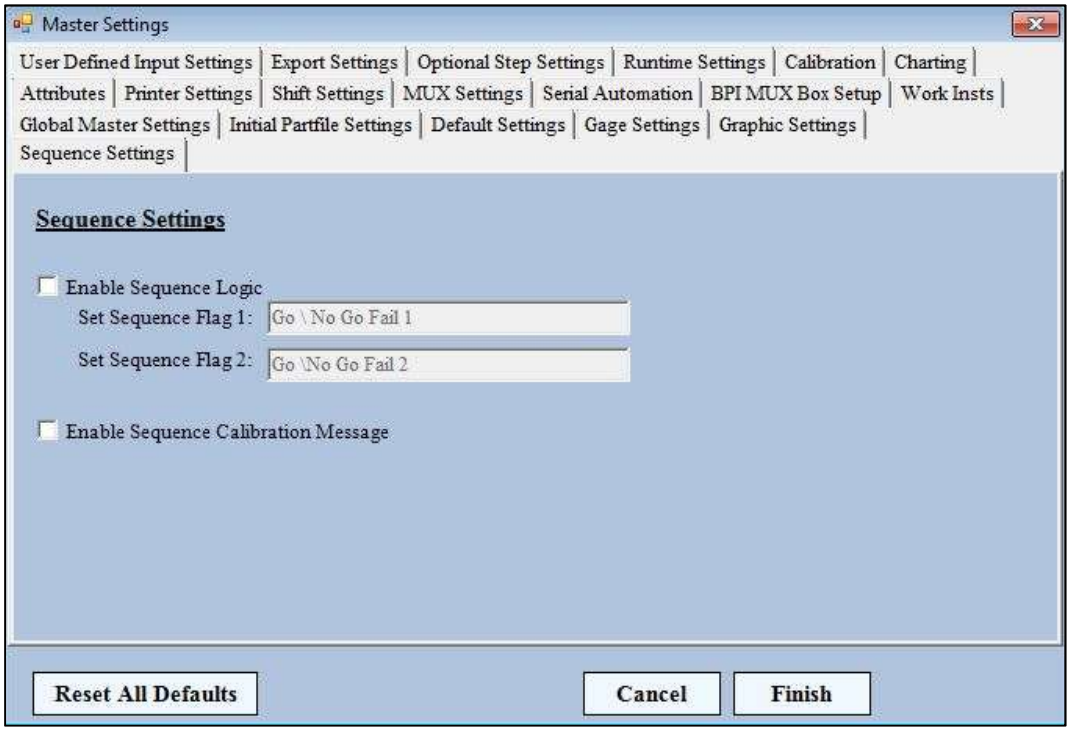
Defaults: Allows the user to set the default gage type and COM port that appear when adding new Gage Points to the Partfile Gages screen.

Graphic Settings



Font: Changes the default font for the Partfile Graphics page.

Sequence Settings

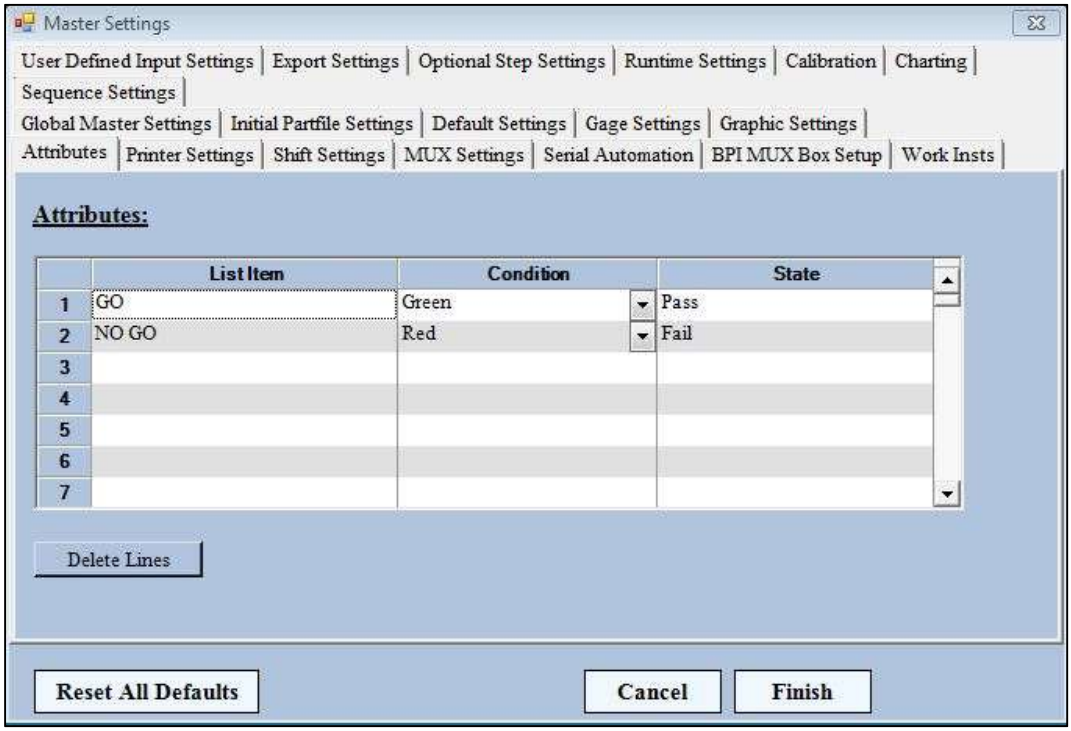


Sequence Settings:

Enable Sequence Logic – Sets a flag for a PLC if used in an automated system.
Enable Sequence Calibration Message – Used if you want to flag the operator to recalibrate the software in a PLC-driven automated system.

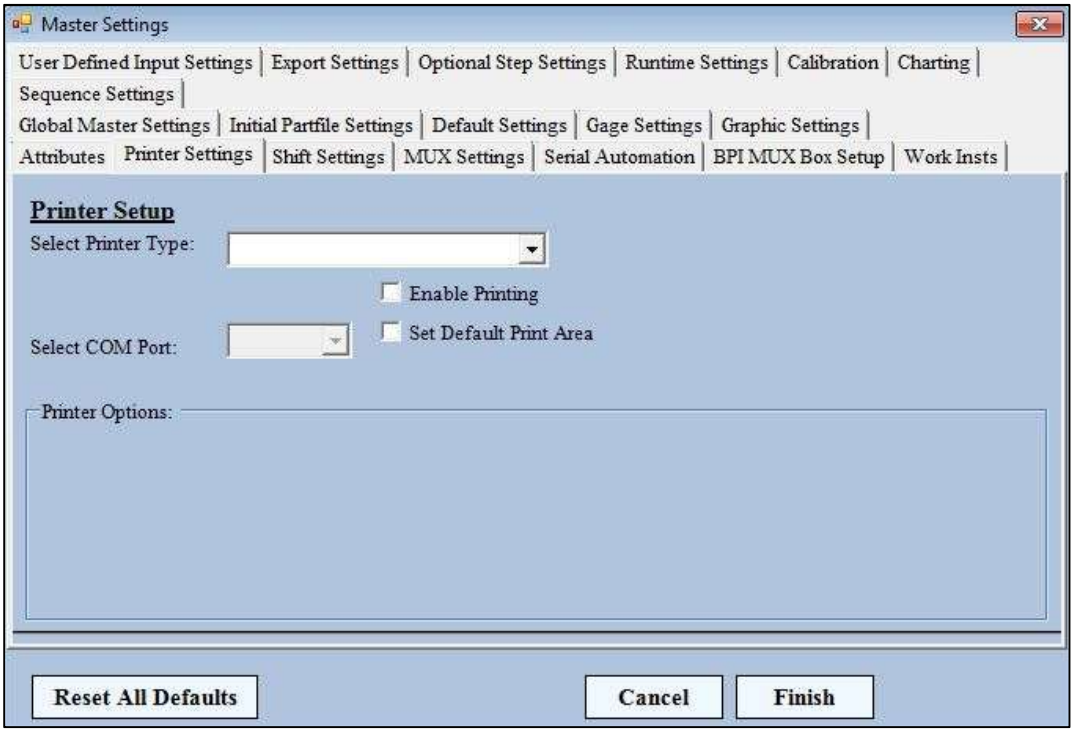
Note: For more information about sequencing, please see Addendum A.

