



OPTICAL DIMENSIONS™
2973 Harbor Blvd, #665, Costa Mesa, CA 92626
Phone: (831) 287-0495
info@optical-dimensions.com
www.optical-dimensions.com

LASER CHECK ✓[®]
*Surface Roughness
Measurement Gages*

Lasercheck Windows Software Manual
V1.6.1



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Operations and Specification Manual for the

Lasercheck Windows Software

Manual Revision 1.61

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Contents

Operations and Specification Manual for the	i
Lasercheck Windows Software	i
<i>Manual Revision 1.61</i>	<i>i</i>
<i>© Optical Dimensions</i>	<i>i</i>
PERFORMANCE SPECIFICATIONS.....	1
<i>Other Features.....</i>	<i>1</i>
SAFETY.....	2
<i>Electrical.....</i>	<i>2</i>
<i>Laser.....</i>	<i>2</i>
WARRANTY OVERVIEW	3
<i>LIMITATION OF WARRANTY.....</i>	<i>3</i>
<i>Contact Optical Dimensions customer service for shipping instructions:.....</i>	<i>3</i>
MAINTENANCE	4
<i>Cleaning the Windows.....</i>	<i>4</i>
<i>Assistance.....</i>	<i>4</i>
Introduction.....	5
<i>Overview.....</i>	<i>5</i>
Measurement Setup	5
Measurements.....	5
Reviewing Results	5
<i>Main window.....</i>	<i>6</i>
Menu Items.....	6
Exit.....	6
Help Menu	6
Pushbutton and Menu Items	6
Measure / Perform Measurements.....	7
Setup.....	7
Review / Review Data.....	7



<i>Section 1 - Perform Measurements Module</i>	7
Measurement Window	9
Measure Menu	9
Measure / Align	10
Measure / Headtest	10
Measure / Monitor.....	11
Measure / Measure.....	11
Measure / Continuous	11
Run Menu	12
Return	12
Start.....	12
Stop	13
Sequence.....	13
Save	13
Export.....	13
Sample LASERDATA.TXT File	14
Right Clicking the Mouse Button	15
<i>Section 2 – Setup Module</i>	16
Setup Menu.....	16
Setup / New.....	17
Product Name	17
Target Roughness.....	17
Data Input Speed.....	17
Finish Process.....	17
Comments	18
Automatic.....	18
Start Options.....	18
Stop Options	18
Save Options	18
Filename Options.....	19
Print Options.....	19
Display/Control	19
X Scale Fields.....	20
Lower	20
Upper.....	20
Update.....	20
Y Scale Fields.....	21
Lower	21
Upper.....	21
Units	21
Control Limits Fields.....	21



Lower	21
Upper	21
Cancel Push-button.....	21
OK Push-button.....	21
Save Parameters	21
Save ASCII File	22
ASCII Values	22
OK Push-button.....	22
Cancel Push-button.....	22
Cancel.....	22
Save Setup	23
Setup / Open	23
Setup / Comm Port.....	23
Setup / Automation Type	24
Lab System	24
Roll Grinding.....	24
Parts Inspections.....	24
<i>Section 3 - Review Data Module.....</i>	<i>25</i>
File Menu	25
Right Clicking the Mouse Button.....	27
File Menu - Data File	28
Print Data File	28
Edit Menu.....	28
View Menu.....	29
Window Menu	29
Cascade.....	29
Tile	29
Arrange Icons.....	29
<i>Data File Format.....</i>	<i>29</i>
Data/Setup Files.....	29
Section 1	29
Section 2	29
Section 3	29
Section 4	30
Section 5	30

PERFORMANCE SPECIFICATIONS

Measurement / Detection Method	Angle resolved laser scattering
Measurement speed	Single measurement in < 0.5 seconds
Measurement range	0.5 μ inch to 80 μ inch / 0.0125 μ m to 2.0 μ m
Repeatability	\pm 3.0% of measured value
Spot size (area-measured)	5 mm X 1 mm
Environmental considerations (temperature / humidity):	
Operating	-10° C to +55° C / 10% to 90% RH
Storage	-40° C to +80° C / 1% to 99% RH
Power requirements	6 (Six) AA Batteries

Other Features

Factory Calibrated to Ra Ground Surface Standards
Multiple calibration files possible in Ra or Rq
Works on any material/color (rubber, glass, steel, etc.)
RS232 Interface Option
Stored items:
All Roughness Values
Date and Time
Average Ra/Rq Roughness and Standard Deviation
Minimum / Maximum Ra/Rq Roughness
CSV text Formatted File

SAFETY

Electrical

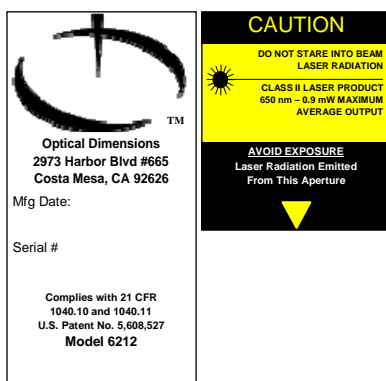
Lasercheck has been designed as a sealed and enclosed system. Voltages to operate the measurement sensor are low (0 to +5 Volts) to minimize shock hazard.

Laser

The laser used in Lasercheck is a class II laser device. Class II lasers are not considered hazardous to the skin but are considered a “chronic viewing hazard”. Users should not stare directly into the beam or directly into the beam reflected off a smooth specular surface. The ends of the Lasercheck measurement sensor have “Caution” and “Avoid Exposure” labels to remind the operator to avoid exposure to the radiation. The sensor also has “Identification” and “Certification” labels. The Lasercheck control unit also has “Identification” and “Certification” labels. Reproductions of these labels are shown below.

Caution – use of controls or adjustments or performance or procedures other than those specified herein may result in hazardous radiation exposure.

The measurement sensor emits a red visible (650-nm) laser beam pulsing at a 10 to 50 Hz. Each “pulse” contains as much as 90 microjoules of energy. Pulses can be as short as a 5 millisecond interval, with 20 microsecond rise and fall times. Maximum “peak” power can be as high as 2.0 milliwatts. Average maximum power being emitted from the laser can be as high as 900 microwatts. Once the beam strikes the measurement surface, the laser energy is reflected back into the Lasercheck detection system. However, multiple reflections and stray light may exit from between the sensor and measurement surface and care should be taken to avoid direct eye exposure to the radiation.



Typical Laser Identification and Warning Labels

WARRANTY OVERVIEW

Optical Dimensions certifies that the Lasercheck surface roughness measurement system meets specifications. The Lasercheck system has a warranty period of one (1) year from date of first usage. This warranty is against defects in material and workmanship. During the warranty period, Optical Dimensions will, at its option, either repair or replace products, which prove to be defective. For detailed warranty information, refer to second page of this manual.

LIMITATION OF WARRANTY

This warranty will not apply to defects resulting from improper or inadequate maintenance by Buyer (please refer to Maintenance section), unauthorized modification or misuse, operation outside the environmental specifications, improper site preparation or site maintenance, fire, flood earth movement or collapse. Optical Dimensions shall not be liable for any direct, indirect, special, incidental or consequential damages, whether based on contract, tort, or any other legal theory.

For warranty service or repair, the Lasercheck system must be returned to Optical Dimensions, after prior Return Material Authorization Number (RMA #) has been obtained. Buyer shall prepay shipping charges to Optical Dimensions. The return shipment should be labeled with the RMA #.

Contact Optical Dimensions customer service for shipping instructions:

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Costa Mesa, CA 92626

Phone: 831-287-0495

Email: info@optical-dimensions.com

MAINTENANCE

Lasercheck has been designed and assembled by skilled and experienced engineers and technicians. All components used in the system operate well within their rated specifications to ensure long life and reliability of the Lasercheck system. Electronics, lasers, and detectors are all solid-state devices and should not need to be serviced or maintained by the user.

The controller housing is made from impact-resistant ABS and is colored black. The housing is not waterproof, but it can be subjected to moderate rain or splash without harm.

The laser head is made of machined aluminum and plastic and all electronics and optics are secured and sealed within the head. The head is rugged enough to withstand handling that might be normally encountered in manufacturing shop floor gage operation. The head is also water resistant and can be subjected to moderate rain or splash without harm.

Boards and electronics used in the system are static sensitive and easily damaged by mishandling. The Lasercheck housing and electronics are well grounded. The head is sealed at all seams and holes to protect components from external contaminants. The user should not open the measurement head. *If opened by non-authorized personnel, the warranty provided by Optical Dimensions will be void.*

Cleaning the Windows

The internal optics and electronics are cleaned during assembly and kept within the sealed sensor. The internal windows at the bottom of the Lasercheck sensor cover and protect the internal sensors and laser source. They will be exposed to outside contaminants and in very dirty environments should be cleaned at least weekly.

The windows are rugged, but care needs to be taken to not scratch them during operation or cleaning. They should only be cleaned with ethanol, methanol, or a glass cleaner and a soft, clean paper towel, tissue, or Q-tip.

