Getting Started With MetroPro™ version 7.7.0 OMP-0398J

Zygo Corporation
Laurel Brook Road
P.O. Box 448
Middlefield, Connecticut 06455-0448

Telephone: (860) 347-8506
Fax: (860) 346-4188
E-mail: inquire@zygo.com
Website: www.zygo.com

ZYGO CUSTOMER SUPPORT

For help within North America, please use the contacts listed below. For help in other countries, please contact your local Zygo representative. Be sure to supply the instrument model and serial number, and the software version.

PHONE Monday - Friday, 8 a.m. - 8 p.m. (Eastern Standard Time)
(800) ZYGO NOW (800) 994-6669
or (860) 704-5191

FAX (860) 346-4188

INTERNET www.zygo.com
support@zygo.com

WRITE Zygo Corporation
Laurel Brook Road
P.O. Box 448
Middlefield, CT 06455-0448
Attn: Customer Support

MANUAL VERSION INFORMATION

The document (OMP) number and version letter for this manual appear on the title page. The corresponding publication date and software release are shown below.

Version	*Date*	*Version*	*Date*	*Software*
A	March 1996	F	February 2001	
B	December 1996	G	April 2001	7.4.2
C	February 1998	H	September 2001	7.6.1
D	March 1998	J	February 2002	7.7.0
E	July 1998			

MANUAL NOTATIONS

Warning! Denotes a hazard that could cause injury to personnel, and can also cause damage to the equipment.

Note: Provides helpful information.

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Installing or Upgrading MetroPro

Chapter 1

The Quick Overview

Steps 1-4 are described in greater detail later in this chapter.

1. Run Setup.exe from the CD to install MetroPro.
2. Open MetroPro, select the Edit/View Licenses command, and enter licensing codes.
3. Run the MetroPro User Setup program to create user accounts.
4. If you have updated MetroPro, it may be necessary to run the "convert" programs to update applications, pattern files, and setting files.

Important

Zygo strongly recommends the following:

1) Create user accounts. Future updates of MetroPro over-write sub-directories and files in the MetroPro directory; user accounts are not over-written.
2) For normal everyday use, do not log on as "administrator". Use "zygo" or other user names created with the User Setup program.

Installing MetroPro

In most cases, MetroPro is factory installed and nothing is required on your part. In the default configuration, there is a "C:\MetroPro" directory, which contains MetroPro files, and a "zygo" user account. To reinstall or upgrade MetroPro, refer to "Upgrading MetroPro," later in this chapter.

It is strongly recommended that you run the MetroPro User Setup program to create user accounts. To use this program, refer to "MetroPro User Setup Program," later in this chapter.

Licensing MetroPro

It is necessary to license MetroPro to make measurements, load existing data, and use specialized applications. MetroPro and separate licensable applications are licensed by entering dates and key codes in Edit/View Licenses window. These values are provided by Zygo and are linked to the serial number of a hardware key, Ethernet ID, or computer processor serial number. The steps are illustrated on the facing page.

1. If you are using a hardware key for validation identification, connect the hardware key to the computer's parallel port. If you want to use the Ethernet ID or the processor serial number, refer to the next procedure before continuing.
2. Turn on the computer and start Microsoft Windows. In the MetroPro Program Group, double-click the MetroPro program icon to open MetroPro.
3. Press the *right* mouse to access the MetroPro Window menu and choose Edit/View Licenses.

   Note: There must be entries under the ID column in the Edit/View Licenses window before dates and key codes can be entered. If there are no numbers in this column, contact Zygo Customer Support.
4. For each applicable option, a Start Date, End Date, and Key must be entered. To enter a value, click on the item with the *left* mouse button, type in the date or key and press Enter. Dates and key codes are supplied by Zygo. When completed, click the Done button to close the window.

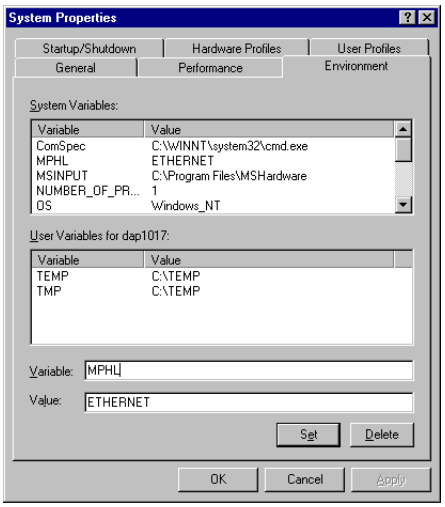
Licensing Using the Ethernet ID or Processor Serial Number

MetroPro supports two additional forms of system identification for the purpose of generating license codes- the Ethernet ID or the Processor Serial Number. To use these forms, an environment variable must to be added to the system.

1. Point to the Windows Start button and select Settings → Control Panel to open the Control Panel.
2. Open the System icon and then select the Environment tab.
3. Click the Variable entry box and type MPHL.
4. Click the Value entry box and type ETHERNET or PROCESSOR to use the corresponding identification.

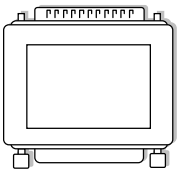
Note: To use Processor, the computer must have a Pentium III or higher processor. Additionally, the serial number feature for the processor may need to be enabled using the BIOS or some other utility.

5. Click the Set button and then OK.

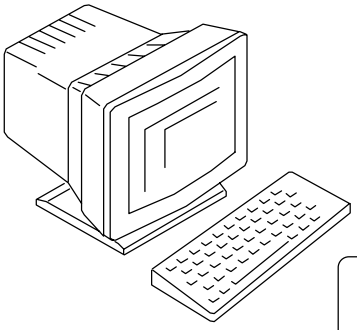


Licensing MetroPro

1.
A unique hardware key, Ethernet ID, or computer processor serial number is required. If using the hardware key, connect the key to the computer's parallel port.

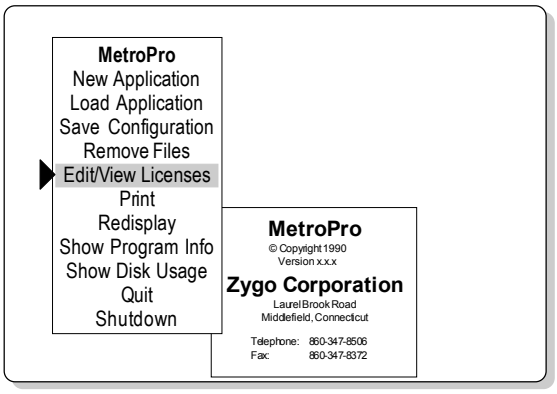


hardware key



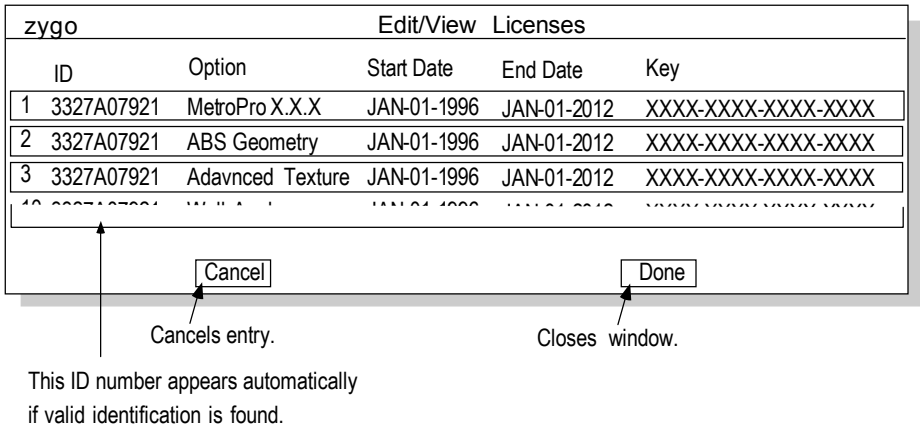
2.
Turn on the computer and start Microsoft Windows. Double-click the MetroPro icon to open MetroPro.

3.
Press the *right* mouse button and choose Edit/ViewLicenses.



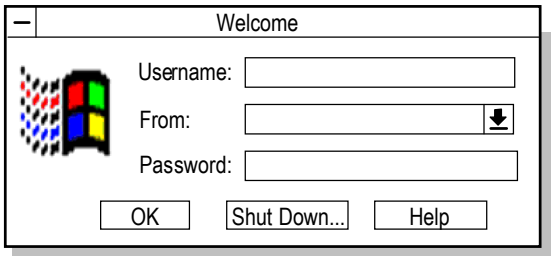
4.
For each applicable option, a Start Date, End Date, and Key must be entered. To enter a value, click on the item with the *left* mouse button, type in the date or key and press Enter. Codes are supplied by Zygo. Click the Done button to close the window.

This is a sample window only; actual window contains more lines.



MetroPro and Microsoft Windows NT

When the workstation is started, the logon message appears. Press CTRL+ALT+DEL to log on. In the Welcome dialog box type a username and password.



Enter "zygo" as the username and press Enter (no password) to start using the system.

Zygo is used as a username because during the factory installation, a "zygo" user account was created. User accounts are created within Microsoft Windows by the administrator.

The "Administrator"

The administrator manages the workstation's overall configuration. The administrator has complete control over the read and write access of directories. *Improper use of administrative functions can cause system difficulties and failures.* Complete details on the administrator's role is found in the Microsoft Windows NT manuals.

Zygo advises that one person should take the role of "Administrator". This person is responsible for controlling the use of MetroPro. To become the administrator, in the Welcome dialog box, enter "administrator" as the username, with "zygo" as the password.

> **Note:** Refer to the Microsoft Windows NT manuals for details on how to change the passwords for the administrator and for user accounts.

MetroPro User Setup Program

The MetroPro User Setup program copies the licensed MetroPro application files, mask files, and script files, and makes working directories so individual users can modify and create custom applications.

1. Log on to the system as the "administrator."
2. Use the Windows NT User Manager to create user accounts.
3. In the MetroPro Program Group, double-click the MetroPro User Setup icon to open the user setup program (Usrsetup.exe).

   > **Note:** MetroPro user setups can only be made for existing user accounts. License MetroPro and your applications before running setup.

4. Follow the on-screen instructions.

Upgrading MetroPro

System Requirements

- Pentium™ compatible processor, 500 MHz or higher
- Microsoft™ Windows NT 4.0, Service Pack 5 or above
- 128 MB RAM (256 MB recommended)
- 2 GB of free hard-disk space
- CD-ROM Drive
- 1.44 MB Floppy Drive

Upgrade Procedure

An Important Note About Upgrading

To work properly, you must install MetroPro into the original installation directory location.

Make backup copies of user files. Upgrading MetroPro over-writes existing files that have the same names as the original file names. User-created files with unique names are not over-written or deleted.

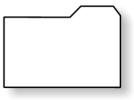
Information You Need to Know Before You Begin

Know the amount of RAM in your computer. To find out the amount of RAM, point to the Windows Start button and select Settings → Control Panel, and open the System icon; at the General tab the amount of RAM is listed.

If you have a MESA or MicroLUPI, you must know the interface bus type of the instrument board. To identify the interface bus, look at the back panel of the board; PCI interface bus type boards are labeled, ISA type boards are not.

1. Shutdown all programs and reboot the system. Log on to Windows NT as "Administrator."
2. Make backup copies of any original MetroPro files that have been 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.
3. Insert the MetroPro CD into the CD-ROM drive.
4. Run the MetroPro installer program **Setup.exe**. Follow the on-screen instructions. For greater detail, refer to the Installation Hints.

Installation Hints



Choose Destination Location
This selection must match the original MetroPro install location.
C:\Metropro is the original default directory.

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 "Information You Need to Know Before You Begin."
Camera Type... *do not change.*
Frame Grabber... *do not change.*
Amount of RAM... enter amount of RAM in the computer as determined beforehand.

5. Restart the computer when prompted. Log on to Windows NT as “Administrator.”
6. 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.
7. If you made backup copies of files in step 2, copy the files back to the appropriate directory.
8. Each user who wants to use the new version of MetroPro will need to run the MetroPro User Setup program to update their files.
9. If you try to use existing application, pattern, or settings files, and MetroPro says the file requires updating, run the applicable conversion utility program.

Updating Existing MetroPro Files

Often, when a new version of MetroPro is released, existing user-created files may require conversion so they are compatible with the new software. MetroPro will inform you that a file requires updating when you try to load it; if this is the case, you must convert your files as described here.

> **Note:** It is not necessary to convert user-created files unless MetroPro provides a message that the file is not compatible.

The utilities to perform the conversion are supplied with MetroPro in the MetroPro\bin directory. In general, once you convert your files, they cannot be opened with an older version of MetroPro.

AppConvert	Converts user-created application files.
PatConvert	Converts user-created pattern files, which control instruments with motorized stages.
SetConvert	Converts settings files, which are used as software presets for applications.

Using AppConvert or PatConvert

1. Open a Command Prompt window.
2. Change to the directory containing the files requiring conversion.
   For example, after the command prompt type: `cd C:\users\MyLogin`

   "C:\users\" is the default MetroPro users directory. "MyLogin" refers to the name of the user directory where your files are located.
3. To convert application files, after the prompt type:
   `C:\MetroPro\bin\AppConvert myapp.app`

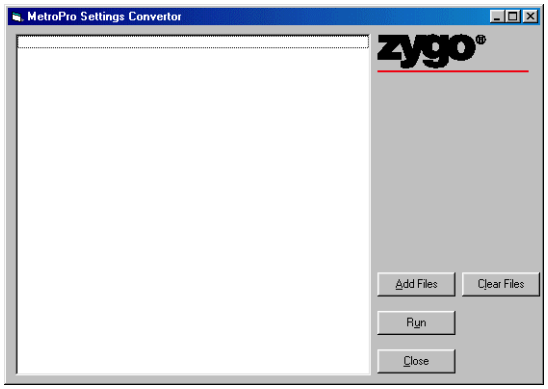
   Where "myapp.app" is the name of the application you want to convert. Additional names may be listed using a space between each name. Note that using "*.app" will convert all application files within the directory specified in step 2.
4. To convert pattern files, after the prompt type:
   `C:\MetroPro\bin\PatConvert mypattern.pat`

   Where "mypattern.pat" is the name of the pattern file you want to convert. Additional file names may be listed using a space between each name. Note that using "*.pat" will convert all pattern files within the directory specified in step 2.
5. After the conversion is over, the successfully converted files are listed. Click the OK button to close the Convert window. To quit the process, close the Command Prompt window.

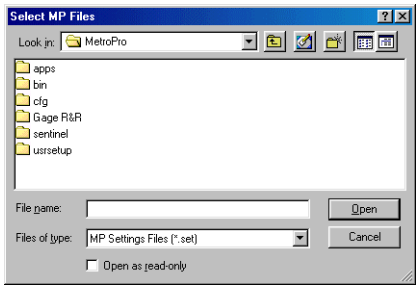
Using SetConvert

1. Open the SetConvert program. It is located in the MetroPro\bin directory.
2. Click the AddFiles button. Using the Select Files dialog box, select the settings files you want to convert. Multiple files can be selected and converted.
3. Click the Run button to convert the files. After the conversion is complete, the program lists the results.
4. When complete, click the Close button to quit the SetConvert program.

