

# Lasercheck 6212 Point Of Measurement System Operations Manual

YLL200201 rev. 01-25-11

Productivity though Precision™



Surface Roughness Measurement Gage





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# **Operations and Specification Manual**

for the

## **Lasercheck 6212 Point of Measurement System**

**YLL200201**

Manual Revision Jan. 25, 2011

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## PERFORMANCE SPECIFICATIONS

Measurement / Detection Method	Angle resolved laser scattering
Measurement speed	Up to 8 measurements per second
Measurement range	1.00 $\mu$ inch to 80 $\mu$ inch / 0.012 $\mu$ m to 2.0 $\mu$ m (Ra)
Repeatability	$\pm$ 1.0% of measured value
Spot size (area-measured)	6 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	110/220 VAC 5. Wall Power Supply, 50 / 60 HZ, 2.0 Amps max.

## 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.)  
RS422 Interface  
Ethernet Interface  
USB Interface  
Input Triggering: Start, Stop, and Save Measurements  
User Configurable Failed Part Trigger Output  
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

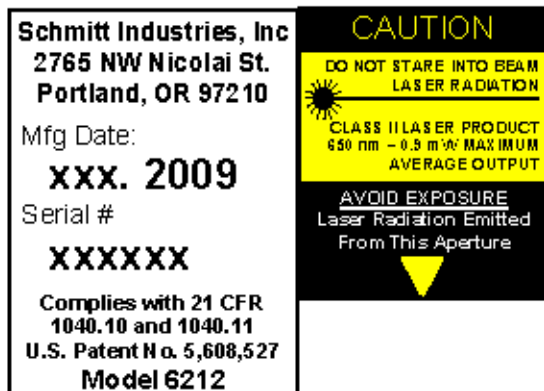
Lasercheck has been designed as a sealed and enclosed system. Voltages to operate the measurement sensor are low (0 to +5 Volts) to minimize shock hazard.

### Laser

At the corner of the control unit is a labeled laser on/off switch. Turning this to the *on* position provides power to the internal 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**

Schmitt Industries, Inc. 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, Schmitt Industries 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. Schmitt Industries 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 Schmitt Industries, after prior Return Material Authorization Number (RMA #) has been obtained. Buyer shall prepay shipping charges to Schmitt Industries. The return shipment should be labeled with the RMA #.

## **Contact Schmitt Industries customer service for shipping instructions:**

### **North America / Asia**

Schmitt Industries, Inc  
2765 NW Nicolai Street  
Portland, Oregon, 97210  
USA

Tel: 503-227-7908  
Fax: 503-223-2158  
<http://www.surface-finish.net>  
Email: [Lasercheck@Schmitt-Ind.com](mailto:Lasercheck@Schmitt-Ind.com)

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Coventry CV4 7EZ  
England

Tel: +44 (0)24 7669 7192  
Fax: +44 (0)24 7641 2697  
[www.schmitteurope.com](http://www.schmitteurope.com)  
Email: [enquiries@schmitt.co.uk](mailto:enquiries@schmitt.co.uk)

## **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.

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 sensor is made of machined aluminum and plastic and all electronics and optics are secured and sealed within the sensor. The sensor is rugged enough to withstand handling that might be normally encountered in manufacturing shop floor gage operation. The sensor 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 can be damaged by mishandling. The Lasercheck housing and electronics are well grounded. The sensor is sealed at all seams and holes to protect components from external contaminants. The user should not open the measurement sensor. *If opened by non-authorized personnel, the warranty provided by Schmitt Industries 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 Schmitt Industries office.

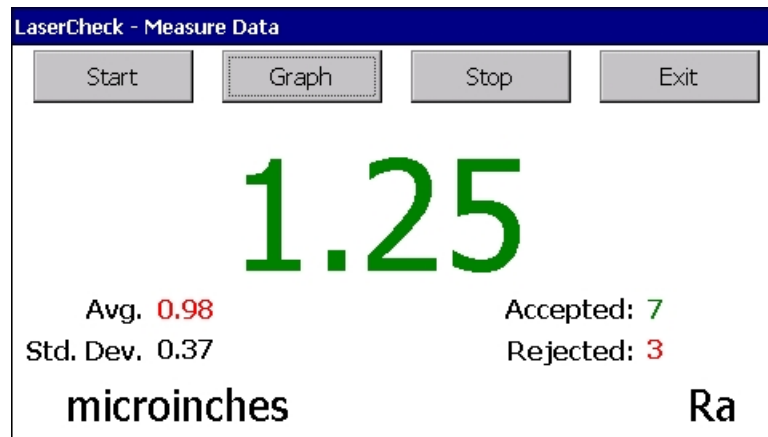
## INTRODUCTION TO LASERCHECK

### Overview

Lasercheck is designed to perform high speed, accurate, non-contact measurements of surface roughness. A built in visible laser illuminates the surface beneath it. The overall intensity and distribution of the reflected and scattered light is measured, digitized by Lasercheck electronics, and then Ra/Rq roughness is calculated for the illuminated area. This Ra/Rq value is then displayed on the LCD screen of the Lasercheck display unit. The Lasercheck display and control software can be used to display the real time Ra/Rq values in graphical and numeric format along with statistical parameters.

Lasercheck has been designed for a nominal height standoff of 0.1 inch  $\pm$  0.01 inches (2.5 mm +/- 0.25 mm) from the measurement surface. Motions and vibrations within that tolerance range are monitored continuously and roughness measurements are corrected for vibrations using patented software algorithms during every measurement cycle to ensure accurate results.

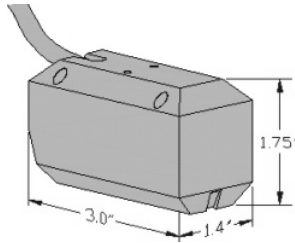
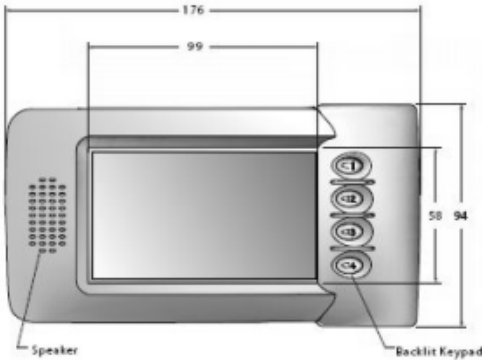

Measurements can be performed by manual operation, or fully automated high speed on-line measurements triggered by external signals and the software. Measurements are saved in comma separated value text (.csv) file format for reading into a variety of spreadsheet and analysis software packages.



## SETTING UP THE INSTRUMENT

### Unpacking Lasercheck

All components of Lasercheck have been inspected and tested individually and as a system before shipping. You should find the following items with your system:

<p><b>1. Lasercheck Measurement Sensor</b></p>	
<p><b>2. Standoff plate</b> (0.100 inch / 2.5 mm)</p>	<p>Attached to measurement sensor for <u>quick set up tests only</u>. Remove for in-plant system installation.</p>
<p><b>3. Lasercheck LCD Display and Control unit</b></p>	
<p><b>4. Electronic Interconnect Box</b> (4.6 x 3.6 x 2.3 inches – 117 x 91 x 58 mm)</p>	
<p><b>5. Wall Power Supply</b></p> <p><b>6. Lasercheck Leveling Tool</b></p> <p><b>7. Lasercheck USB Stick with Manual, Quick Setup Guide and Backup Files</b></p>	

### Basic Connections

Connect the sensor to female DB15 connector labeled "SENSOR" on interconnect box. The cable should be secured with the thumbscrews on the cable.

Connect the LCD Display and Control Unit to male DB15 connector labeled "DISPLAY" on interconnect box. The cable should be secured with the thumbscrews on the cable.

Connect proximity sensors (triggering inputs) to the female DB9 connector labeled "INPUT/OUTPUT" on interconnect box. These are optional and would only be used during "automatic operation".

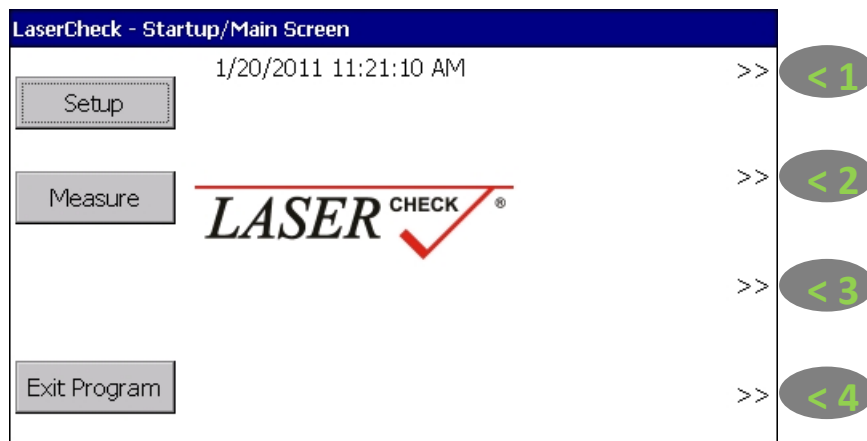
Connect the wall power supply to the circular connector labeled "POWER" on interconnect box.