Assistance

Contact your nearest Optical Dimensions office.

Introduction

Overview

The Lasercheck software allows the user to determine measurement setup (manual or automatic measurements for example), appearance of display, data acquisition, and presentation of results. Once setups have been created, performing measurements involves starting the program, selecting the programmed setup file, and beginning the measurement.

The Lasercheck software operates on two types of files. These files are setup files, which contain information on how the measurement will be performed, and data files.

The software must operate in a Microsoft Windows 98 or newer environment. Minimum requirements for the target computer are:

- Pentium Processor
- 32 MB of RAM
- Microsoft Windows 98 or newer
- 20 MB free disk space
- One available serial communications port configured as COM1 to COM4
- Mouse or similar pointing device
- Color display

Measurement Setup

A setup file contains information about graphical display, measurement sequence, and information to be saved. Typically, a setup file will be selected for a series of measurements of different samples of the same material and/or process. Lasercheck software will then attach this setup file to the data files that are saved by the user.

Measurements

Measurement mode involves the Lasercheck software reading the data from the Lasercheck electronics, plotting the data, calculating any statistical information, and saving the data in the document file.

While the data acquisition is running, data points are plotted within the graph window associated with the current data acquisition run. You may size or rescale the data document and/or main windows while data is being acquired. The grid, grid legends, other text and data plot will be appropriately sized and redrawn when the window is sized.

Reviewing Results

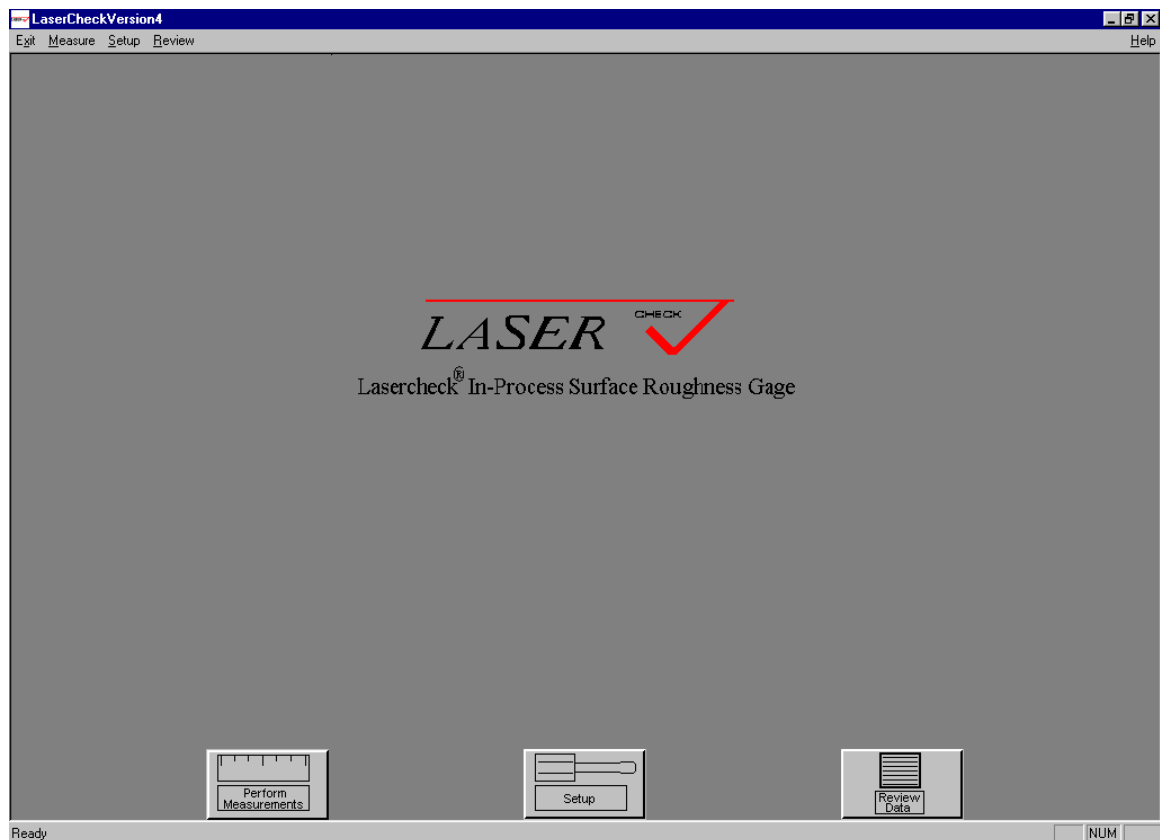
After saving a measurement as a Lasercheck (.LSC) file, the files can be reopened at any time for review. They are displayed on screen in graphical format with time and date of the measurement plus statistics on the

measurement such as average and standard deviation of the measurement values. Hard copy plots of the graphs as they appear on the screen can be made from the software.

Capability to create ASCII format files for importing into a spreadsheet or SPC software is provided with the Lasercheck software.

Main window

The main window is displayed when the Lasercheck software is started from the program manager.



Menu Items

Exit

Exits the program.

Help Menu

Provides the Version number of the software.

Pushbutton and Menu Items

Three large push buttons (with redundant top line menu items) are also available in the Main Window.

Measure / Perform Measurements

This opens the "perform measurements" module to provide functions related to performing measurements.

Setup

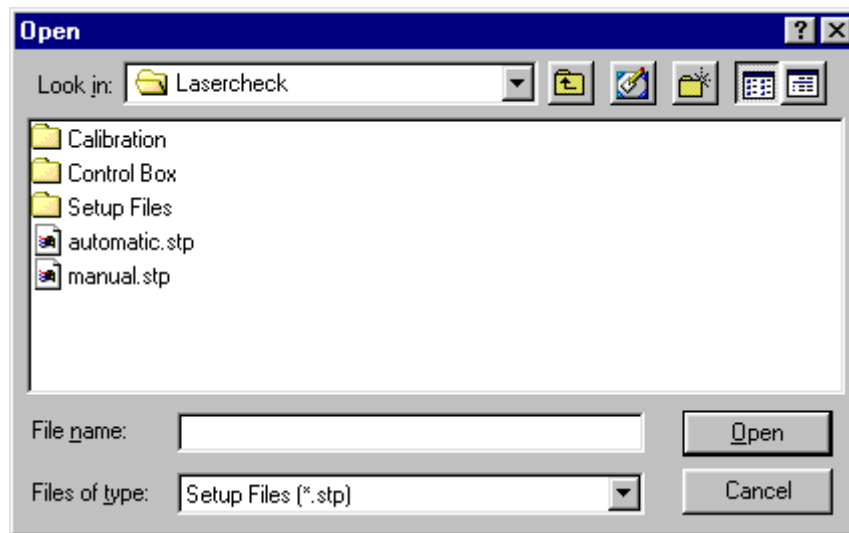
This opens the setup module to provide functions related to designing Lasercheck setup files.

Review / Review Data

This opens the review data module to provide functions related to reviewing Lasercheck measurements.

Section 1 - Perform Measurements Module

Selecting the "Perform Measurements" push-button from the main window creates the "Open" dialog box.



When Lasercheck software is first installed on your computer, sample setup files (*.STP) are loaded on your computer and will appear under the C:\Program Files\Lasercheck directory

Information about the setup file, the product, and the process appears for verification that the correct setup file has been selected.

Setup Information

Product Name: Target Roughness:

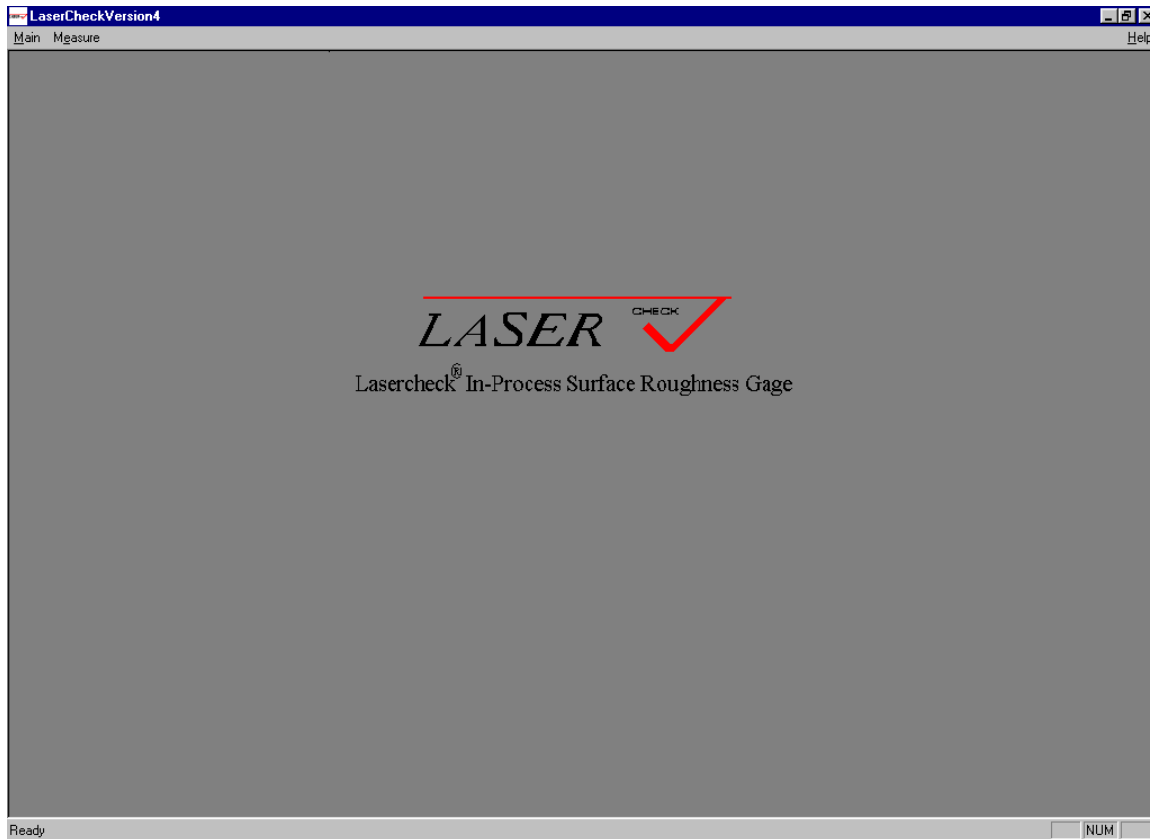
Data Input Speed: Finish Process:

