
MetroPro User Notes

Includes changes for:
Versions 7.7.0 & 7.8.0

OMP-0470B

Use this document with:

Getting Started with MetroPro, OMP-0398

MetroPro Reference Guide, OMP-0347

MetroScript Programming Guide, OMP-0399



Summary of New Features and Improvements

Drop Down Menu—Controls with multiple selections have a menu from which it is easy to select the desired option with one click.

Non-ASCII Unit Symbols—These symbols have been added to the display unit abbreviations.

Crosshair Slice Option—Two linear slices whose endpoints are defined by the plot size. Interactive readout included.

Background Print Color—Select either blue or white when printing to a file or a printer.

Control Window Option—Grouping is easier with the ability to open a control window from within another control window.

Objective Button—Now displays zoom, resolution, and field of view settings.

Encoded Image Zoom—Automatic updating between the instrument's hardware and software controls. Hardware upgrade required.

Pattern Editor/Viewer—Now supports rectangular patterns with up to 99 rows and 99 columns.

Options for Limits—Limits can be defined as Nominal, High Allowance, or Low Allowance.

Application Locking—Can now be used with or without a password.

Q-DAS Report Window—Output numeric data in Q-DAS format.

Custom Result—Two new custom result types can be created.

New and Updated Controls and Buttons

For systems with the programmable stage option, new controls include—

AutoNull, AutoNull Mode, AutoNull Iterations, Measure Radius of Curvature & Nominal Radius of Curvature

Other controls and buttons new in this version—

Phase Avg Min N Pct Centroid X & Y
Custom

New Segmentation Controls include—

Test2 Mask Mode, Test2 Min Area Size, Test2 Trim, Test3 Mask Mode, Test3 Min Area Size, Test3 Trim, Test4 Mask Mode Unfill/Fill, Test4 Trim, Test4 Min Area Size, Ref Min Area Size, Ref Trim Test Min Area Size, Test Trim, Histogram Data Type

MicroLUPI Controls Renamed—

Many of the AutoNull controls have been renamed with no change in functionality. See the MicroLUPI section of this document.

New Results and Attributes

Centroid X and Centroid Y results
Many new attributes that correspond to new controls listed above.

New MetroScript Commands

resaveapp
loadswli

System Requirements

- Dell OptiPlex GX200 Computer (hardware requirements)
- MS Windows NT™ 4.0, SP 5 or above
- 128 MB RAM (256 MB recommended)
- 2 GB free hard disk space
- CD-ROM Drive
- 1.44 MB floppy drive

Software Upgrade Procedure

Use this procedure **only** if you are upgrading from a previous version of MetroPro. New systems are shipped with MetroPro already installed.

Important! Before You Begin . . .

- Determine how much RAM is installed in your computer. (See Step 1 below.)
- If you have a MicroLUPI or MESA, you must know the interface bus type of the instrument board, either PCI or ISA. Look at the back panel of the board; PCI boards are labeled. ISA boards are not labeled.
- MetroPro *must* be installed in the original installation directory to ensure proper operation. The original default directory is: C:\Metropro.
- Make back-up copies of user files. If you don't, MetroPro will over-write existing files that have the same name as the original files. Files you have created with unique names will not be overwritten or deleted.

Installing the Software

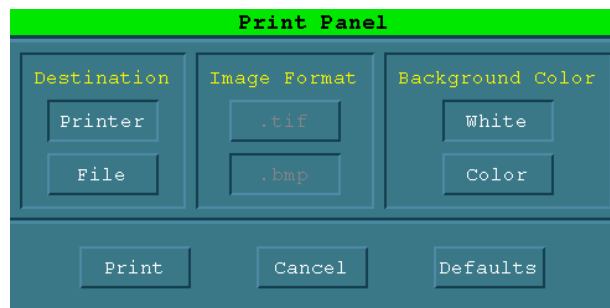
1. Check the amount of RAM installed in your PC. Click on the Windows Start button and select Settings→Control Panel. Open the System icon. Click on the General tab. The amount of RAM is displayed here.
 2. Shutdown all programs and reboot the system. Log on to Windows NT as "Administrator." For more information on this, refer to the *Getting Started with MetroPro* manual.
 3. Make backup copies of any original MetroPro files that you've modified for your own use. This may include application files (.app), mask files (.mas), and script files (.scr). Make copies of files in the default MetroPro directory and user files created with the User Setup program in the user directory. More information on the User Setup program is provided in the *Getting Started with MetroPro* manual.
 4. Insert the MetroPro CD into the CD-ROM drive.
 5. Run the MetroPro installer program, **Setup.exe**. Follow the on screen instructions, making selections as follows:
Choose Destination Location – This must be the original MetroPro install location. The default is: C:\Metropro.
- Step 5 continued-*
Select Instrument Files Location – These files are read during installation. C:\Metropro\cfg is the default location. These files are also provided on a floppy disk with the original instrument.
Install Selection – Instrument type *do not* change. Interface Bus Type...see Important! above. Camera Type...*do not* change. Frame Grabber...*do not* change. Amount of RAM...enter the amount; see Step 1.
6. Restart the computer when prompted. Log on to Windows NT as "Administrator."
 7. Open MetroPro. Select the Edit/View Licenses command from the MetroPro window menu. Enter the key and dates for the new version; these values are supplied by Zygo. Click the Done button.
 8. If you made backup copies (Step 3), copy the files back to the appropriate directory.
 9. Each user who wants to use the new version of MetroPro will need to run the MetroPro User Setup program to update their files.
 10. If you try to use an existing application, pattern, or setting file, and MetroPro indicates that the file requires updating, run the applicable conversion utility program.

