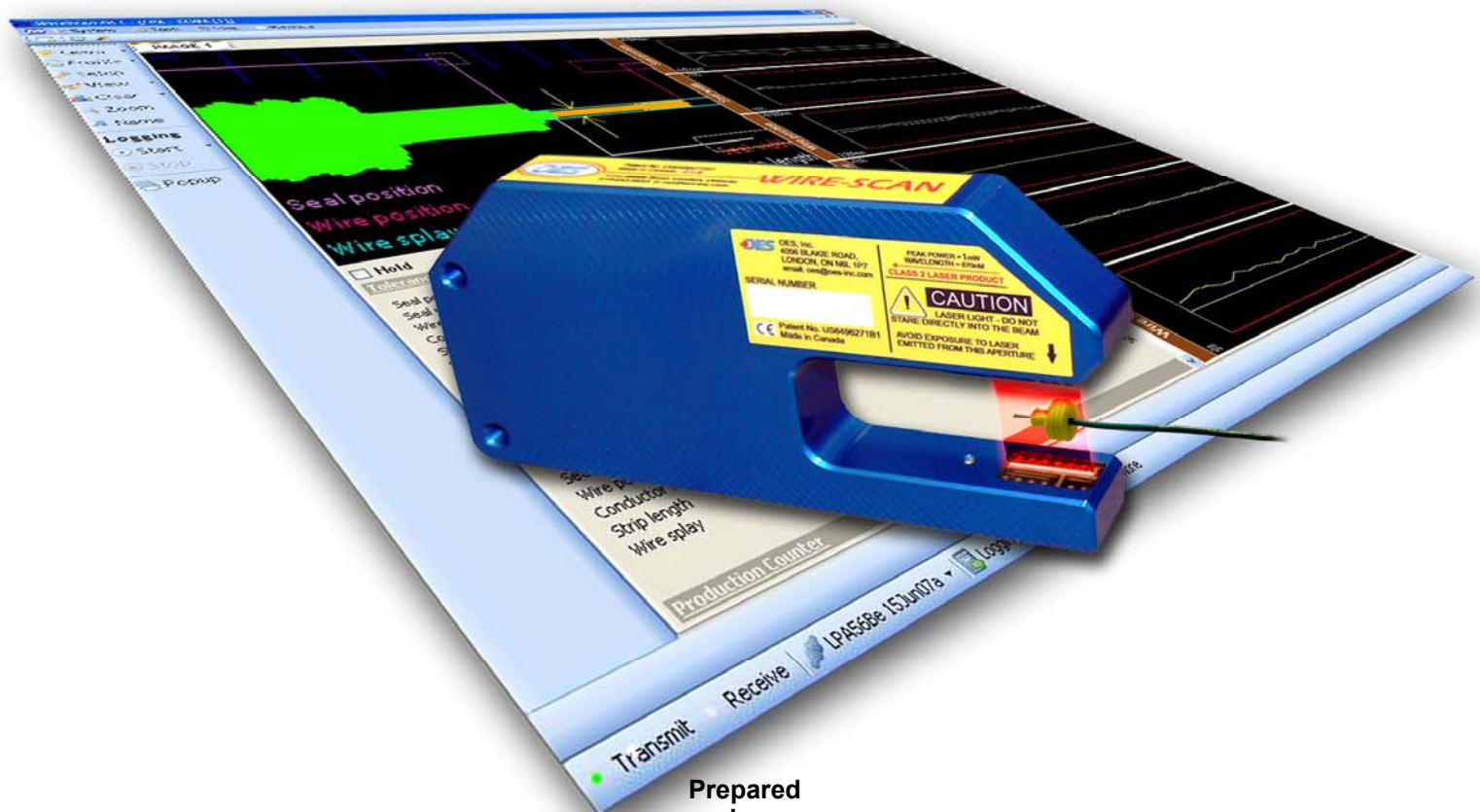


Laser Profile Analyzer and WireScan.NET™ Manual

Model LPA56B™
Release 3.1



Prepared
by
OES, Inc.



ISO 9001 2000
FM 64157



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Purpose & Function

The **LPA56B™** is a Sensor Head containing an image processor controller; which is connected by an electrical interface cable to an automatic wire processing machine. The Sensor Head is mounted on the machine so that the prepared wire end passes through the 16mm sensing window. The **LPA56B** analyzes the wire end image inspecting for defects such as:

- Strip length
- Wire Position
- Conductor Diameter
- Pulled Strands
- Excessive wire splay
- Seal position
- Seal presence
- Seal orientation
- Pierced or skewed seal

The Sensor Head is compact and robust in design, and completely self contained to simplify installation and maintenance. The high resolution image receiver of the **LPA56B** can process images and make pass/fail decisions very quickly to minimize the possibility of reduced machine production rates, typical of other inspection systems.

The key features of this product are its unique and innovative method to capture profile images and discriminate between good and bad wire samples in high speed wire processing applications.