Comments:

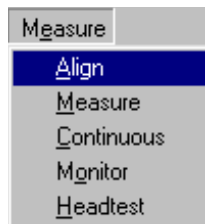
If it is not the correct setup file select the “Cancel” push-button. This will return you to the “Main Measurement Window” where you can repeat the procedure of selecting a setup file. If the correct setup file appears, select the “OK” push-button. You will be presented with a Measurement Window.

Measurement Window

If the selected setup file has been programmed for manual (or automatic) operation, the following measurement window will appear.



Measure Menu

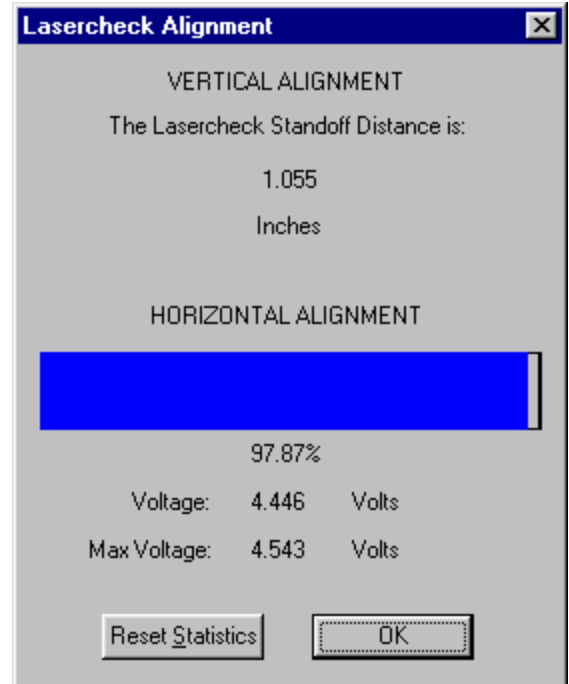


The “Measure” menu provides five measurement options – Align, Measure, Continuous, Monitor, and Headtest.

Measure / Align

Select “Measure / Align” to set horizontal alignment of the Lasercheck gage over cylindrical surfaces. Please read the section on alignment found in the Model 6212A manual before using this alignment feature of the Lasercheck Windows software.

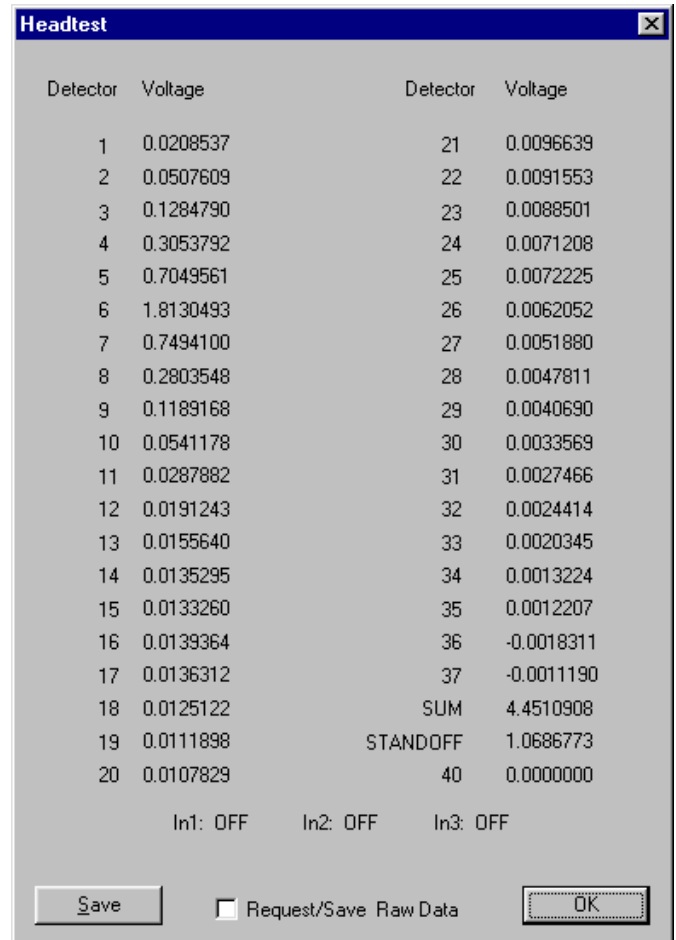
The lower portion of the dialog box provides information about horizontal alignment. On a cylindrical part, the Lasercheck head is moved back and forth across the “crown” of the cylinder. After two passes, the software will find the optimal position that is represented by maximum position of the bar graph and the digital indication of “Max Voltage”. The head should be positioned to provide a reading as close to 100% of the “Max Voltage” and bar graph as possible. In this example maximum voltage obtained in 2 passes was 4.543 volts and the head was repositioned to obtain 4.446 volts or 97.87% of the maximum voltage as indicated by the bar graph.



Measure / Headtest

Select “Measure / Headtest” to set vertical alignment of the Lasercheck gage over surfaces. Please read the section on alignment found in the Model 6212A manual before using this alignment feature of the Lasercheck Windows software.

This alignment feature works only on smooth surfaces (or rough surfaces coated with a thin film of light oil to make it appear smooth to the Lasercheck head). The distance from the head to the surface is adjusted until the largest voltage reading within the first 37



detectors is obtained on detector number 6 as shown in this example.

Measure / Monitor

Select “Measure / Monitor” from the main menu to check and monitor Lasercheck performance and measurement parameters such as current roughness values and statistics.

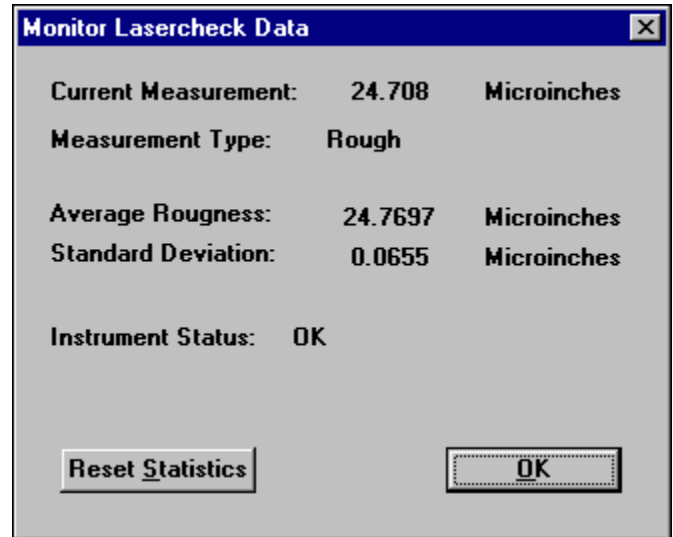
Measure / Measure

Select “Measure / Measure” for final measurement, and saving measurements. This opens the “Run Menu” described in the section below with an empty graph.

Once a graph is filled with measurement values, it is updated, starting at the next measurement number. All of the previous data is saved.