New MetroPro User Interface Functionality

The features described in this section apply to all MetroPro applications. These features provide enhanced functionality and ease of use.

Background Print Color

When printing to either a printer or a file, you may select either white or blue as the background color. The background default color for printing to a printer is white. The background default color for printing to file is blue. Additional information on printing is provided in “Section 8” of the *Getting Started with MetroPro Guide*.



Crosshair Slice Type

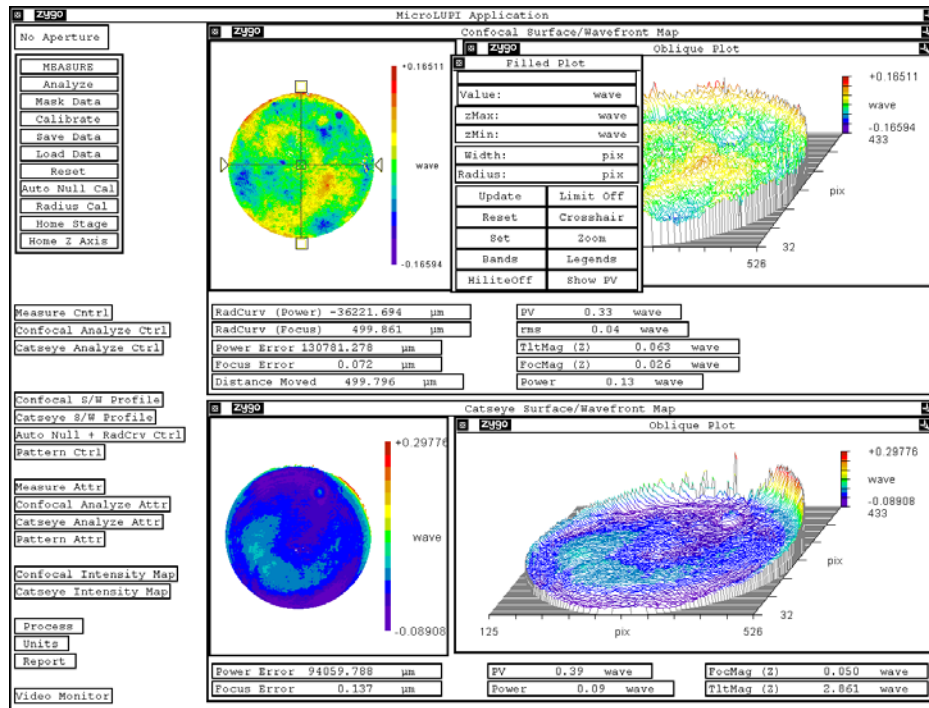
Additional information on slice types is located in “Section 5” of the *MetroPro Reference Guide*.

A Crosshair slice is now available. It is two linear slices whose end points are defined by the plot size. When moving the crosshair, an interactive readout provides position information. Two different coordinate systems are used when displaying position information. When moving just the crosshairs (*not a single end point*), the position of the crosshair intersection is displayed. The position is displayed using the same coordinate system as the mask editor. However, the coordinate system used when moving just an endpoint is the same as the one used for creating and moving linear slices. Plots update in real time as the crosshair is moved.

The slice results are displayed within the existing profile plot, with the results of each slice displayed simultaneously.

In addition, there are two new plots: Profile X and Profile Y. These two plot types enable the vertical and horizontal slices that define the crosshair to be displayed separately. These plots are available in:

New Data Window...→Surface/Wavefront Test/Defaults...→Profiles.



Creating a Crosshair Slice

Click the Plot Controller's slice button to select the slice type. A crosshair slice is automatically drawn within the filled plot.

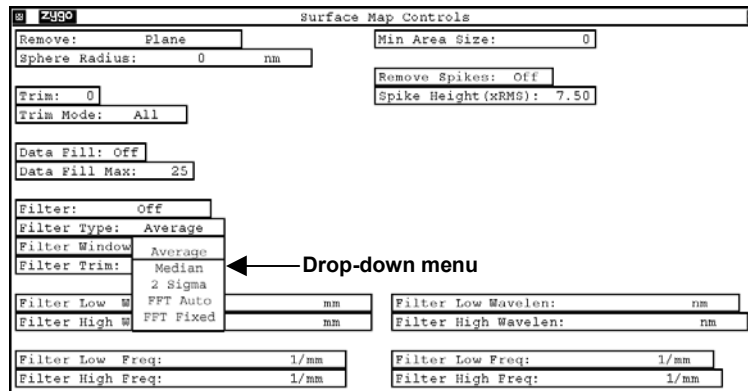
Moving the Slices

A slice may be moved only within the plot's boundaries. The vertical and horizontal slices may be moved independently of one another, the angle of a slice can be changed, and the crosshair intersection can be repositioned.