How It Works

The **LPA56B** consists of a laser line-generator that projects a parallel beam onto the line array receiver. This 16mm parallel beam between the laser and receiver is the “sensing window”. As the wire end passes through this sensing window, it interrupts the beam at each of the pixels which compile a profile. This profile is then captured to generate a high resolution digital image. The data processing is initiated following the exit of the wire end through the sensing window. The processor normalizes the profile image for sizing and display, and the internal algorithms determine the strip and/or seal quality by comparing the captured image to a previously learned wire end; which acts as a reference for determination of a “good” or “bad” part. The **LPA56B** communicates the Pass/Fail decision to the machine through two configurable outputs, making the system a fully integrated solution.

The inspection algorithms for wire strip inspection includes strip length, conductor diameter, wire splay, and/or wire position. The inspection algorithms for seal inspection include: seal presence, seal orientation, skewed/pierced seal and/or seal position.

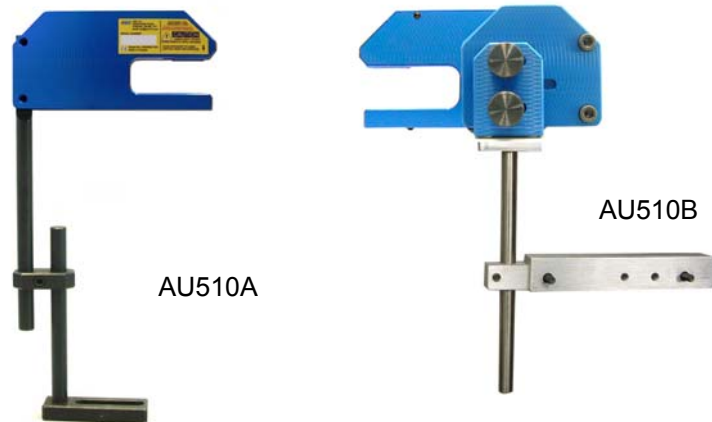
Once installed, the sensor head does not require further adjustment for changeover to different processes. The **LPA56B** has a “Learn” feature that will relearn/reconfigure a new reference for the current process. A profile option allows the user to pre-configure sets of tolerances per part or type of part, according to their quality requirements, which helps to facilitate the changeover process.

The WireScan.NET™ software enables the user to optionally view each image captured by the **LPA56B** to verify operation, and is a simple and useful tool for configuration and setup of the tolerances. The **LPA56B** is a stand alone unit, but the companion software provides a very good tool for monitoring and data collection, and it is required for making configuration changes.

Installation

Sensor Head Mounting

The first step is to determine the optimum mounting location for the Sensor Head according to the machine. OES offers several machine specific mounting brackets to ease the installation (Contact OES Inc or an authorized rep for further information).



Some considerations for selecting the mounting location of the **LPA56B** are as follows:

- The wire end must pass through the sensing window according to the inspection requirement mode enabled. See “Requirement Inspection mode” section of the manual.
- Presentation speed is not critical from one cycle to the next, however vibration or deflection of the part as it passes through the sensing window can cause inconsistent results.
- Ensure that foreign material is not introduced into the sensing window as the wire passes through the sensing window (i.e. insulation slugs, etc.)
- Machine timing – the Sensor Head should be mounted at a location that ensures the inspection will occur early enough in the process for the **LPA56B** to provide an output to handle defects (i.e. prior to processing the wire to next station).
- Mount the Sensor Head on a bracket fixed to the machine and ensure minimum vibration. The Sensor Head should be mounted so the wire passes through the center of the inspection window to minimize the possibility that the wire will strike the sensor head.



Ensure the sensor cable has sufficient loop at the sensor end to avoid stress or unnecessary wear during machine setup or movement. Also ensure that the cable is not in the way of any moving parts.

After the **LPA56B** has been mounted, small adjustments may be needed so the wire presentation within the window matches the Inspection mode requirements. This step will be further explained in the “Setup Tool” and “Inspection Requirement mode” section of the manual.



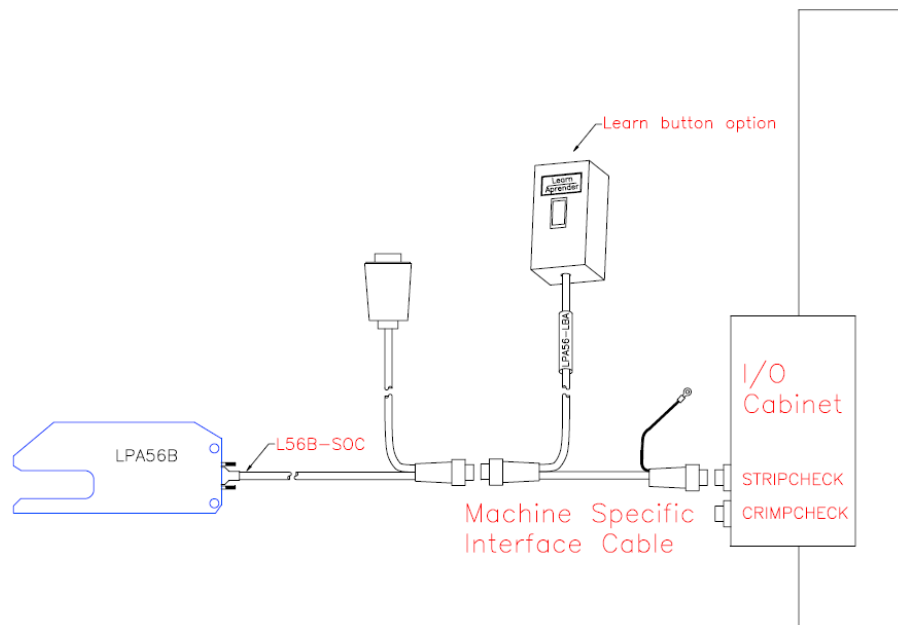
Before running the machine, always ensure the swing or conveyor arm does not hit the Sensor Head by manually moving the arm through it's trajectory without air being applied to the machine.