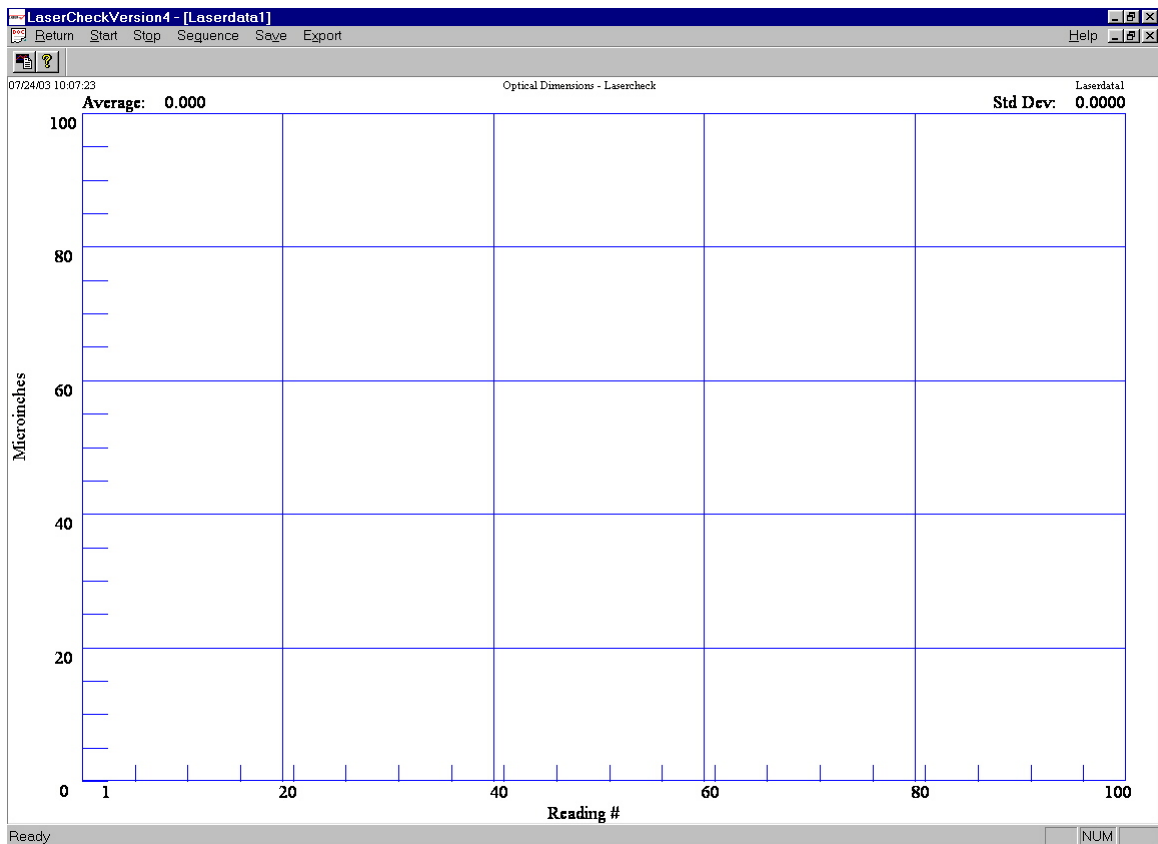
Measure / Continuous

Select “Measure / Continuous” for continuous monitoring of a process . This opens the “Run Menu” described in the section below with an empty graph. Once a graph is filled with measurement values, it is refreshed, starting at measurement number 1 again. None of the previous data is saved.



Run Menu

Selection of “Measure / Measure” or “Measure / Continuous” opens the run menu with an empty graph.



This run menu displays the following selections:

Return; Start; Stop; Sequence; Save; Export

Note: Depending on configuration of the setup file (discussed later in this manual), some or all of the run menu selections may be ghosted and unavailable. Those ghosted selections would be under “automatic” control by external input to Lasercheck electronics.

Return

Selection of “Return” returns the user to an empty measurement window.

Start

Selection of “Start” from the Run Menu begins measurements and the Lasercheck graph begins displaying roughness information. A graph of roughness vs. reading number will begin appearing in real time on the screen. In addition, statistics of all measurements will be displayed digitally in real time at the top of the graph screen (average of all measurements, each individual “current” measurement and standard deviation of all measurements).

Stop

While the roughness graph is running, Stop can be used to stop the data acquisition. Selecting Start will resume taking measurements. The “Stop / Start” cycle can be repeated as many times as is necessary for the measurement set.

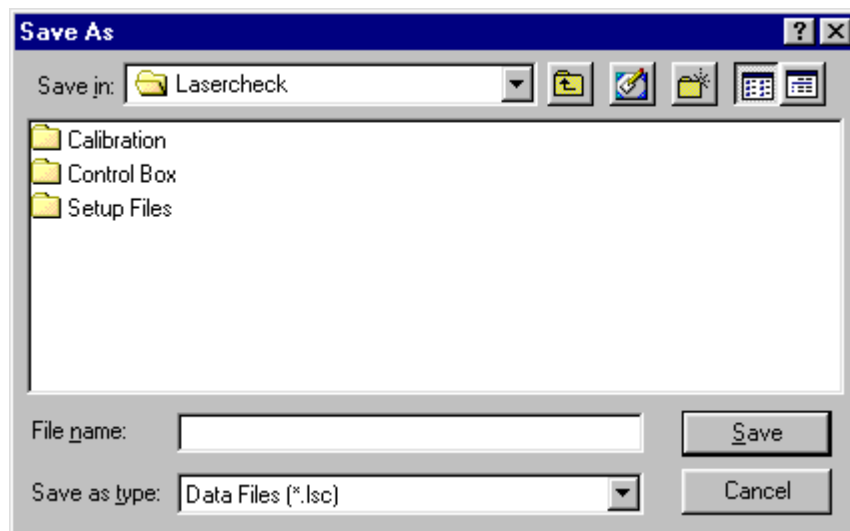
Sequence

Sequence clears measurements from the graph and begins a fresh measurement set.

Save

This menu item stops measurement taking with the current data set and gives the user the option to save the measurement.

If the file name generation is manual, the Save menu selection will provide a Windows “Save As” dialog box prompting the user to enter a filename to save the data for the measurement set. Lasercheck software automatically attaches a Lasercheck “.LSC” data file extension to the file name that is typed in.



Export

Export is used to save the data in the current measurement set to a file named LASERDATA.TXT. This file is an ASCII data file, which can be imported into popular spreadsheet or SPC software packages. The file will be saved in the Lasercheck working directory C:\Program Files\Lasercheck. In addition to all the information in the previously described files, it also contains some setup information for the measurement (calibration information, control limits, etc.). Each time a measurement is performed and “Export” is selected, the same file name is used and the previous “Lasrdata.txt” is overwritten. An example of the format of the text file is below.

Sample LASERDATA.TXT File

Document Title:Laserdata3

Date: 03/08/02

Time: 11:47:10

Average: 8.557

Std Dev: 0.7617

Maximum: 10.482

Minimum: 7.470

SETUP INFORMATION

Serial Number: 123456

Process: Surface

Comments: Comments

Product Name: Uncal.Stp

ShortWaveLengthValue: 0.000800

ShortWaveLengthDetectorIndex: 25

LongWaveLengthValue: 0.800000

LongWaveLengthDetectorIndex: 2

Data Acquisition Speed: 600 per minute

Number of On Measurements: 1

Number of Off Measurements: 0

DISPLAY AND CONTROL

Target Roughness: 5.50

Lower Tolerance Limit: 3.00

Upper Tolerance Limit: 7.50

Finish Process: Grind

Y Scale Units: Microinches

SMOOTH SURFACE CALIBRATION

A Coefficient: 0.00000

B Coefficient: 0.00000

C Coefficient: 0.00000

D Coefficient: 1.00000

E Coefficient: 0.00000

Roughness Limit: 0.00000

ROUGH SURFACE CALIBRATION

A Coefficient: 0.00000

B Coefficient: 0.00000

C Coefficient: 0.00000

D Coefficient: 1.00000

E Coefficient: 0.00000
Roughness Limit: 0.00000

Number of Data Points: 12

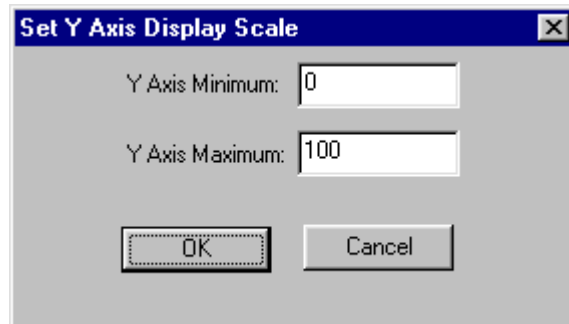
8.194916
8.887589
8.515392
8.931622
8.866924
8.585489
7.472837
8.913241
8.265692
10.482466
8.102471
7.470079



Right Clicking the Mouse Button

At any time, you may click the right button on the mouse. The following dialog box will appear.

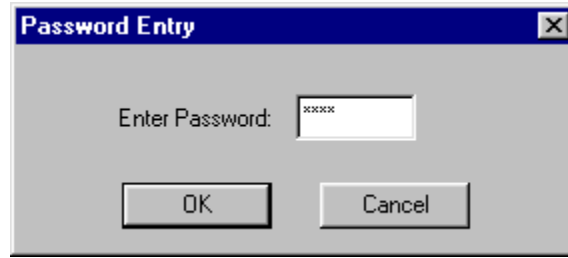
Selecting “Y Axis Scale” will open the following dialog box:



New values for the upper and lower Y Scale can be entered and the graph scale will be redrawn to the new scale without any loss of data.