- To move the vertical or horizontal slices independently, position the pointer on or near a slice, but away from the intersection of both slices. Press and hold the left mouse button. Move the slice to a new position and release the mouse button.
- To move the crosshair intersection, position the pointer on or near the intersection box of the slices and press and hold the left mouse button. Move the slice and release the mouse button. This option preserves the angle of each slice.
- To move the crosshair intersection to a new location, click the cursor (within the plot's boundaries) on a position that is not too close to either of the slices. The crosshair intersection will move to the selected position. This option resets the slices perpendicular with respect to each other.
- To move the crosshair endpoints, hold down the Shift key while you press and hold the left mouse button at a point near one of the four slice markers. Move the mouse to change the angle of the slice. Release the mouse button.
- To reset both the crosshair to the center of the plot and the slices to perpendicular, hold down the Ctrl key while pressing the left mouse button anywhere in the plot except on a slice.
- To set one slice perpendicular to the other, hold the Ctrl key while pressing the left mouse button on a slice. The selected slice will automatically adjust to become perpendicular to the other slice.

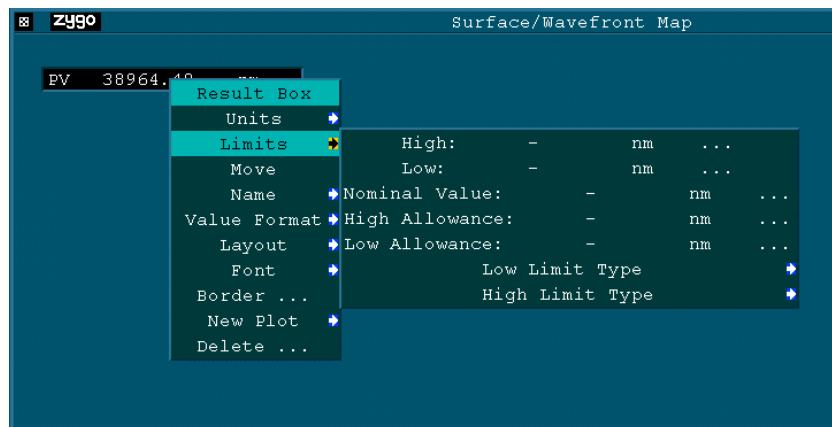
Drop Down Menus

Many MetroPro controls have several settings from which to choose. Previously this meant clicking through the settings to select the desired one. There is now a drop down menu that presents all of the settings in list format, making it easy to just click on the desired setting.



Limits Command Options

(For additional information on the Limits Command, refer to “Section 3” of the *MetroPro Reference Guide*.) Currently, high and low limit settings can be established for a result. An alternate method of specifying limits is available. Nominal Value, High Allowance, and Low Allowance. The Limits Command is accessed through the result’s menu. Click on the desired option and enter a value. Press Enter when done.



When using Nominal Value, you must set a value for either High Allowance or Low Allowance. These values relate directly to the high and low limit values as follows:

$$\text{High Limit} = \text{Nominal Value} + \text{High Allowance}$$

$$\text{Low Limit} = \text{Nominal Value} + \text{Low Allowance}$$

The Nominal Value may be any number. High Allowance must be greater or equal to zero. Low Allowance must be less than or equal to zero. If either High Allowance or Low Allowance is blank, then the high or low allowance limit is not used. If the Nominal Value is blank, then neither allowance limit is used.

Limits Command Options, continued-

If both the High Limit and High Allowance Limit are used, then the smaller of the two is used to check for the high limit. If both the Low Limit and Low Allowance Limit are used, then the larger of the two is used to check for the low limit.

There are also two new information fields associated with limits. These fields specify whether each limit is a specification limit or a natural boundary.

Locking an Application

(Additional information on locking and unlocking an application is located in “Section 8” of the *MetroPro Reference Guide*.)

It is now possible to lock an application without using a password. (The password option is still available as well.) Applications may be locked so that controls or windows can't be changed. When an application is locked, there are no menus, icons can't be opened, and items can't be moved. Even if MetroPro is restarted, locked settings are preserved. However, controls and buttons work if they are visible, and the application can be opened and closed.

To lock an application without using a password, press CTRL-Shift-L. When the 'Assign a password?' prompt is displayed, click No. The application will be assigned an ID number, which will appear in the upper right corner of the application window.

Non-ASC Unit Symbols

Non-ASCII Unit Symbols have been added to the display unit abbreviations. To turn off the non-ASCII unit symbols, start MetroPro using the command line option –DNAUS (Disable Non-ASCII Unit Symbols). Refer to “Appendix C” of the *MetroPro Reference Guide*, OMP-0347, for additional information on using the command line option.

Objective Button (Applicable to Microscope Applications)

The Objective button has several new features, including: the ability to display settings for zoom, resolution, and field of view. The button can also be moved within the application window, like other buttons, and the appearance of the font and border of the button can be customized.

Displaying Additional Settings

1. Right click the Objective button to display the menu.
2. Select one or more values to be displayed. The sample below shows an Objective button with zoom, resolution, and field of view values.

```
Obj : 100X Mirau
Zoom: 1.0 X
Res : 0.11 µm
FOV : 0.07 x 0.05 mm
```



Moving the Objective Button

This button can now be moved by clicking and holding down the middle mouse button, positioning the button at the desired location, and releasing the middle mouse button.