Electrical Interface

There are different methods and options available for electrical interface of the sensor; the **LPA56B** comes with a standard interface cable (L56B-SIC) with flying leads for interfacing flexibility. OES also offers several machine specific interface cables to ease the installation (Contact OES Inc or an authorized Rep. for further information).

It is recommended to make all connections and complete the setup without enabling the inspection option on the wire processing machine, until the installation and configuration has been successfully completed and tested.

The following illustration shows a typical connection of the **LPA56B** sensor directly to the machine:



Use *Real Time Mode* for applications where the interface connections are not predefined and/or to troubleshoot connections. Refer to *Real Time Mode* section of the manual.



The **LPA56B** requires a 24VDC power source. Do not use any other type/range of power to energize or interface with the Sensor Head. Refer to the "Electrical specification" section of the manual.

WireScan.NET™

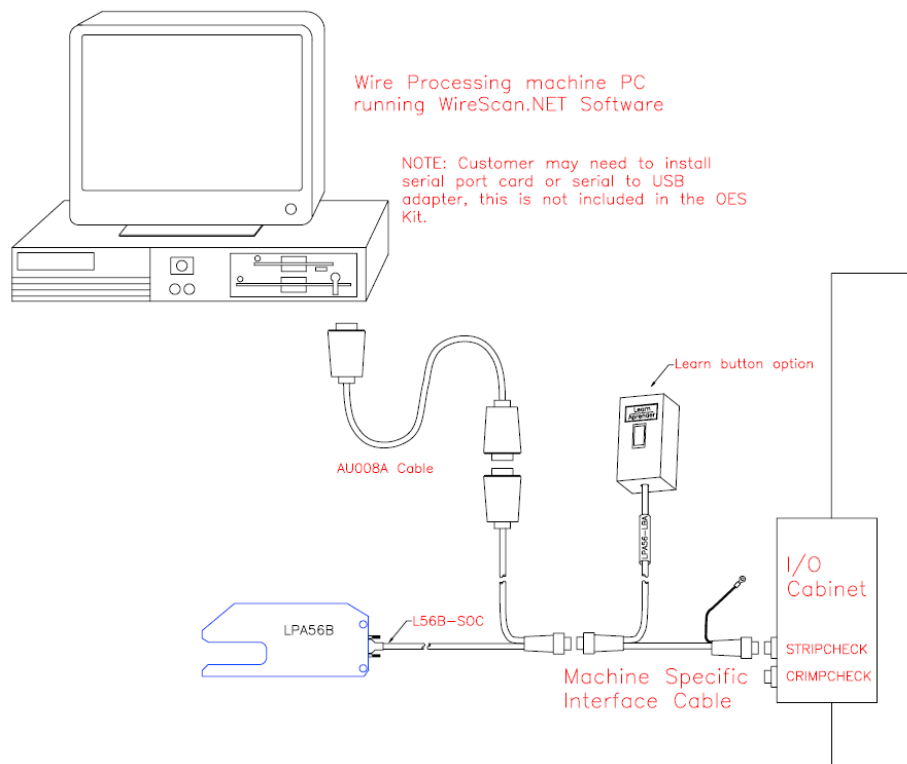
WireScan.NET is the companion software package designed for use in conjunction with the **LPA56B**. The software is indispensable for configuring the monitor, and very useful for viewing the process, monitoring results in greater detail and logging production data for later analysis. WireScan.NET Application Software and manual are provided on a CD. Install the CD and follow the installation prompts.

By default the software will install under:
C:\Program Files\OES, Inc\WireScan.NET

After the software has been successfully installed, it will automatically load. It can also be manually opened by double clicking on the icon on the desktop.



Connect the **LPA56B** to the PC using the serial cable (Part # AU008A), as shown on the figure below, and energize the **unit**.



Installation Setup

Adding Devices

A device needs to be added per **LPA56B** connected. Each device will open a window inside WireScan.NET, so there is no need to run more than one WireScan.Net at the same time.

To add a device, click on the New Window icon, which will open a window with all its components.