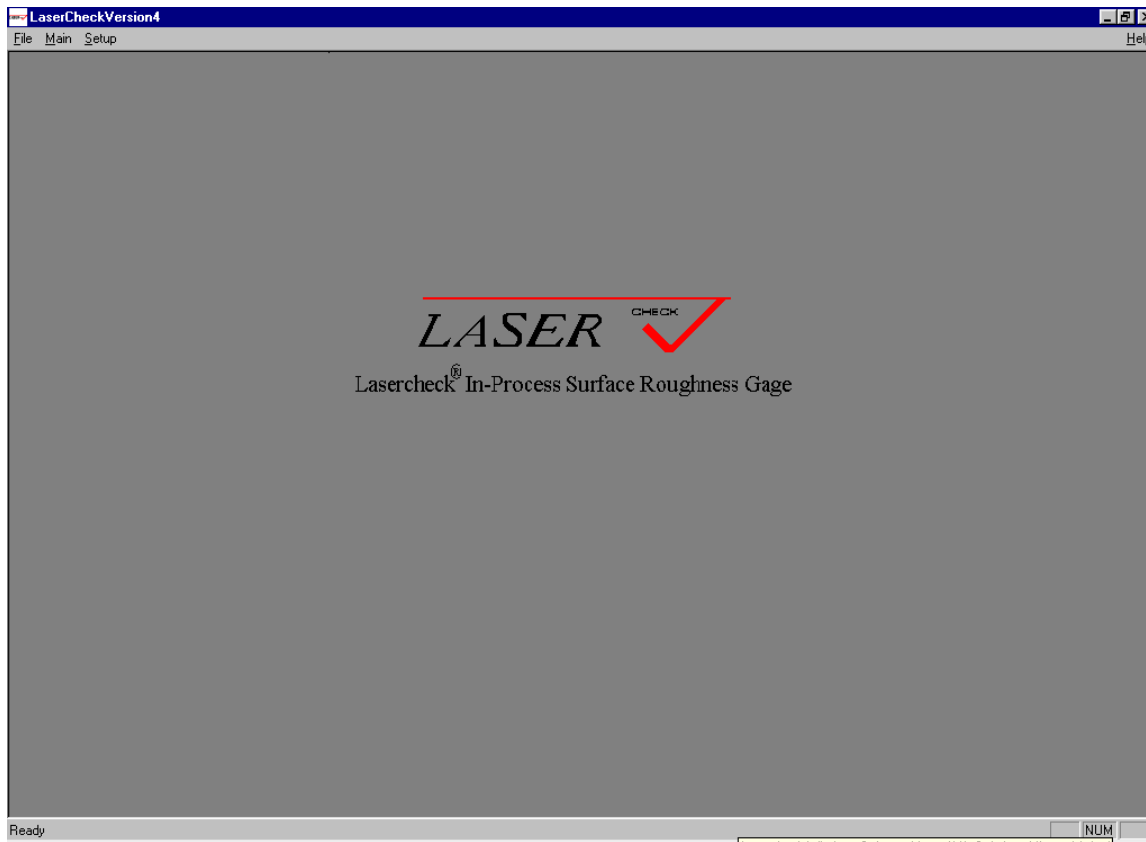
Section 2 – Setup Module

Selecting the “Setup” push-button from the main window allows modification or creation of new setup files to be used in operation of Lasercheck. Entry into the Lasercheck program is password protected and the password entry dialog box appears when the “Setup” Push-button is pushed.



main window files to be this module protected when the

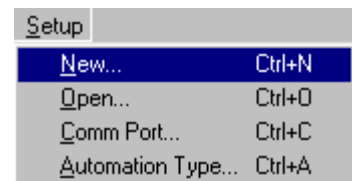
Once the setup password “4956” is entered, the “Main Setup Window” is displayed.



Three menu items are available: File, Main, and Setup. File is inactive in this revision of software. Main returns you to the main startup window of the software. Several options are available under “Setup”.

Setup Menu

Selection of the “Setup” menu item creates the setup “drop down” dialog box.



Setup / New

Selection of “Setup / New” opens the “Setup-New” dialog box.

The image shows a Windows-style dialog box titled "Setup". It has a blue title bar with a close button (X) on the right. The dialog contains the following elements:

- Product Name:** A text entry field containing "Product Name".
- Target Roughness:** A text entry field containing "5.5".
- Data Input Speed:** A list box with a dropdown arrow, showing "600 per minute".
- Finish Process:** A text entry field containing "Grind".
- Comments:** A large text area with the label "Comments" above it and "Comments" inside.
- Buttons:** At the bottom, there are six buttons: "Automatic...", "Display/Control...", "Save Parameters...", "Cancel", "Save Setup", and "Help".

There are several input fields and push-buttons available to the user. These serve to describe the setup file and product to the operator and to define how Lasercheck will operate when an operator uses the setup file.

Product Name

This Text Entry Field is descriptive and allows the user to enter a brief description of the product to be measured.

Target Roughness

This Text Entry Field is descriptive and allows the user to enter the target roughness of the product to be measured.

Data Input Speed

This List Box Field defines how Lasercheck will operate when the setup file is used. It allows the user to select the data acquisition rate by scrolling through the List Box and highlighting the desired value. Possible rates range from 600 per minute (default) to 1 per minute.



Finish Process

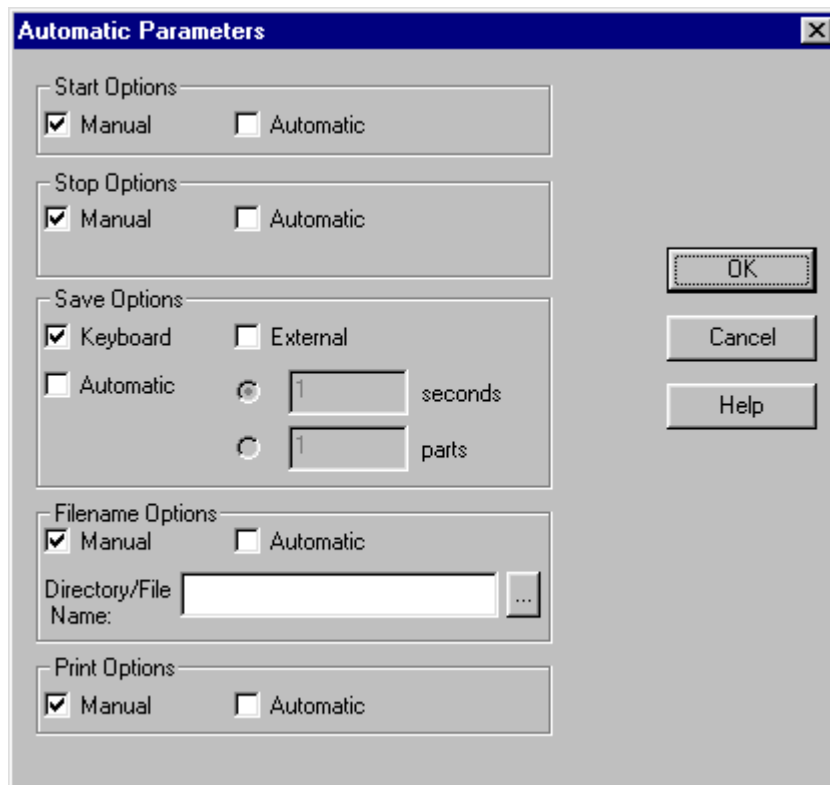
This Text Entry Field is descriptive and allows the user to enter the finish process of the product to be measured.

Comments

This Text Entry Field is descriptive and allows the user to enter a more detailed description of the product to be measured.

Automatic

This push-button opens the “Automatic Parameters” dialog box.



Start Options

Selection of “Manual” (default) requires the operator to select “Start” from the “Run Menu” to initiate the measurement. Selection of “Automatic” will cause the measurements to begin automatically upon an input to the Lasercheck electronics.

Stop Options

Selection of “Manual” (default) requires the operator to select “Stop” from the “Run Menu” to end the measurement. Selection of “Automatic” will cause the measurements to stop automatically upon an input to the Lasercheck electronics.

Save Options

Selection of “Manual” (default) requires the operator to select “Save” from the “Run Menu” to initiate saving the measurement. Selection of “Automatic” will cause the measurements to automatically initiate saving the

measurement based on number of parts or time specified in the dialog box, or upon an input to the Lasercheck electronics.

This file format can only be opened by the Lasercheck windows software. It contains all Ra values recorded, average and standard deviation of all Ra values, time and date, plus formatting information for the graphical display in Lasercheck software. When the user opens the file the graph with all this information is presented.

Filename Options

In either manual or automatic save mode, file names can be generated automatically or manually. If a directory and file name are entered into the “File Name” data entry field, then this name with sequential numbering and a .LSC file extension will automatically be saved when this setup file is selected. Lasercheck software will seek the name in the directory with the smallest number attached and use this name “plus 1”.