Changing Font and Border Attributes

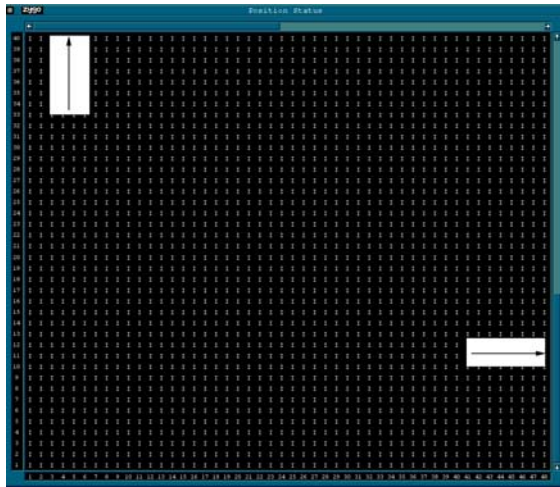
This topic is covered in “Section 5” of the *Getting Started with MetroPro Guide*.

Pattern Editor – Additional Rows and Columns Feature

Refer to “Section 7” of the *MetroPro Reference Guide*, OMP-0347, for information on Pattern Editor functionality.

The pattern position editor and viewer now support rectangular patterns with up to 99 rows and 99 columns. To accommodate this number of additional rows and/or columns the editor or viewer modes have a scrollbar to allow access to the rows and columns not displayed.

Open the Pattern Editor. In the sample window at the right, the values for rows and columns were set to 99. Use the scroll bars to display all of the positions.



Arrows show scroll bars.

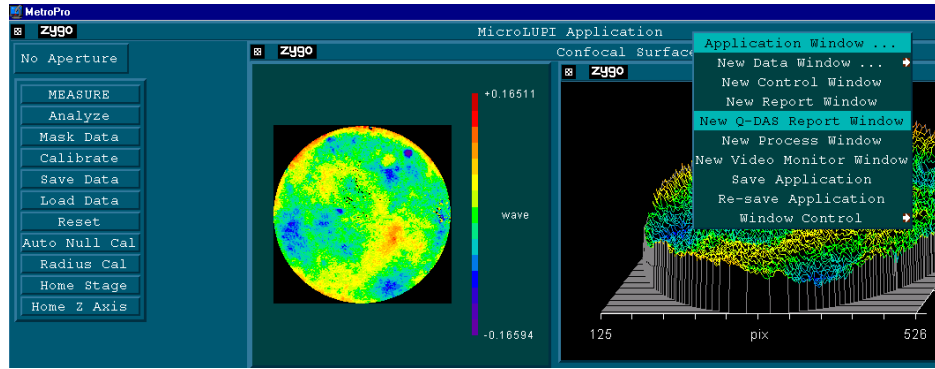
Pattern Editor (Rect)		
Num Rows:	99	
Num Cols:	99	
Row Space:	10.0000	mm
Col Space:	10.0000	mm
Sec Row Incr:		
Sec Col Incr:		
Sec Row Space:		mm
Sec Col Space:		mm
Origin Loc:	Lower Left	
Order:	Rows (Rast)	
Origin X:	0.0000	mm
Origin Y:	0.0000	mm
Load X:		mm
Load Y:		mm
Rotation:	0.0000	deg
Operation:	None	
Prompt:	None	
Pre-Pause:	0.00	sec
Post-Pause:	0.00	sec
Failure Action:	Prompt	
Start Command:		
End Command:		
Set Origin	Set Load	Save
	Unset Load	Resave
Goto Origin	Goto Load	Load
Edit Pos	View Pos	Rect

Q-DAS Report Window

This report window outputs data in the Q-DAS file format. Only numeric data may copied to a Q-DAS report window. Functionality is similar to the existing MetroPro report option. See “Section 8” of the *MetroPro Reference Guide* for a description of any button, control, or result not explained in this section.

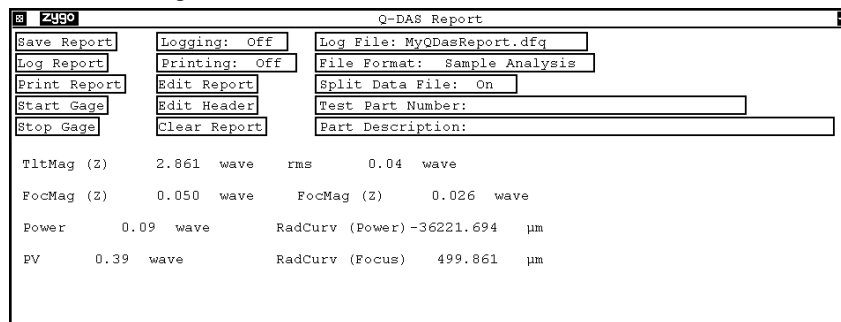
To Create a Q-DAS Report Window

From an Application Window menu, select New Q-DAS Report Window using the right mouse button. The frame of the report window appears. Move it to the desired location, and click the left mouse button.



To Copy Data to the Report

1. From the Q-DAS Report Window menu, select Copy Output Box. The cursor turns to an arrow with an asterisk.
2. Point to the result that you want to copy and press and hold the left mouse button. An outline of the result box appears.
3. Move the mouse to position the box inside the Report window and release the mouse button. The box appears at this location. Copied Result and Attribute boxes “snap” to an invisible grid. The grid helps keep boxes aligned without overlapping.
4. To copy additional results, repeat steps 2 and 3.
5. When done, click the right mouse button.