## PERFORMING AUTOMATED ON-LINE MEASUREMENTS

*Important:* Be sure to remove standoff plate for Factory Floor setup of the Lasercheck system.

### Power ON

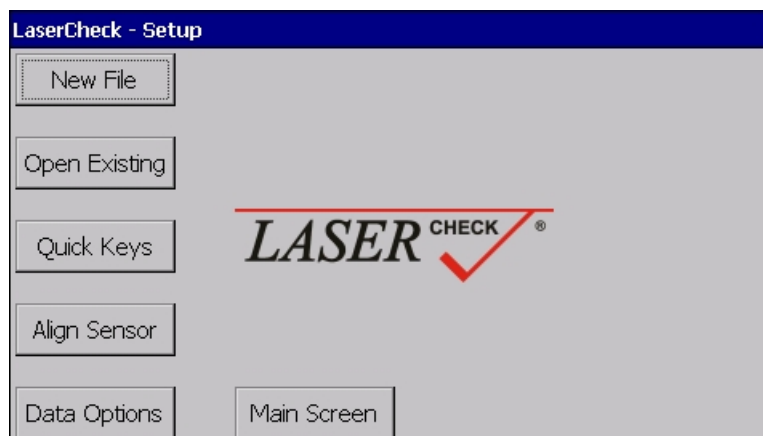
After all connections are made toggle the power switch on the side of the interconnect box to the on position. The following screen will be displayed:



Lasercheck Startup/Main Screen

### Creating a Software Setup File

From the Lasercheck Startup/Main Screen, push the "Setup" button. The following Screen will be displayed:

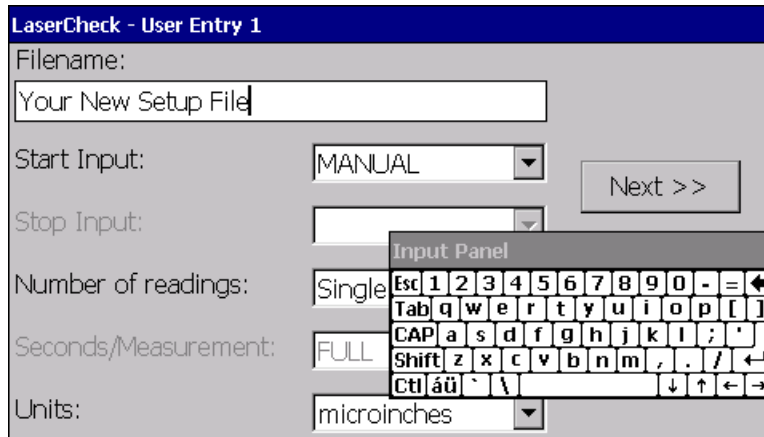


Main Setup Screen

## Main Setup Screen

Push the “New File” button in the Main Setup Screen.

The following screen will be displayed:



User Entry Screen #1

*Note Above: Windows CE keypad for user entry in fields will be displayed as necessary.*

### Filename Field

In the Filename field enter the name you wish the setup file saved to. This name will also be the name that measurements will be saved to.

### Start Input Field

Three options can be selected:

#### MANUAL

Measurements will be performed by pushing the Measure button on the LCD display.

#### EXTERNAL

Measurements will be performed by external trigger sent to the “INPUT/OUTPUT” connector on the Electronic Interconnect Box.

#### BOTH

Measurements will be performed by pushing the Measure button on the LCD display or by external trigger sent to the “INPUT/OUTPUT” connector on the Electronic Interconnect Box.

### Number of readings Field

Three options can be selected:

#### Single

One measurement will be made every time the “Measure” button is pushed or the external trigger is active.

#### Continuous

Continuous measurements at a rate of approximately 8 measurements per second will be made every time the “Measure” button is pushed or the external trigger is active.

## 2 to 99

Continuous measurements at a rate of approximately 8 measurements per second will be made until the selected number of measurements is reached every time the “Measure” button is pushed or the external trigger is active.

## Seconds/Measurement Field

This field will only be active if “Continuous” is selected in the “Number of readings” field. Two options can be selected:

### FULL

Continuous measurements at a rate of approximately 8 measurements per second will be made.

### 1 to 100

Continuous measurements at a rate of exactly 1 measurement per number of seconds selected will be made.

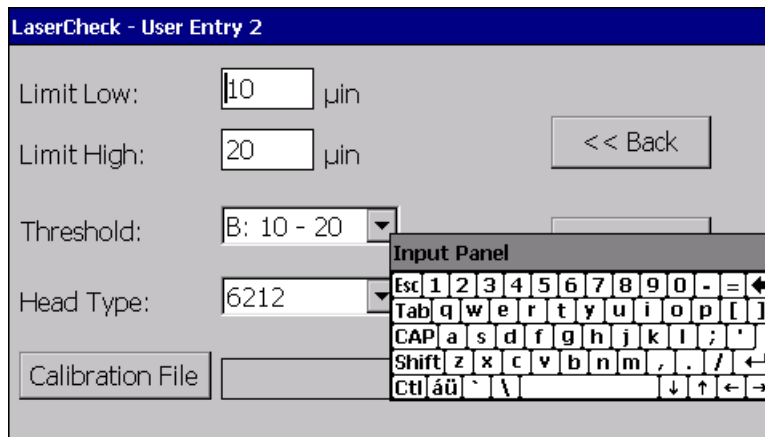
## Units Field

This selection determines the roughness units that will be displayed. The options are:

- microinches
- microns
- nanometers

## Next Button

Once all selections have been made, push the “Next” button. File” button in the Main Setup Screen. The following screen will be displayed:



The screenshot shows the "LaserCheck - User Entry 2" screen. It features several input fields: "Limit Low" with the value "10" and unit "μin", "Limit High" with "20" and "μin", "Threshold" with a dropdown menu showing "B: 10 - 20", "Head Type" with "6212", and "Calibration File" with an empty field. A "<< Back" button is visible. An "Input Panel" is overlaid on the screen, displaying a keyboard layout with keys for Esc, numbers, letters, and function keys.

User Entry Screen #2

## Limit Low Field

Enter the minimum roughness specification for surface to be measured.

## Limit High Field

Enter the maximum roughness specification for surface to be measured.

### Threshold Field (Roughness Ranges)

Three options can be selected:

#### A: 0 – 10 microinches

Select if surfaces are less than 10 microinches (0.25 microns) Ra.

#### B: 10 – 20 microinches

Select if surfaces are greater than 10 and less than 20 microinches (0.25 to 0.50 microns) Ra. This selection is default if surface roughness is unknown or if surfaces cover a wider range than either the “A” or “C” option.

#### C: 20 + microinches

Select if surfaces are greater than 20 microinches (0.50 microns).

### Sensor Type Field

This selection determines the model of Lasercheck sensor. The options are:

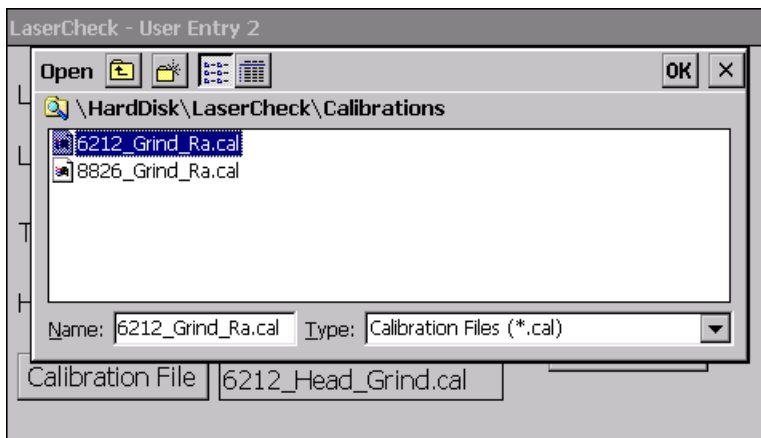
#### 6212 (Default Sensor)

#### 8826

Select the model of Lasercheck sensor.

### Calibration File Button

A calibration file must be selected for the surface being measured. The following screen will be displayed:



Calibration File Select Screen

The “6212\_Grind\_Ra.cal” is the default calibration for the 6212 POM Lasercheck system.