The SetConvert Program Screen



The Select Files Dialog Box



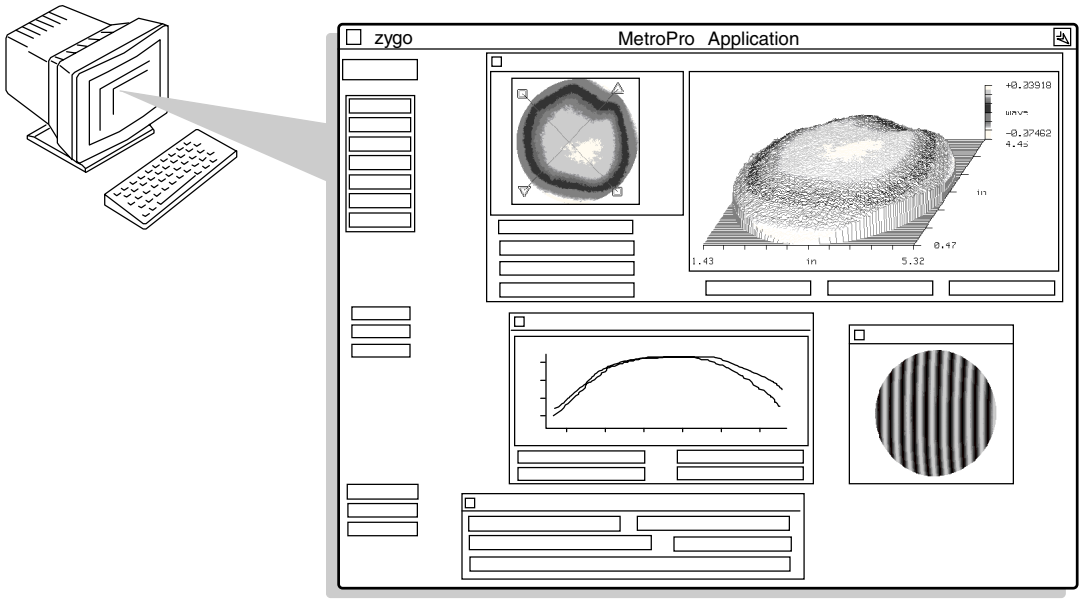
MetroPro Basics

Chapter 2

What is MetroPro?

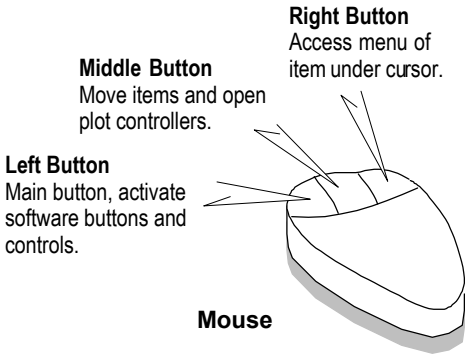
MetroPro software is for use with Zygo's metrology systems, such as the NewView, Maxim, and GPI series instruments. With MetroPro, you get a full-featured, precision measurement program that includes standard applications to get you started quickly, and the tools to make your own special application to fit your needs. Once you learn the basic operation of the mouse, menus, and windows, it is easy to get the results you need.

MetroPro transforms data from Zygo's instruments into measurement results. Data is converted into graphic displays and numeric results, and displayed on the MetroPro screen.

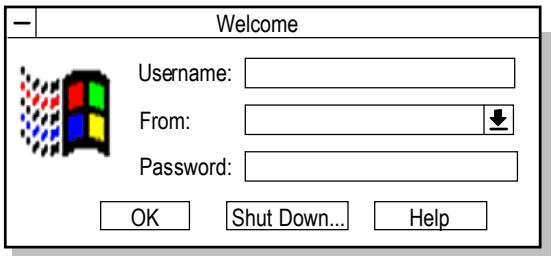


Using the Mouse

The mouse has three buttons. The *left* button is used primarily to activate screen buttons and controls. The *middle* mouse button is used to move items and to open control panels for plots (plot controllers). The *right* mouse button is used primarily to display menus and choose commands from them.



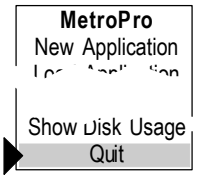
Starting MetroPro



1. Turn on the computer and instrument. When the logon message appears, press CTRL+ALT+DEL to log on.
2. In the Welcome dialog box type a username and password. If you do not have a username, enter "zygo" and press Enter or click OK.

3. In the windows Program Manager, open the MetroPro Program Group where MetroPro is installed or find the program in the MetroPro directory. Double-click the MetroPro program icon.

Quitting MetroPro



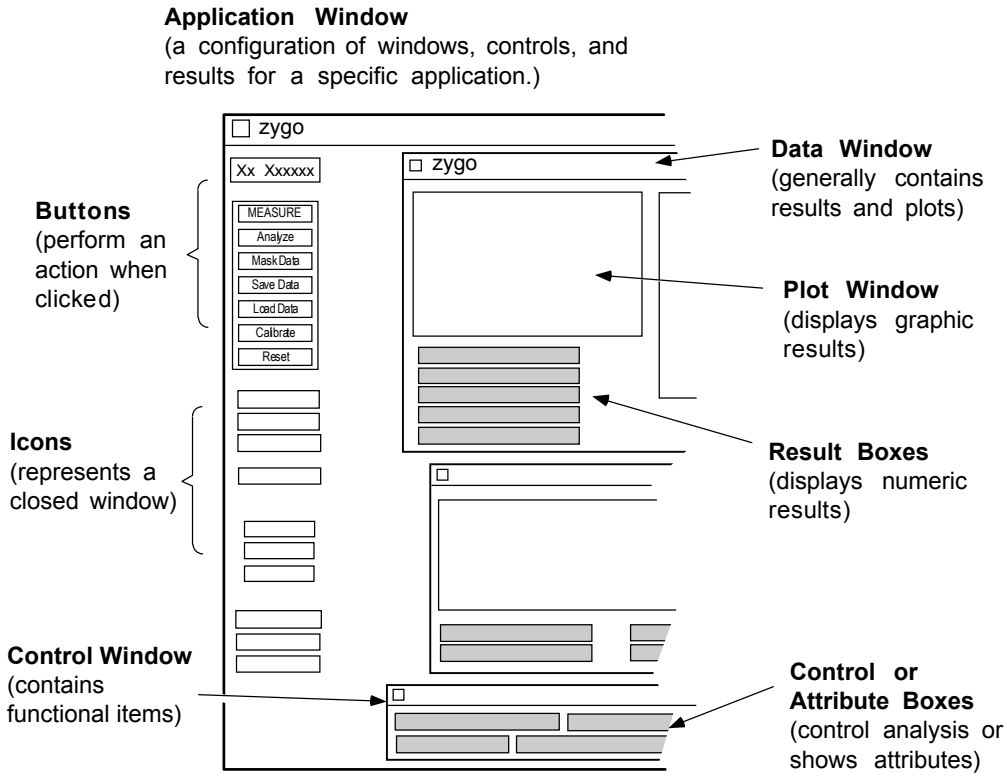
1. Close open MetroPro applications by clicking the close box ☒ in the upper left corner of each application window.
2. Press and hold the right mouse button; choose Quit from the MetroPro Window menu.

OR

3. Position the mouse cursor over the system menu ▭ in the MetroPro Window title bar; choose Close.

A Quick Look at Applications

You should become familiar with the parts that make up a MetroPro application. This terminology is used throughout this manual and in other Zygo documentation.

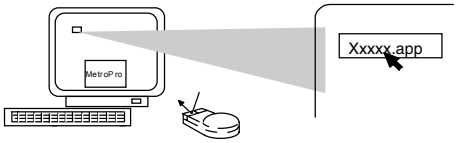


An application consists of one or more windows, boxes, and buttons. The particular combination of items represent one use of the instrument. Most items have their own unique menus, but more on this in later chapters.

Making a Measurement

Making a measurement is as simple as focusing the instrument on the test part and clicking the MEASURE button. Most functions are performed by clicking the mouse.

STEP 1 Open the application by clicking on the icon with the *left* mouse button.



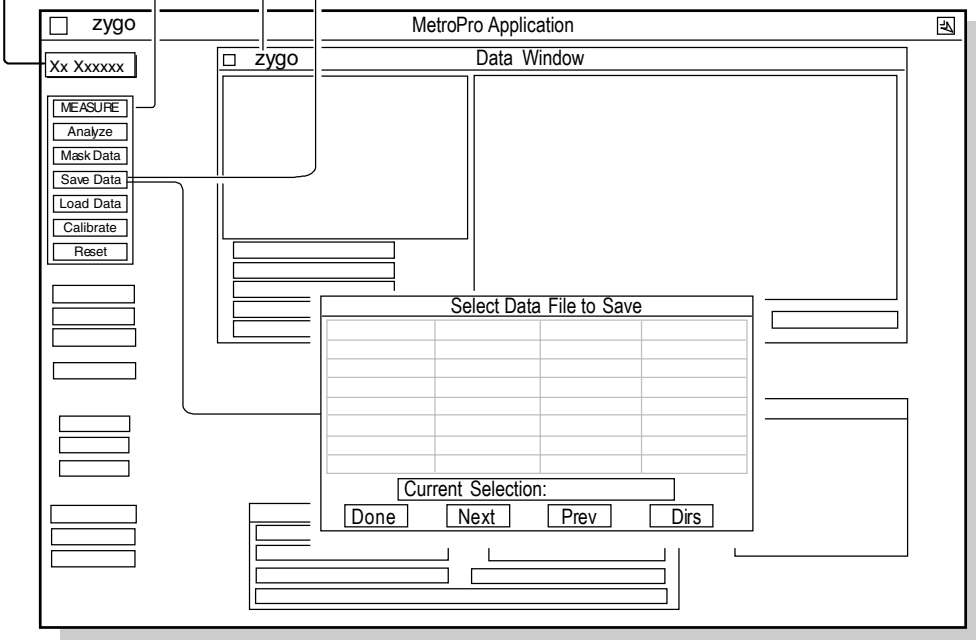
STEP 2 Position the test part and focus the instrument on the part and null the fringe pattern as described in the instrument's operation manual.

STEP 3 Select the appropriate aperture type or objective. Click here with the *left* mouse button.

STEP 4 ***Measure*** Click the *left* mouse button on the **MEASURE** button (or press F1). Results are calculated and displayed.

STEP 5 ***Print*** Click the *left* mouse button on the word "**zygo**". In the Print Panel, click **Print**.

STEP 6 ***Save Data*** Click the *left* mouse button on the **Save Data** button; this opens the File Handler. Click on the Current Selection box, type in a name for the data and press [Enter], then click the **Done** button.

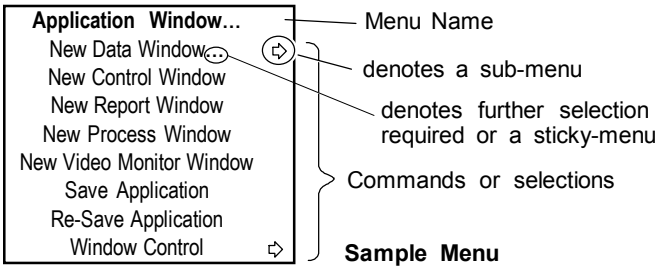


Working With Menus

Chapter 3

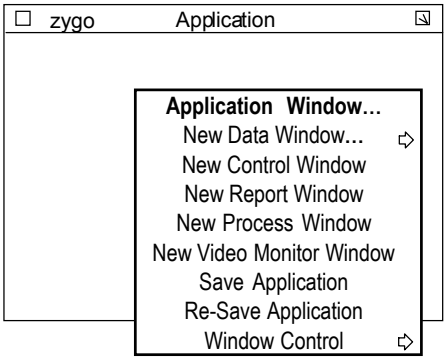
What is a Menu?

Menus are used to control all aspects of MetroPro operation. Like a menu in a restaurant, MetroPro menus allow you to select a command or function from a list of choices.



Accessing a Menu

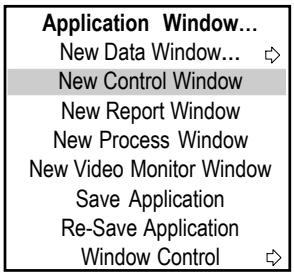
To access a MetroPro menu position the mouse pointer on an item and press the *right* mouse button. A menu appears on the screen wherever the mouse pointer is, and remains visible as long as you hold the button down. The items listed on the menu pertain to the particular window, box, or button that the pointer was on when you pressed the mouse button.



To access a menu -
Position the mouse pointer on a window, box, or button and press the *right* mouse button.

Selecting a Command

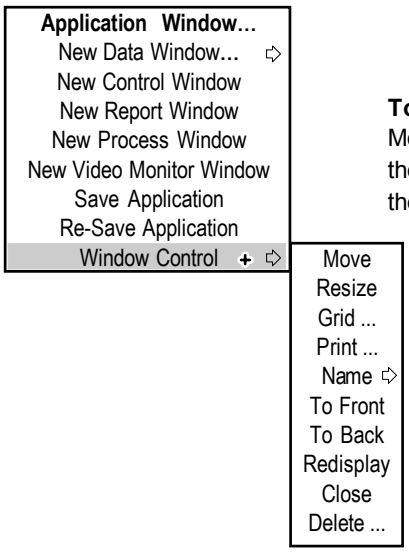
To select an item from a menu, you first access the menu, drag the mouse pointer down the list until the item that you want is highlighted; then release the mouse button. In the menu shown here, the New Control Window command is highlighted.



To select an item -
Release the mouse button when the desired item is highlighted.

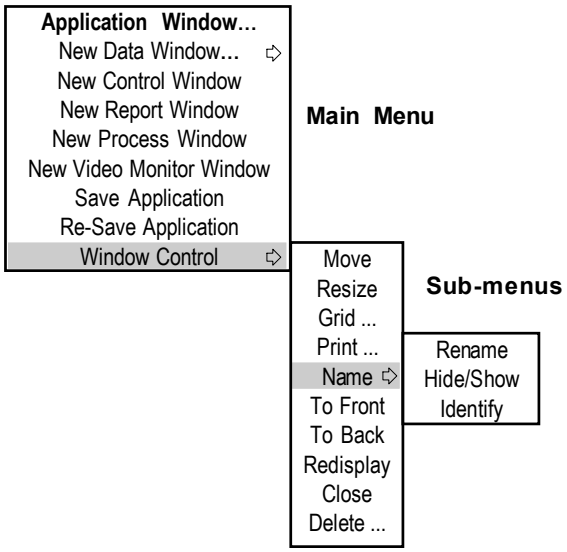
Selecting a Sub-menu

If a menu item has a right-pointing arrow next to it, that item itself is not a command; rather, it is used only to access a sub-menu. Instead of releasing the mouse button on an item with an arrow, drag the cursor onto the arrow; a sub-menu appears to the right of the existing menu.

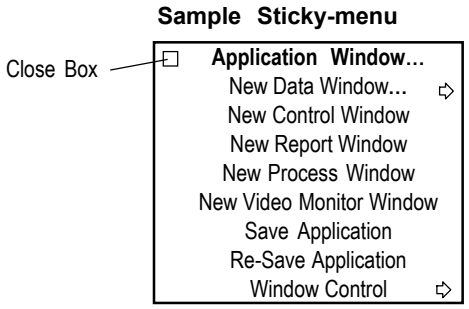


To access a sub-menu -
Move the cursor onto the arrow next to the item. The sub-menu appears to the right.

To select certain items, you may have to access two or three sub-menus before arriving at the one that has the item you're looking for.



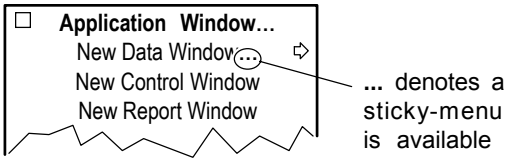
Using Sticky-menus



Menus choices with "…" (dot-dot-dot) can be posted on the screen; this allows you to select commands without having to access the menu each time. We call this type of menu a "sticky-menu". Sticky-menus work a little different from the other menus; you use the left mouse button to select commands instead of the right.

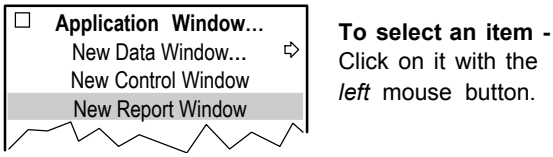
Creating A Sticky-Menu

To create a sticky-menu, access the menu and choose a "…" menu selection. An outline of the menu appears; press a mouse button, and move the mouse to position the outline on the screen. Release the mouse button and the sticky-menu appears.