Attributes



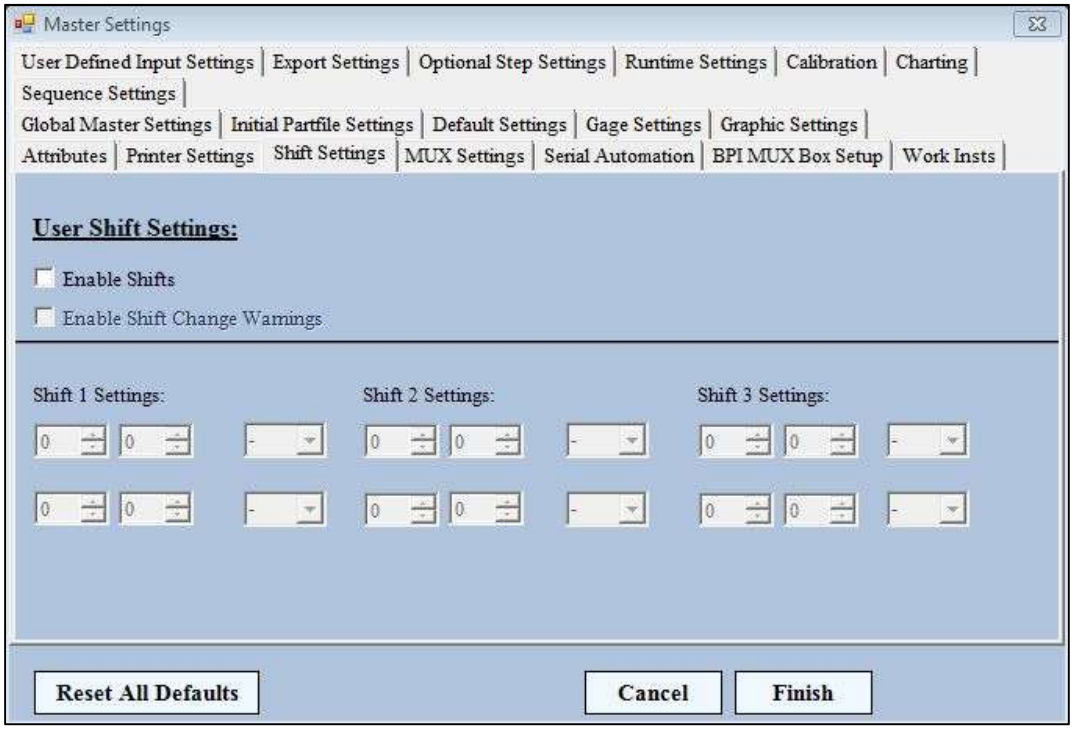
Attributes: Used to set-up the Attributes Gage Type. Refer to Section IV for more information about attributes.

Printer Settings



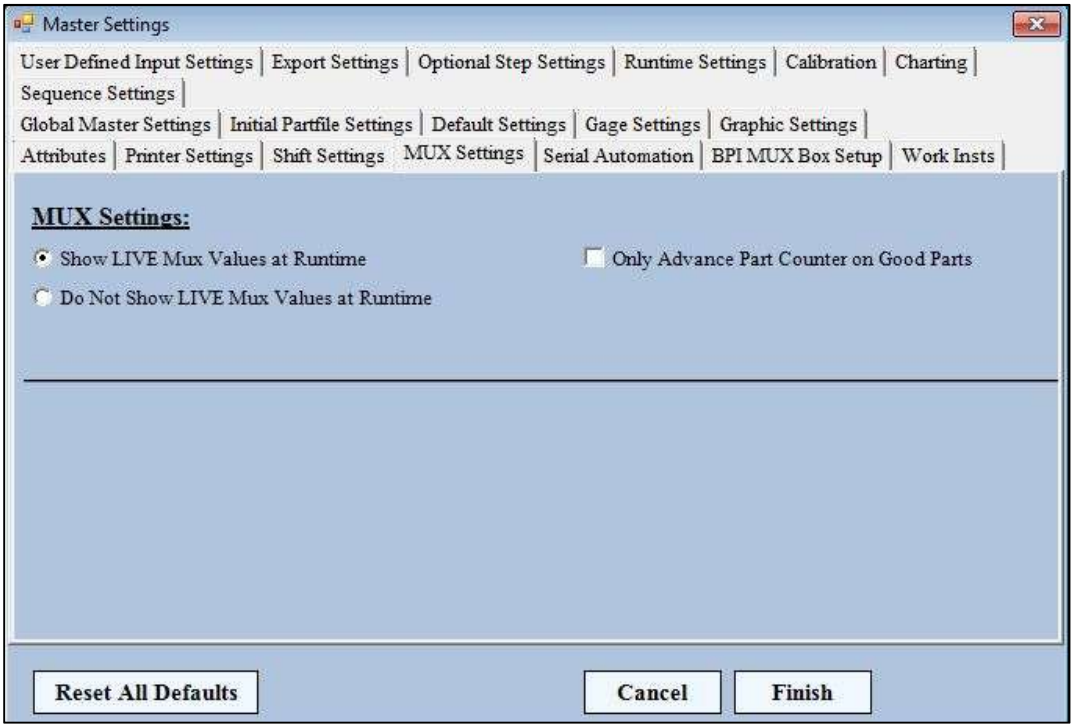
Printer Setup: Used in connection with an automated system that allows the user to print part labels for parts that have passed. Please consult LMI for more details about the capabilities for label printing within UGI.

Shift Settings



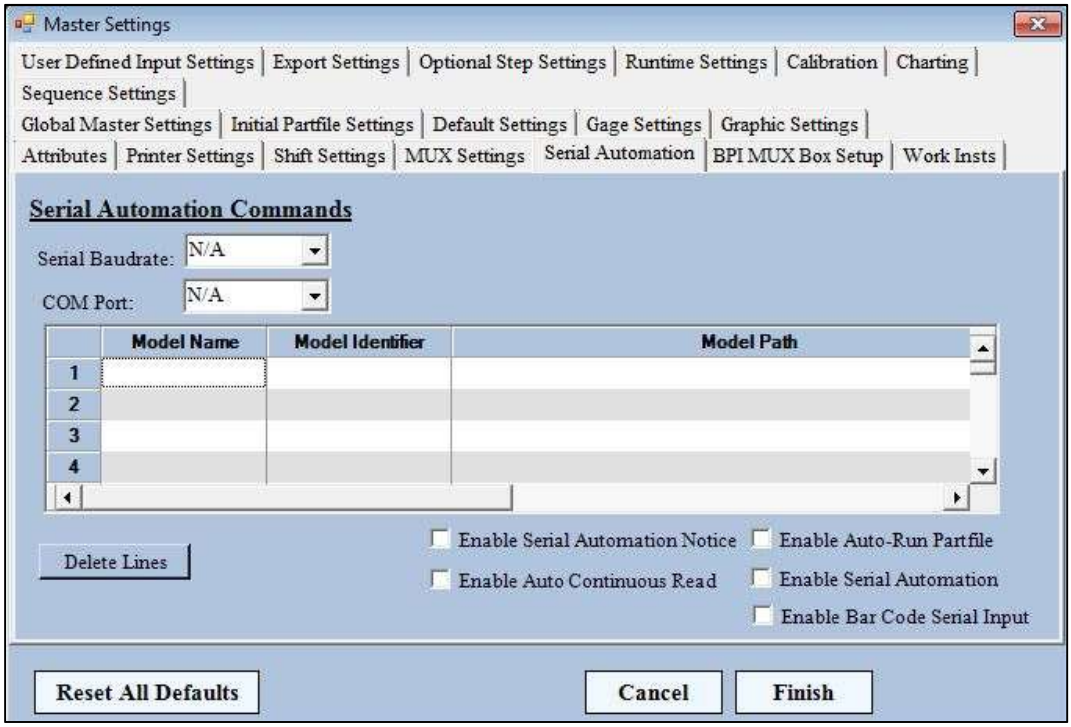
User Shift Settings: Used to create a pop-up message at the end of each shift stating that the shift has ending. This serves as a reminder to the user to recalibrate their probes without being forced to recalibrate the probes.