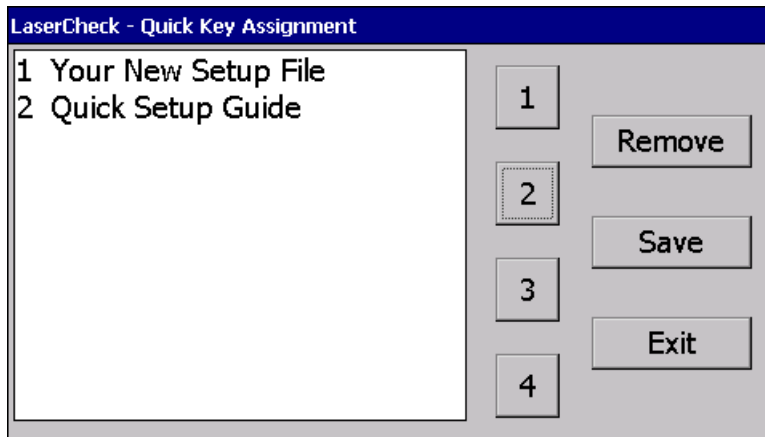
Select the appropriate calibration file most appropriate for the surfaces to be measured. The “6212\_Grind\_Ra.cal” is the default calibration for the 6212 POM Lasercheck system. Factory file settings provide Ra values on ground surfaces calibrated to known ground surface standards. If your Lasercheck will be used on surfaces other than ground surfaces Schmitt Industries provides custom calibration files for a nominal cost to suit your surfaces and materials.

### Save Button

Pushing the Save Button will save the setup file to the name entered in the Filename Field and return to the Main Setup Screen. Push "Main Screen" to return to the Lasercheck Startup/Main Screen.

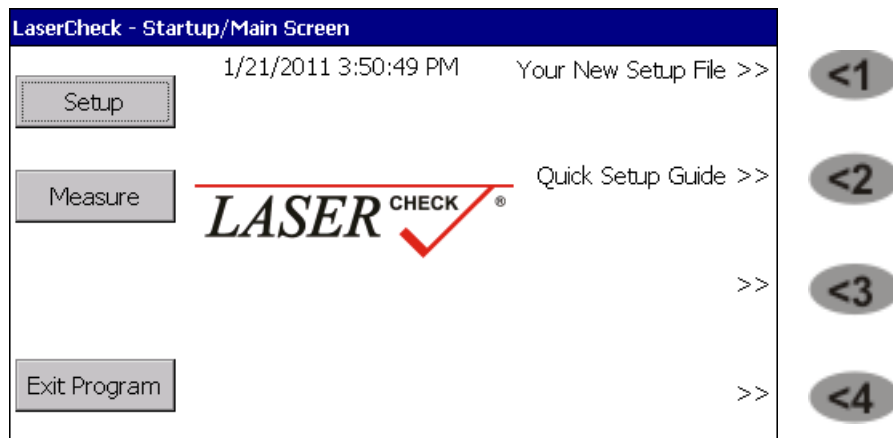
### Quick Key Assignment

For convenient operation, up to 4 commonly performed measurements can be assigned to the 4 numbered buttons to the side of the LCD display. To assign measurement setup files to quick keys, push the "Setup" button in the Lasercheck Startup/Main Screen. Then push the "Quick Keys" button. The following screen will be displayed:



Quick Key Assignment Screen

Highlight the setup file you wish to assign a "Quick Key". Then push button 1, 2, 3, or 4 depending on which "Quick Key" you want the setup file assigned to. Assign as many as you wish up to a total of 4. Then push the "Save" Button. You will be returned to the Main Setup Screen. Pushing Exit will return you to the Lasercheck Startup/Main Screen with assigned Quick Keys identified to the right of the screen beside their specific "Quick Key Number".



Lasercheck Startup/Main Screen with Quick Keys Assigned

## Aligning Lasercheck Using Mechanical and Software Aids

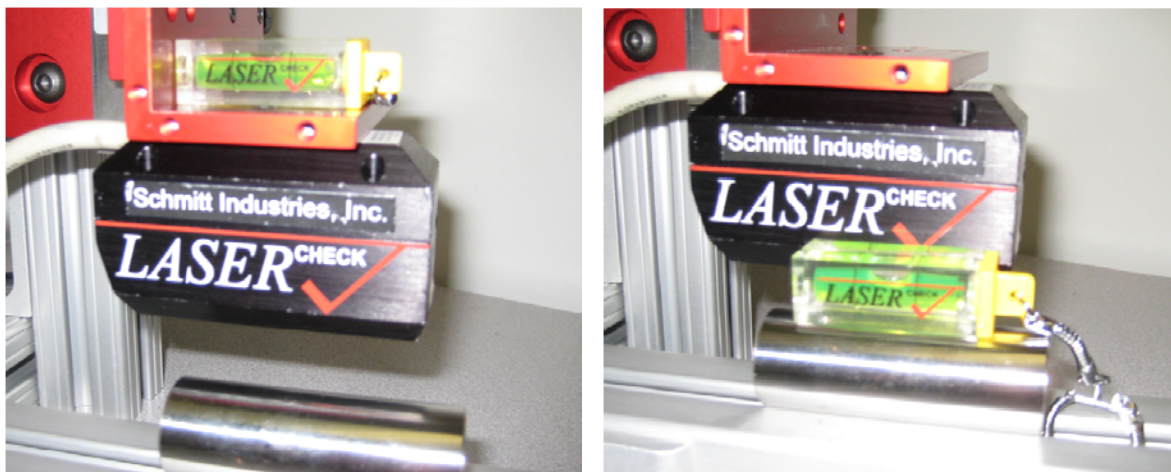
### Pre-Position Sensor

For surfaces with different geometry or for on-line automated applications, alignment fixturing must be used. The YYL706201 Adjustable XZ Mount is a robust and flexible adjustable mounting system for Lasercheck that provides improved repeatability, accuracy, and reliability of Lasercheck measurements in your plant installation. An understanding of alignment procedures for Lasercheck is required for development of fixturing. Please read the section on Mounting/Fixturing Lasercheck in the appendix of this manual.

***Important!*** If the measurement surface is relatively rough (greater than 10 microinches / 0.25 microns Ra) then a piece of shiny clear tape should be applied to the surface at the measurement location. This aids in alignment and must be removed after the alignment procedure.

### Level Surfaces to be Measured with Lasercheck Sensor

Once the Lasercheck is mounted in a fixture the typical surface being measured should be positioned under the Lasercheck sensor. Position the Lasercheck leveling tool on the Lasercheck sensor head and check level of the head in its mount. Do the same with the surface to be measured. Adjust the Lasercheck sensor and mount for the surfaces until they are level with respect to each other.



Test level of Lasercheck and Surfaces to be Measured

Once the leveling operation is complete, the Lasercheck sensor head should be positioned directly over the surface to be measured. Set the stand-off plate supplied with your Lasercheck on the surface and lower the sensor head until it contacts the stand-off plate. This will pre-position the measurement head approximately 0.1 inch (2.5 mm) from the surface.

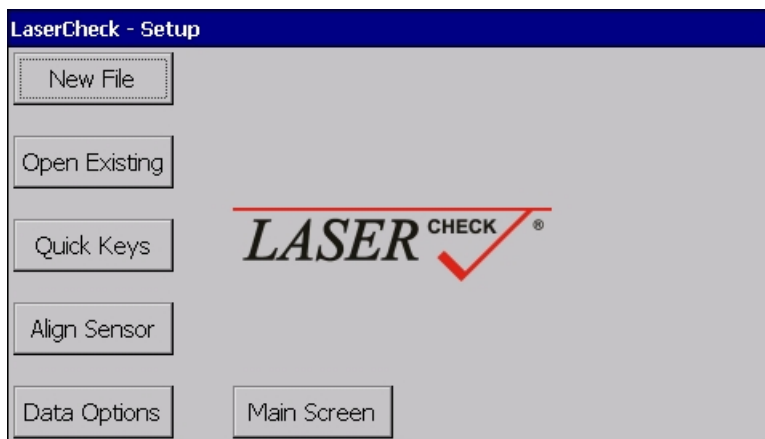


Lasercheck Sensor Lowered to pre-set 0.1 inch gap using stand-off plate

The installation is now ready for final fine adjustment of alignment using the Lasercheck Alignment Software Module.