Selecting a Sticky-menu Command

To select an item from a sticky-menu, point to the item with the cursor and click the *left* mouse button. If the selection has a sub-menu, press the *left* mouse button to select other options.



Moving a Sticky-menu

To move a sticky-menu, position the cursor anywhere on the menu and press the *middle* mouse button, or position the cursor on the title of the menu and press the *left* mouse button. Drag the mouse to relocate the menu and release the mouse button.

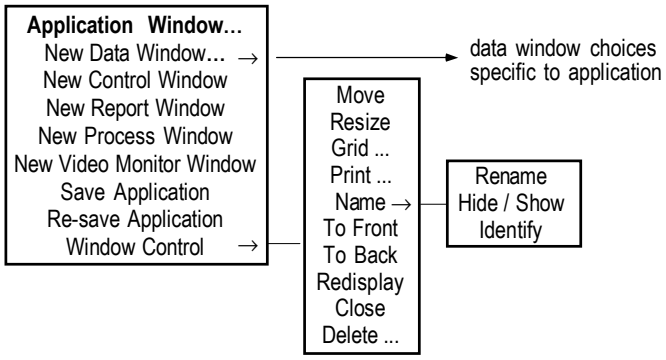
Removing a Sticky-menu

To remove or delete a sticky-menu from the screen display, click its close box with any mouse button or close the window from which the menu was accessed.

Typical Menus

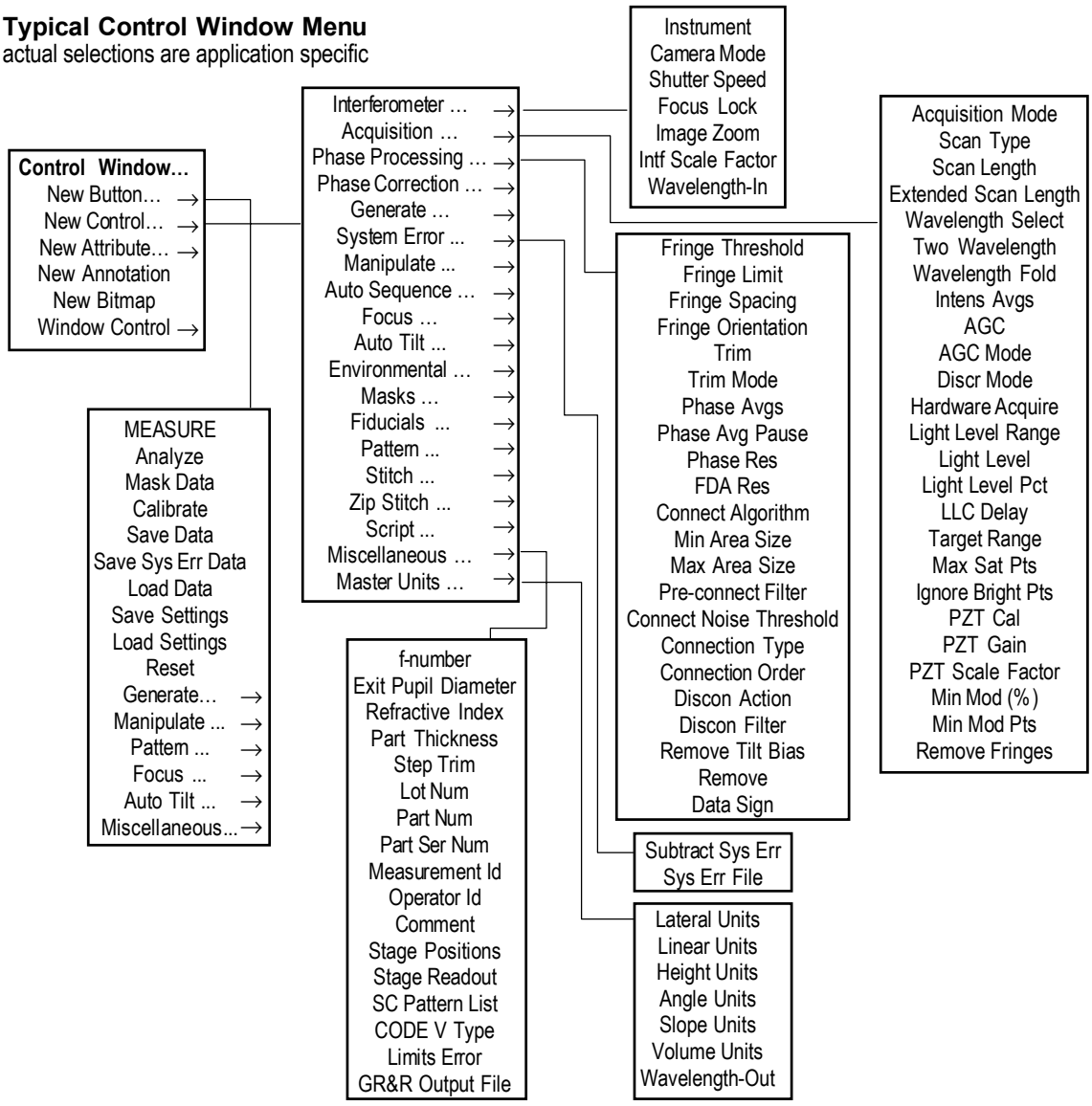
MetroPro Window Menu

Application Window Menu

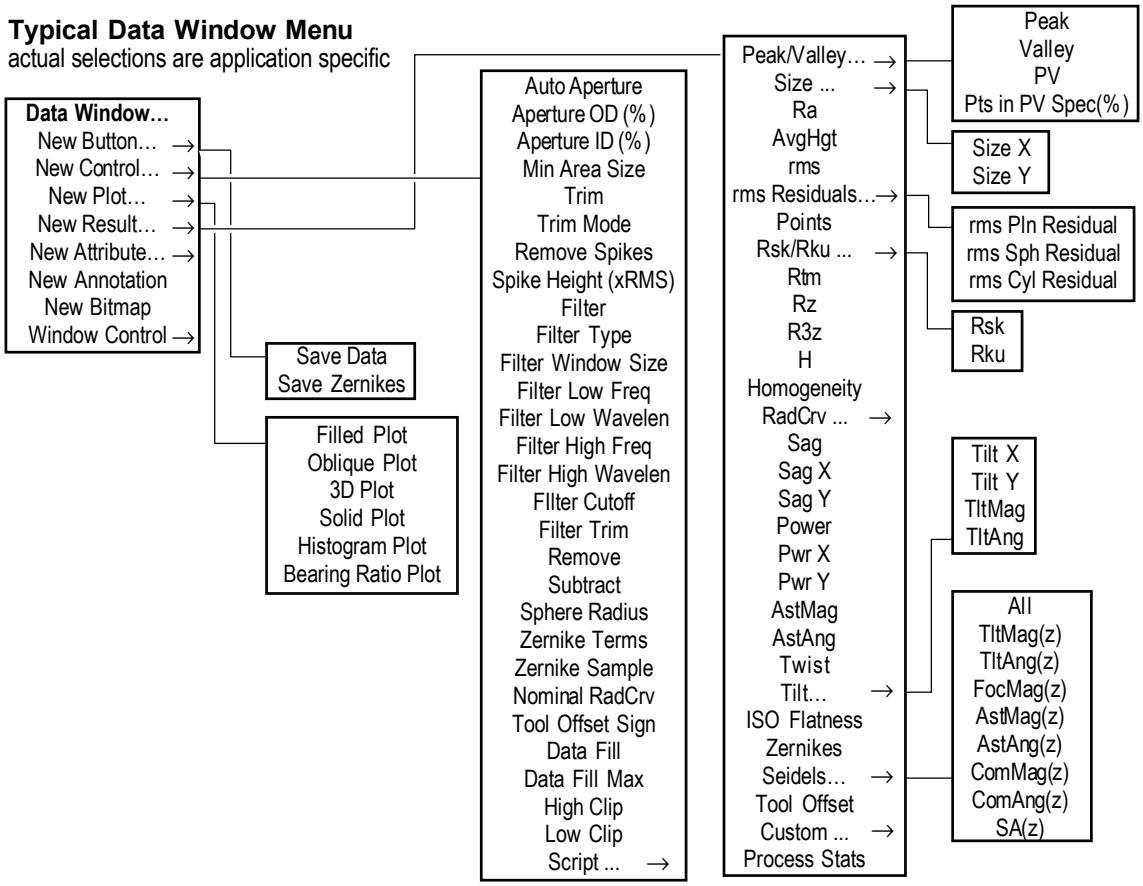


Typical Control Window Menu

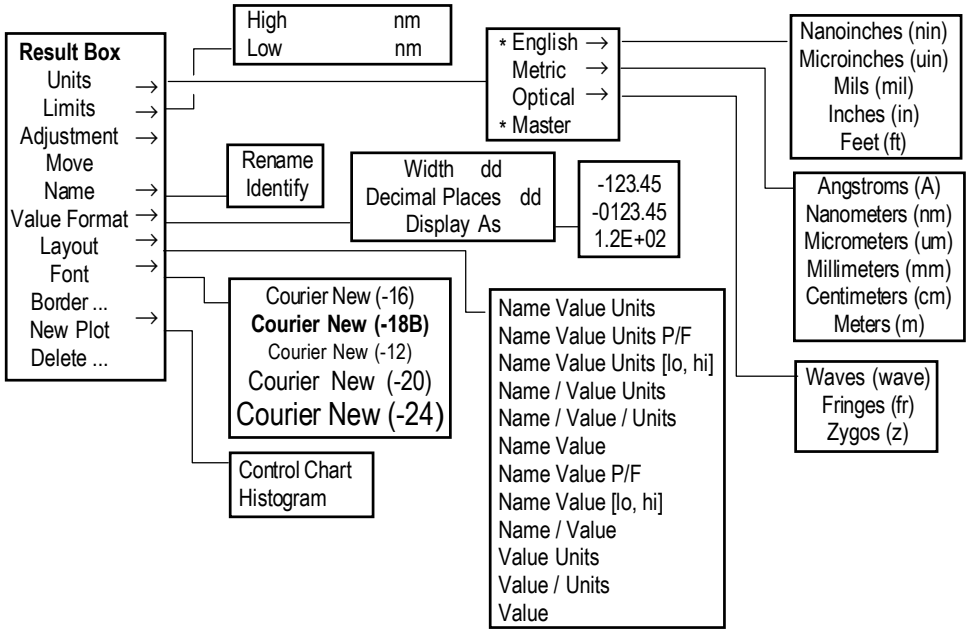
actual selections are application specific



Typical Data Window Menu
actual selections are application specific



Typical Result Box Menu
actual selections will vary



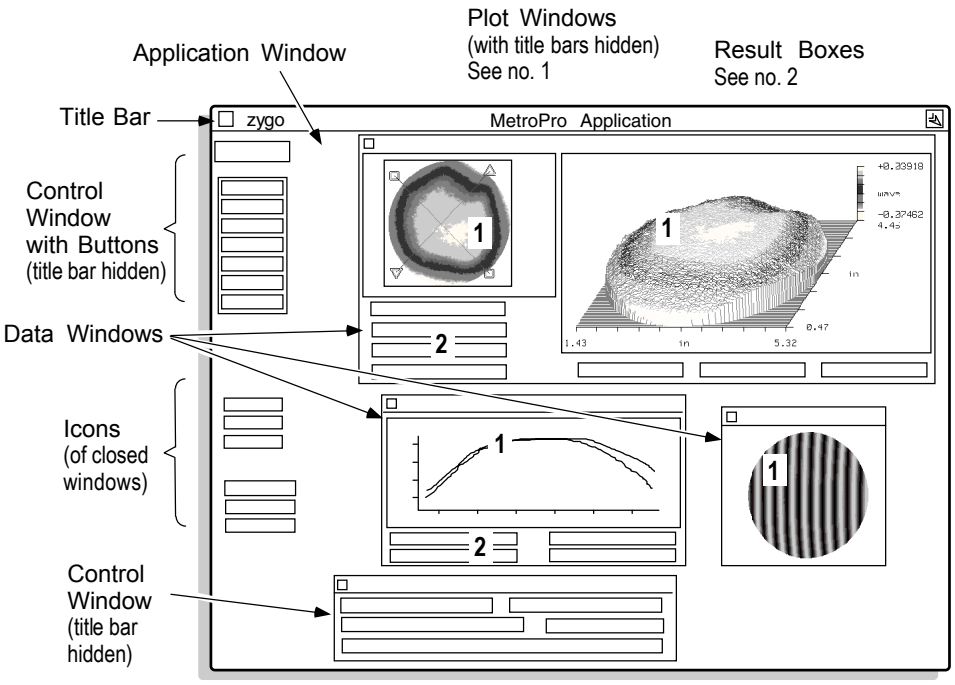
Working With Windows

Chapter 4

What is a Window?

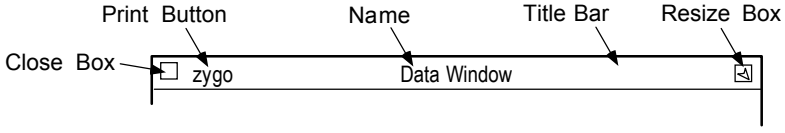
All MetroPro displays and controls appear within "windows". A window is a rectangular outline on the screen that defines an area where related things are displayed. MetroPro uses "nested" windows; some windows must be created and used within a parent window.

The Application window is the main or parent window of an application. The Application window may contain Data windows and Control windows. Data windows may contain Plot windows, buttons, and boxes. Control windows may contain only buttons and boxes. Any windows, boxes, or buttons created within a parent window always remain inside the parent window boundaries.



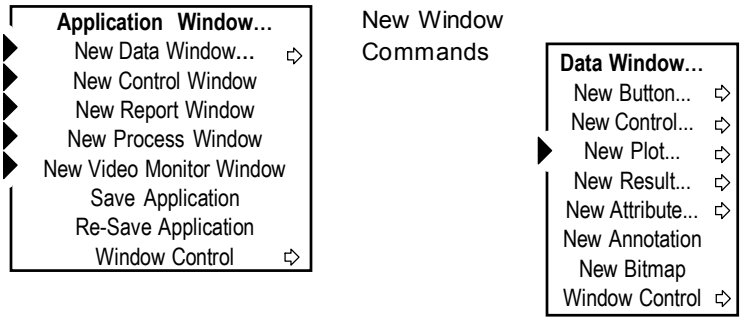
Parts of a Window

A window usually has a title bar at the top containing a name, a Resize box, a Close box, and a "zygo" Print button. The title bar itself also serves as a place to grab the window to move it.



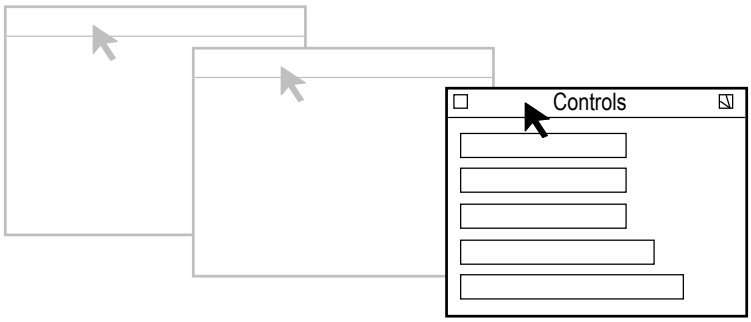
Creating a New Window

To create a window, select a relevant command from the parent window menu; an outline of the window appears; move the mouse to position the outline. For the window to appear, *click* any mouse button. Alternatively, to resize the window before it appears, *press* any mouse button and drag the mouse to size the window; then, release the mouse button.