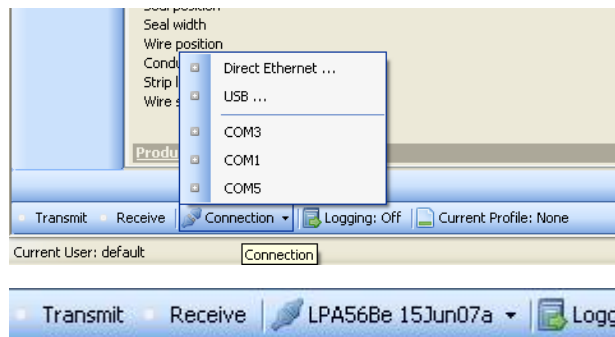


Connecting a Device

To establish communication between the **LPA56B** and WireScan.NET make sure it is already connected and powered up. Then click on the quick access tab shown on the status bar. See picture below.

A list of the ports on the PC will be displayed. Select the port where the Sensor Head is connected.

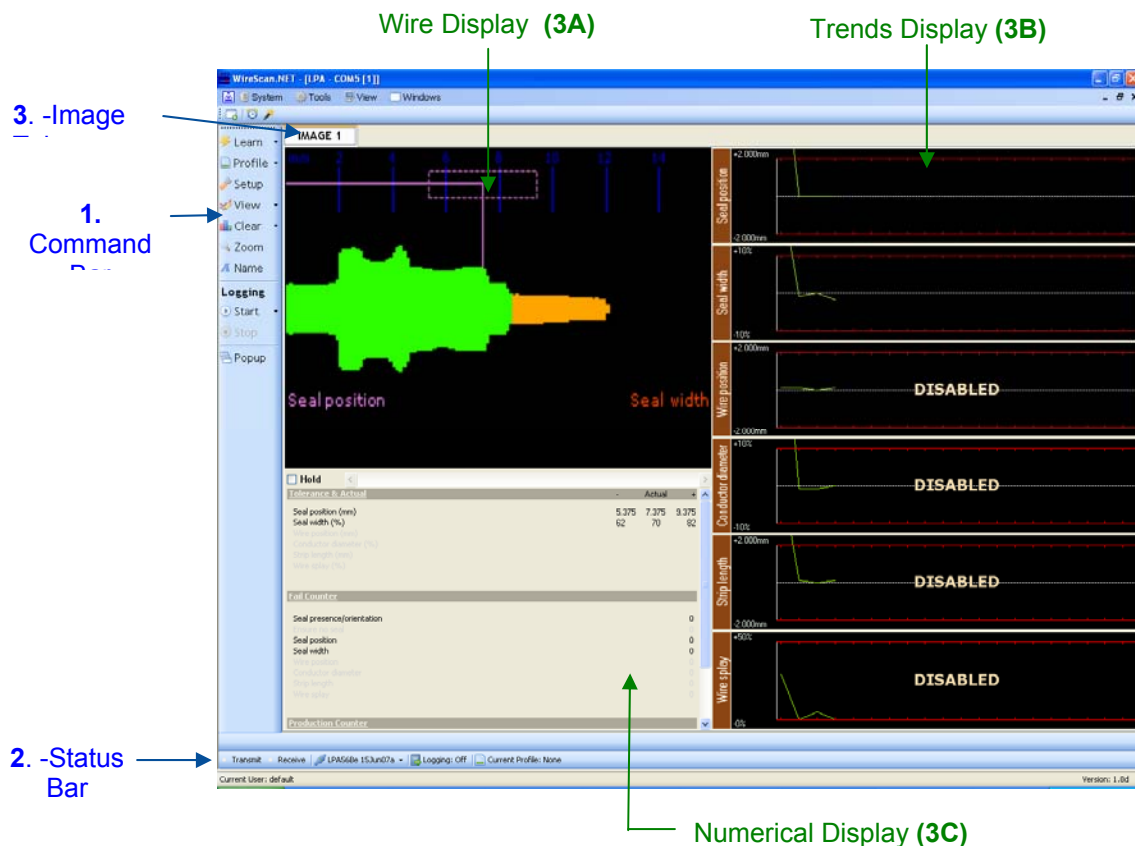
After the **LPA56B** has successfully connected, the *Connection bar* will display the firmware version the unit is currently running.



If using a USB to Serial adapter, ensure the adapter has already been installed and connected to the computer before running the software. Do not plug or unplug the adapter while the software is running. Unexpected errors may occur.

Window Components

A window includes three main areas: a Command Bar, Image Tab and Status Bar.



1. Command Bar

The Command Bar gives quick access to the most frequently used features. Each of these commands will be explained individually further on in this manual.

2. Status Bar

This bar shows the communication and current status of the **LPA56B**.

The *Transmit/Receive lights* work as an aid to quickly troubleshoot the communication flow between the PC and Sensor Head.

The *Connection bar* shows the available communication ports and/or the firmware version loaded on the connected Sensor Head.

Logging status will display an "Off" message when the software is not logging data. It will display the file path where a log file is being saved when logging data. Further information on the logging feature can be found in the "Logging" section of this manual.

The *current profile* will display the profile name that the unit is currently using when the **LPA56B** is running a predetermined configuration profile. The Profiler feature will be explained in the "Profiles" section of this manual.