Item	Function	
Many of the controls, buttons, and attributes listed in this section can be found in the Q-DAS Report window menu under one of the following: New Button... New Control... New Parts Control... New Results Control... New Attributes...		
Test Part Number	control	Required entry. Number for part being tested.
Part Description	control	Required entry. Description of part being tested.
Amendment Status	control	Date/time of last change to drawing.
Product	control	Product information.
Sector	control	Sector information.
Department	control	Department information.
Test Plan Creator Information	control	Test Plan Creator information.
Cost Area	control	Cost Area information.
Test Location	control	Test Location information.
Standard Number	control	Type 1 gage study. Part Number of the standard.

Q-DAS Report Window Controls and Buttons, continued-

Item		Function
Standard Description	control	Type 1 gage study. Description of the standard.
System Resolution	control	Used by Q-DAS to verify that system resolution is at least 10 times greater than the part tolerance. This refers to the resolution of the height data.
Split Data File	control	Specifies whether the report is saved as one file or two. As a single file, the extension is .dfq. To split the file so that the header information is in one file, and the data in the other, header information is tagged with a .dfd extension. Data is tagged with a .dfx extension. In the case of a split file, each file will have same base name as specified in the Log File control.
Number of Trials	control	Type 3 gage study. The number of measurements per part.
Number of Parts	control	Type 3 gage study. The number of parts being measured.
Current Part	control	Type 3 gage study. The current part being measured.
Number of Reference Measurements	control	Type 1 gage study. The number of references being measured.
Gage Sequence	control	Selects the sequence during a gage study when the File Format control is set to Gage-Type 3. The settings are: Manual, All Parts Per Trial, or All Trials Per Part. When set to manual, the operator tracks the measurement sequence. For each measurement, <i>current part</i> in the Current Part control must be specified. The “Current” attribute provides feedback on the sequence. The manual study is started with the Start Gage button and ended by clicking the Stop Gage button. When set to All Parts Per Trial, every part is measured once in an ordered sequence and then this sequence is repeated. The Number of Trials control determines the number of sequences. When set to All Trials Per Part, each part is measured multiple times in succession and then the next part is measured and so on. The Number of Trials control determines how many times each part is measured. For both All Parts Per Trial and All Trials Per Part settings, the study is started with the Start Gage button, but is ended automatically. Also, the part number is automatically incremented after the data is logged and the “Current” and “Next” attributes show the status of the gage study.

Q-DAS Report Window Controls and Buttons, continued-

Item		Function
Edit Header	button	If Split Data File is off, then the file specified in the Log File control is opened for editing. If Split Data File is on, then the .dfd file(header) is opened for editing.
Start Gage	button	Clears old data and starts the gage test. The Report Format control must be either Gage—Type 1 or Gage—Type 3.
Stop Gage	button	Stops a running gage test.
Edit Report	button	If Split Data File is off, then the file specified in the Log File control is opened for editing. If Split Data File is on, then the .dfx file is opened for editing.
File Format	button	Selects the format of the Q-DAS report. The settings are: Sample Analysis, Gage-Type1 or Gage-Type 3. Sample Analysis is a standard test measurement. Gage-Type 1 is a gage study using one operator measuring a known reference standard a number of times. Gage-Type 3 is a gage study using one operator measuring a number of parts in a series of measurement trials.
Current Reference Measurement	attribute	Indicates how many reference measurements have been logged. Data is displayed only when the File Format is <i>Gage-Type 1</i> , and a gage test is running
Current Trial	attribute	Indicates the trial number of the part most recently logged. Use the Current Part attribute to see which part the trial number applies to. Data is displayed only when the File Format is <i>Gage-Type 3</i> , and a gage test is running.
Current Part	attribute	Indicates the part number of the part most recently logged. Data is displayed only when the File Format is <i>Gage-Type 3</i> , and a gage test is running.
Next Reference Measurement	attribute	Indicates the next number of the reference measurement. Data is displayed only when the File Format is <i>Gage-Type 1</i> , and a gage test is running. If the last measurement of the gage test was taken, then no data is displayed.
Next Trial	attribute	Indicates the trial number of the part that will be used the next the data is logged. Use the Next Part attribute to see which part the trial number applies to. Data is displayed on when the File Format is <i>Gage-Type 3</i> , the Gage Sequence control is not set to <i>Manual</i> , and a gage test is running. If the last measurement of the gage test was taken, then no data is displayed.
Next Part	attribute	Indicates the part number that will be used the next time the data is logged. Data is displayed only when the File Format is <i>Gage-Type 3</i> , the Gage Sequence control is set to manual, and a gage test is running. If the last measurement of the gage test was taken, then no data is displayed.

Results in the Q-DAS Report Window

Results in this window have two additional options. Right click on a result to display two submenus. The first submenu allows you to specify the standard's value for the result. This is necessary only when performing a Gage—Type 1 study. The second submenu is for the system resolution for the result. By default, the system resolution refers to the height data, so this option enables you to specify the resolution for other types of data.

Microscope Systems with Encoded Image Zoom

The image zoom control in MetroPro no longer needs to be set to the same value as the Image Zoom thumbwheel on the Microscope. The software is able to detect the microscope thumbwheel setting and adjusts the software control to match. The control now appears black with white lettering, and is updated in real time. A hardware upgrade is required.