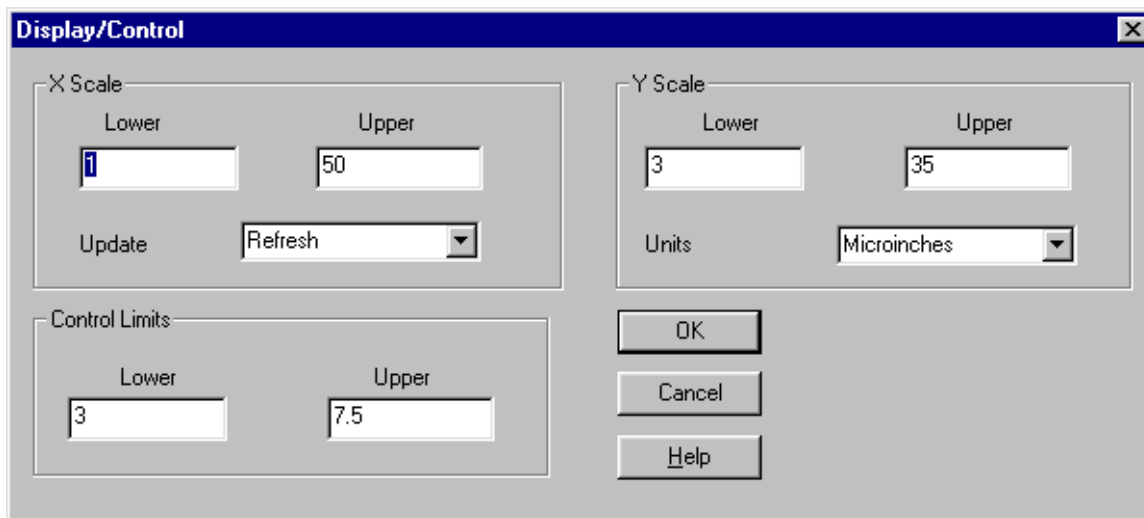
For example if the name “Laser” is entered into the entry field, then file names will be saved as “LASER1.LSC, LASER2.LSC, LASER3.LSC” etc.. If files are removed from the directory, then the software will use the smallest available number to use as its file number. If the data entry field is left blank, then the operator will be prompted to enter a file name with a windows “Save As” dialog box which will be opened by either the automatic or manual “Save” prompt.

Print Options

The Selection of “Automatic” will cause a graph of the current data to be automatically printed when the either the operator elects to save the data, or the electronics automatically save the data.

Display/Control

Selection of this push-button from the “Setup” dialog box opens the “Display / Control” dialog box.



X Scale Fields

Lower

This data entry field allows specification of the lower reading number on the X axis of the graph. The default value is 1.

Upper

This data entry field allows specification of the upper reading number on the X axis of the graph.

Update

This list box field defines how the X axis will change once the screen is filled with measurements by scrolling through the List Box and highlighting the desired value. The available options are:



Refresh

Data points are displayed starting with “Lower” and continuing to “Upper” as defined in the X Scale Field. If “Measure / Measure” is being performed, when the data points exceed “Upper”, the X axis scale is redefined. A new “Lower” is defined as the previous scale's “Upper” + 1. For example, if “Lower” is defined as 1 and “Upper” is defined as 200, after 200 measurements the screen automatically changes to a “Lower” of 201 and “Upper” of 400. If “Measure / Continuous” measurements are performed then the screen is refreshed and the “Upper” and “Lower” remain constant

Strip Chart

Data points are displayed starting with “Lower” and continuing to “Upper” as defined in the X Scale group box. If “Measure / Measure” is being performed, when the data points exceed “Upper”, the X axis scale is redefined. The “Lower” remains unchanged. The “Upper” is defined as the previous scale's “Upper” plus an increment of the original “Upper”. For example, if “Lower” is defined as 1 and “Upper” is defined as 200, after 200 measurements the screen automatically changes to a “Lower” of 1 and “Upper” of 400. After 400 measurements, the screen automatically changes to a “Lower” of 1 and “Upper” of 600. This incrementing continues until the measurement is stopped either manually or automatically. All measurements are being saved and displayed in this mode of display until the measurement is stopped.

Y Scale Fields

Lower

This data entry field allows specification of the lower reading number on the Y axis of the graph. The default value is 3.

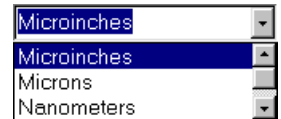
Upper

This data entry field allows specification of the upper reading number on the Y axis of the graph. The default value is 35.

Units

This list box field defines the units or roughness that will be displayed by scrolling through the List Box and highlighting the desired value. The available options are:

Microinches, Microns, Nanometers, and Angstroms



Control Limits Fields

These two data entry fields allow input of minimum and maximum roughness specification. Data values out of these limits will be displayed in red. Data values inside of these limits will be displayed in green.

Lower

This data entry field allows specification of the lower reading number of "acceptable" data on the Y axis of the graph. The default value is 3.

Upper

This data entry field allows specification of the upper reading number of "acceptable" data on the Y axis of the graph. The default value is 7.5.

Cancel Push-button

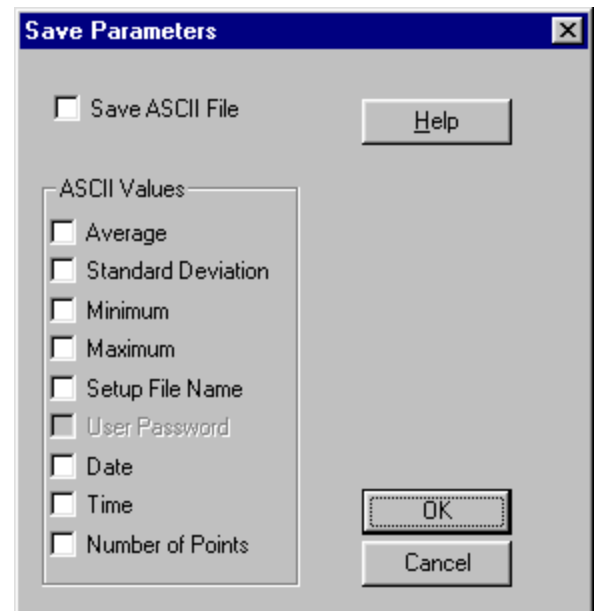
This push-button allows the user to exit the Display/Control dialog without saving any changes.

OK Push-button

This push-button allows the user to save the changes to the Display/ Control dialog and return to the 'Setup' dialog box.

Save Parameters

Selection of this push-button from the "Setup" dialog box opens the "Save Parameters" dialog box.



Save ASCII File

If this checkbox is checked, an additional ASCII text file is saved with the same filename as the Lasercheck file with a .txt extension. This file contains all of the same information as the .txt file without the formatting information for the graphical display. An example of the format of the text file is below.

```
SETUPFILE=C:\Program Files\Lasercheck\test.stp
DATE=03/08/02
TIME=11:47:33
AVERAGE= 8.557
STD_DEV= 0.7617
MAXIMUM= 10.482466
MINIMUM= 7.470079
NUMBER_POINTS=12
```

```
8.194916
8.887589
8.515392
8.931622
8.866924
8.585489
7.472837
8.913241
8.265692
10.482466
8.102471
7.470079
```

ASCII Values

This group box allows the user to specify which values will be saved for each measurement in the ASCII file. In addition to these parameters, all files have time and date saved with them.

OK Push-button

Selection of the OK push-button returns the user to the Setup-New dialog box saving the selections that have been made in the "Save Parameters" dialog box.

Cancel Push-button

Selection of the Cancel push-button returns the user to the Setup-New dialog box without saving the selections that have been made in the "Save Parameters" dialog box.

Cancel

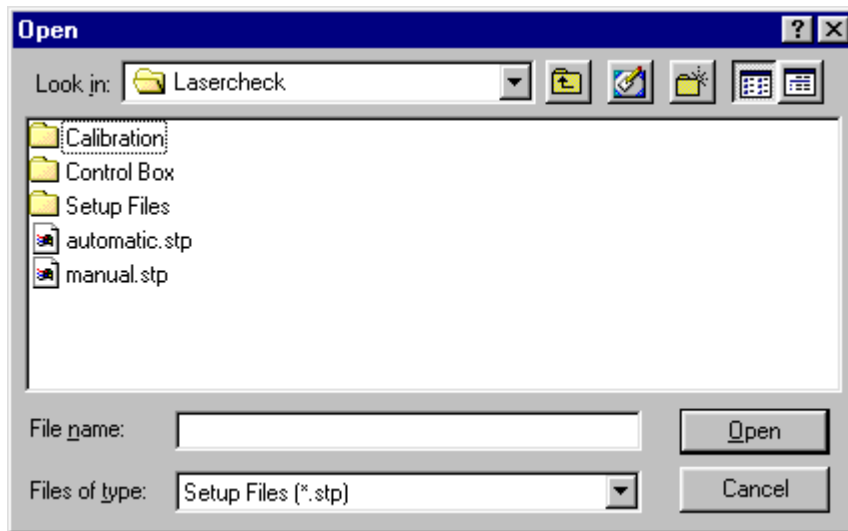
This push-button allows the user to exit the Setup-New dialog box without saving any changes that have been made.