3. Image Tab

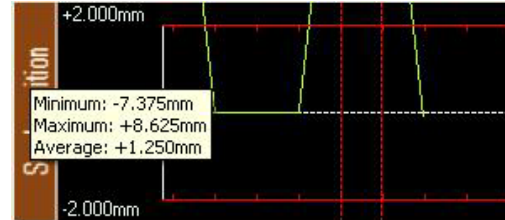
The Image Tab contains all the information captured by the Sensor Head. The data is organized in three areas: wire display, trends display and numerical data display.

The *wire display (3A)* shows the last image scanned by the **LPA56B** as well as a graphic display of the current measured value within its respective tolerance box. It also displays the name of each of the parameters currently being inspected, and when a fail occurs, the text of the parameter(s) that has failed will flash.

The *trends display (3B)* shows the behavior of each of the parameters being inspected through the production run. The overall production variation can be analyzed, could help to indicate maintenance problems/needs.

The red lines represent the upper and lower tolerances and the white dotted line represents the learned target. A vertical red dotted line appears when the measured value exceeds the tolerances (fail).

The minimum, maximum and average measurements are dynamically calculated during production. These values can help the user determine if the tolerances need to be increased or decreased. By hovering the cursor over each trend name, this information can be viewed temporarily.



The *numerical display (3C)* consists of three sections: the tolerance and actual, fail counter, and production counter.

The *Tolerance and actual* contain the measured values of the actual image and the tolerance data calculated over the target value. When a fail occurs, the inspection parameter(s) that generated the fail will be highlighted in red.

The *Fail Counter* maintains a running count of the various failure modes. This helps to sort the various defect types for maintenance and quality control.

The *Production counter* is a running counter of the total of parts, good parts and failed parts passed through the **LPA56B**. It also calculates the *Scrap rate* as the percentage of failed parts over the total parts produced.

Setup Tool

Setup mode is a useful tool to do the final adjustments to the Sensor Head location; previously mentioned at the "Sensor Head mounting" in the manual.

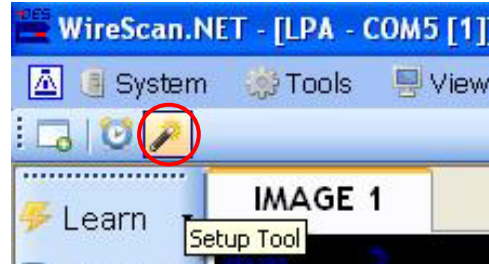
To enter setup mode, use either a discrete input or the software.

A discrete input is used when a PC is not available, this option will be explained at the "Input Settings" section of the manual.

To enter setup mode using the software; click on the Setup Tool icon shown on this image.

When the **LPA56B** is in setup mode, the yellow LED on the Sensor Head will flash with one short pulse followed by one long pulse.

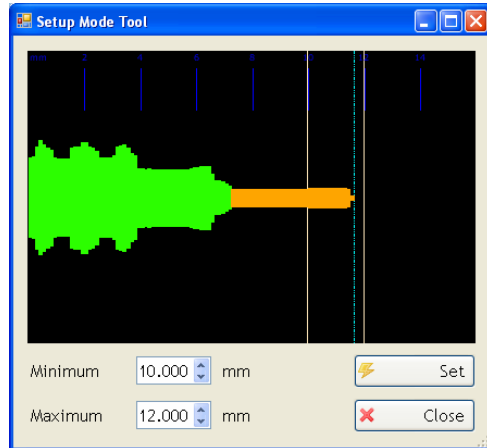
The **LPA56B** will capture every image and display it but will not analyze them, so the outputs will remain at the normal state.



The Setup Mode Tool window will open and display the image and two limits, the minimum and maximum position. These two values can be set, and will allow for repetitive and consistent setup within several installations.

The minimum and maximum limits are shown as two vertical yellow lines.

The green LED on the Sensor Head will turn on and a green image will be displayed when the end of the wire is within the minimum and maximum limits, otherwise the red LED will flash on and the image will be red.



The required minimum and maximum limits depend on the Inspection requirement mode used. See "Inspection Requirement Mode". By default the values are set to 10 and 12 mm respectively.

Real Time Mode

The Real Time feature helps the user find the appropriate connections while installing the **LPA56B** or troubleshooting them.

To enter Real Time mode using the software; click on the Real Time Tool icon shown on this image.



When the **LPA56B** is in Real Time mode, it will not analyze any image or activate the outputs, but it will display the status of both inputs (Input 1 - white and Input 2 - yellow) and CCD (CCD pulse - orange).

The *Trigger mode* indicates when the software will start collecting data.

Immediate, will start collecting data after clicking start.



Input 1, *Input 2* and *CCD Pulse*, will start collecting data after receiving a signal from the physical input 1, 2 or an image comes in respectively.

Duration refers to the length of time that data will be collected after the trigger.

Descriptions and comments can be saved when logging data in real time mode; just add text in the respective location.