MUX Settings



MUX Settings: Used to display or hide live readings in an AutoGage system. The checkbox allows the user to advance the part counter only when a part is good.

Serial Automation



Serial Automation Commands: Used if you have a semi-automated or automated system.

Serial Baudrate – Communications rate between the equipment sending data and UGI. Usually this is 9600.

COM Port – Communications port being used to send information to UGI. This is part-file dependent.

The grid contains three columns that need to be filled in order for UGI to correctly open the right part file in the automated runtime environment.

Model Name – is the name of the specific model to be opened

Model Identifier – is the code that will open the partfile that is set in the Model Path

Model Path – is the location of the partfile to be opened when a particular Model Identifier is called

A note on Model Identifiers: The Model ID is dependent on how many characters are in the VIN or part number. Variables are denoted by asterisks. For example, a 13 digit VIN with the Model ID of XYZ falling in the 8th, 9th, and 10th spots would be input as *******XYZ***.

Enable Serial Automation Notice – Sends a pass/fail message back to a line-side serial-string box (contact LMI for specific details about this option)

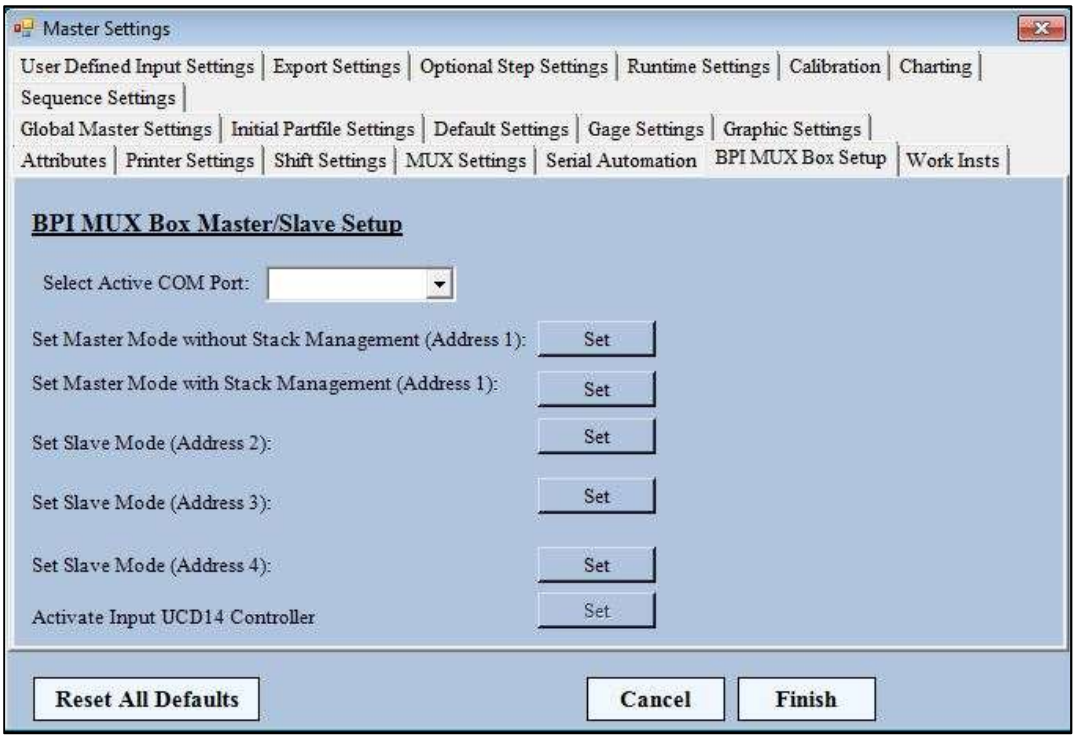
Enable Auto Continuous Read – Keeps the same partfile open until a command is received to open a new partfile

Enable Auto-Run Partfile – Activates UGI's line-side automation feature

Enable Serial Automation – Check if using an opening command from a line-side serial-string box (contact LMI for specific details about this option)

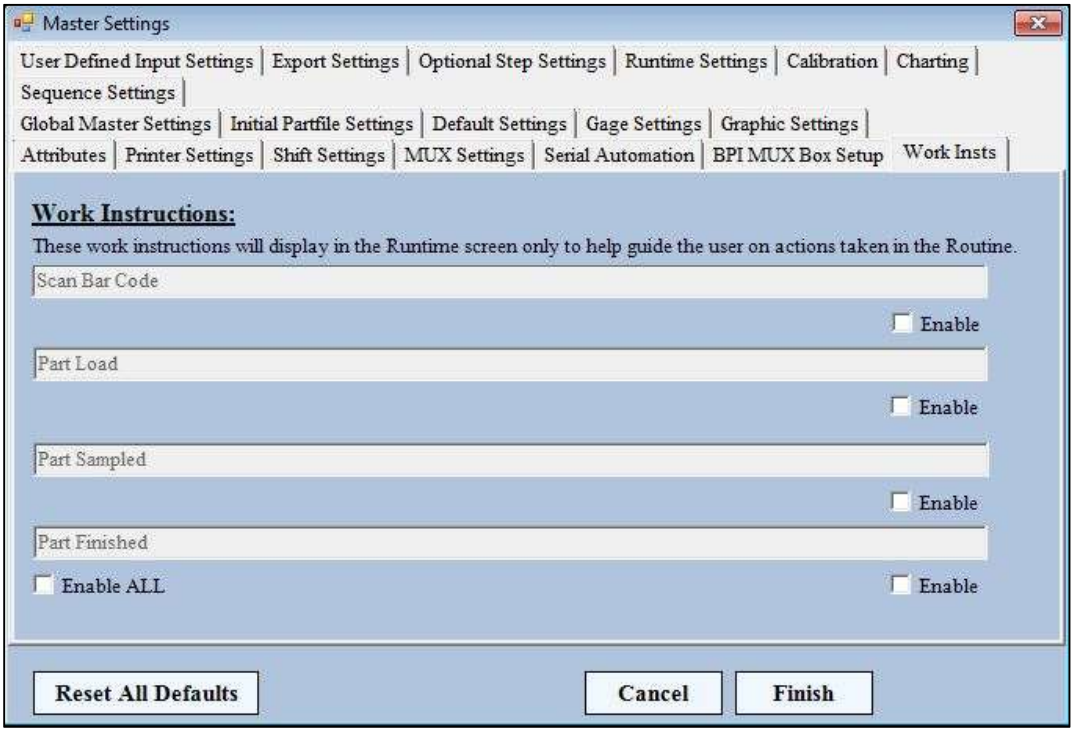
Enable Bar Code Serial Input – Check if using a barcode scanner to open up UGI partfiles.

BPI MUX Box Setup



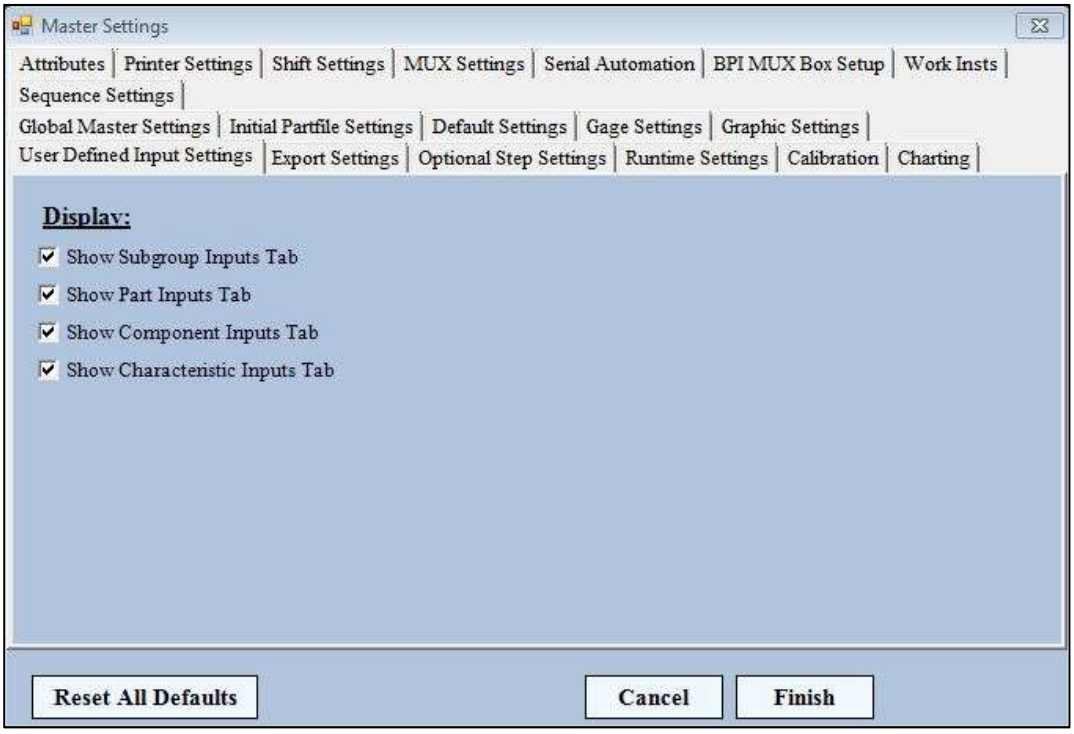
BPI MUX Box Master/Slave Setup: This is part of UGI solely to support a legacy product. If you have a BPI Mux system, please contact LMI Corporation directly for assistance in setup.