New Controls

Auto Null Controls

There are a variety of new and renamed Auto Null controls. They are available in the MicroLUPI and GPI applications. Stage hardware is required. For a list and description of these controls, refer to the MicroLUPI Application section of this document.

Phase Avg Min N Pct

Available in both microscope and GPI applications.

New Control→Phase Processing...

Function:

This control specifies the percentage of the contributing height maps wherein a point must be valid in order to produce a valid average height. This allows phase averaging to be performed somewhat differently so that dropouts in some of the contributing height maps do not produce dropout in the final average height map. For example, if the Phase Avgs control is set to 10 and the Phase Avg Min N Pct control is set to 50%, then only 5 out of 10 contributing height values need to be valid in order to produce a valid height. The Phase Avg Min N attribute would show 5. The new control may be helpful in a metrology situation in which points in the height map drop out intermittently, perhaps due to a low signal-to-noise condition. Use of phase averaging with the Phase Avg Min N Pct control set to a low number will have the effect of “accumulating” valid data points in the height map.

Measure Radius of Curvature

Available in MicroLUPI and GPI applications. Stage hardware required.

See the MicroLUPI section of this document for a description.

Nominal Radius of Curvature

Available in MicroLUPI and GPI applications. Stage hardware required. See the MicroLUPI section of this document for a description.

New Results and Attributes

New attributes will be listed following the new results. The attribute's value is derived from the control of the same name.

Custom

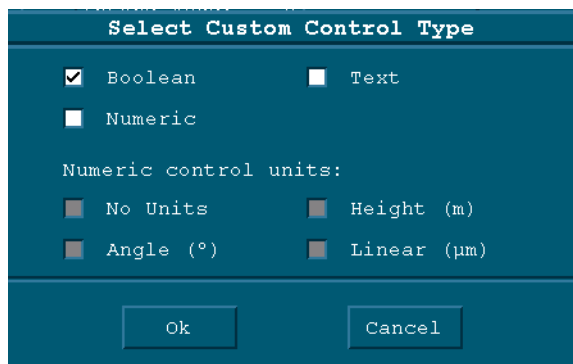
Available in microscope and GPI applications.

New Control→Custom...→Create New

Function:

A Custom result can be created to output a measurement result that is customized for a specific measurement. A Custom result may be Boolean (on/off), numeric, or text. The value of a custom result is derived from a user-created MetroScript. If creating a numeric result, a unit of measure is required. There is a No Units option if the other options do not apply to the custom result. The Auto Run Script command tells the system to run the script, and the Script File command identifies its location.

The new Custom result is created using the dialog shown below. Custom results can be renamed using the button's rename command.



Centroid X and Centroid Y

Available in microscope and GPI applications.

New Result...→Centroid...

Function:

These two results return a value that is more precise representation of the location of the center of the data in the X-axis and Y-axis. The calculation is based on a weighted average.

New Buttons

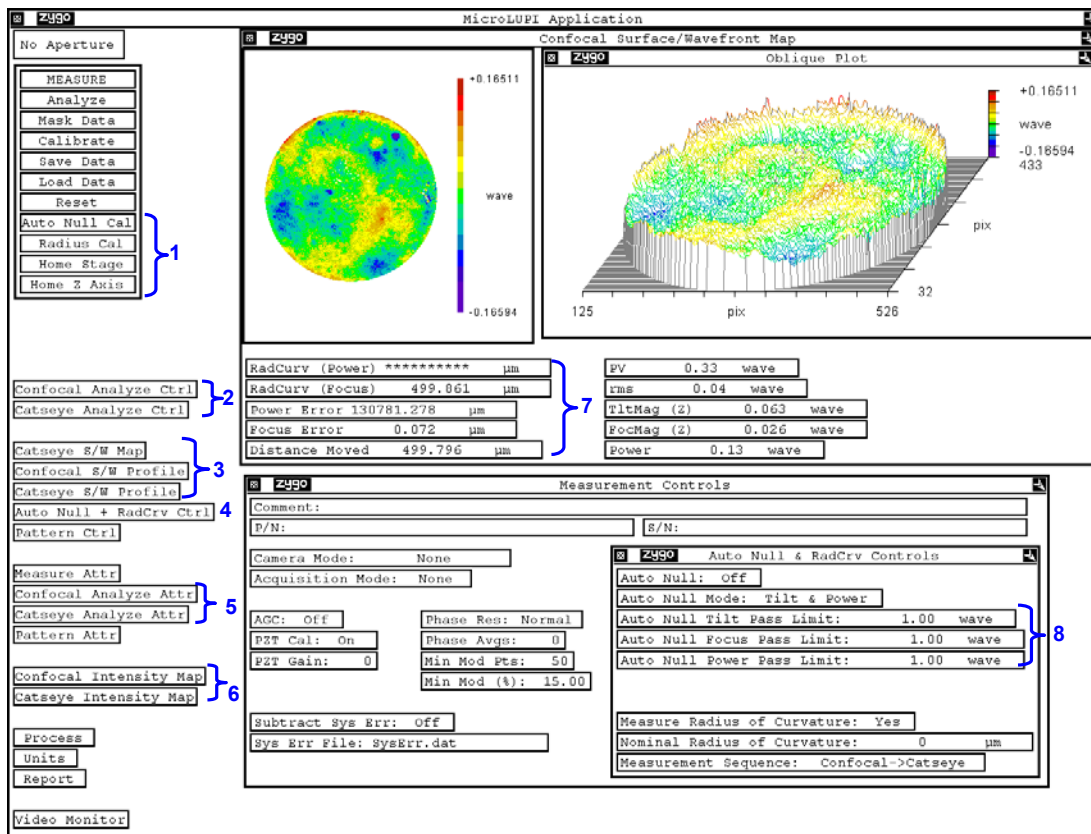
Two new buttons, Close App and Close Window are available. They are located in: Control Window→New Button→Miscellaneous.