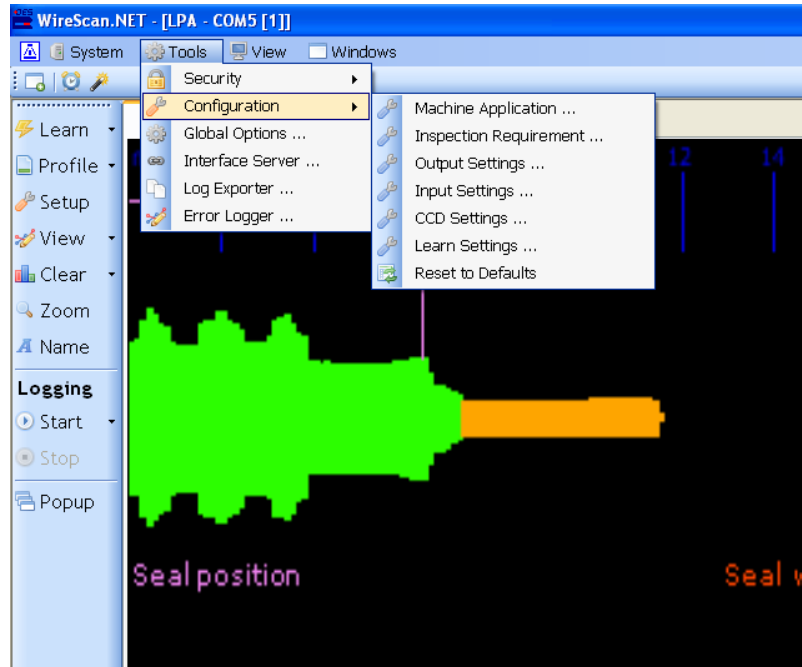
Click Start and Stop to initiate or interrupt the data collection.

To zoom in data, drag and hold with the mouse highlighting the area to magnify.

To zoom out data, right click the mouse and click on Show All.

Configuration

The **LPA56B** configuration can be found on the main menu, under Tools / Configuration.

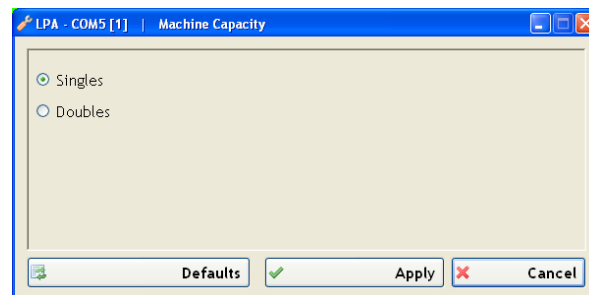


Machine Application

The machine application or capacity refers to the number of wires the machine can produce on one swing or movement.

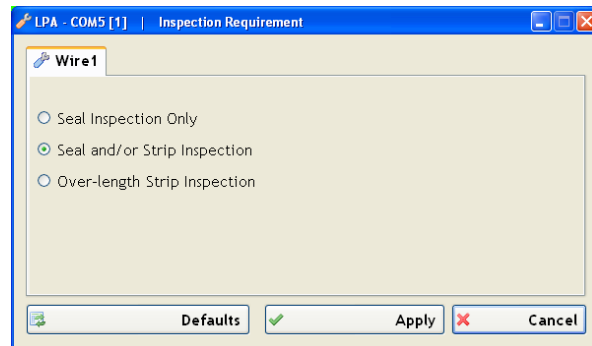
Singles refers to one wire end per machine swing/movement and *Doubles* refers to two wire ends produced per machine swing/movement.

The double mode capability for the **LPA56B** is an option. Contact OES Inc or an authorized rep. for more information.



Inspection Requirement

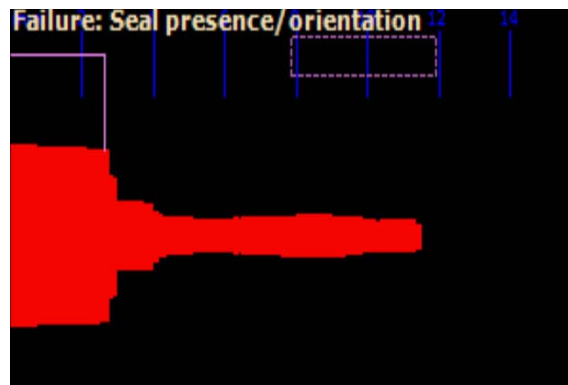
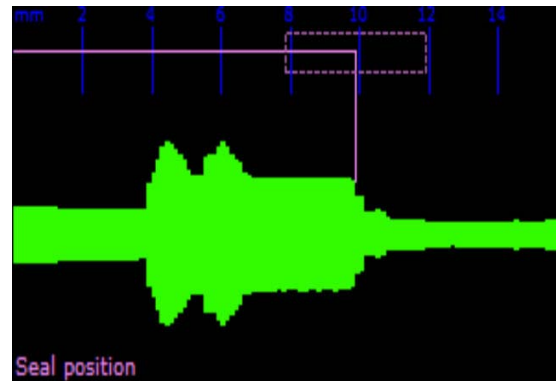
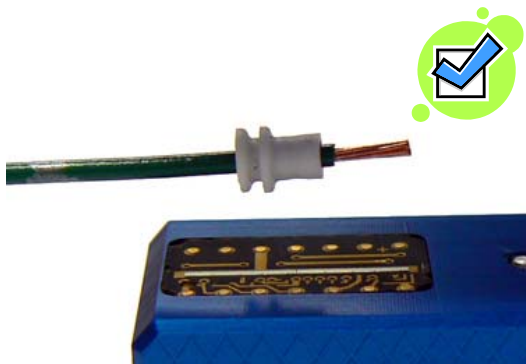
There are three types of Inspection Requirements: Seal Inspection Only, Seal and/or Strip Inspection and Over-length Strip Inspection.