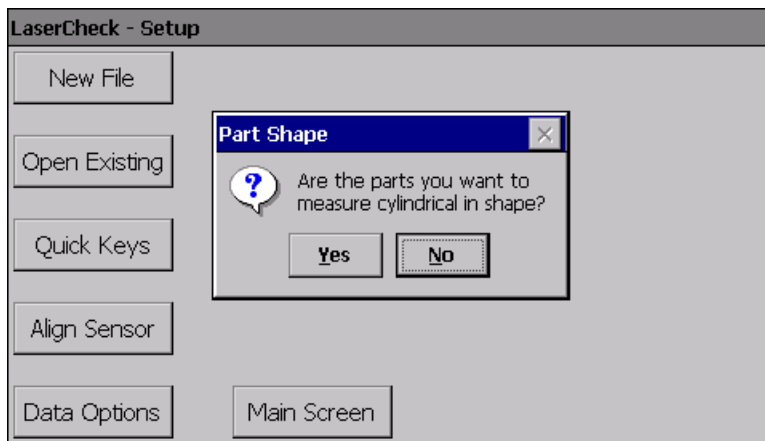
### Enter Setup /Alignment Software Module

From the Lasercheck Startup/Main Screen, push the "Setup" button. The following Screen will be displayed:



Main Setup Screen

Push the "Align Sensor" button. The following screen will be displayed:

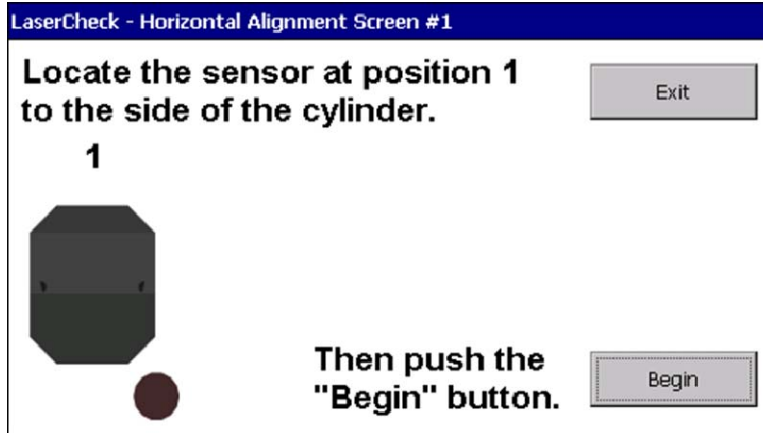


Cylindrical in Shape

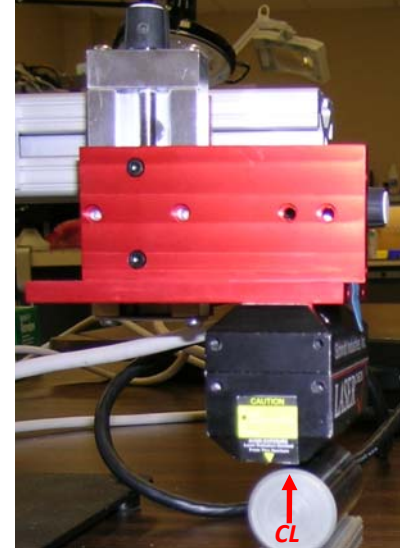
If your surfaces are flat, select no. The software will open Vertical Alignment Screen #1 discussed later in this section. Select yes for cylindrical parts or for material passing over a cylindrical roll where Lasercheck will be positioned over the material passing over the crown of that roll.

### Horizontal Alignment of Sensor

If your parts are cylindrical in shape and you select yes, the following screen will be displayed:



Horizontal Alignment Screen #1

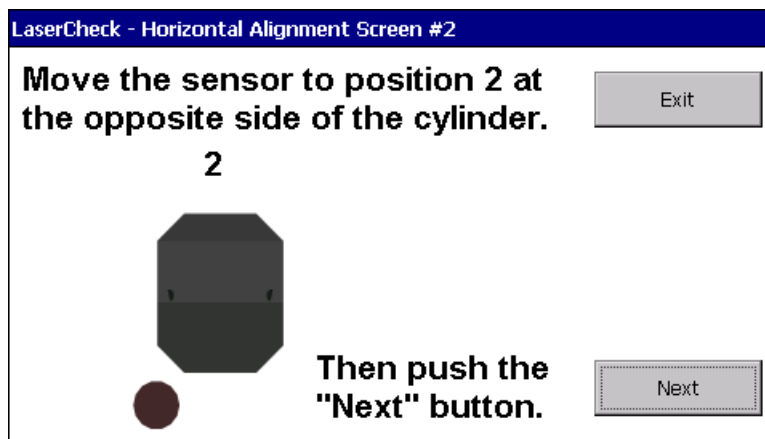


Lasercheck Sensor Positioned over Cylindrical Part

Using horizontal fine adjustment positioners provided on model YYL706201 Adjustable XZ Mount move the measurement sensor to one side of the centerline of your cylindrical surface as prompted in the software display screen.

Once complete, push the “Begin” button at the bottom right corner of the software screen.

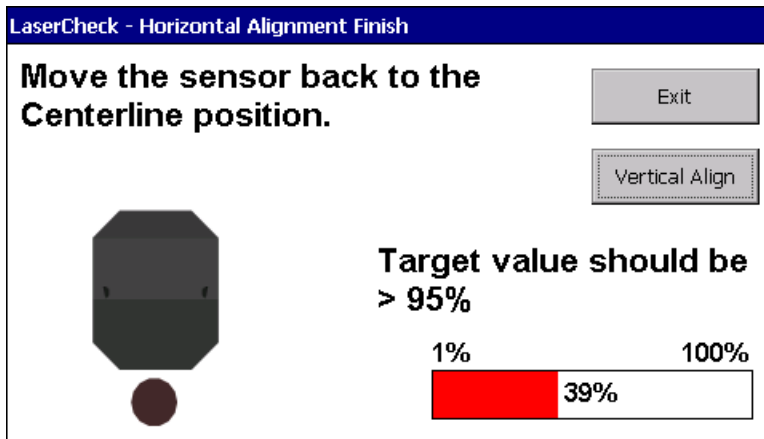
The following screen will be displayed:



Horizontal Alignment Screen #2

The measurement sensor in the software screen will move horizontally from one side of the cylindrical part to the other side. Perform the same operation with the measurement sensor using the horizontal fine adjustment positioners provided on model YYL706201 Adjustable XZ Mount. When completed, push “Next”.

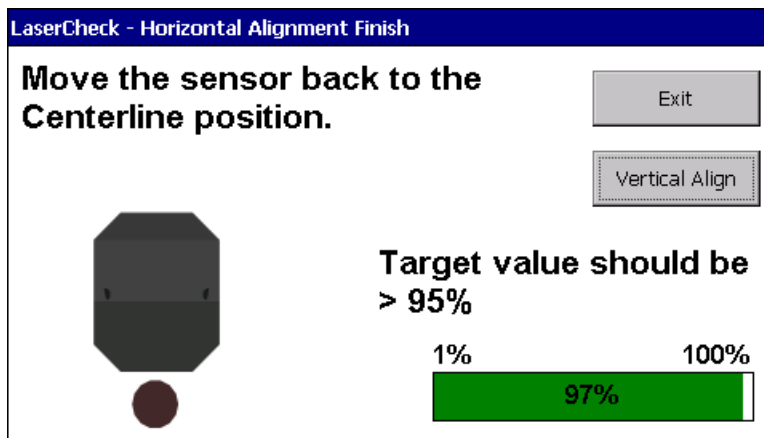
The following screen will be displayed:



Horizontal Alignment Screen #3

The measurement sensor in the software screen will move horizontally back to the center line of the cylindrical part. Perform the same operation with the measurement sensor using the horizontal fine adjustment positioners provided on model YYL706201 Adjustable XZ Mount. Observe the bar graph while performing this operation.

When the sensor is well aligned the bar graph will change from red to green as shown in the screen below:



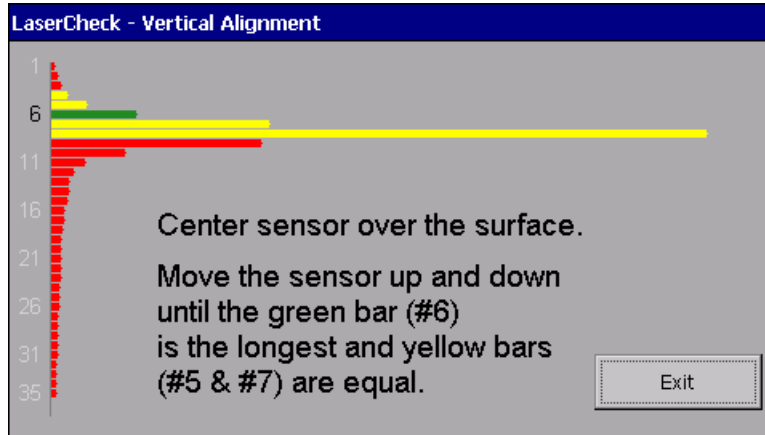
Horizontal Alignment Screen #4

Fine adjust horizontal position until the bar graph is as close to 100% as possible.

When completed, push "Vertical Align".