Moving a Window

To move any window, except a Plot window, position the cursor on the window and press the *middle* mouse button. Or, for all windows, position the cursor on the window title bar and press the *left* mouse. Then, drag the mouse to relocate the window and release the mouse button.

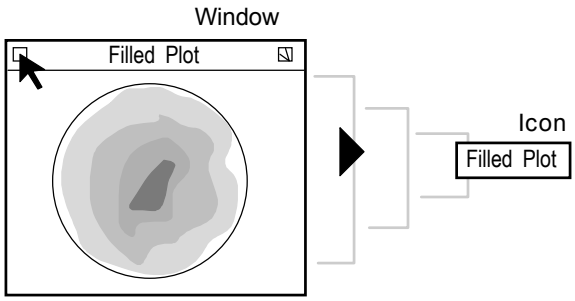


Press the middle mouse button on the window, drag to relocate window, then release the mouse button.

Remember, a window cannot be moved outside the boundaries of its parent window. For example, in the previous illustration, the Control window must remain within the Application window.

Closing a Window

Click the *left* mouse button on the window Close box to close the window into an "icon". An icon represents a closed window. The entire window and anything inside of it are preserved in the icon.



Closing a Window for the First Time

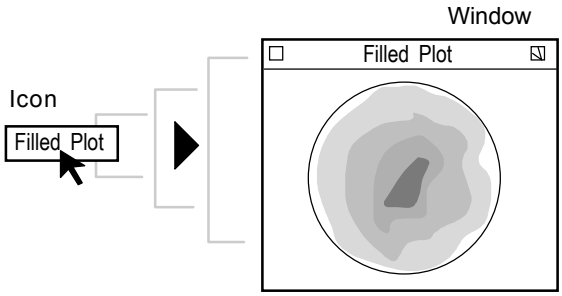
The first time you close a window you have to position the icon. When you click the window Close box, the window closes down to an icon outline. Press and hold any mouse button; move the mouse to locate the icon and release the mouse button. The icon appears where you placed it.

Closing a window to an icon conserves room on the screen without discarding any measurement data. The window reappears full size, with all data intact, when you click on the icon with the *left* mouse button.

Opening a Window

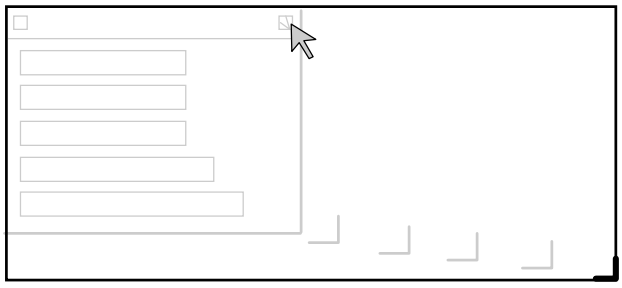
To open a window, in icon form, position the cursor over the icon and click the *left* mouse button.

Note that only three application windows can be opened at a time.



Resizing a Window

Press any mouse button on the window Resize box to change the size of the window. A window outline appears with a reverse "L" shape bracket at the lower right corner of the window. The window is resized from the "L" bracket. Drag the mouse to change the size of the window and release the button when the window is the size you want.

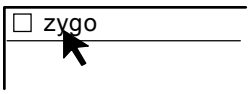


Press the left mouse button on the Resize box, drag "L" bracket to size window, then release the mouse button.

If you reduce the size of the window too much, items inside the window can be hidden or cut off. Remember, you can't enlarge a window beyond the boundaries of its parent window.

Printing a Window

To print the contents of a window, click the left mouse button on the **zygo** Print button in the title bar.



A Print Panel opens which is used to send the image to a printer or a file. Printing is discussed in a later chapter.

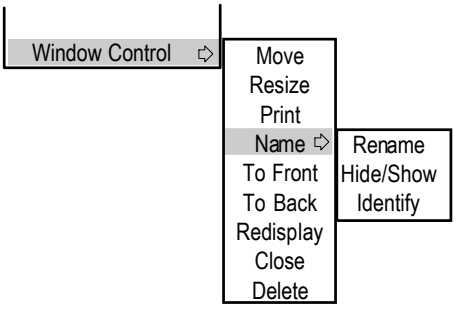
Layering Windows

Windows and icons may overlap or cover one another. All opened items, even it is not the front most item, are active.

To bring a window to the front, click the *middle* mouse button inside the window, or click the *left* mouse button on the window title bar.

Using the Window Control Command

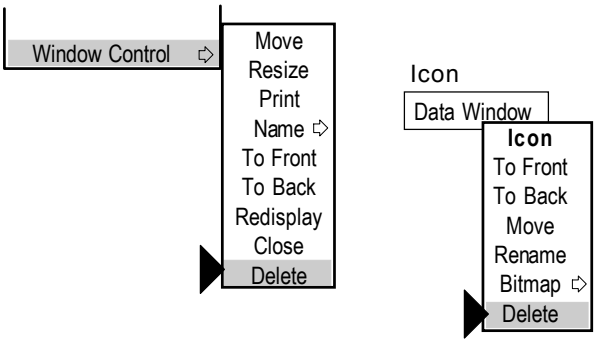
Most of the techniques described in this section can also be performed with the Window Control → menu command. These commands are especially useful if the title bar of a window is hidden.



Take note of the Name → Identify command. Select this command if you want to get information on a window. It is useful when window names have been changed and you want to know the original name.

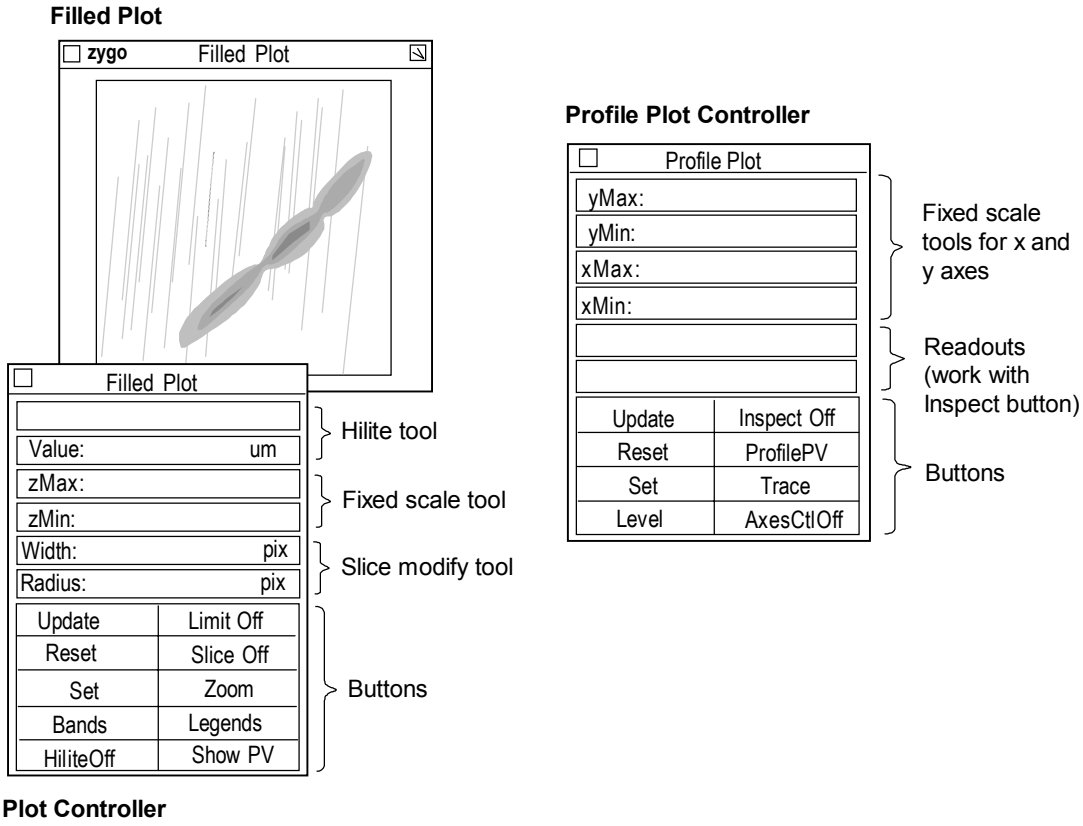
Deleting a Window

To remove a window from the screen, select Window Control → Delete from the window you want to delete. If the window is in icon form, select Delete from the Icon menu.



Working With Plots

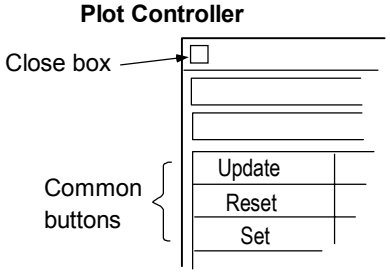
Plots are unique types of windows. The display within the plot window is modified by a plot controller. Each plot has its own controller. There are different controllers for each of the plot types. Controllers use buttons and other tools to control the plotting of data. An example of two plot controllers is shown below.



Plot Controller

To access a plot controller, click on the plot window with the *middle* mouse button; or position the cursor over the plot, click the *right* mouse button and select the Show Controller command. When it is opened for the first time, an outline of the Controller appears; drag the mouse to position the Controller and then release the mouse button.

All plot Controllers have three common buttons: Update, Set, and Reset, plus a close box.



Update redraws the plot to the latest changes. Set makes the current settings the default. Reset changes the plot display to match the default settings.

Other buttons in the Controllers function as activators (to cause something to happen), switches (to turn something off and on), or selectors (to cycle through a series of choices). Most buttons are activated with the *left* mouse button.

More details on using plot controllers can be found in the *MetroPro Reference Guide*.

Working With Boxes and Buttons

Chapter 5

What is a Box?

A box is a small rectangular view of information on the screen. A box may show results or be used as a software control device. There are four categories of boxes: Control, Attribute, Result, and Annotation.

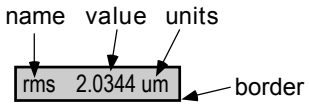
Category	*Description*	*Sample*	*Color*
Control	Specify and adjust measurement parameters.	Trim 2	blue
Attribute	Show status information about the current data.	Trimmed: 2	black
Result	Display numeric measurement results.	rms 2.0344 um	black
Annotation	Allow user-input text.	zygo corporation	black

You can differentiate boxes by their color; Control boxes are blue, the rest are black. An Attribute box is distinguished from a Control box having the same name by its color. Also, some Attribute boxes have the past tense of the word in the Control box. For example, if the Control box says Remove, the corresponding Attribute box says Removed.

When working with MetroPro, a message may be displayed on the screen. These messages are presented within boxes called Dialog boxes.

Parts of a Box

Most boxes have similar parts. Each box is identified with a name and usually has a border; it also displays other information, such as values or current selections.



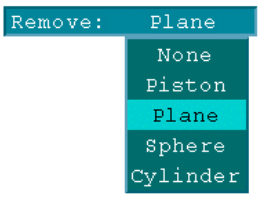
Using Boxes

Result and Attribute boxes only display information. Control boxes, on the other hand, are devices used to specify analysis or to control the measurement.

To use a Control box, click on it with the *left* mouse button. For text entry controls, enter text in the text frame. For controls with selections, the selection either toggles to an alternate choice, or select the setting from the drop-down list and release the mouse button.

The Annotation box is used for adding comments; text is entered by clicking on the box and typing with the keyboard.

Example of a Control Box Drop-Down List

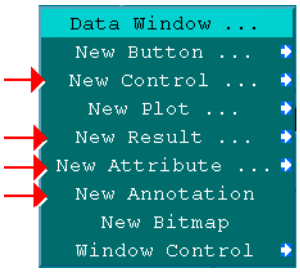


Creating a New Box

Boxes may be created in Data, Control, Report, Process, and Video Monitor windows. To create a box, choose the appropriate command from the window menu and use sub-menus to specify the exact box.

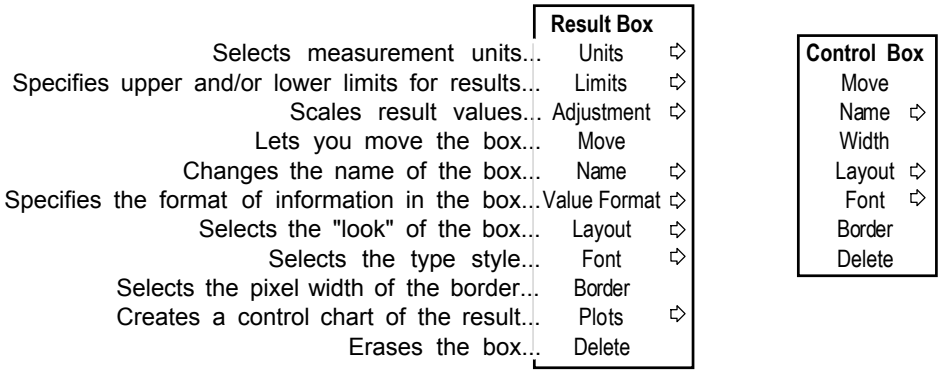
After you choose a specific box on the sub-menu, an outline of the box appears on the screen. Press the *left* mouse button and drag the mouse to locate the box. Release the mouse button and the box appears

Commands That Create New Boxes

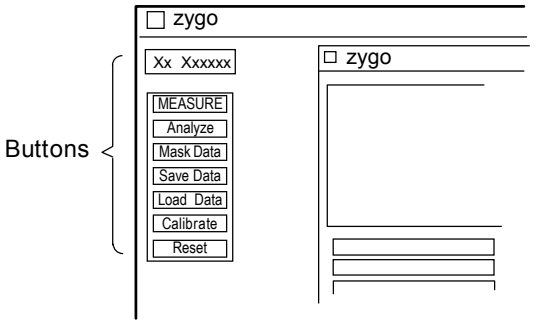


Modifying a Box

You can move a box by pressing the *middle* mouse button on the box, dragging it to a new location, and releasing the button. Using the box's menu, you can rename it; delete it; or change its display format, border width, and type style. Unlike windows, boxes cannot be resized, closed, or printed by themselves. Typical box menus are shown below.



What is a Button?



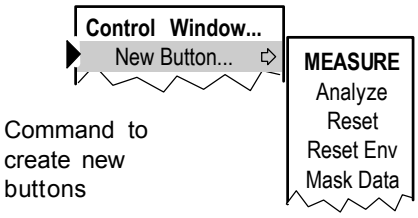
Buttons are on-screen switches that perform an action.

To activate a button, click the *left* mouse button when the cursor is over the button.

To cancel a button selection, move the cursor off the button before releasing the mouse button.

Creating a New Button

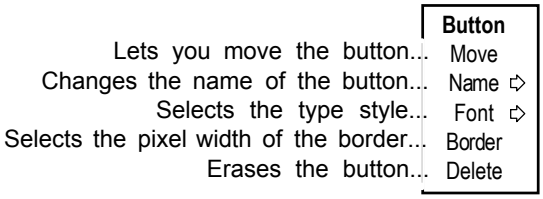
Buttons may be created in Data, Control, Report, Process, and Video Monitor windows. To create a button, choose the appropriate command from the window menu and use sub-menus to specify the exact button.



After you choose a specific button on the sub-menu, an outline of the button appears on the screen. Press the *left* mouse button and drag the mouse to locate the button. Release the mouse button and the button appears.

Modifying a Button

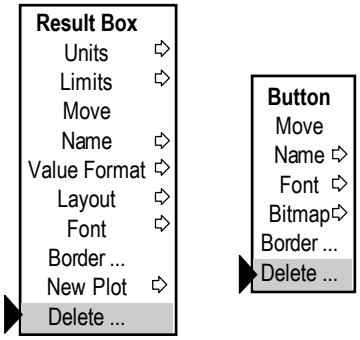
Just like a box, a button can be moved with the *middle* mouse button. By using the button menu you can rename it, delete it, alter its type style, and change its border width. A typical button menu is shown.