Seal Inspection Only

This mode is for applications where just the seal needs to be inspected and the strip can be ignored. The parameters that can be inspected in this mode are: Seal presence, orientation, position, and skewed seal.

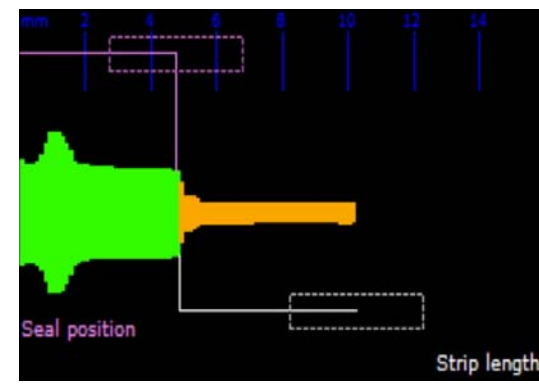
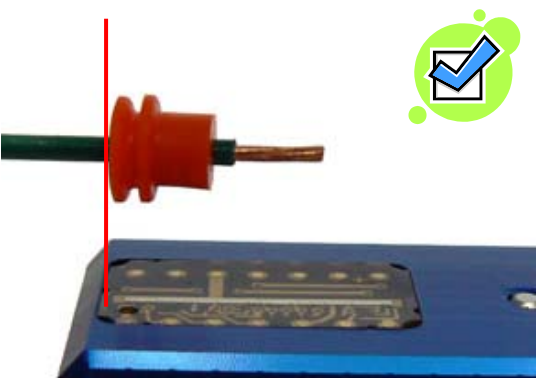
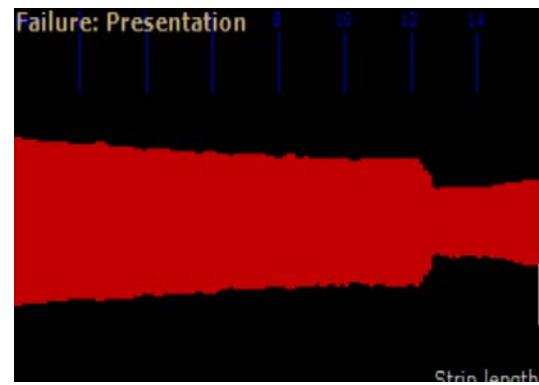
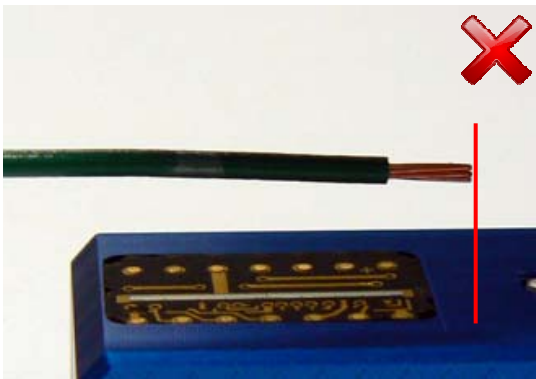
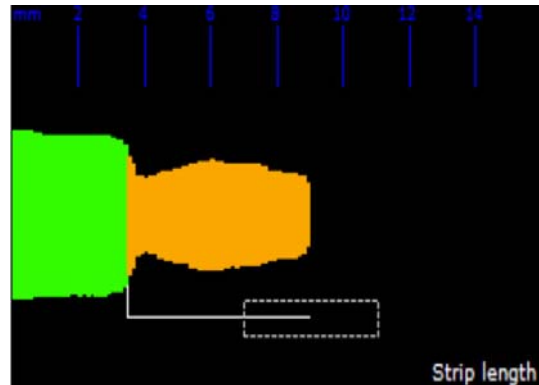
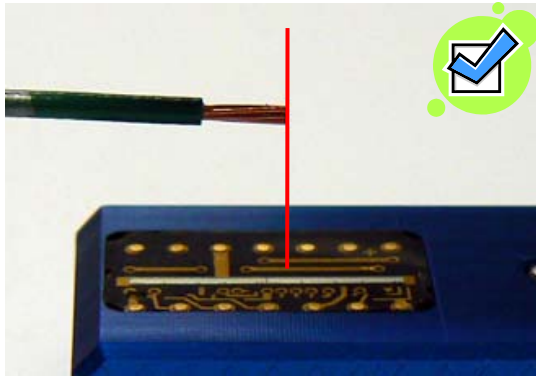
In this mode, the end of the wire can extend beyond the end of the Sensor Head line array. The wire should be placed so the seal is in the middle of the inspection window. See pictures below.