Work Insts



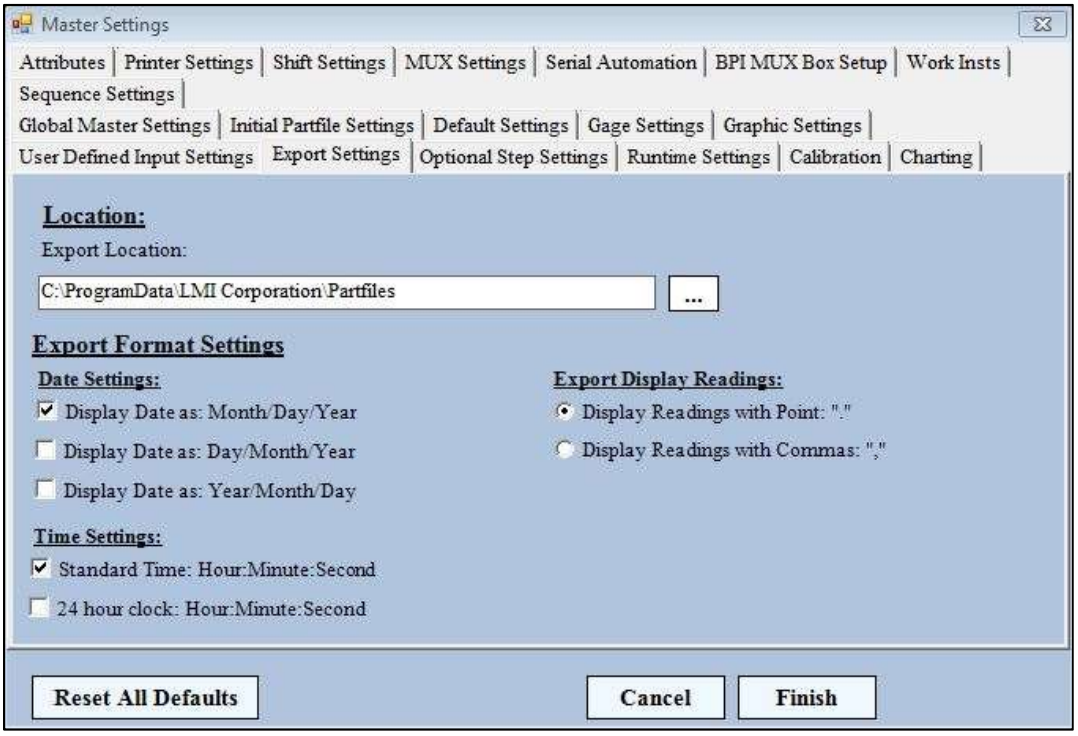
Work Instructions: Used only in complex automated systems, this tab allows UGI to open different work instructions in .pdf or doc/.docx format to assist the user at different times throughout the runtime sequence.

User Defined Input Settings



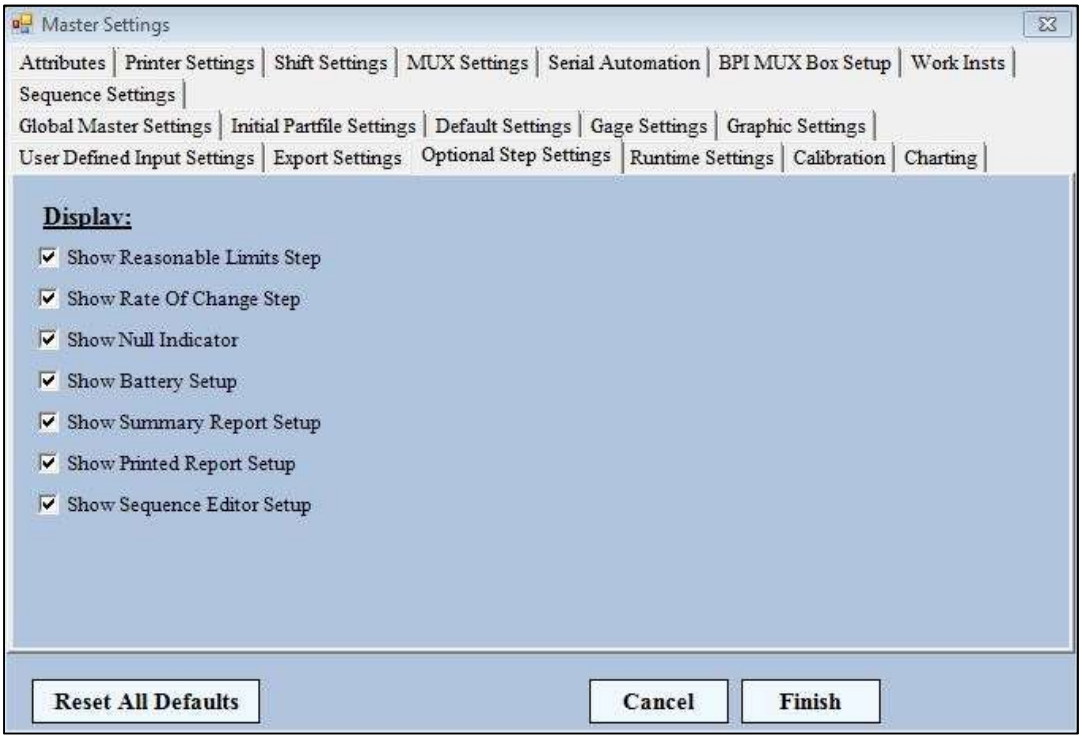
Display: Choose what tabs to show on Partfile Inputs screen. LMI recommends at least having the Show Part Inputs Tab checked.