Take note of the Name → Identify command. Select this command if you want to get information on a box or button. It is useful when names have been changed and you want to know the original name.

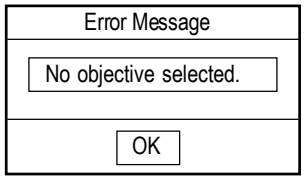
Deleting a Box or Button

To remove a box or button from the screen, select Delete from the item's menu. When a Control box is deleted, it is only deleted from the screen; the last setting of the box is used for subsequent measurements.

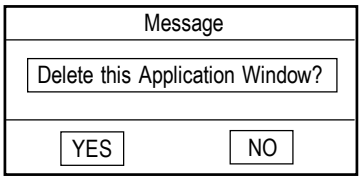


What is a Dialog Box?

A dialog box is a box that contains a message, often requesting more information from you or a requesting you to confirm an action. It is not related to any of the other boxes described earlier in this section.



Sample Dialog Boxes



Responding to a Dialog Box

To confirm an action or respond to the message, click on the appropriate button in the box with any mouse button.

Dialog boxes with an OK button also accept any keystroke as the response. Dialog boxes with YES or NO buttons also accept a Enter key for a “yes” response or the [Esc] key for a “no” response.

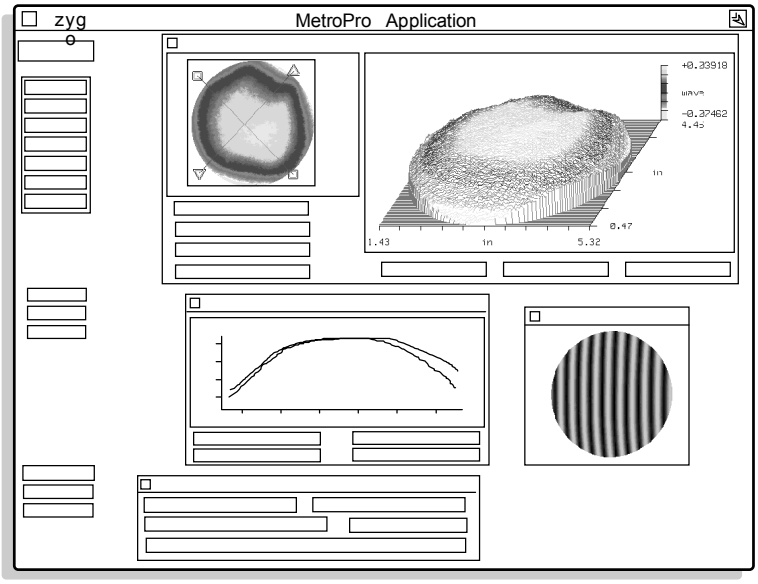
Working With Applications

Chapter 6

What is an Application?

An application is an arrangement of windows, controls, plots, and numeric results configured to acquire, analyze, and display data. An application is independent of the measurement data; it is the *way* the data is acquired, analyzed, and displayed; it is not the data itself. Once an application is loaded and opened, you may acquire and examine new data, or *load* and examine previously-stored data.

An Application is an assembly of windows, controls, buttons, and results that are used to measure and analyze a test part.



Why Are Applications Useful?

MetroPro applications are designed to fit most customers' requirements. All controls, graphic plots, and results are already in place so you can start making measurements immediately.

Applications can also be custom-designed to fit a specific measurement need. You select the controls and displays you need, arrange them on the screen the way you like to see them, configure them to perform the functions you want, and save them as an application.

Multiple applications can be created and stored to provide you with a storehouse of testing tools. In day-to-day operation, you just load and open the application that suits the type of testing you are doing. An existing application can be modified slightly or extensively, and renamed to become a new application of the future.

Learning to Use Applications

The easiest way to learn about an application is to "jump right in". Open the application by clicking on its icon with the *left* mouse button. Position a test part and click the MEASURE button; then try experimenting with the displays.

Types of MetroPro Applications

MetroPro comes with several applications. Most applications are described separately in booklet form for easy reference. All applications are available in the "MetroPro\app" directory.

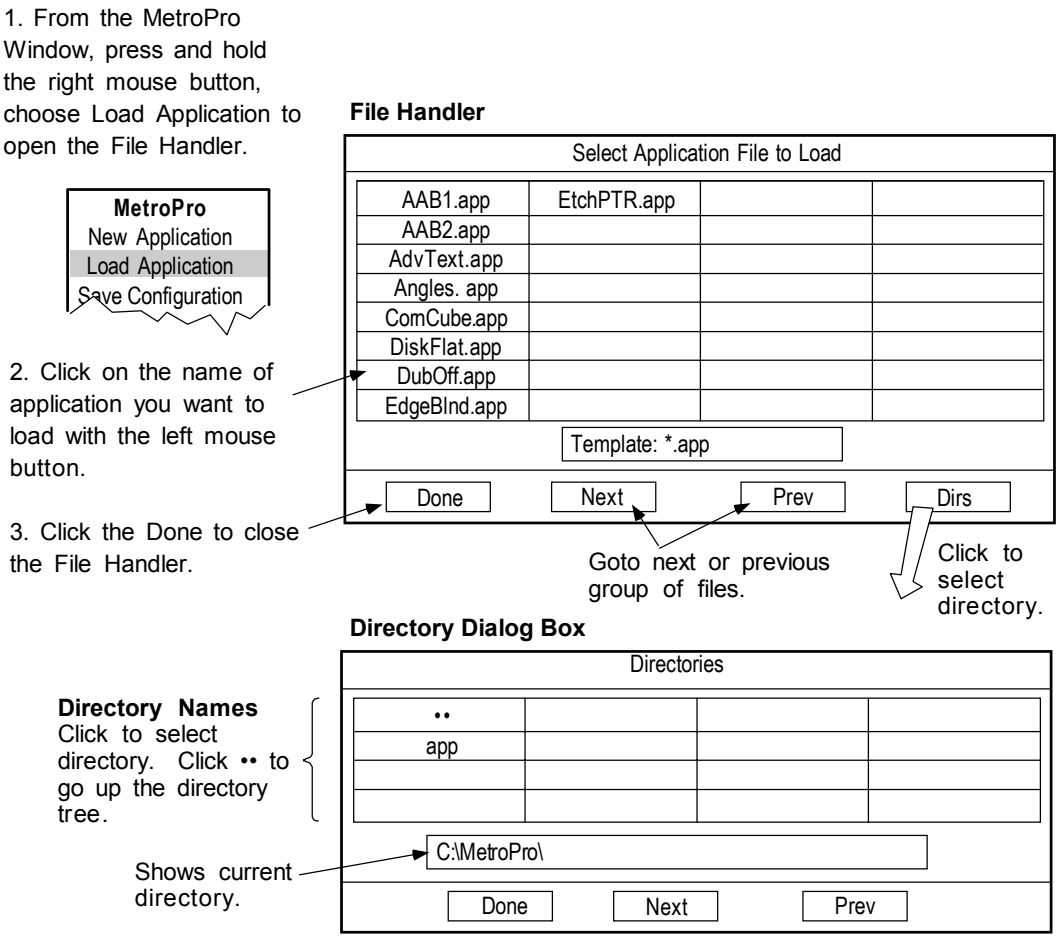
Some applications are "standard", that is, they are included with, and licensed with MetroPro. Other applications are "optional", they are sold separately, usually require individual licensing, and sometimes special hardware as well. If you have specific questions regarding your applications contact your Zygo sales representative.

Note: The applications in the MetroPro\app directory are write-protected to most users, except the administrator. These applications should not be changed, even by the administrator. Run the MetroPro User Setup program to create a working directory for user accounts. (See Chapter 1.)

Loading and Opening Applications

Loading Applications

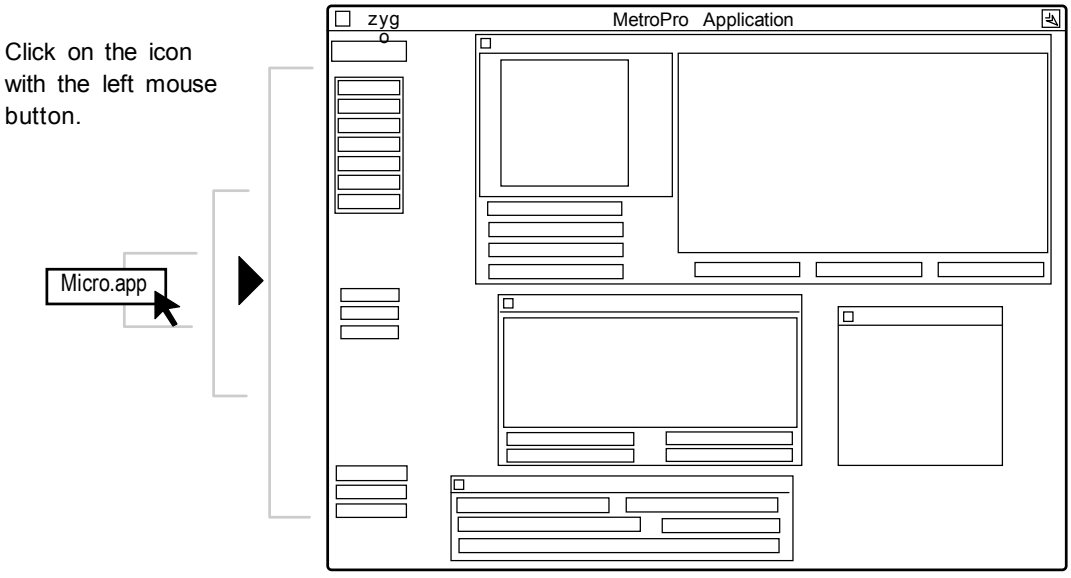
When you first start MetroPro, all the applications that are applicable to your display and instrument usually load unto the MetroPro window in the form of icons. If an application icon is not displayed on the MetroPro window, you can load an existing application by selecting Load Application from the MetroPro menu. This opens the File Handler; instructions on using the File Handler are shown in the illustration below. Multiple application icons may be loaded onto the MetroPro window.



Opening Applications

Applications are opened by clicking once on the application icon with the *left* mouse button. Only three applications may be *open* at any given time. When you first open an application, the plot windows are blank and the result boxes have no numeric values in them. Even though the application is open and operational, it doesn't have any measurement data to display yet.

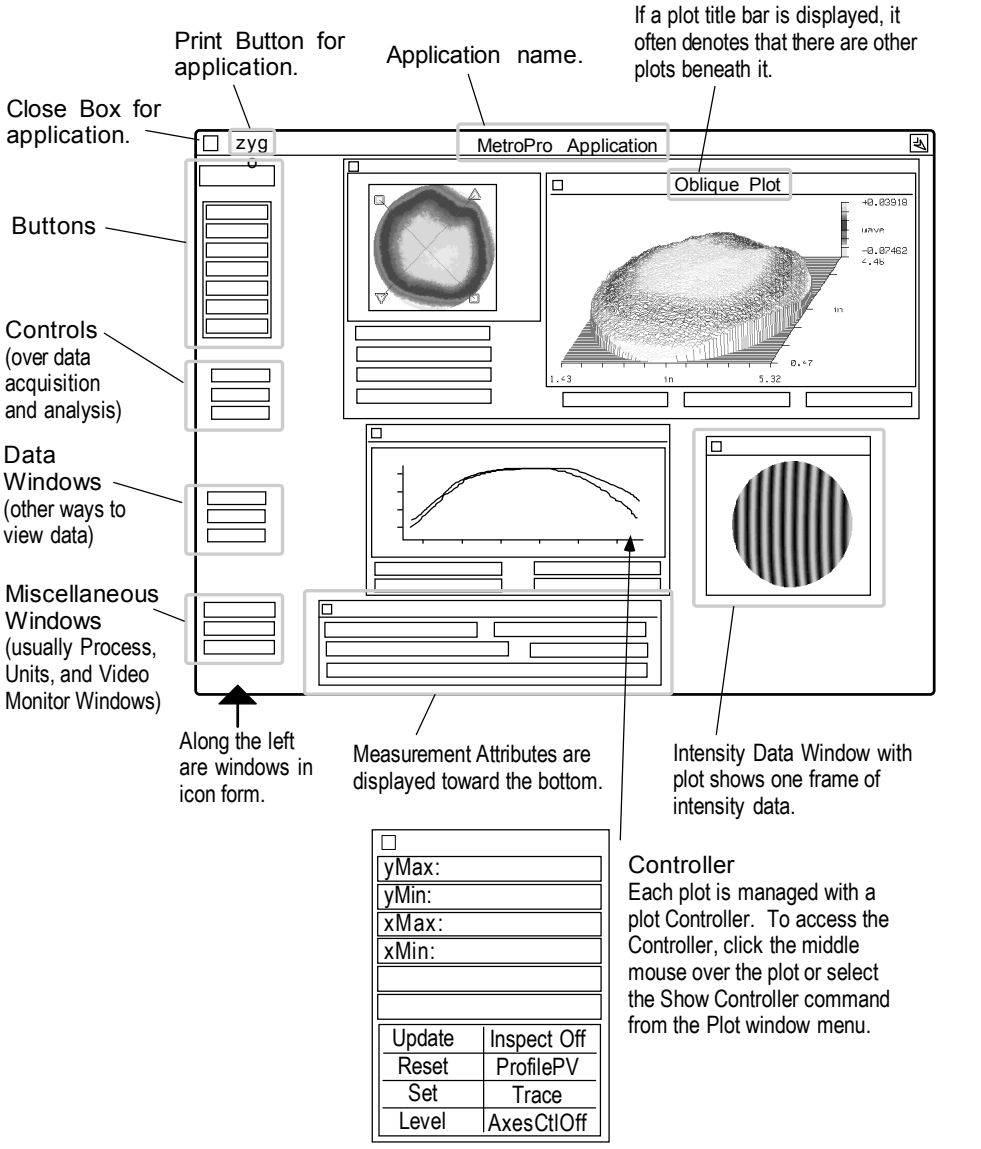
Assuming that you have connected the instrument to the computer, configured a test setup, and focused on the test part, you may acquire data by clicking the MEASURE button. Measurement data is automatically analyzed and displayed in the Result boxes and Plot windows.



Looking at Applications - the Common Threads

All applications share a similar design and layout. Becoming familiar with these "common threads" will make it easier to understand and use MetroPro applications.

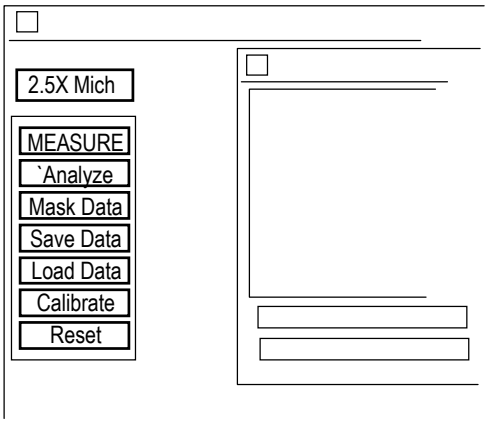
If you can't take measurements, be sure that you have licensed MetroPro and the applications you plan to use, as described in Chapter 1.



Parts shown are typical of Zygo applications, actual layout and components will vary.

Buttons

Below is a brief explanation of the most common buttons that appear in the upper left corner of Zygo applications. Some applications have additional buttons.



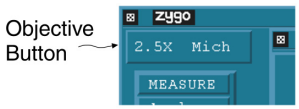
Button	*Function*
Objective or Aperture	Specifies which microscope objective you are using, or Configures the GPI for small or large aperture.
MEASURE	Initiates the acquisition, analysis, and display of measurement data.
Analyze	Re-analyzes measurement data after changing analysis parameters.
Mask Data	Opens the Mask Editor, which specifies measurement areas.
Save Data	Opens the File Handler, which saves unanalyzed measurement data.
Load Data	Open the File Handler, which loads saved measurement data.
Calibrate	Open the Calibrate window, which calibrates the instrument for lateral measurements.
Reset	Reloads the current application.