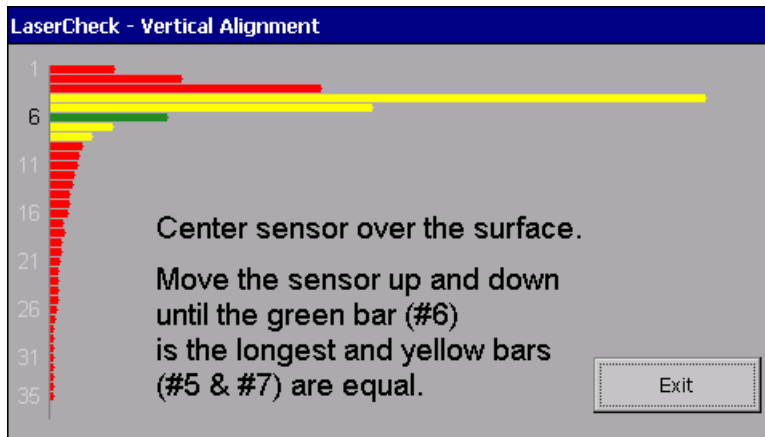
## Vertical Alignment of Sensor

The following screen will be displayed:



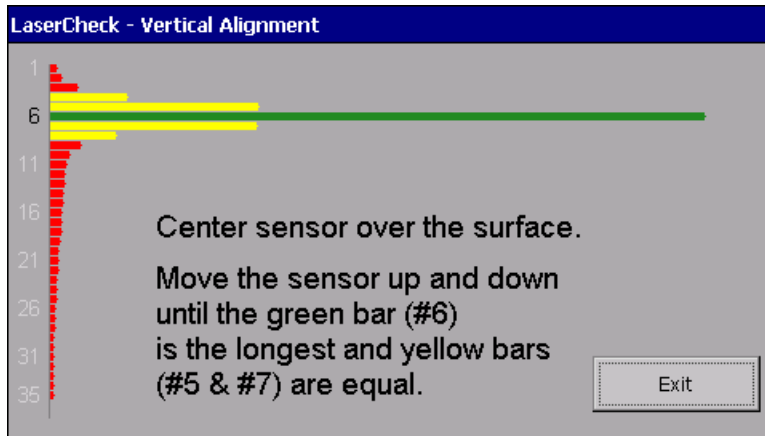
Vertical Alignment Screen #1

If the sensor is too close to the surface, the vertical alignment screen may appear like Vertical Alignment Screen #1 above.



Vertical Alignment Screen #2

If the sensor is too far from the surface, the vertical alignment screen may appear like Vertical Alignment Screen #2 above.



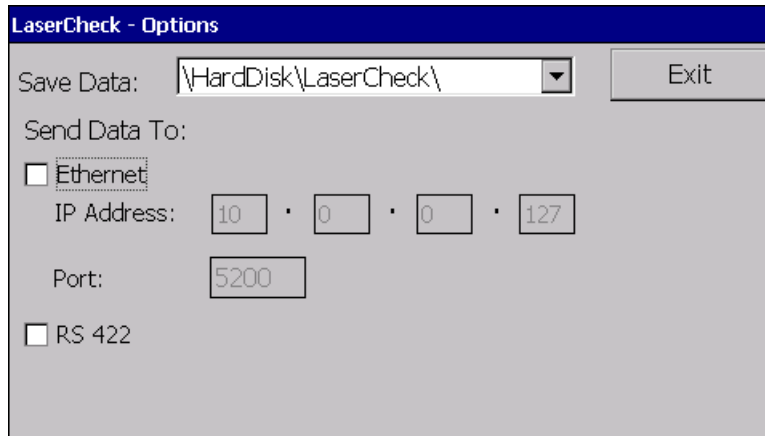
Vertical Alignment Screen #3

Use the vertical fine adjustment positioners provided on model YYL706201 Adjustable XZ Mount to carefully move the sensor up or down until the vertical alignment screen looks like Vertical Alignment Screen #3 above.

Set the vertical position of the sensor so that the green bar becomes the longest and that the yellow bars on either side of the green bar are as equal in length as possible. When completed, push "Exit". The software will return to the Main Setup Screen.

## Lasercheck Data Collection Monitoring Options

Lasercheck measurements can be saved to any location on the “hard disk” of the LCD controller or to a memory stick inserted in the back of the LCD controller. Additionally data can be collected remotely from either the Ethernet or Com2 connector on the Interconnect Box in RS422 format. To assign output options, push the “Setup” button in the Lasercheck Startup/Main Screen. Then push the “Data Options” button. The following screen will be displayed:



Lasercheck Options Screen

### USB or Lasercheck Controller Hard Disk

In the “Save Data” field use the drop down box to select the Lasercheck local hard disk or USB location you wish to have measurements saved to.

### Ethernet

Select the check box beside Ethernet and data will stream out the Ethernet port as measurements occur. The receiving computer requires software to receive the csv formatted text values and save to a location on the computer or network.

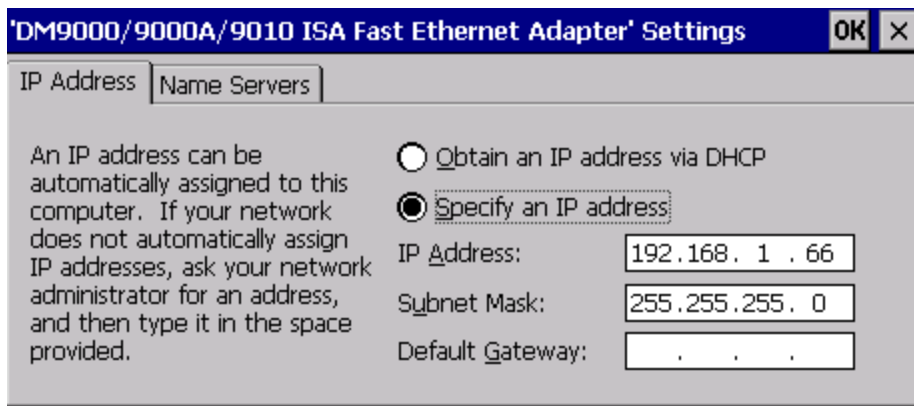
A crossover cable that is made for computer to computer connections is required. A router should take care of the crossover connection if a crossover cable is not available.

The IP Address entered should be the IP Address of your computer or network location receiving the measurement results. Enter that exact IP Address in the fields when the Ethernet box is checked.

The subnet mask must be the same on both the Lasercheck and on the receiving computer. To set the subnet mask on the Lasercheck controller, you must first exit the program. Then:

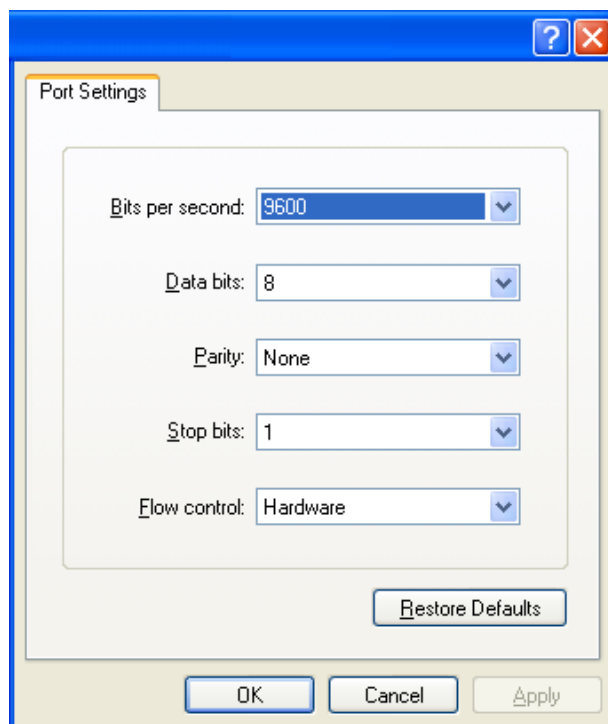
- In the Windows CE main screen select Start/Settings/Network and Dial-Up Connections
- Select DM9CE1
- In the IP address tab, check “Specify an IP Address
- Specify an IP address that matches the first 3 boxes of your receiving computer IP; in the last box enter a unique number for the Lasercheck Controller
- Match the Subnet Mask field exactly to the Subnet Mask of your receiving computer

- Default Gateway can be left blank



## RS422

Select the check box beside RS422 and data will stream out the COM 2 port as measurements occur. The receiving computer requires software to receive the csv formatted text values and save to a location on the computer or network. HyperTerminal provided in Windows XP based computers or by secondary market suppliers can be used to accomplish this. Computer com port settings should be 9600, 8, N, 1 as shown below:

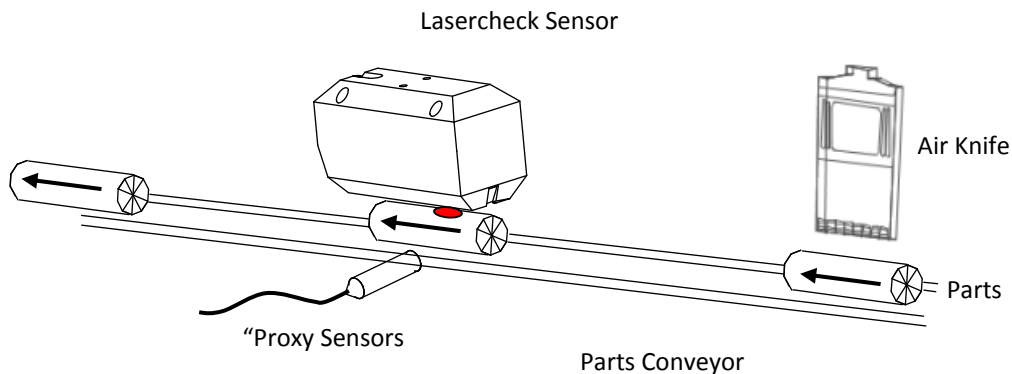


A serial null modem crossover cable that is made for computer to computer connections is required to establish communications and data transfer.