Export Settings



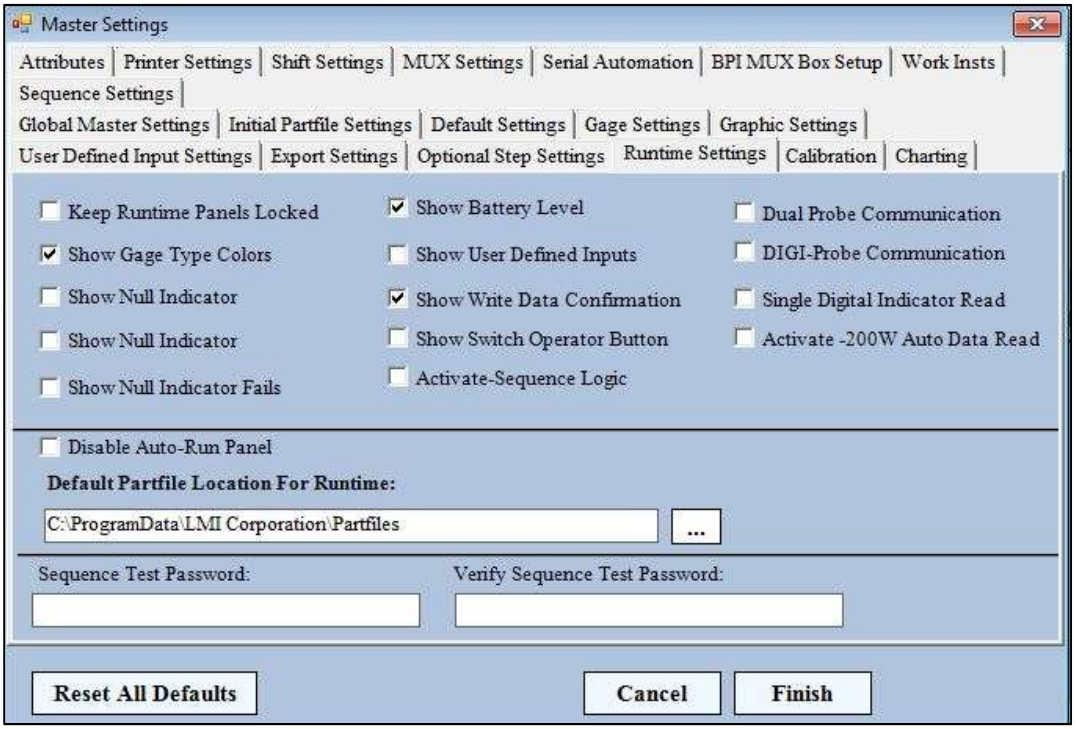
This page sets the defaults for the Part Export.

Optional Step Settings



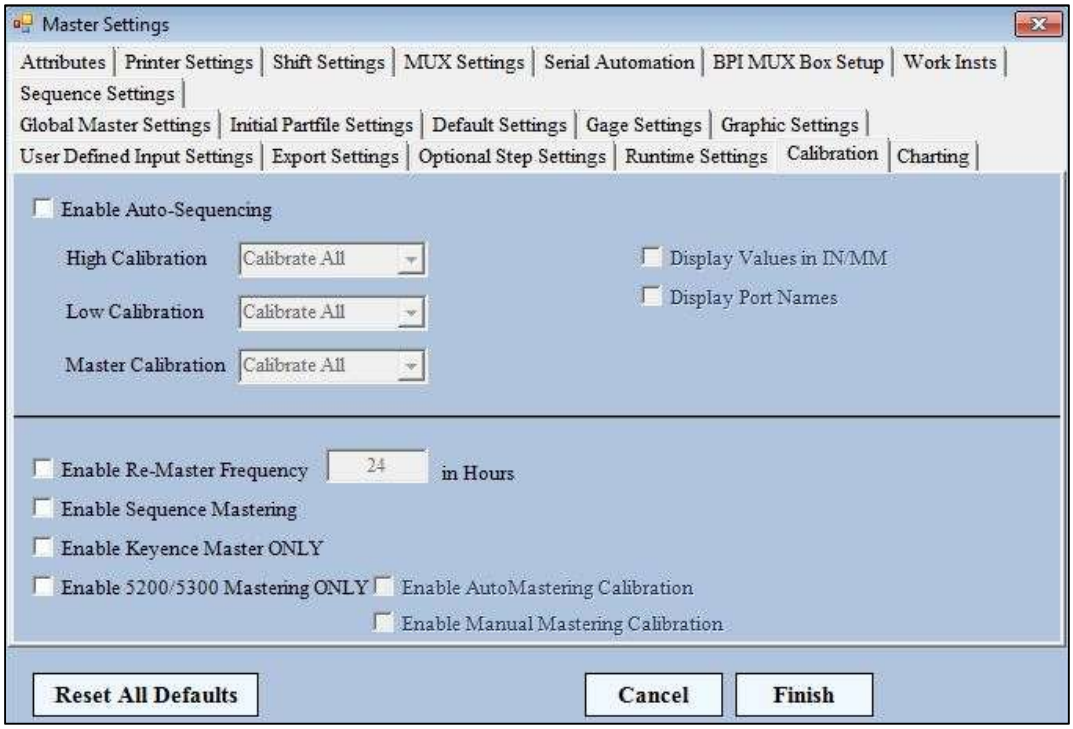
Determines if Optional Steps will be available to the user in Create/Edit mode.

Runtime Settings



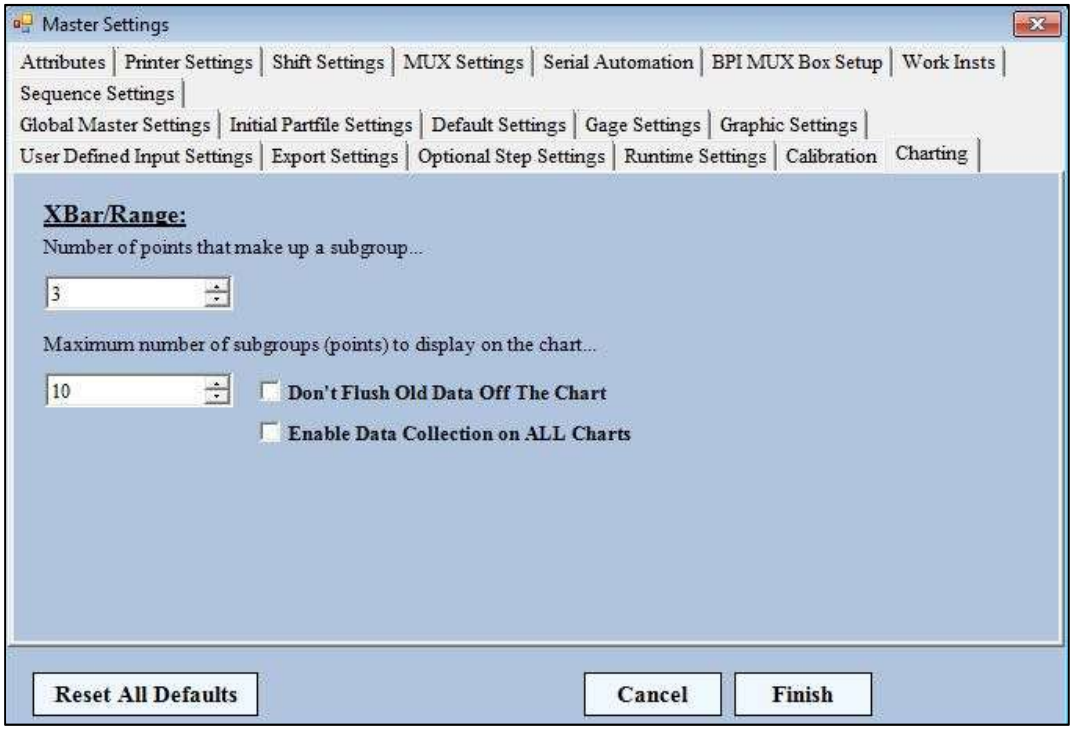
These settings determine what the user sees on the screen when running a partfile. Shown above are UGI's defaults.

Calibration



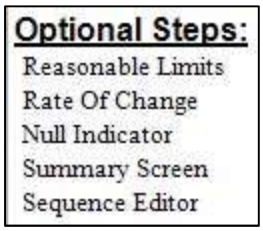
This tab tells UGI how it should behave when calibrating 5200/5300 probes. See Section II. Autogage for more details on this setup.

Charting



Xbar/Range: For use with simple histogram charting. If utilizing this feature, the user must have at least three points in a subgroup.

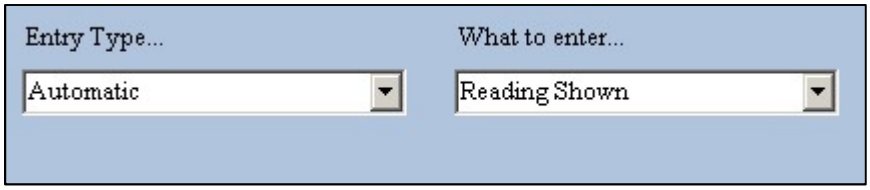
Addendum: Optional Steps



UGI contains additional optional steps that can – depending on application – enhance your partfile. These steps are turned off by default, but can be activated by clicking on *Tools > Preferences* in the menu bar and then clicking on the Optional Step Settings tab. Not all steps will apply to your partfile, so only activate those which pertain to your particular file (please consult LMI Corporation if you are unsure). After selecting which steps you wish to make active, click on Finish and exit out of UGI. When you either create or edit a partfile, you will see the **Optional Steps** appear under the **Required Steps** menu on the left hand side of the UGI window.