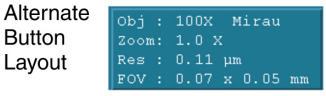
Objective Button (Microscope Applications Only)

To select the objective in use, click the Objective button with the left mouse button.

To display the current instrument settings, choose the Layout → Obj/Zoom/Res/FOV command from the Button's menu.

Obj is the current objective
(with motorized turret this automatically updates).
Zoom is the image zoom setting
(with encoded zoom this automatically updates).
Res is the objective lateral resolution.
FOV is the objective field of view (horizontal x vertical).





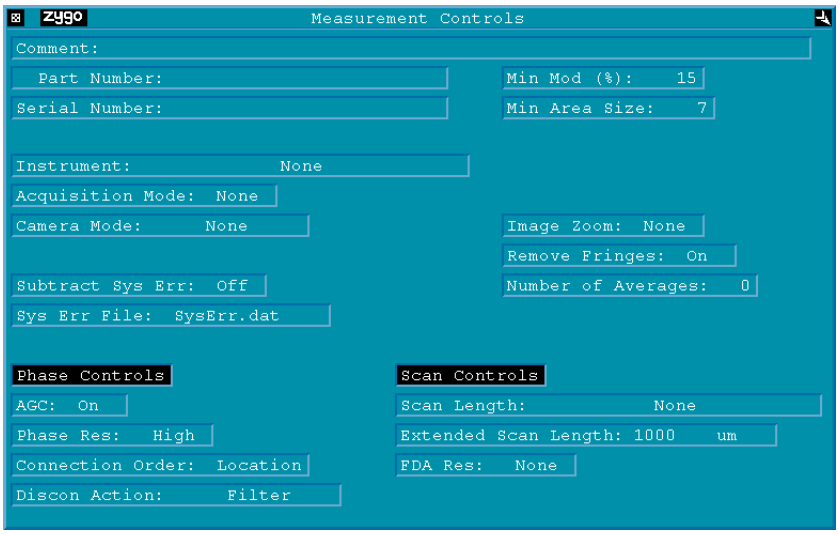
Controls and Attributes

All Zygo applications include controls. Here is an overview of the windows where you'll encounter these controls:

Measure Cntrl

These Control boxes select parameters that control the measurement and are used to enter descriptive text. Information entered in the first three boxes are displayed in the Measure Attributes window shown below.

Measurement Controls

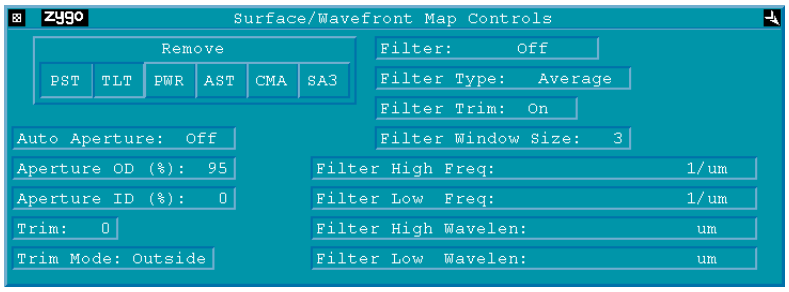


Microscope Application Shown

Analyze Cntrl

These Control boxes are used to select data analysis parameters. Click the Analyze button to update results after changing these controls.

Analyze Controls

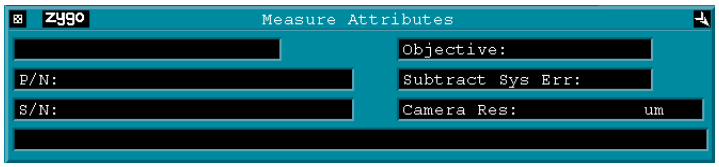


GPI Application Shown

Measure Attr

These Attribute boxes display information about the measurement and settings of controls when the measurement was made.

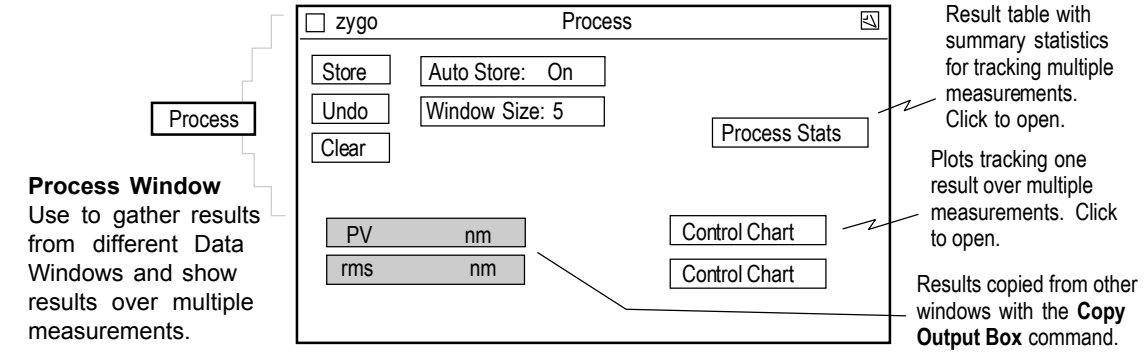
Measure Attributes



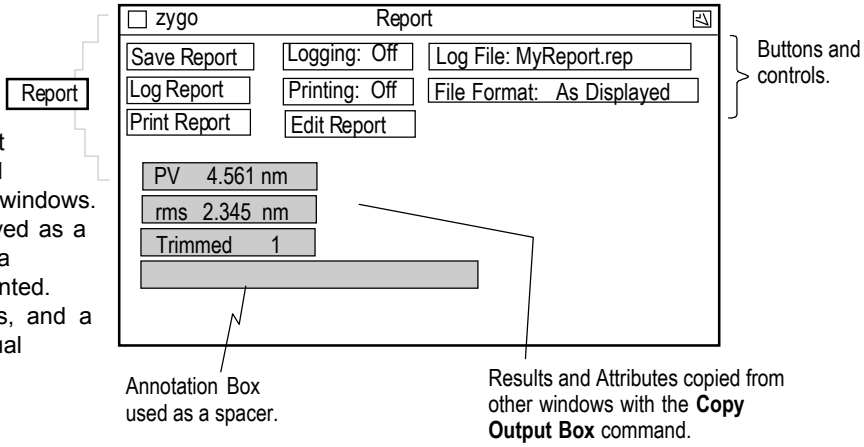
Microscope Application Shown

Miscellaneous Windows

Most Zygo applications include Process, Video Monitor, Units Systems, and Report Windows. The purpose of these windows is highlighted below. For additional information on anything shown, see the *MetroPro Reference Guide.*

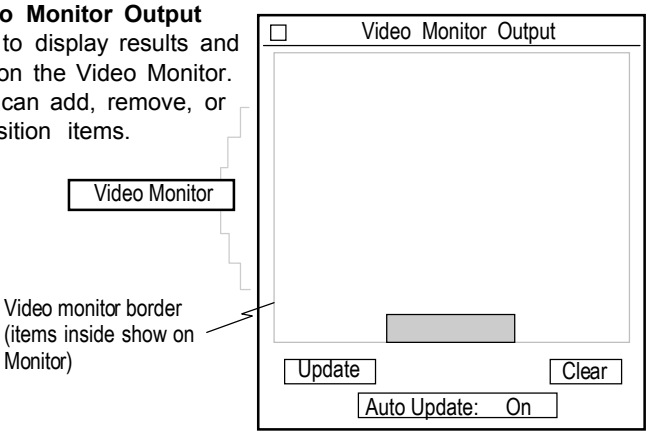


Process Window
Use to gather results from different Data Windows and show results over multiple measurements.

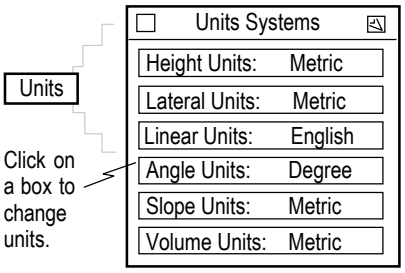


Report Window
Use to create a report containing results and attributes from other windows. The report can be saved as a single file, logged as a continuous file, or printed. Only results, attributes, and a title make up the actual report.

Video Monitor Output
Use to display results and text on the Video Monitor. You can add, remove, or reposition items.



Units Systems
Selects measurement unit systems for plots and results.



Parts shown are typical of Zygo applications, actual layout and components will vary.

Making New Applications

There are two techniques to make a new application: build your own application from scratch, or modify an existing application and resave it. It is usually easier to modify an existing application for your needs.

> **Note:** The applications in the MetroPro\app directory are write-protected to most users, except the administrator. These applications should not be changed, even by the administrator. Run the MetroPro User Setup program to create a working directory for user accounts. (See Chapter 1.)

Building an Application

To build an application, select New Application → from the MetroPro menu and then choose one of the applications listed in the sub-menu. Next, create Data and Control windows in the Application window. In the Data windows create the plots and results you need. In the Control window, create the Control boxes and buttons required. Then add other windows as needed.

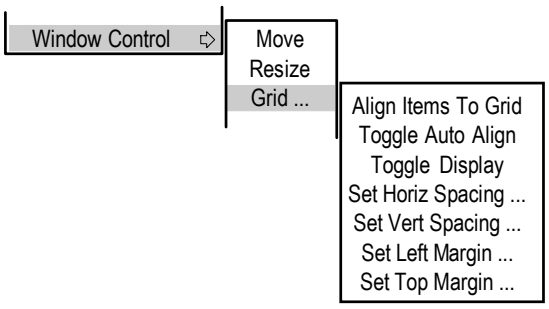
Modifying an Existing Application

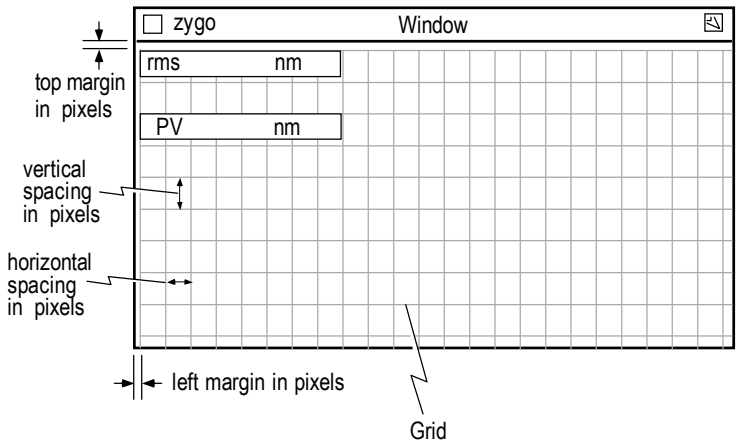
1. Start by opening an application that is similar to the one you have in mind to create. Clear out any existing data by clicking the Reset button.
2. Modify existing windows, boxes, or buttons. You can delete, move, and rename items. Add new plots and boxes. Arrange items into the arrangement you want.
3. Modify plots with the plot Controller for each plot. To ensure that your plot settings are preserved, click the plot Controller Set button.
4. The first time you save the application, select the **Save Application** command from the Application Window menu. Select a unique name.
5. Regularly save the application during the creation process with the **Re-save Application** command from the Application Window menu.
6. Select the **Save Configuration** command from the MetroPro Window menu, if you want to preset MetroPro to load and open your applications.

Using the Grid Controls

The grid controls are used when building or modifying applications or windows to automate the spacing and alignment of items inside the window.

The controls are accessed through the window's Window Control → Grid command.



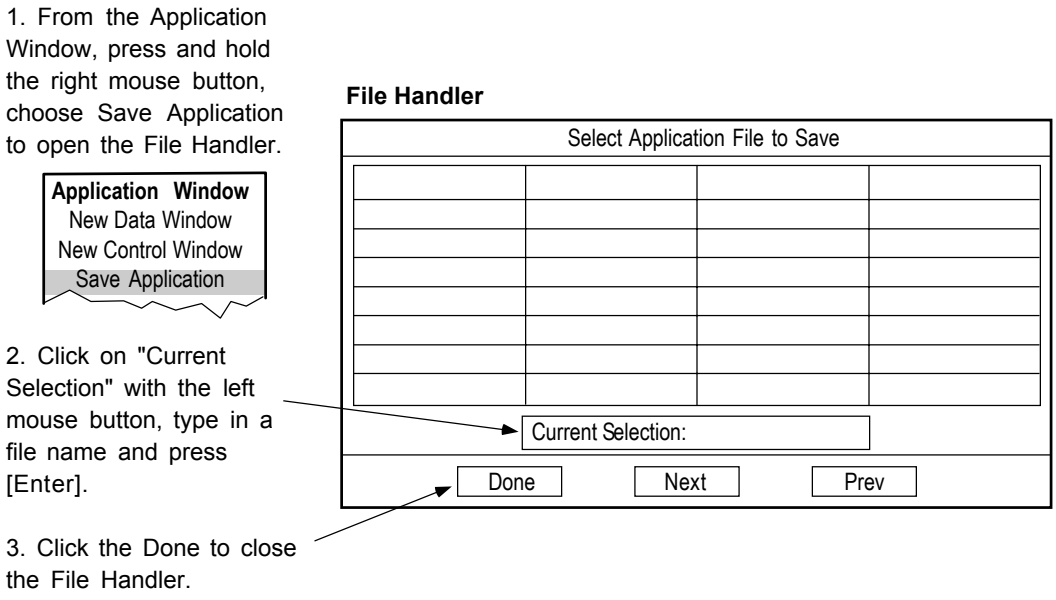


Control	*Function*
Align Items To Grid	Select to immediately realign all items to the grid.
Toggle Auto Align	Select to turn automatic align on/off. When on, items snap to grid positions when created or moved.
Toggle Display	Select to display/hide grid lines in the window.
Set Horiz Spacing	Specifies the horizontal spacing of the alignment grid in pixels.
Set Vert Spacing	Specifies the vertical spacing of the alignment grid in pixels.
Set Left Margin	Specifies the left side margin from the edge of the window to the alignment grid.
Set Top Margin	Specifies the top side margin from the edge of the window to the alignment grid.

Saving Applications

If you have created an application or modified a standard application, you may save it on the hard drive, with a name of your choosing. If you make changes to a standard application, the only way to preserve your changes is to save the application under a new name.

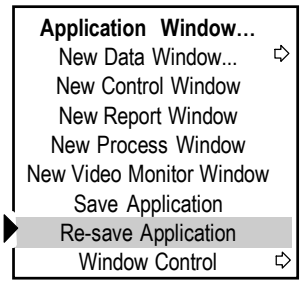
To save an application, position the mouse pointer on the Application window, press the *right* mouse button to access the Application menu, and select the **Save Application** command. Then use the File Handler as shown below.



File names must start with a letter or a number and may contain underscores (_) and periods. However, names may not contain spaces or special characters, or be longer than 20 characters. Use ".app" for a file extension. You could incorporate your company name, like "AcmeCorp.app".

Re-Saving Applications

To bypass the File Handler and save the application under its current name and settings, select the **Re-save Application** command from the Application menu. This replaces the existing application file.