## Input Trigger Setup

### Single Measurements per Surface

Lasercheck measures moving parts after a finishing operation. Parts should be transported under the Lasercheck sensor on a stable conveyor or brought to the Lasercheck sensor with automated robotic positioning machinery. Input trigger devices must be positioned and timed so that the trigger becomes active when the



Lasercheck Sensor Mounted on Conveyor for Automated Single Measure Inspection

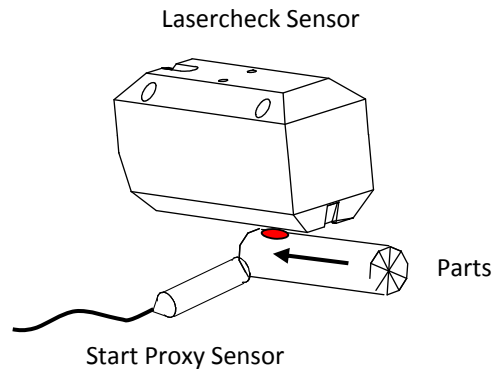
surface is in correct measurement position. Once the input goes "active" a single measurement will occur. The surface roughness measurement will begin a few milliseconds after the trigger is received. Measurement time is approximately 10 milliseconds. The surface can be moving at any speed under the measurement sensor while the measurement takes place.

If parts are not clean, an air knife should be installed and mounted prior to the laser sensor to blow-dry excess coolant off of the surface to be measured. Ideally the parts would pass a few millimeters under the air knife, which would operate with a pressure of approximately 20 psi blowing on the surface to clean off coolant and debris.

### Setting Input Triggers for Automated Single Measurement Inspection

A "start" input should be set so the trigger activates as soon as the surface to be measured is in a measurement position. From the Lasercheck Startup/Main Screen push the "Setup" button, then the "Align Sensor" button. When prompted about cylindrical parts, select "No". The laser will now start pulsing. Move a surface under the Lasercheck sensor until the pulsing laser spot is visible on the measurement area as shown in the image below.

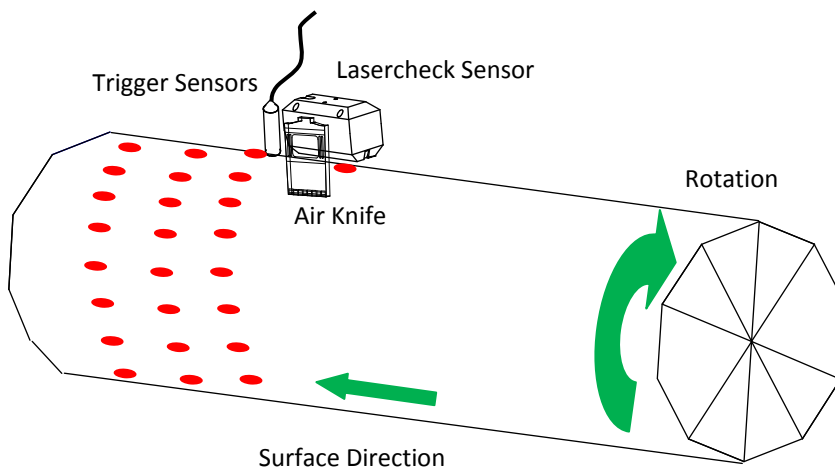
Then set or position the trigger mechanism so that it activates at exactly this point.



Proximity Sensor Trigger positioned to activate as surface reaches Measurement Position

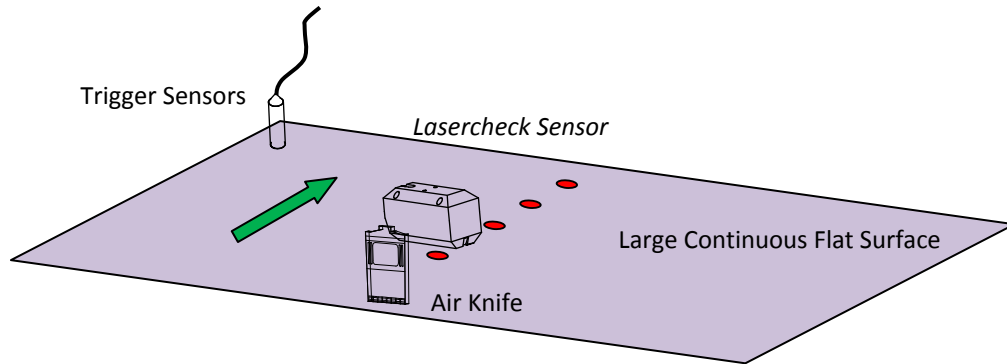
### Continuous Measurements on a Surface

Lasercheck measures large moving surfaces during or after a finishing operation. The Lasercheck sensor is positioned over the surface and the surface is transported under the measurement sensor. Input trigger devices must be positioned and timed so that the trigger becomes active when the surface is in correct measurement position. Once the input goes “active” multiple continuous measurements will occur at a rate of approximately 8 complete measurements per second. The surface roughness measurements will begin a few milliseconds after the trigger is received. Measurement time for each measurement is approximately 10 milliseconds. The surface can be moving at any speed under the measurement sensor while the measurement takes place. Measurements will stop as soon as the trigger becomes inactive. This procedure is the same for either large flat or curved surfaces passing under the Lasercheck sensor.



Lasercheck Sensor Mounted on Large Rotating Roll for Automated Continuous Inspection

If the surface is not clean, an air knife should be installed and mounted prior to the laser sensor to blow-dry excess coolant and debris off of the surface to be measured. Ideally the parts would pass a few millimeters under the air knife, which would operate with a pressure of approximately 20 psi blowing on the surface.



Lasercheck Sensor Mounted on Large Flat Sheet  
for Automated Continuous Inspection

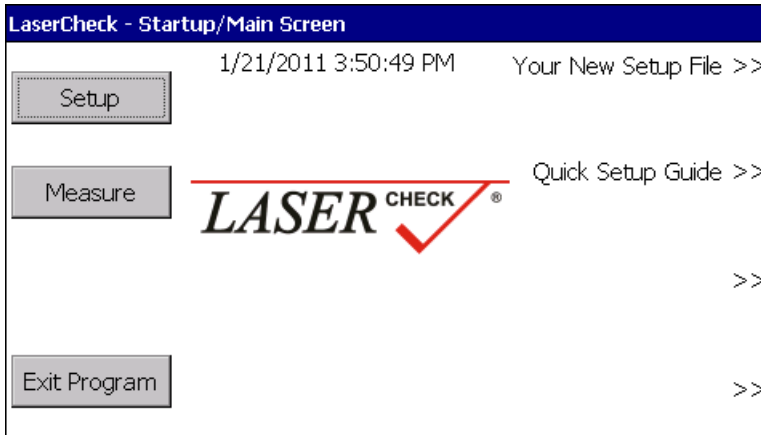
### **Setting Input Triggers for Automated Continuous Measurement Inspection**

A “start” input should be set so the trigger activates as soon as the surface to be measured is in a measurement position. From the Lasercheck Startup/Main Screen push the “Setup” button, then the “Align Sensor” button. When prompted about cylindrical parts, select “No”. The laser will now start pulsing. Move the Lasercheck sensor or surface under the Lasercheck sensor until the pulsing laser spot is visible on the measurement area.

Then set or position the trigger mechanism so that it activates at exactly this point.

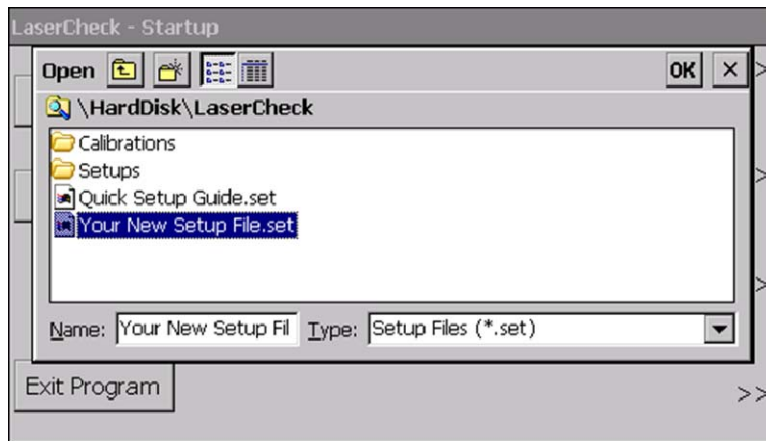
## Begin Automated Measurements

Exit back to the Lasercheck Startup/Main Screen.