Reasonable Limits

The HR and LR columns in the Partfile Gages screen set up the limits for a reading being so far away from the nominal that it is flagged within UGI. The Reasonable Limits option will determine what the program does when it encounters one of these values. **Note:** When **not** activated in the Optional Steps menu, values that fall outside the HR and LR values will be denoted by a blue box, but the user will be able to continue on with data collection.

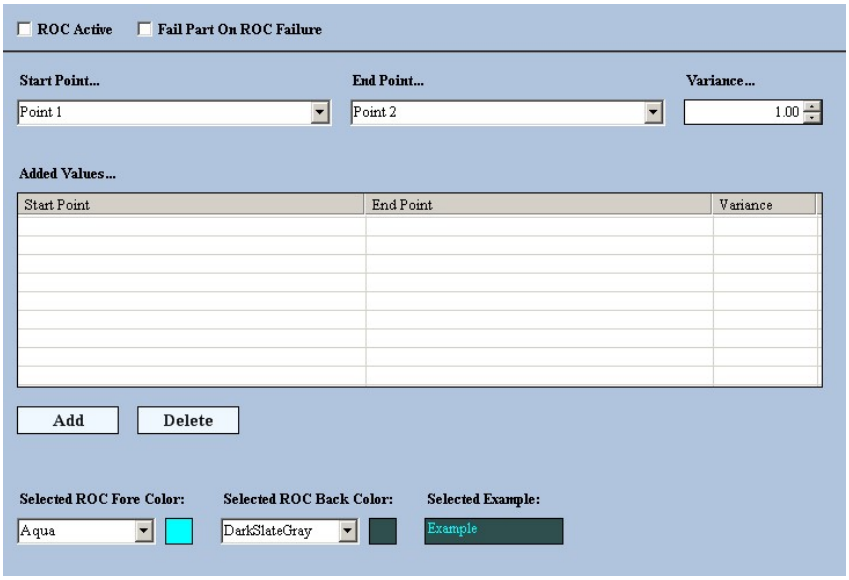


- **Entry Type -** The entry type for reasonable limits can either be automatic or manual. If automatic is selected, then depending on what has been selected from the What To Enter field, data will automatically be entered into the Partfile when sampled. If manual is selected, then a message box will be displayed when the data has been sampled and the user must then choose what to do with the data.

- **What to Enter -** Entry of the reasonable limits can be one of two different options: the reading as shown or a NULL value. If Reading Shown is selected then what ever the reading was at the time of the data being sampled will be placed in the export file. If NULL value has been selected then the word *NULL* will appear in the export file. The "What To Enter" field will be disabled if the entry type has been set to manual.

Rate of Change

The purpose of this screen is to configure gage points whose difference is a value necessary to keep track of. The difference between gages is called the rate of change.



- **ROC Active –** Checking this will activate the rate of change

- **Fail Part On ROC Failure –** Checking this will return a rate of change fail if any of the points used in rate of change are outside of their variance

- **Start Point -** The start point is the first value that will be used in the variance check. It can be any of the gages that were setup from the Partfile Gages screen.

- **End Point -** The end point is the other value that is used in the variance check. It can be any of the gages that were setup from the Partfile Gages screen except the gage currently selected for the start point.

- **Variance -** The variance is the acceptable difference between the start point and the end point.

- **Added Values -** This view shows all of the points that have a rate of change associated with them. It also shows the acceptable variance for the two points.

- **Add/Delete Rate Of Change -** Use these two buttons to add and remove any rate of change queries. To add a rate of change, select the start point, the end point, and the variance of the two points. Then press the Add button. To remove a rate of change, select the line item to delete from the Added Values list and press the Delete button.

- **Selected ROC Fore Color -** This is the color of the characteristic labels text for this particular gage type when selected. For example, using the above figure, when this Partfile is running and any rate of change occurs, the fore color of those selected readings will be aqua.

- **Selected ROC Back Color -** This is the color of the characteristic labels background for this particular gage type when selected. For example, using the above figure, when this Partfile is running and any rate of change occurs, the background color of those selected readings will be dark slate gray.

- **Selected ROC Example -** This is an example of what a selected characteristic of this gage type will appear as on the screen. It is a combination of the Selected Fore Color and the Selected Back Color.

Null Indicator

In order to activate the Null Indicator function in UGI, you must first enable the option in the masterfile. Click on *Tools* > *Preferences* in the menu bar and enter the password *admin*. Click on the **Optional Step Settings** tab. Click on *Show Null Indicator* if there is not a checkmark in the box. Click on Finish and then OK. Restart UGI.

After you have created and saved the partfile that will utilize the null indicator, click on Edit a Partfile, and choose the file you wish to edit. Open the file and then click on Partfile Graphics from the navigation pane on the left hand side of the screen.

Click on the Null Indicator button at the top of the screen to enable the indicator, which will appear at the bottom of the screen.

Next, Click on *Null Indicator* under the **Optional Steps:** menu. Click to check the Null Indicator Active checkbox. Fill in the grid in the same way that you filled in the Partfile Gages page.

Click on Finish, then Yes to save your changes.

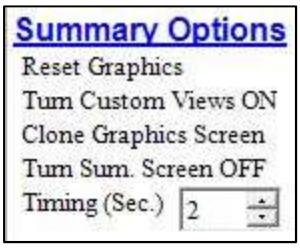
Summary Screen

In order to activate the Summary Screen in UGI, you must first enable the option in the masterfile. Click on *Tools* > *Preferences* in the menu bar and enter the password *admin*. Click on the **Optional Step Settings** tab. Click on *Show Summary Report Setup* if there is not a checkmark in the box. Click on Finish and then OK. Restart UGI.

> **NOTE:** If you are running an automated sequence, the summary screen will need to be activated from within the Sequence Editor page, not the Summary Screen page.

After you have created and saved the partfile that will utilize the summary screen, click on **Edit a Partfile**, and choose the file you wish to edit. Open the file and then click on the Summary Screen link under Optional Steps. Additional options will appear on the left hand side of the screen and within the menu at the top of the screen.

The options in the top menu and the body of the page (the blue background) operate much like the Partfile Graphics page. Using the toolbar at the top of the window, the user can add images, lines, circles, arrows and/or a global pass/fail message. The characteristic boxes can also be moved around and placed anywhere within the blue field.



In addition to this, the user can affect the following fields on the left hand side of the screen:

Reset Graphics – Returns the graphics to a "default" state. Clicking on this will reset the characteristic box positions and delete any images you have placed within the window.

Turn Custom Views OFF/ON – Toggling this will display either the actual readings or the word PASS when a point falls within the upper and lower spec limits set on the Partfile Gages page.

Clone Graphics Screen – This will automatically insert the graphic and settings from the Partfile Graphics page. **Not** recommended if using multiple components in your Partfile Graphics page.

Turn Sum. Screen OFF/ON – This toggles the summary screen on or off within the partfile.