Save Setup

This push-button allows the user to save the setup file with all changes that have been made. The standard Windows “Save as...” dialog box is opened to allow the user to enter a filename with a default “.STP” extension which is automatically attached by the Lasercheck software.

Setup / Open

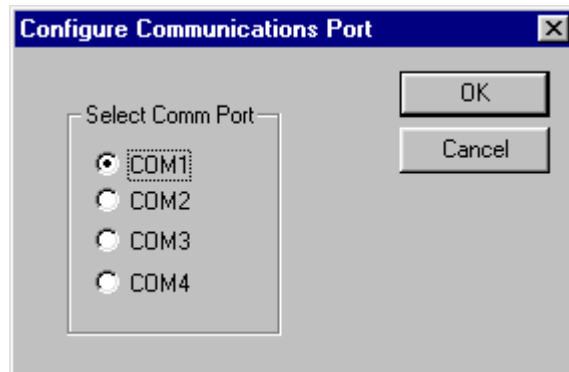
Selection of “Setup / Open” opens the setup open dialog box.



Note that only setup files (file extension .stp) are displayed for opening from this box. Existing setup files can be selected from this box to be edited, modified, and then saved under the existing name or under a new setup file name. Sample setup files are loaded on the computer with the Lasercheck 6212A installation disk. Once a setup file is opened from this module, all options available and previously discussed under “Setup / New” are available to the user. Modification of an existing setup file will normally be easier than creating a brand new setup file.

Setup / Comm Port

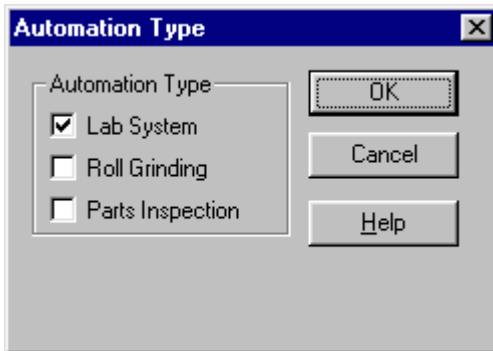
A dialog box will be opened to allow the user to specify the port number of the serial communications port used.



Correct settings are the Port that the Lasercheck is connected to (COM1 to COM4). This needs to be set only once and once set, this should not be changed unless computer and / or computer connections are changed.

Setup / Automation Type

A dialog box will open to allow you to configure the Automation Type.



The automation type must be set for the Windows software to work correctly.

Lab System

Lab System refers to manual measurements where operators will typically be controlling stop, start, and save using computer mouse push button control on a variety of surfaces.

Roll Grinding

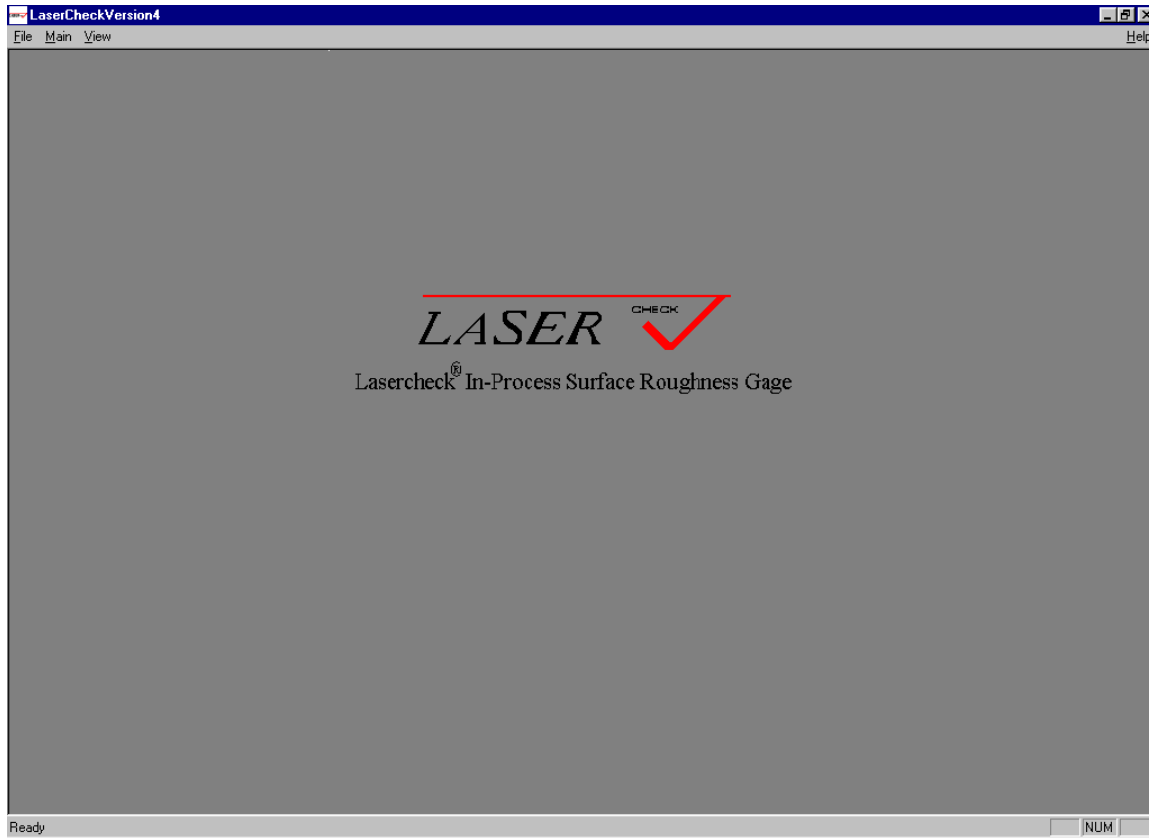
Roll grinding refers to typically automated measurements of large continuous surfaces, collecting a number of roughness values between a "start" and "stop" to effectively create a "map" of roughness of that large surface.

Parts Inspections

Parts inspection refers to automated measurements of numerous parts being presented to the gage, collecting individual roughness values between a "start" and "stop" to effectively perform 100% roughness inspection of high volume parts manufacturing operations.

Section 3 - Review Data Module

Selection of the “Review Data” Push-button from the Main Window opens the “Main Review Data Window”.



Three menu items are available: File, Main, and View. Main returns you to the main startup window of the software. Several options are available under “File”.

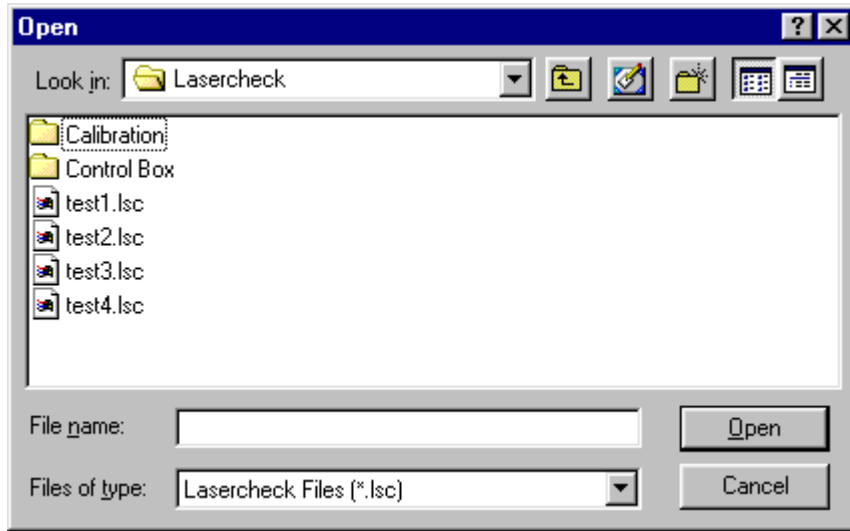
File Menu

The file menu provides the following choices.