Lasercheck Startup/Main Screen

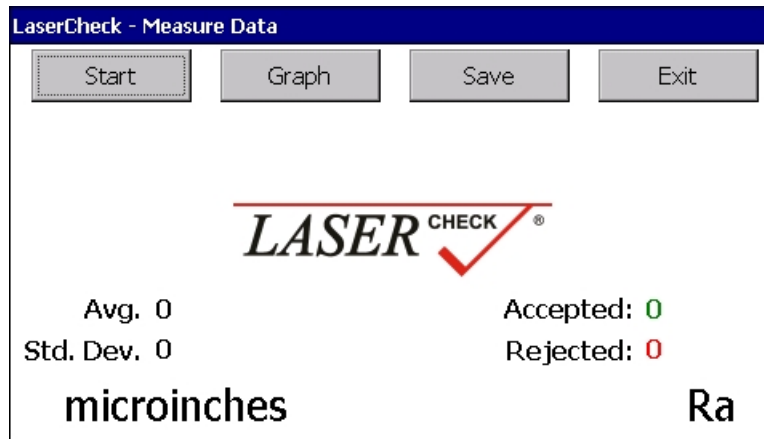
Push the Measure button, the following screen will be displayed:



Measure Open Setup

Select the "Setup" file for the surface measurements you will be performing.

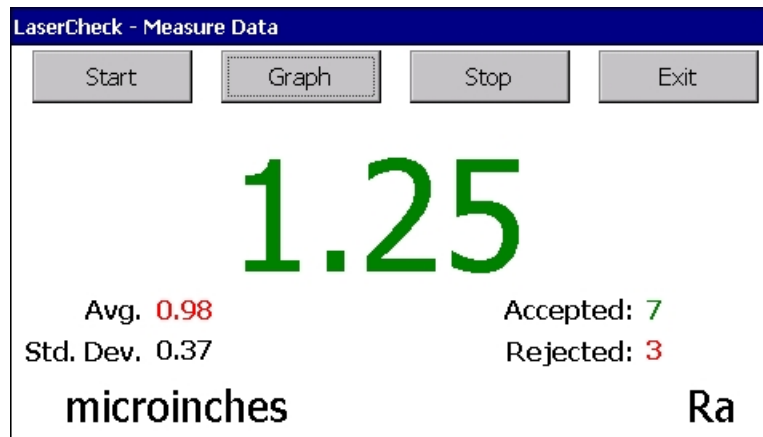
The following screen will be displayed:



Measure Data Screen Prior to Trigger

The "Start" button is grayed out and not functional. Measurements will be automatically performed upon activation of the input trigger.

When measurements begin, the following screen will be displayed:

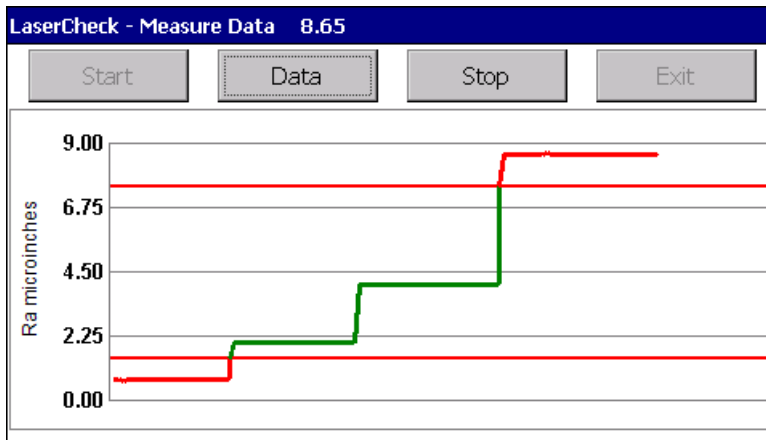


Measure Data Screen after Trigger

Note that the values will be displayed in GREEN if results are within the minimum and maximum Roughness values specified in your setup file. Values will be displayed in RED if results are outside the minimum and maximum Roughness values specified in your setup file.

Average of all measurements will be displayed in GREEN if the average is in specification and in RED if the average falls outside your specification. Real time counters appear in the bottom right corner indicating how many measurements are in specification / Accepted in GREEN and out of specification / Rejected in RED.

Push the "Graph" button and the following screen will be displayed

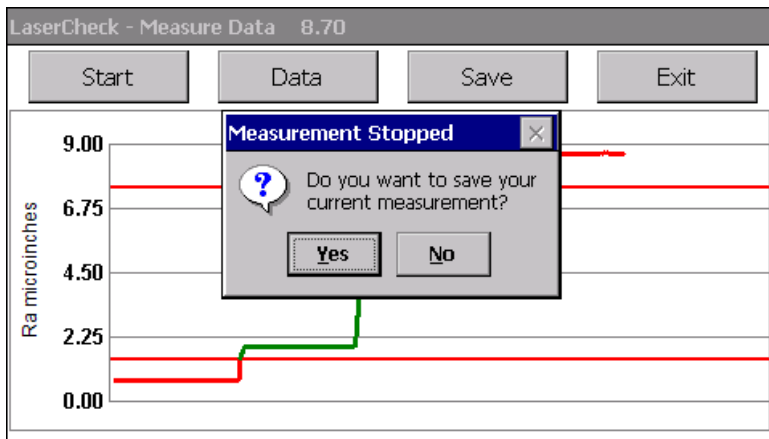


Measure Graph Screen Scanning 1, 2, 4, and 8 Microinch Surfaces

The same measurement results will be displayed in real time in a graphical display. Note that horizontal RED lines designating the minimum and maximum Roughness values specified in your setup file. The graph of measurement values will be displayed in GREEN if results are within the minimum and maximum Roughness values specified in your setup file. The graph of measurement values will be displayed in RED if results are outside the minimum and maximum Roughness values specified in your setup file.

You can toggle back and forth between graph and data display of roughness values. Pushing "Stop" from the data or graph screen stops the measurement.

Then pushing "Save" will save the measurements or pushing "Exit" will display the following screen:



Measure/Save Screen

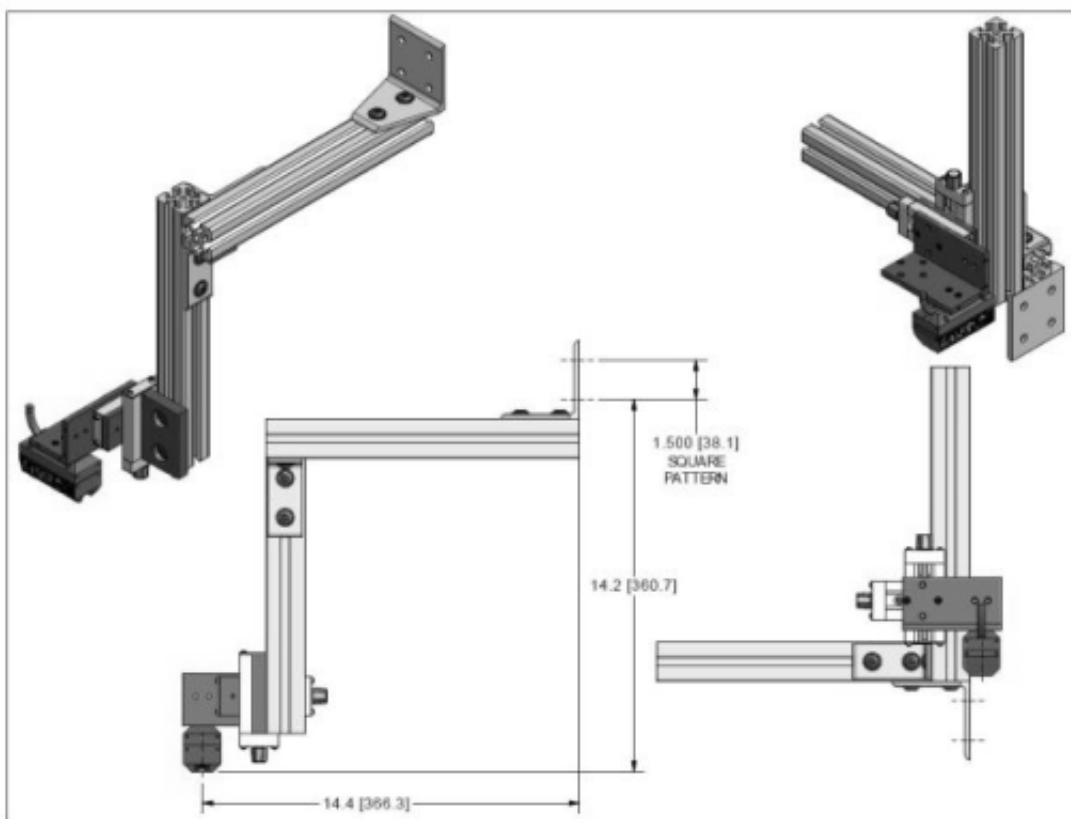
If "Yes" is selected, the measurement results will be saved to a predetermined location then you will be returned to an empty Measure Data Screen. If "No" is selected, you will be returned to an empty Measure Data Screen without saving any values.