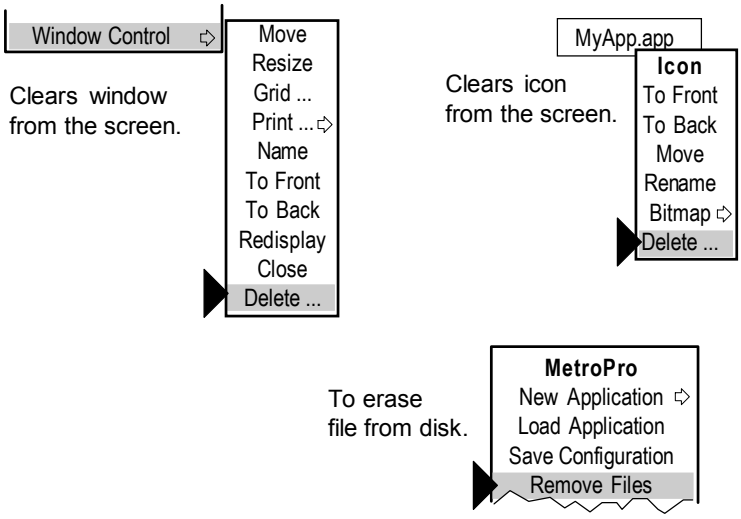
Updating Old Applications

Whenever there is a major update in MetroPro, your existing applications may require conversion to run in the latest MetroPro version. Refer to the complete discussion in Chapter 1.

Deleting an Application

To clear an application window from the screen, select Window Control → Delete. If the application is in icon form, select Delete from the Icon menu to clear the icon from the MetroPro window.

To erase a saved application from disk choose the Remove Files command or use the Windows File Manager.



Saving Application Configurations

To save the current configuration of the opened application select the **Save Configuration** command from the MetroPro window menu. The next time MetroPro is started, the application will automatically load and open.

A configuration file, named "MetroPro.cfg", is saved that tells MetroPro what applications to load and open, and their position on the screen. Note that many applications can be loaded onto the MetroPro window, but only two applications can be opened at a time. The configuration of the windows and boxes within the application itself is saved with the Save Application command.

Working With Files

Chapter 7

Files in MetroPro

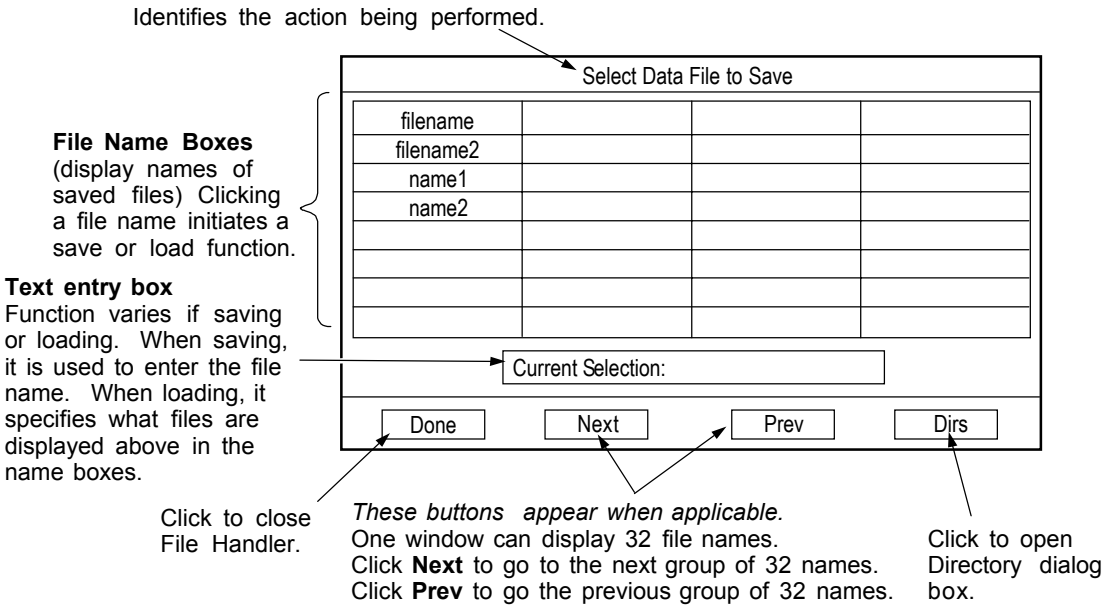
There are several different file types in MetroPro. Each is saved and loaded independently of the other. The most commonly used file type is the data file.

File Type	*Extension*	*Description*
Application	.app	A file containing the look and placement of windows and boxes, plus all control settings.
Data	.dat	A file containing measurement data. A data file contains multiple numerical arrays representing the part under test, plus measurement parameters.
Fiducial	.fid	A file containing fiducial information. For a detailed discussion of fiducials, refer to the *MetroPro Reference Guide*.
Mask	.mas	A file containing information that defines the way a measurement is taken or analyzed. For a detailed discussion of masks, refer to the *MetroPro Reference Guide* and the topic "Mask Editor".
Pattern	.pat	A file containing programmable stage data.
Report	.rep	A text file containing user-selected measurement results and attributes. For a detailed discussion of making and using a Report file, refer to the *MetroPro Reference Guide*.
Script	.scr	A MetroScript file.
Settings	.set	A file containing control setting information.
Template	.geo	A file containing the geometric description of templates used for test part analysis.
Zernikes	.zfr	A text file containing Zernike terms in CODE V format. For a detailed discussion of exporting a Zernike file, refer to the *MetroPro Reference Guide*.

Using the File Handler

File Handler is the general name given to the dialog box that is used to save, load, and remove files. All files are all managed in a similar fashion using a File Handler. A File Handler is invoked when you click a save or load button, or select a save or load menu command. A typical File Handler is shown below. File Handlers will vary depending on the file type and the selected action.

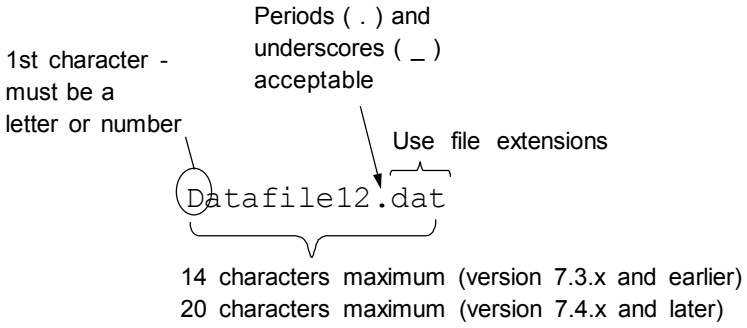
A Look at a File Handler



Naming Files

When naming files, keep these guidelines in mind:

- The first character must be a letter or number.
- Subsequent characters can be letters, numbers, underscores (_) and periods. Names are limited to:
  14 characters (MetroPro version 7.3.x and earlier)
  20 characters (MetroPro version 7.4.x and later)
- Spaces and special characters are not accepted.
- Use file extensions to simplify file organization.



MetroPro uses a default name when a file is saved for the first time. It is a good idea to use file extensions along with each name, as they make it easier to locate file types and perform backup functions. The default names and recommended file name extensions are shown in the following table.

File Type	*Default Name*	*Recommended Extension*
Application	MyApp.app	.app
Data	MyData.dat	.dat
Fiducial	MyFid.fid	.fid
Mask	MyMasks.mas	.mas
Pattern	MyPattern.pat	.pat
Report	MyReport.rep	.rep
Script	MyScript.scr	.scr
Settings	MySettings.set	.set
Template	MyGeom.geo	.geo
Zernike	MyZernikes.zfr	.zfr

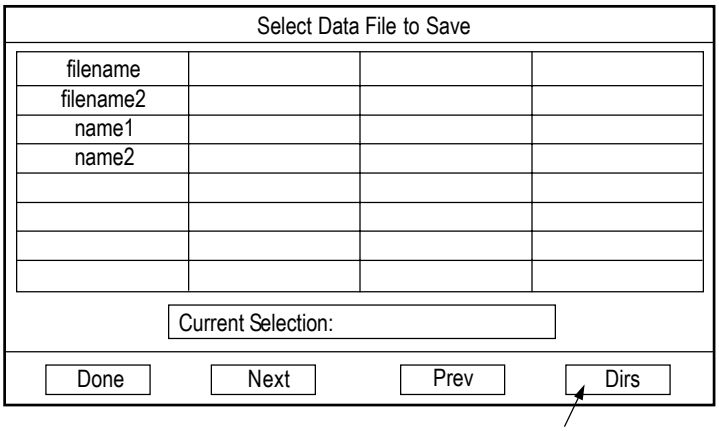
Saving Files

A File Handler appears when *saving* files, such as: selecting the Save Application command, or clicking on the Save Data button, Save Report button, Save Template button, or the Save button in the Mask Editor.

1. To open a File Handler, click the appropriate **Save** button or select the **Save Application** command.

2. Click on "Current Selection" with the left mouse button, type in a file name and press [Enter].

3. Click Done to close the File Handler.



Note - the Directory feature is disabled when saving applications.

Re-saving an existing file
Substitute this for step 2:
Click on the file name box you want to resave and respond "Yes" to the Warning Message.

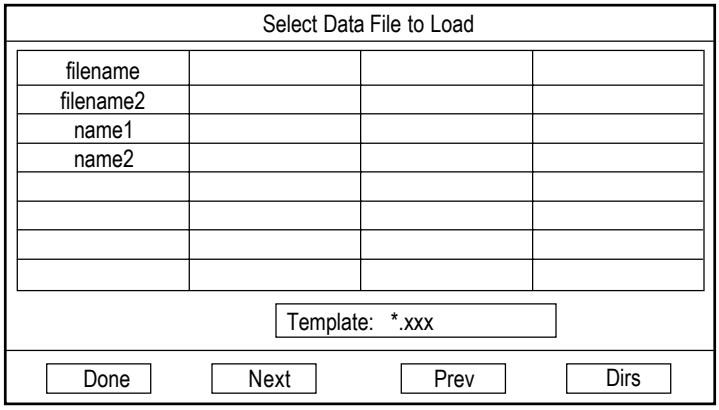
Loading Files

A File Handler appears when *loading* files, such as: selecting the Load Application command, or clicking on the Load Data button, or the Load button in the Mask Editor.

1. To open a File Handler, click the appropriate **Load** button or select the **Load Application** command.

2. Click on the file name box you want to load with the *left* mouse button.

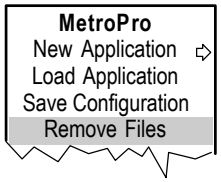
3. Click Done to close the File Handler.



Removing Files

A File Handler appears when removing or erasing files -- selecting the Remove Files command from the MetroPro Window menu.

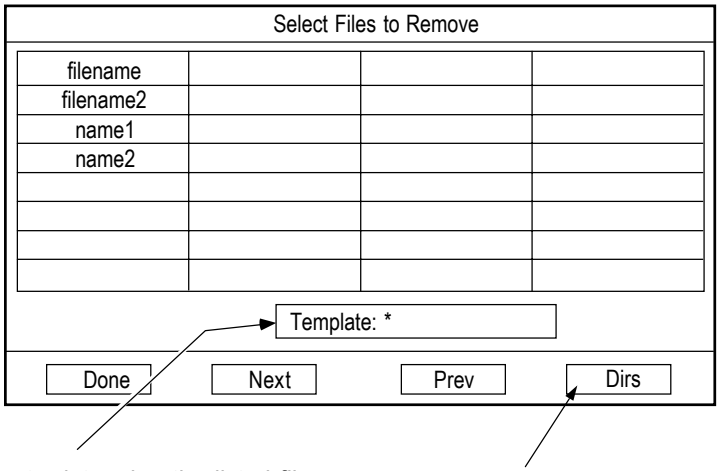
1. Select the **Remove Files** to open the File Handler.



2. Click on the file name you want to erase with the *left* mouse button.

3. Respond "Yes" to the screen message to confirm your action.

4. Click Done to close the Handler.



Use the template entry box to determine the listed files.
A * (star) will list all files.
.app lists applications, ***.dat*** lists data files, etc.

Click to open Directory Dialog box, which is used to access other directories.

Using the File Handler Directory Function

A directory is an organizational structure into which files are stored and retrieved. After you've used your system for a while, you may accumulate a large number of files. With the help of directories, you can organize your files into manageable, related groups.

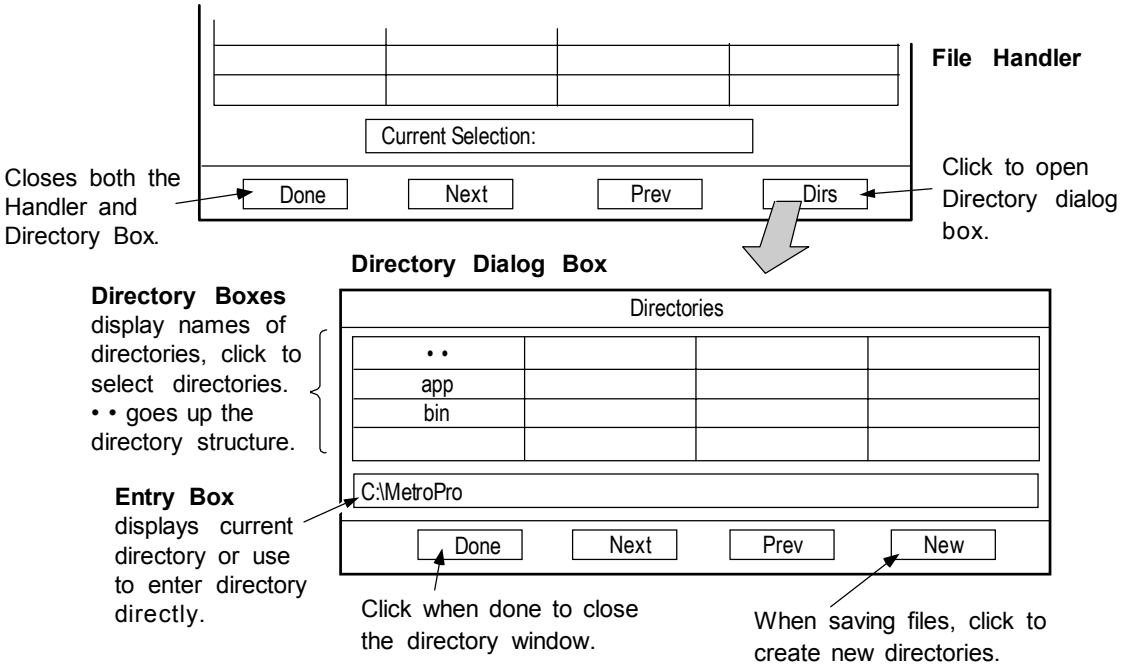
The Directory Dialog Box

The Directory Dialog box appears when you click the File Handler's Dirs button with the *left* mouse button. Each File Handler is linked to one Directory Dialog box.

Note: The Directory Dialog box allows you to access other directories and to also create directories when saving files. The Directory Dialog does not allow you to manage directories. Use the Microsoft Windows File Manager to rename, delete, or to manage directories.

More than one File Handler (such as the Save Data handler and the Remove Files handler) and Directory Dialog box can be opened at the same time. If you choose to do this, exercise care, as you might accidentally confuse which directory goes with which File Handler.

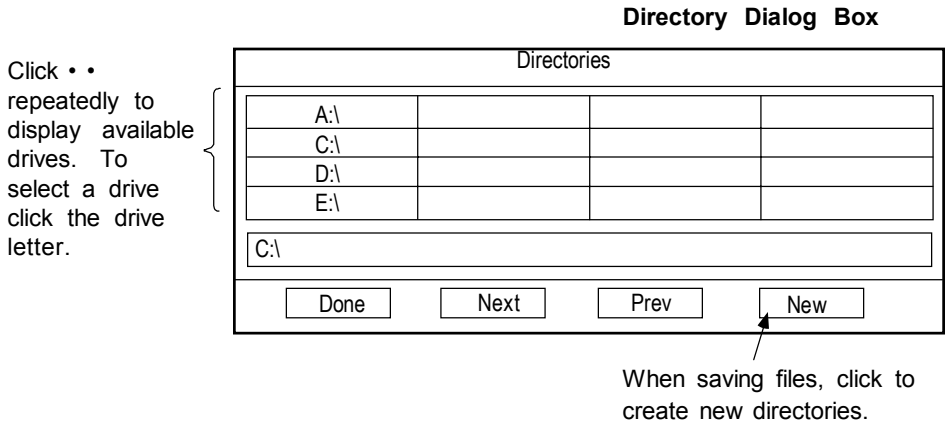
The Directory Dialog box is linked to the File Handler in which it is accessed. Both handler and directory may be closed simultaneously by clicking on the Done button in the File Handler. If you close the directory and handler this way, the next time the File Handler is opened the Directory box also opens. Use the Done button in the Directory box to independently close the Directory box.