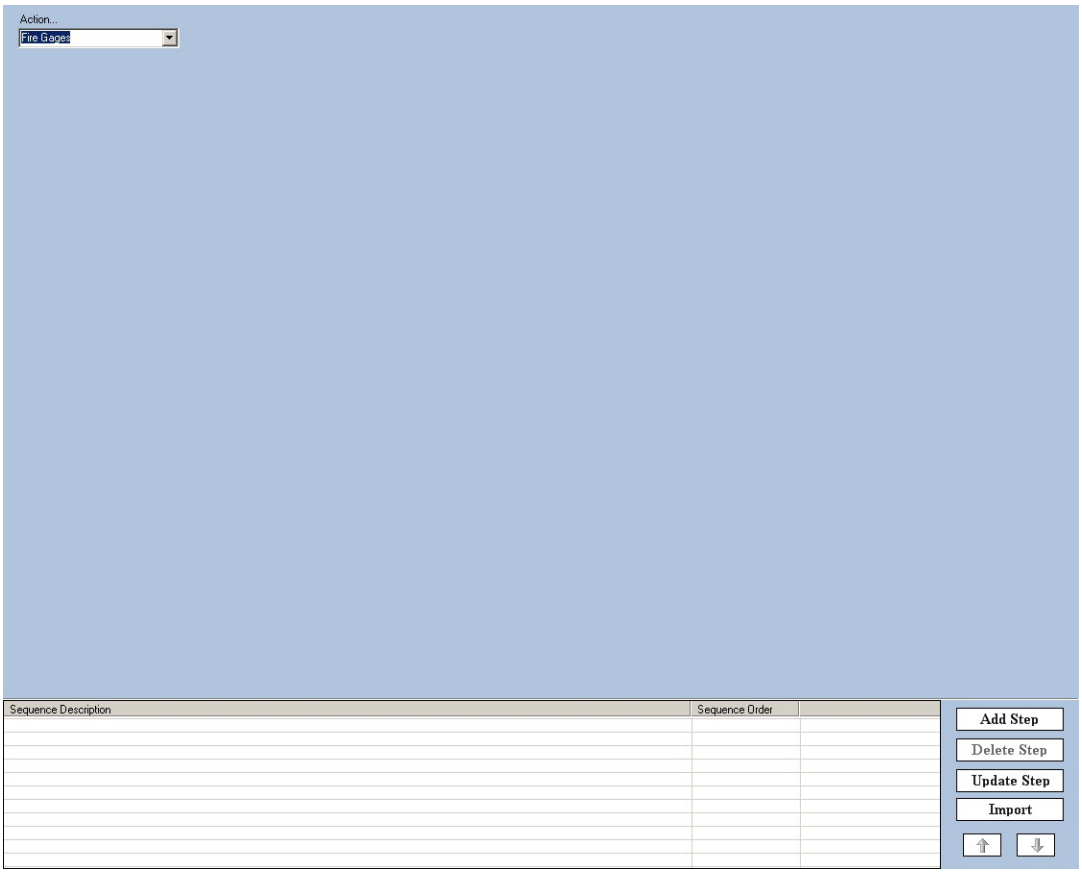
Timing (Sec.) – Determines the time the summary screen appears on the screen before writing if Automatically Write Data is turned on in the Partfile Exports Screen.

Sequence Editor

In order to use UGI with a PLC sequence, you must first activate the *Enable Sequence Logic* and *Enable Sequence Calibration Message* found in the Sequence Settings and then enable *Show Sequence Editor* from the **Optional Steps** tab.

If you have already created the partfile, open UGI and choose to **Edit A Partfile**. Under *Required Steps*, click on Partfile Exports. Under Optional Steps, choose Sequence Editor.

The Sequence Editor allows the user to setup specific tasks to be automated during the runtime mainly through the use of external IO devices. Most sequences have multiple steps that consist of conditions and actions.



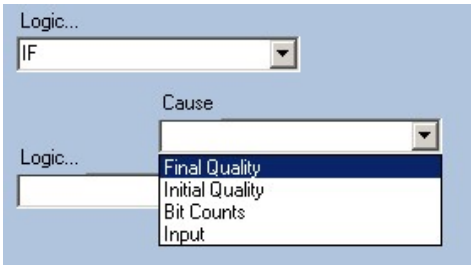
The first drop down box consists of both conditions and actions. Choosing either of these will form a string of logic.

- **Conditional Statements –** Conditional statements consist of either IF/THEN or WHILE/DO statements, one or more causes, and one or more actions based on the causes.

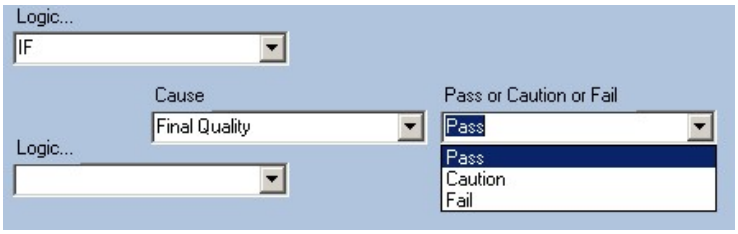
    - IF – The IF statement is a condition that consists one or more causes that will then perform one or more effects

    - WHILE – The WHILE statement is a condition that consists of one or more causes that will perform one or more actions as long as the causes are true statements.

    - Causes – There are four causes that can be selected when using a conditional statement. One or more causes can be used to make up a complete sequence step. If multiple causes are used, either and AND or OR statement will be selected to connect the multiple causes together.

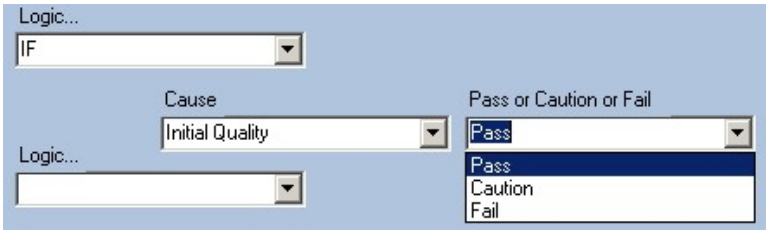


1. Final Quality – This cause will check the quality of the part being checked AFTER it has been sampled. It can have one of three different states at that point.



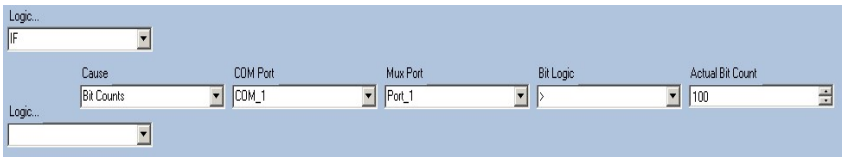
   If Pass is chosen, then all the readings on the screen will have to be green for this to be a true statement. If Caution is chosen, the readings on the screen can be either yellow or green, but no red can exist. Finally, if Fail is chosen, then one or more readings will be red on the screen.

2. Initial Quality – The value of the initial quality is determined when the readings on the screen have been frozen (an action in the sequence). Just like final quality, initial quality has three different states that it can be.



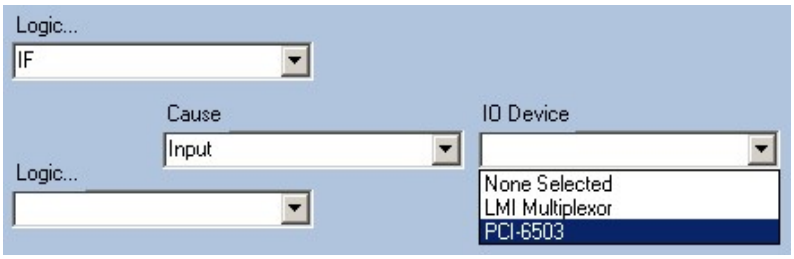
   If Pass is chosen, then all the readings on the screen will have to be green for this to be a true statement. If Caution is chosen, the readings on the screen can be either yellow or green, but no red can exist. Finally, if Fail is chosen, then one or more readings will be red on the screen.

3. Bit Count – The bit count cause checks a specific mux port on the LMI multiplexor for a certain value. This value can be greater then (>), less then (<), equal too (=), greater then or equal too (>=), less then or equal too (<=), or not equal at all (<>) to an actual bit count value of the users choice.

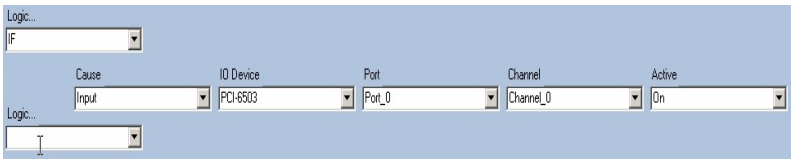


The actual bit count value can be any number from 100 to 4096 which would indicate that the multiplexor was not responding.

4. Input – The input cause checks the user's pc for any National Instrument I/O cards so it can display the correct ports and channels for that car. It also uses the newly designed multiplexor that contains multiple inputs and outputs.