Close Window and Close App function the same way as the  in the upper left corner of the window. The advantage of these buttons is for applications that have a touch screen feature. The mouse does not have to be used to click the application or window closed.

MicroLUPI Application

The MicroLUPI Application includes new buttons, controls, results, and data windows. The newly designed interface provides enhanced organization of commonly used controls and results, especially for those pertaining to the Auto Null process and radius of curvature measurements. Several plot and profile displays represent both confocal and cat's-eye data. Some controls have been renamed, but their functionality remains the same. See the cross-reference list for these controls later in this section.

For additional information on the MicroLUPI instrument, and for guidelines for using Auto Null and the measurement sequence, refer to the *MicroLUPI Operation Manual*, OMP-0448. The sample screen below shows the MicroLUPI Application with the Measure Controls window open. Note: Buttons, icons, windows, controls, and results not described in this document are covered in the *MetroPro Reference Guide*.



Summary of Application Changes

Refer to the corresponding number on the sample screen.

1. The Auto Null process is now activated from the Auto Null control in the Measurement Controls window. The Auto Calibrate function is activated using the renamed, Auto Null Cal button.
2. Analyze control windows are now available for both confocal and cat's-eye.
3. Surface/wavefront maps and profile plots can be displayed for confocal and cat's-eye data.
4. In addition to the Measurement Controls shown in the above sample screen, clicking on the Auto Null + RadCrv Ctrl icon opens an additional measurement controls window. This window provides several other controls that pertain to the Auto Null routine and radius of curvature measurements.
5. Attributes are displayed in two separate windows—one for confocal and the other for cat's-eye.
6. There are also two intensity maps—one for confocal and the other for cat's-eye.
7. Results have been reorganized within the Surface/Wavefront Map window, and new results are included. See the following New Results section for an explanation.
8. Some controls were renamed. See the following section.

MicroLUPI Renamed Controls

Current 7.7.0 Name	Previous Name	Functionality
Auto Null Tilt Pass Limit	Lateral Pass Limit	Specifies the minimum TiltMag(Z) value that Auto Null should achieve before considering the part nulled. Required entry for Auto Null.
Auto Null Focus Pass Limit	Focus Pass Limit	Specifies the minimum FocMag(Z) value that Auto Null should achieve before considering the part nulled. Required entry for Auto Null.
Auto Null Power Pass Limit	Power Pass Limit	Specifies the minimum Power values that Auto Null should achieve before considering the part nulled. Required entry for Auto Null.
Auto Null Tilt X Cal Factor	X Calibration Factor	Specifies the $\mu\text{m}/\text{wave}$ factor that Auto Null uses when nulling the part along the X-axis. This value is usually set by Auto Null calibration.
Auto Null Tilt Y Cal Factor	Y Calibration Factor	Specifies the $\mu\text{m}/\text{wave}$ factor that Auto Null uses when nulling the part along the Y-axis. This value is usually set by Auto Null calibration.
Auto Null Focus Cal Factor	Z Calibration Factor	Specifies the $\mu\text{m}/\text{wave}$ factor that Auto Null uses when nulling the part along the Z-axis based on FocMag(Z). This value is usually established by Auto Null calibration.
Auto Null Power Cal Factor	Z Calibration Factor	Specifies the μm factor that Auto Null uses when nulling the part along the Z-axis based on Power. This value is usually set by Auto Null calibration.
Auto Null Calibrate X Step	Auto Cal X/Y Step	Specifies the distance, along the X-axis, to move between measurements when calibrating the system for Auto Null.
Auto Null Calibrate Y Step	Auto Cal X/Y Step	Specifies the distance, along the Y-axis, to move between measurements when calibrating the system for Auto Null.
Auto Null Calibrate Z Step	Auto Cal Z Step	Specifies the distance, along the Z-axis, to move between measurements when calibrating the system for Auto Null.

MicroLUPI New Controls

New Control Name	Functionality
Auto Null Mode (<i>This control is a replacement for the previous controls: AutoNULL Power, AutoNULL Focus</i>)	Determines how Auto Null is performed, and includes these settings: <i>Tilt</i> —only Tilt Mag. <i>Focus</i> —only Focus. <i>Power</i> —only Power. <i>Tilt & Focus</i> —Both Tilt Mag and Focus. <i>Tilt & Power</i> —Both Tilt Mag and Power.
Auto Null Iterations (<i>This control replaces the previous: Precision AutoNULL.</i>)	Identifies the number of attempts Auto Null should try when correcting the part's position for null.
Measure Radius of Curvature	Enables or disables a radius of curvature measurement for the next measurement. Settings: On or Off
Nominal Radius of Curvature	Specifies the nominal radius of curvature of the spherical part. This value must be entered <i>before</i> making a measurement.
Measurement Sequence	Selects the sequence used to perform the radius measurement. Settings: Confocal>Catseye Catseye>Confocal

MicroLUPI New Results

Result Name	Functionality
Radius of Curvature-Power	Displays the measured radius of curvature using power to determine null error.
Radius of Curvature-Focus	Displays the measured radius of curvature using FocMag(Z) to determine null error
Power Error	Displays the null error value based on power for the cat's-eye wavefront of a radius of curvature measurement.
Focus Error	Displays the null error value based on FocMag(Z) for the cat's-eye wavefront of a radius of curvature measurement.
Distance Moved	Displays the actual distance traveled by the z-stage between the confocal and cat's-eye positions.