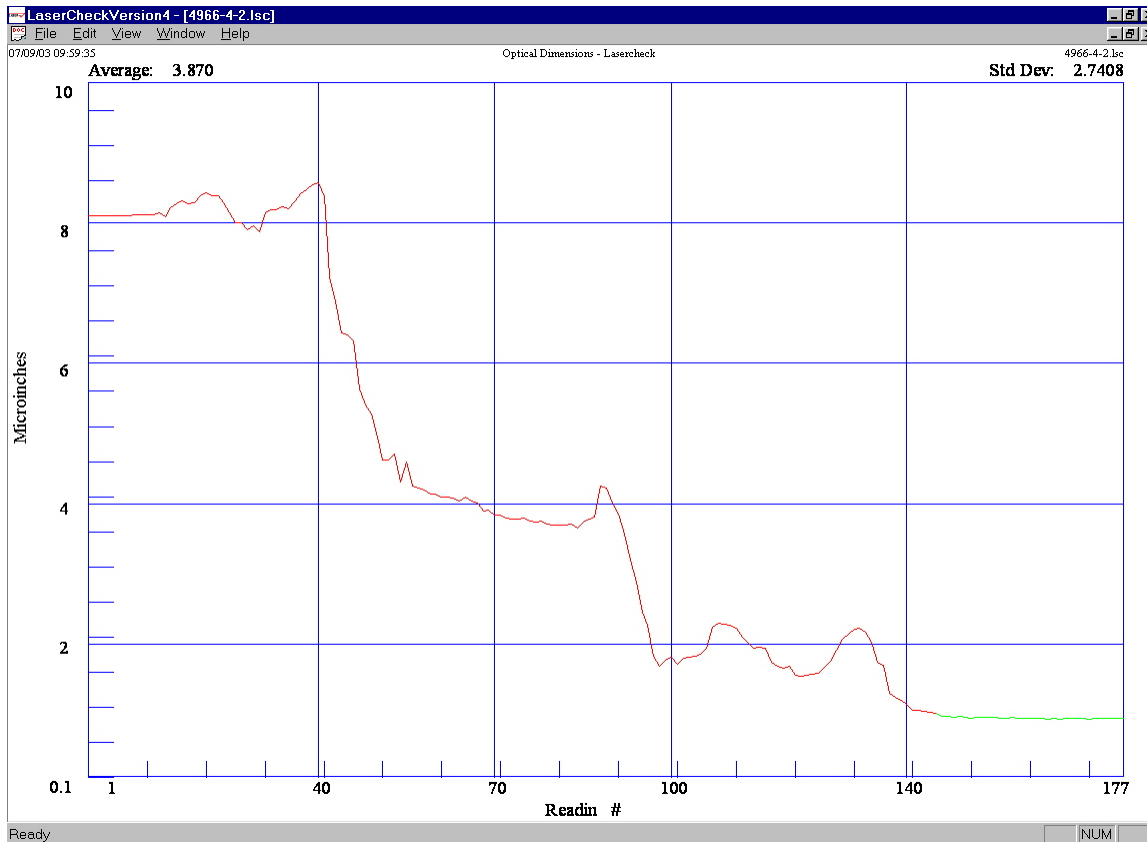


Print Setup allows the user to configure the printer for printing files that will be opened. A list of the previous four files that have been opened will be displayed. Selecting any of them opens that specific file.

Selecting “File / Open” opens the windows “File / Open” dialog box. Note that only data files (file extension .lsc) are displayed for opening from this box.



Selection of a file opens a measurement graph inside the “Review Data” window.



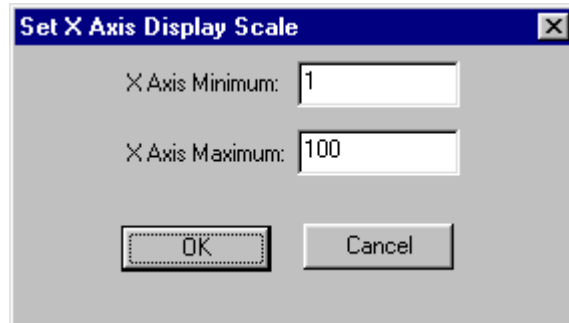
The file displays graphical represent of roughness from the measurement file, statistical values of the roughness measurement set, file name, and the date and time stamp of the measurement set.

Right Clicking the Mouse Button

At any time, you may click the right button on the mouse. This opens the following dialog box in the graph:

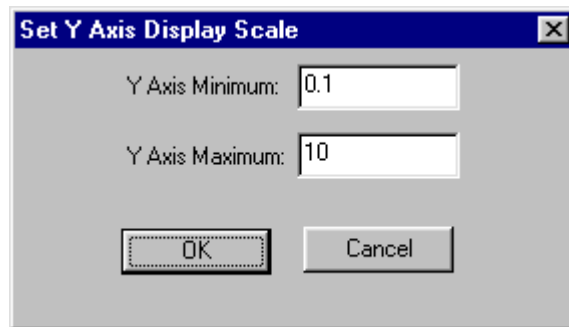
X Axis Scale...
Y Axis Scale...

Selecting "X Axis Scale" opens the following dialog box:



New values for the upper and lower X Scale can be entered and the graph scale will be redrawn to the new scale without any loss of data.

Selecting "Y Axis Scale" opens the following dialog box:



New values for the upper and lower Y Scale can be entered and the graph scale will be redrawn to the new scale without any loss of data.

File Menu - Data File

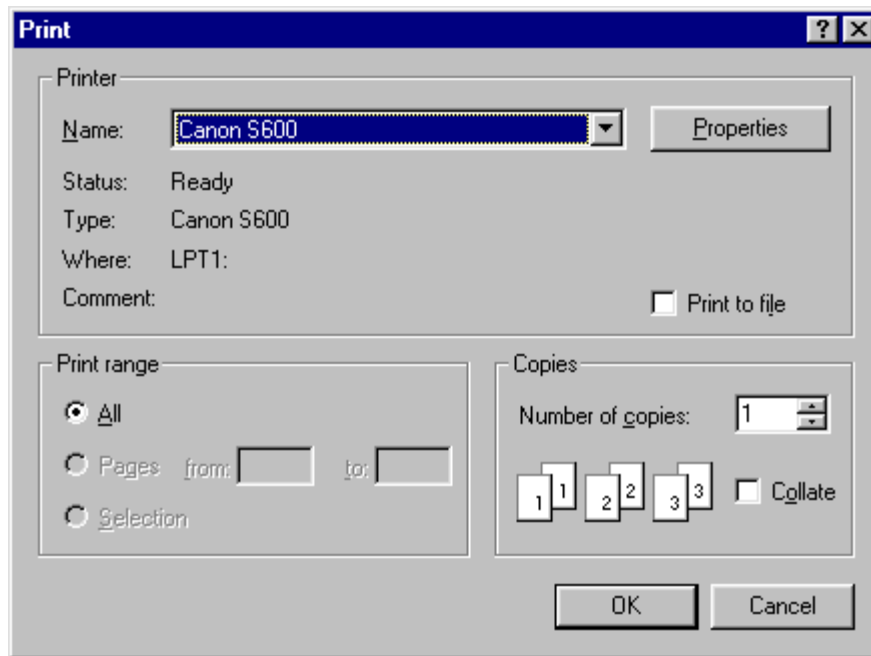
The user has several more menu options available once a data file has been opened. These additional menu options are discussed below.

Print, Print Preview, Print Setup, and Print Data File are added to the print options. Print allows printing of the graph of roughness as it appears on the Windows software screen. The Print Preview option allows the user to examine, on screen, what the printed output will look like. Print Setup prints information about the specific setup file that was used. Print sends the displayed graph to a printer of your selection.

Print Data File

The Print Data File Option opens the windows print data file dialog box.

File	Edit	View	Window
N ew			Ctrl+N
Open...			Ctrl+O
Close			
Save			Ctrl+S
Save A <small>s</small> ...			
Print...			Ctrl+P
Print P <small>re</small> view			
Print S <small>e</small> tup...			
Print D <small>a</small> t <small>a</small> F <small>i</small> l <small>e</small> ...			
Send...			
1 test1.lsc			
2 test2.lsc			
3 test3.lsc			
4 test4.lsc			
Exit			



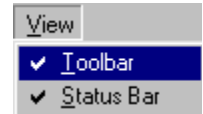
This allows the user to obtain a tabular printout of all the numeric roughness values of the selected data file. These values can also be “printed to file” by clicking on the “Print to file” selection. This opens a windows file/open dialog box where the full file name *including file extension (.txt or .prn etc.)* is entered to form an ASCII format file of the measurement for analysis in software packages other than Lasercheck such as commercial spreadsheet or SPC software.

Edit Menu

The edit menu items are not activated in this version of Lasercheck software.

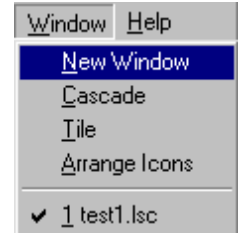
View Menu

The View menu options allow the user to view the toolbar and/or status bar when checked.



Window Menu

The Window menu allows the user to arrange open data documents in windows as well as to select a particular data document to have the input focus.



Cascade

The open windows are cascaded within the display area.

Tile

The open windows are tiled within the display area.

Arrange Icons

The arrange icons selection is not activated in this version of Lasercheck software.

Data File Format

Data/Setup Files

The data file format will utilize the existing "serialization" feature of Visual C++ to save and retrieve data files. The file print utility will currently print the file to the printer as an ASCII file. The print utility can print this data to a file, if the user so desires.

The general layout of the ASCII setup and data Files is shown below. Actual fields are not displayed, but the general file structure is presented.

Section 1

Setup File Data

Instrument Serial #

Process

Known Roughness

Comments

Calibration Coefficients

Section 2

Data and Time that the last data acquisition was taken. If no data exists, these fields are filled with zeros.

Section 3

Statistical Information Summary

Average Value

Standard Deviation

Section 4

Number of Data Points

Section 5

Data