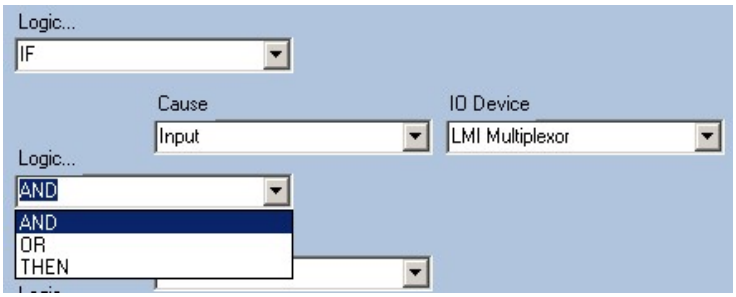
Once the IO Device has been selected, the associated Ports and Channels for that device are ready to be setup.



Once the port and channel have been selected, the user will determine if that channel on that port should be on or off for the conditional statement to be true. This is the Active drop down.

NOTE: When using the Grayhill board (now a legacy product), the logic is reversed, so the lights will turn on when Active is set to OFF and the light will turn off when the Active is set to ON

- Logic Extensions – The logic can be extended to use more then one cause statement by selecting a logic extension. These consist of AND, OR, and THEN (if the IF statement is used) or DO (if the WHILE statement is used).



1. AND – use this when two or more statements must both be true for the condition to be true

2. OR – use this when two or more statements are used where either can be true for the condition to be true

3. THEN – This will stop checking the causes and, if the cause conditions are true, it will perform the actions found after the statement

- **Actions –** The actions found in the sequence editor are responsible for the automation of specific events. There are 11 actions to choose from.

  - Sample – This action will perform a sample of the data

  - Freeze Readings – This action will freeze the readings on the screen. At this point, the Initial Value will be evaluated

  - Unfreeze Readings – This action will unfreeze any froze readings on the screen

  - Write Data – This action will write any sampled data to the desired export file(s)

  - Print Report – This action will print a specific report to a specified printer. This will override the printed reports section.

  - Print Screen – This action will print the screen at a specific point

  - Show Summary – This action will show the summary screen for a specific amount of time. This will override the summary screen setup.

  - Clear All Data – This action will clear out any sampled data at the point it was called.

- Wait – This action will stop all actions for a specific amount of time

- Stop Sequence – This action will stop the sequence at the point that it was called, preventing any other steps in the sequence from being called

- Output - The output action checks the user's pc for any National Instrument I/O cards so it can display the correct ports and channels for that card. It also uses the newly designed multiplexor that contains multiple inputs and outputs.

Once the IO Device has been selected, the associated Ports and Channels for that device are ready to be setup.

Once the port and channel have been selected, the user will determine if that channel on that port should be on or off for the conditional statement to be true. This is the Active drop down.

NOTE: When using a (now legacy) Grayhill board, the logic is reversed, so the lights will turn on when Active is set to OFF and the light will turn off when the Active is set to ON

a. Extend Gages – To extend gages automatically, the new multiplexor with multiple inputs and outputs will need to be used. The following actions will extend the gages…

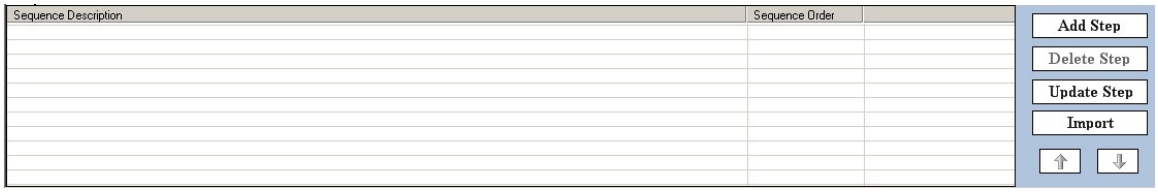
Action – Output
IO Device – LMI Multiplexor
Port – Desired COM Port
Channel – The output channel that the pneumatic value is attached too
Active – ON (turning the valve on will turn on the air)

b. Retract Gages - To retract gages automatically, the new multiplexor with multiple inputs and outputs will need to be used. The following actions will extend the gages…

Action – Output
IO Device – LMI Multiplexor

Port – Desired COM Port
Channel – The output channel that the pneumatic value is attached too
Active – OFF (turning the valve on will turn on the air)

- **Sequence Steps –** This portion of the sequence screen shows all of the steps that are included in the sequence. Here is where you would also add steps, delete steps, update steps, and import a global sequence. You can move steps up and down as well.



Sequence Editor – Toolbar

The sequence editor toolbar consists of two buttons, finish and back.

- **Finish -** Pressing either of these buttons will exit the creation of the Partfile and display the Partfile Options screen.

- **Back -** Pressing either of these buttons will progress the Partfile creation wizard to the previous screen. In this case, the Printed Reports screen would appear.

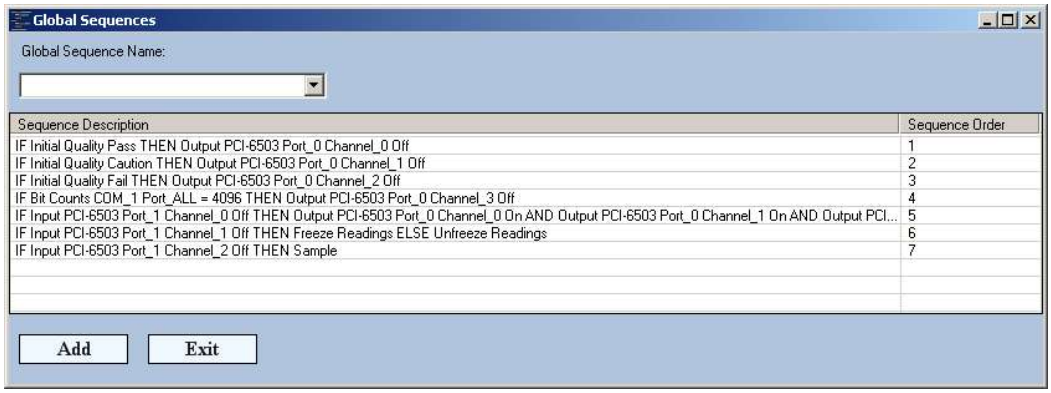
Sequence Editor – Navigation

The navigation on the left of the screen shows the user that they in the Sequence Editor portion of the software. The sequence editor screen has four additional options available to the users.

- **Turn Sequence ON/OFF –** Clicking this link will make the sequence either active or inactive. This gives the user the ability to setup a sequence one time and enable it or disable it as they choose. The status of the sequence is displayed at the bottom of the screen.

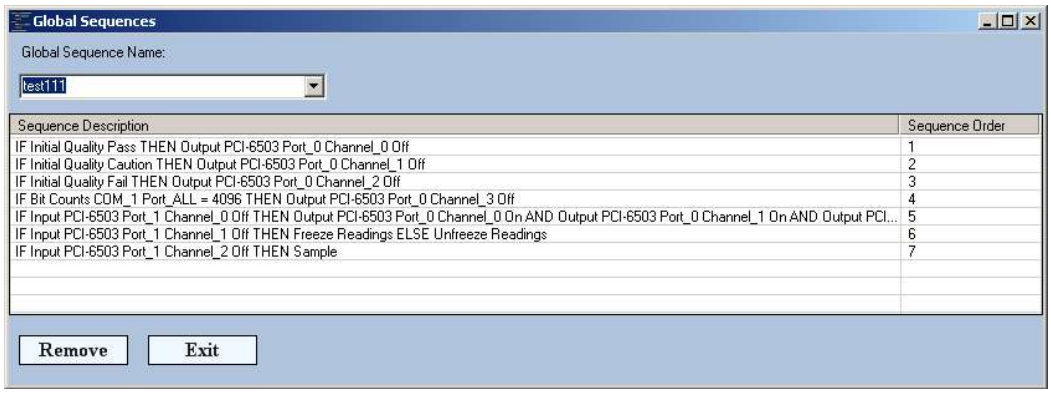
- **Turn Seq. Switch ON/OFF –** Clicking this link will allow a user to either start or stop the sequence during the runtime.

- **Add Gbl. Sequence –** Clicking on this link will allow the user to add the sequence they created to a global list so it can be used in many other Partfiles without having to create the sequence again.



When the link is clicked, the above screen will appear. It shows the sequence steps and the order in which they will be called. All the user has to do is give the global sequence a name and press the Add button.

- **Remove Gbl. Sequence –** Clicking this link will allow the user to remove a previously added global sequence.



To remove a sequence, select the name of the sequence from the drop down box and press the remove button.