## Appendix A

### Mounting/Fixturing Lasercheck

There are ten drilled and tapped holes on the Lasercheck sensor that can be used for mounting and installing the Lasercheck in an automated inspection application. The sensor should be positioned at a location where surface will be at the correct vertical and horizontal position relative to the gage sensor. The Lasercheck sensor must be precision adjusted over the surface in 2 axes (X and Z position) for optimal mounting / alignment.

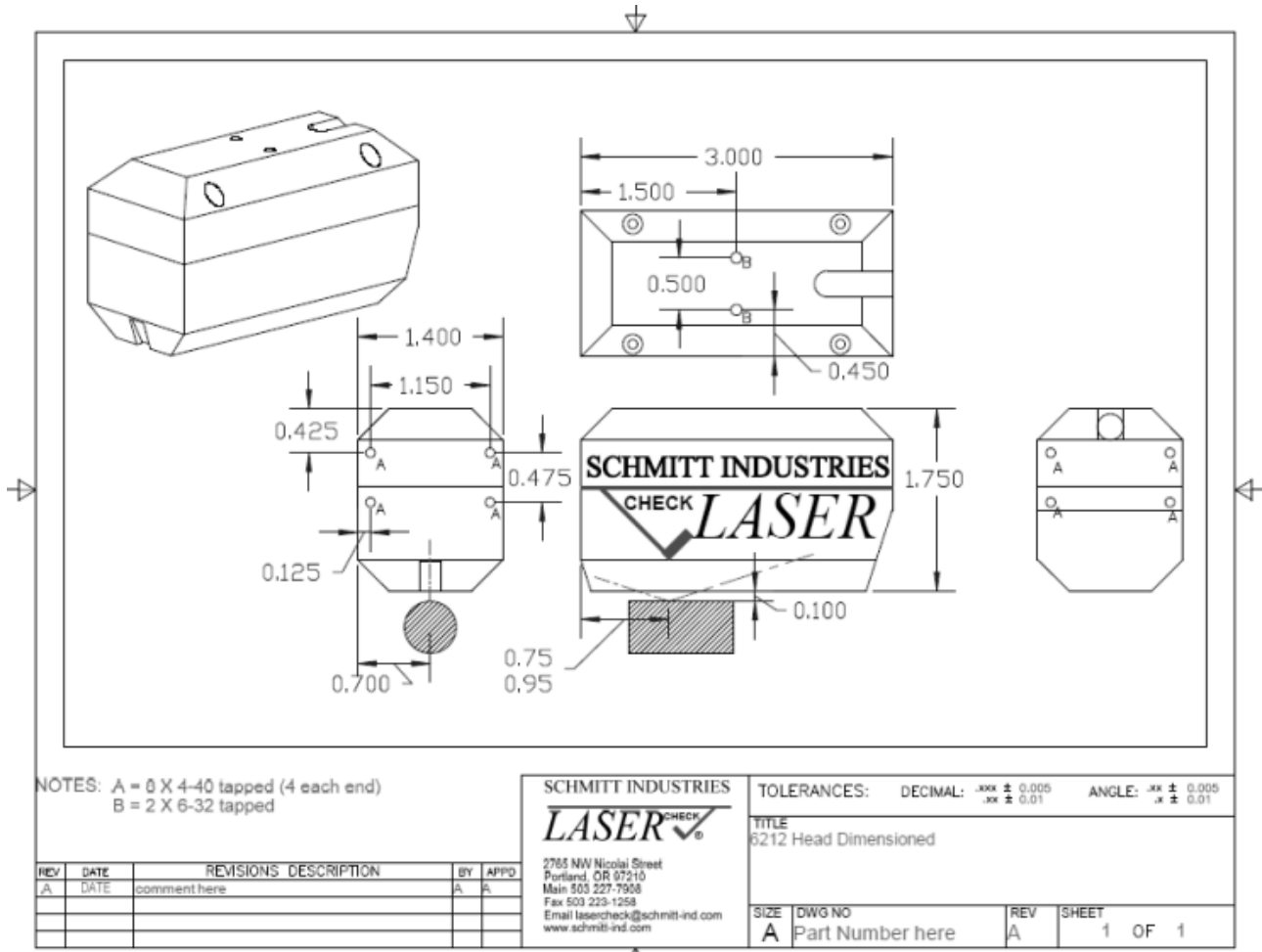
Schmitt Industries provides an optional adjustable mounting fixture (model YYL706201) that provides necessary adjustment of sensor position in an on-line measurement application.



YYL706201 Adjustable XZ Mount

The CAD image above provides dimensional information for mounting of Lasercheck sensor over a cylindrical surface. **IMPORTANT:** the position of the measurement sensor relative to the surface is an approximate value. All mounting designs must incorporate fine positioning adjustment of the Lasercheck sensor in the X and Z axis to set correct alignment using Lasercheck software aids.

**Existing mounting holes on Lasercheck sensor.**

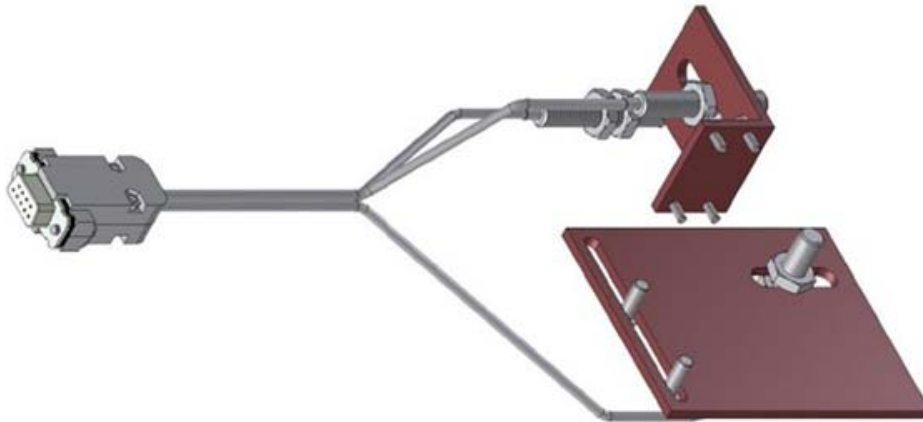


YYL006212 Sensor Dimensioned

## Appendix B

### INPUT/OUTPUT connector

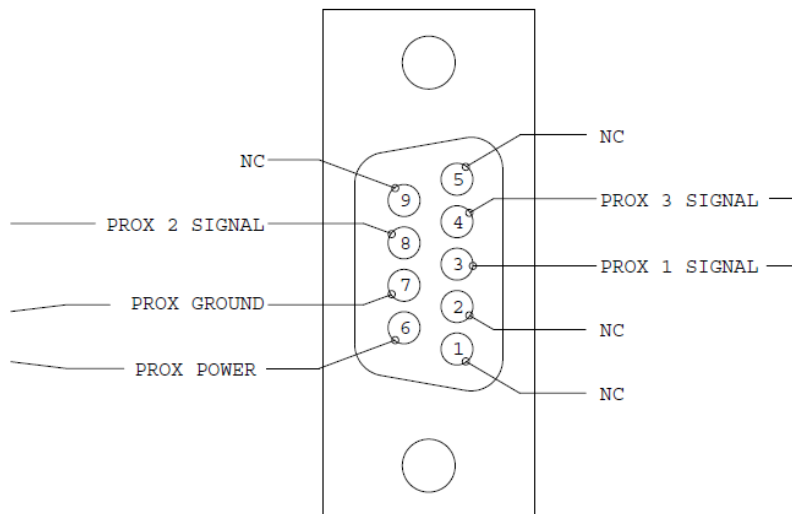
The model YYL706202 Input Triggering Sensors provide convenient and easy adjustment and setting of proximity sensor input trigger position.



YYL706202 Input Triggering Sensors

Input triggers should be wired to the “INPUT/OUTPUT” connector on the Electronic Interconnect Box as described in the image below. Power for proximity sensor inputs and other powered devices can be obtained from Pin 6 of the DB9 connector. “PROX 1 SIGNAL” is the start input trigger.

By closing contact between Pin 3 (Proxy 1 Signal) and Pin 7 (Proxy Ground) measurements are initiated if software Main Setup Screen has been configured for external start input.



Electronic Interconnect Box Input Pin Map