MicroLUPI New Buttons

Auto Null Calibrate:	Click to initiate the Auto Null Calibration routine.
Radius Cal:	Click to initiate the Radius of Curvature calibration routine.

MicroLUPI New Attributes

Attributes take their values from the control of the same name. Refer to the *MicroLUPI New Controls* section.

Auto Null	Auto Null Tilt Pass Limit
Auto Null Mode	Auto Null Focus Pass Limit
Auto Null Tilt X Cal Factor	Auto Null Power Pass Limit
Auto Null Tilt Y Cal Factor	Auto Null Iterations
Auto Null Focus Cal Factor	Measure Radius of Curvature
Auto Null Power Cal Factor	Measure Sequence

MultiSurf Application

There are many new controls in this application. They are listed below, but described in the *MultiSurf Application* booklet, OMP-0376. Many of these controls are also available in the microscope applications. They can be found in: New Control→Segmentation.

- | | | |
|-----------------------|-----------------------|-----------------------|
| ▪ Test2Mask Mode | ▪ Test4 Min Area Size | ▪ Test Trim |
| ▪ Test3 Mask Mode | ▪ Ref Max Area Size | ▪ Test2 Trim |
| ▪ Test4Mask Mode | ▪ Test Max Area Size | ▪ Test3 Trim |
| ▪ Ref Min Area Size | ▪ Test2 Max Area Size | ▪ Test4 Trim |
| ▪ Test Min Area Size | ▪ Test3 Max Area Size | ▪ Histogram Data Type |
| ▪ Test2 Min Area Size | ▪ Test4 Max Area Size | ▪ Histogram Remove |
| ▪ Test3 Min Area Size | ▪ Reference Trim | ▪ Ref Mask Mode |

MetroScript Commands

Refer to the *MetroScript Programming Guide* for additional information.

New Commands

Command Name	Description
resaveapp	This command resaves the current application file.
loadswli	This command loads swli data files.

Automatic System Error Filename Generation

Refer to “Section 8” of the *MetroPro Reference Guide* for additional information on system error files. The automatic filename feature described below has been available beginning with version 7.4.2.

The system error subtraction function is used to improve measurement accuracy by subtracting wavefront distortion (inherent to all interferometers) during the analysis cycle. MetroPro provides the ability to measure the system error and save it as a data file.

The automatic system error filename function automatically generates system error filenames and selects the correct system error file based on the instrument's current settings. To accomplish this, the Sys Err File control has added functionality, and there is a new Save Sys Err Data button.

For proper operation, the system error data file must match the current setup of the instrument. Specifically, the system error data must be measured using matching values for the following MetroPro controls and/or instrument settings.

- Camera Mode •Image Zoom •Objective (microscopes only)
- Coherence Mode (Mesa only) •Surface Filter (Mesa only)

If these settings are changed frequently, maintaining multiple system error data files can be time-consuming. The automatic system error file name generation feature eliminates this problem.

Creating System Error Data Files

1. Enter the “at” symbol (@) for the name of the file in the Sys Err File control.
2. Select a desired combination of settings for Camera Mode and other controls mentioned above.
3. Perform a system error measurement.
4. Click the Save Sys Err Data button. The normal Select Data File To Save dialog is displayed with the Current Selection box set to an automatically generated filename (described below). Double-click on the Current Selection box to save the data using that filename in the current directory.
5. Repeat steps 2, 3, and 4 for other required combinations of settings.

Using System Error Data Files

1. Enter the “at” symbol (@) for the name of the file in the Sys Err File control.
2. Set the Subtract Sys Err control to On.
3. Select a desired combination of settings for Camera Mode, etc.
4. Perform a part measurement. MetroPro will automatically generate the correct system error filename and subtract that data file. (If the file does not exist in the current directory, an error is generated.)
5. The Sys Err File attribute will display the actual filename used.

When the @ symbol is entered in the Sys Err File control and Subtract Sys Err is set to On, the system error filename is automatically selected when a measurement is made.

Naming Convention for Automatically Generated Filenames

Microscopes: XXXXYYYYMMMMZZ.dat

Simetra: XXXXYYYYFF.dat

Other: XXXXYYYY.dat

XXXX = Camera X Dimension (pixels)

YYYY = Camera Y Dimension (pixels)

MMMM = Objective magnification

ZZ = Image Zoom

FF = Field of View

Filename Examples:

GPI with camera resolution of 640x480:

0640 0480.dat

Microscope with camera resolution of 640x480, 50X objective, and .5 image zoom:

0640 0480 0050 05.dat