(continued)

Selecting Drives

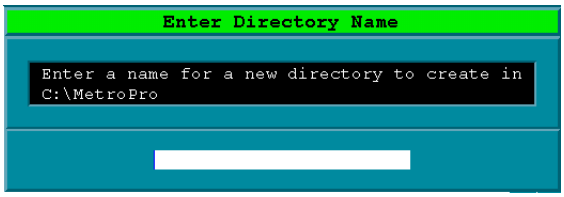
Click • • (dot-dot) repeatedly until the topmost directory is displayed. Select the drive by clicking on it.



Creating New Directories

This feature is available when saving files other than application files.

1. Using the directory buttons, navigate to the location where you want to create the directory.
2. Click the Directory Dialog Box New button.
3. In the dialog box, type in the name of the new directory and press Enter. To cancel press Esc.



Working With Directories

Directories are renamed, deleted, and managed using the Microsoft Windows File Manager. The degree of control provided depends on the user account privileges set with the Windows NT User Manager.

To use the Windows NT User Manager function, you must log on the system as the "administrator". Complete details on the administrator's role is found in the Microsoft Windows NT manuals.

A program is included with MetroPro that can create directories for users. Refer to the MetroPro User Setup program as mentioned in the first chapter.

Printing Results

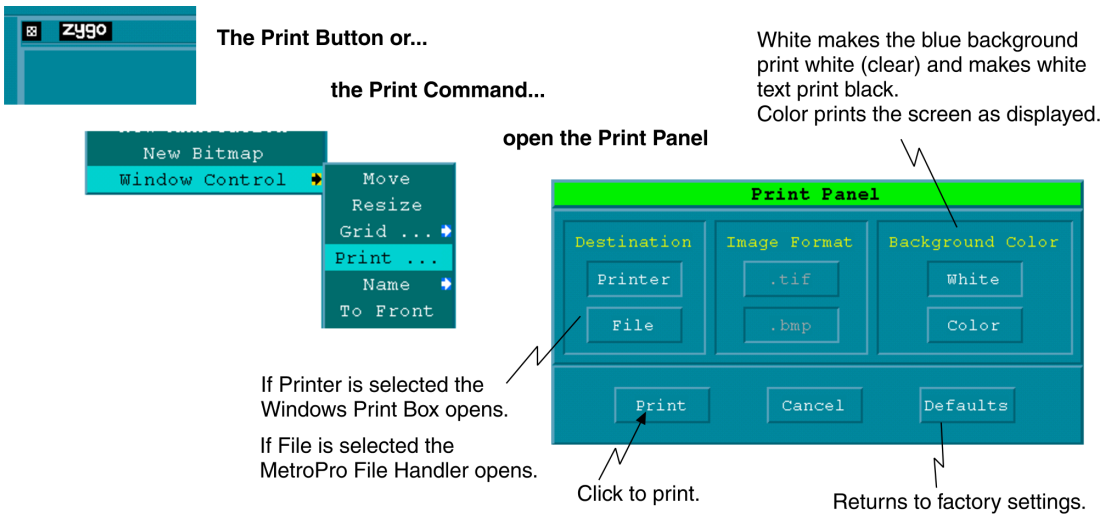
Chapter 8

Output Options

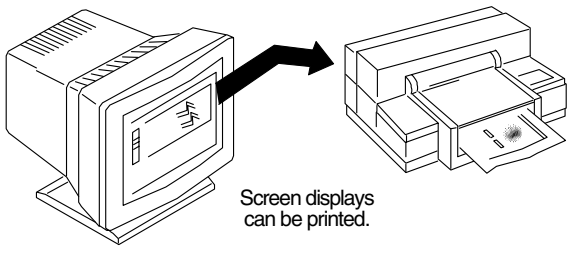
- Print screens to hard-copy printer.
- Print screens to disk in graphic formats.
- Print measurement data as text.

The Print Panel

When the "zygo" Print button or the Print command is selected, a Print Panel opens. The Print Panel can send an image to the printer or save a file to the hard drive for later export to other software programs. The particular Print Panel invoked is dependent on the window. The basic Print Panel is shown below.



Printing Screens to a Printer



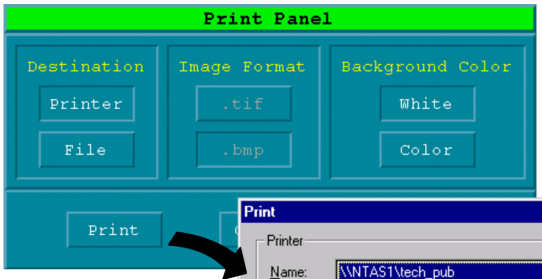
Your measurement results can be printed to any printer configured and operational under Windows. For best reproducibility of screens and graphic results, you may want to print to a color printer, such as an HP DeskJet printer. When printing a screen image to an HP DeskJet, the blue background is eliminated and white screen characters are printed in black, and the image is automatically sized to fit the page.

Printing the Contents of a Window

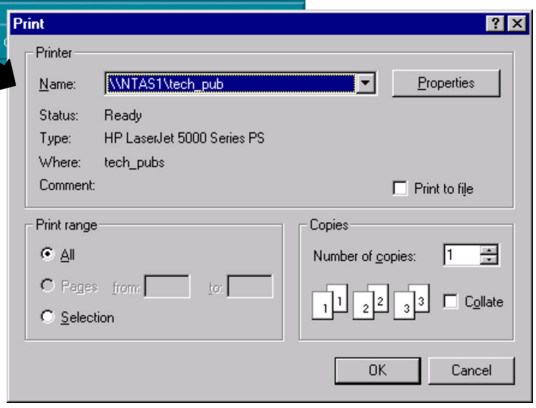
Everything inside the window where you access the print command is printed. This can include anything from the entire application screen to a single plot.

1. Click the "zygo" Print button or select the Window Control → Print command.
2. In the Print Panel, click Printer as the destination, then click Print.
3. In the Windows Print dialog box, select the printer and click OK.

Print Panel



Typical Windows Print Dialog Box



Printing Screens to Disk in Graphic Formats

Measurement screens can be saved to disk as tagged image file format (tif) or a bitmapped image (bmp).

1. Click the "zygo" Print button or select the Window Control → Print command.
2. In the Print Panel, click File as the destination, select .tif or .bmp as the image format, then click Print. (If the print panel has a Source selection it must be Image.)
3. In the File Handler, type a name for the file, with the correct extension, and press Enter.

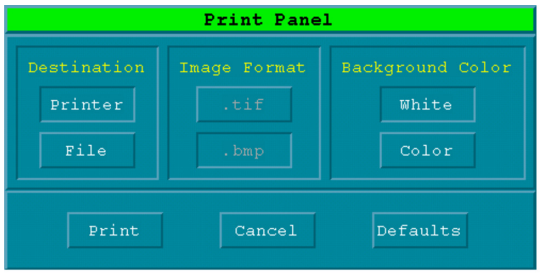
Printing Measurement Data as Text

Measurement data from Profile Plots, Control Charts, and Process Stats, can be saved to disk or printed as text.

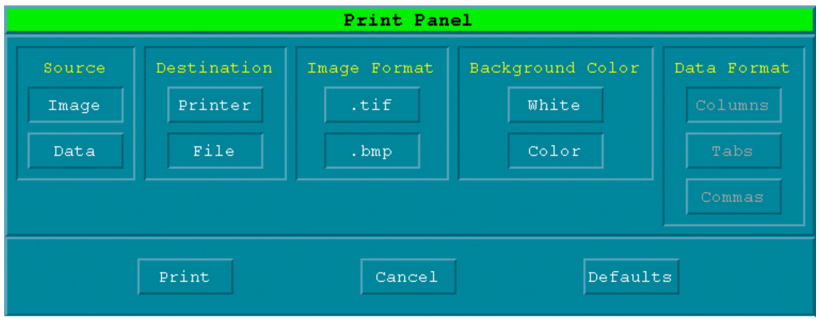
1. From the applicable window, click the "zygo" Print button or select the Window Control → Print command.
2. In the Print Panel, select Data as the source, next select the destination for the data, and select the data format, then click Print.
3. To print the data, use the Windows Print dialog box to select the printer and click OK.
4. To save the data to disk, use the File Handler to type a name for the file, and press Enter.

Print Panel Options

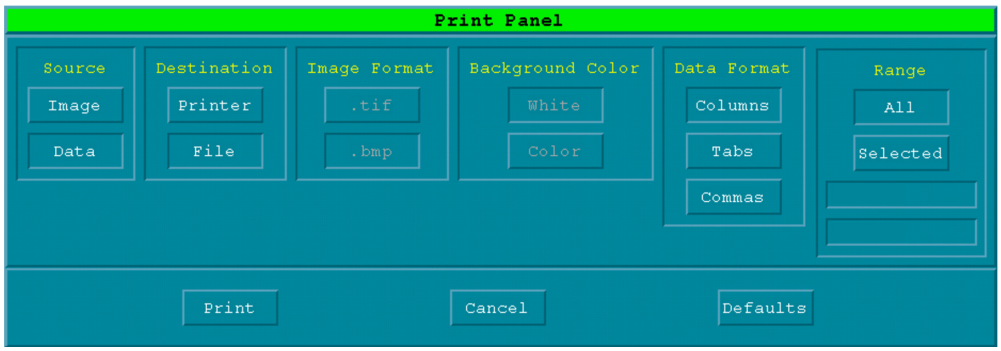
Note: Buttons that appear grayed indicate that the option is not applicable to the type of data being printed.



General Print Panel



Print Panel from Profile Plots and Control Charts



Print Panel from Process Stats

Source	Destination	Image Format	Background Color	Data Format	Range
Image Use screen image. **Data** Use data points in image.	**Printer** Send image or data to printer. **File** Save image or data as a file.	**.tif** Tagged Image File Format is a standard, bitmapped graphics format. **.bmp** A bitmapped file format is common graphics format.	**White** Makes the blue background print white (clear) and makes white text print black. **Color** Prints the screen as displayed.	**Columns** Vertical rows of data used for viewing. **Tabs** Tab separated values for export to other programs. **Commas** Comma separated values for export to other programs.	**All** Output all data. **Selected** Output the data rows specified in the First and Last controls (not shown above).

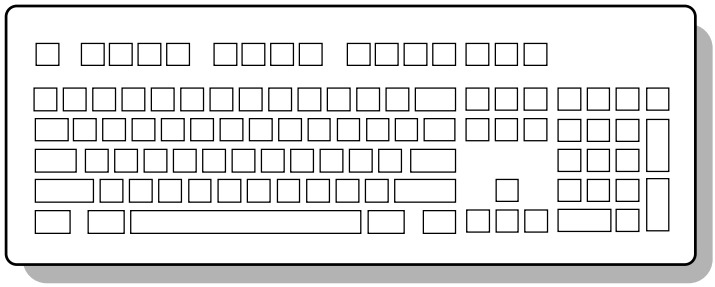
Using the Keyboard

Appendix

A

The Keyboard

The keyboard in MetroPro is used for text entry, when using controls, when saving and loading files, and to substitute for mouse clicks.



Entering Text and Numbers

Text and numbers are entered with the keyboard. You must enter text when you select a menu item that needs information to carry out the command. For example, text is entered when renaming an item, saving a file, inputting a limit, and entering a numeric value.

At the start of an entry, the entire field is highlighted. If you start entering text, the previous entry is completely replaced by the new entry. To edit or modify the current text, click on any point in the text. These keys move you through an entry: left and right arrow, Home, and End. These keys edit the entry: Insert, Delete, and Backspace. To end text entry press Enter or click the *left* mouse button. To cancel a text entry, press Esc or the *right* mouse button.

Special Keys

Key	*Function*
Esc	Aborts processing, cancels text entry, alternate for NO in a Dialog box.
Ctrl	Modify key used when deleting slices.
Shift	Modify key when moving cursors, slices, and deleting.
Enter	Completes text entry, alternate for YES or OK in a Dialog box.
Backspace	Moves cursor left one space does not delete characters.
Insert	Toggles insert mode; when on characters are added at cursor.
Delete	Removes characters in front of cursor one at a time.
←	Moves cursor left one space, move slices left.
→	Moves cursor right one space, move slices right.
↑ ↓	Moves slices up or down.
Page Down	Same as clicking Next in the File Handler.
Page Up	Same as clicking Prev in the File Handler.

Key Combinations

Key Combo	*Function*
Ctrl C	Cancels text entry.
Shift ←	Move cursor to beginning of text field, move slices left in larger increment than ←.
Shift →	Move cursor to end of text field, move slices right in larger increment than →.
Shift ↑	Move slices up in larger increment than ↑.
Shift ↓	Move slices down in larger increment than ↓.
Shift Backspace	Delete character to left of cursor.
Ctrl Alt Delete	Quit MetroPro and all processing, return to Login screen.

Function Keys

Key	*Function*
F1	Same as clicking MEASURE button.
F2	Same as clicking Analyze button.
F4	Opens Light Level window.
F5	Automatically adjusts light level.
F8	Closes application window.
F9	Open live video window.

Light Level Keys

Key	*Function*
F4	Opens Light Level window.
F5	Automatically adjusts light level.
* /	Coarse up and down light adjust.
+ -	Fine up and down light adjust.
Tab	Toggle between last two light level settings.
Number keys	Adjust light level in 10% increments, 1=10%, 2=20%, etc.

Using A Touchscreen with MetroPro

Appendix **B**

The Basics

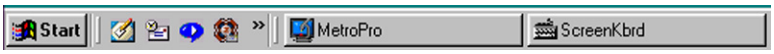
MetroPro software is touchscreen compatible. The user interacts with MetroPro by touching the screen display. When required, a software Screen Keyboard is invoked for text entry. Touchscreen interaction with MetroPro is applicable for instruments in a production environment.

Working with the Screen Keyboard

The software Screen Keyboard is automatically opened when required for MetroPro input. For example, the keyboard appears when touching a MetroPro control that requires text input. The Screen Keyboard works similar to a normal keyboard.

The Software Screen Keyboard

The ScreenKbrd Icon in the Taskbar



Function	*Procedure*
Open	The keyboard opens when an applicable control or button is touched. Or touch the ScreenKbrd icon in the taskbar.
Close	Any terminating action closes the Screen Keyboard, such as Enter, Esc, or touching the screen away from the edit area. Or double-touch the Zygo logo.
Enter text	Touch the keyboard keys. To end, touch the Enter key. To cancel press Esc.
Move the Screen Keyboard	Touch the Zygo logo, drag your finger, and then remove your finger.

Other key functions are identical to the regular keyboard, except the Alt and Ctrl keys are nonfunctional. For information on general keyboard functions see Appendix A.

Working with Controls – Touchscreen

Function	*Procedure*
Choose a Setting	Touch the control repeatedly until your choice is displayed.
Enter Text	1. Double touch the control, the software keyboard opens. 2. Touch the Screen Keyboard keys to enter characters. 3. Touch the Enter key to complete the entry.
Cancel Entry	Touch the Esc key.

Working with Windows – Touchscreen

Window Function	*Procedure*
Open	Touch the closed window representation (icon).
Close	Touch the Close box on the window's title bar.
Close Application	Touch the large Close button.
Move	Touch the window's title bar, drag your finger to move the outline, and then remove your finger.
Resize	Touch the Resize box on the window's title bar; when the outline appears, drag your finger to define the outside borders, and then remove your finger.

W

X

Y

Z