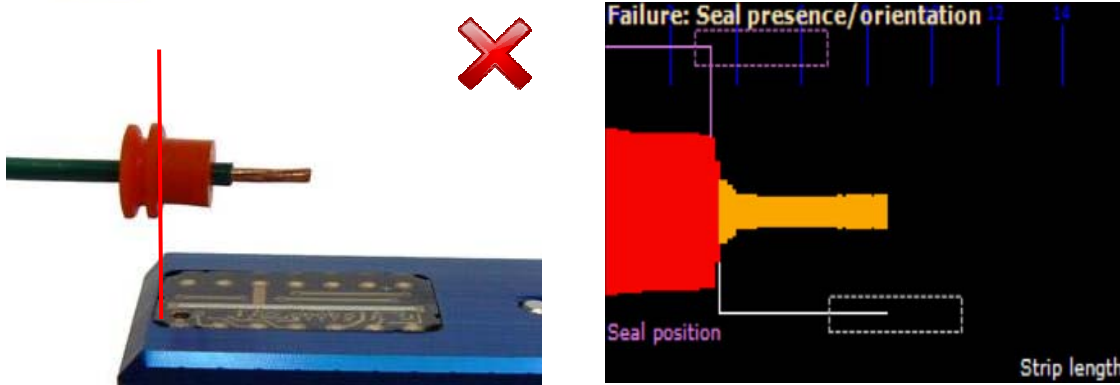


Seal and/or Strip Inspection

This mode is for applications where just the seal, just the strip, or both the strip and seal need to be inspected. All parameters can be inspected in this mode (Seal presence, orientation, position, skewed seal, strip length, wire position, conductor diameter and/or wire splay)

Using this mode the end of the wire must not extend beyond the end of the sensor head line. If the wire has a seal, at least one rib of the seal needs to be inside the inspection window, several ribs inside the window is better. When the Wire end is outside of the window a *Presentation failure* occurs.



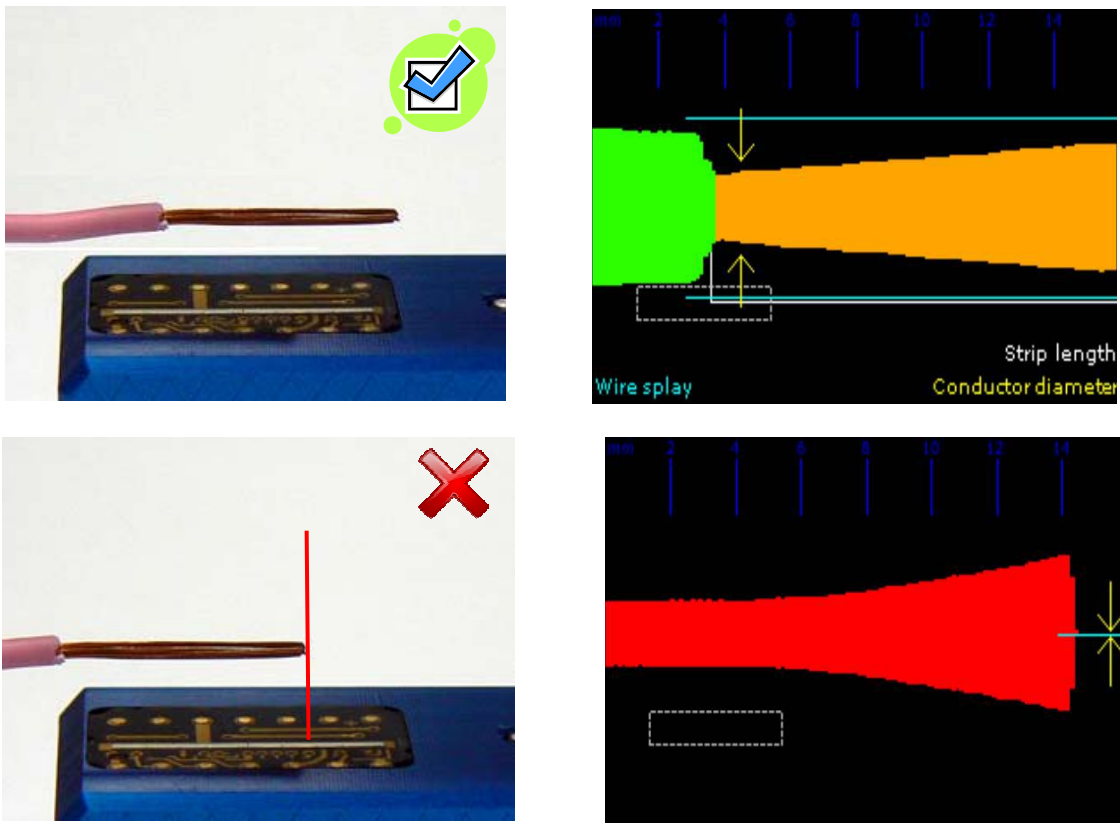


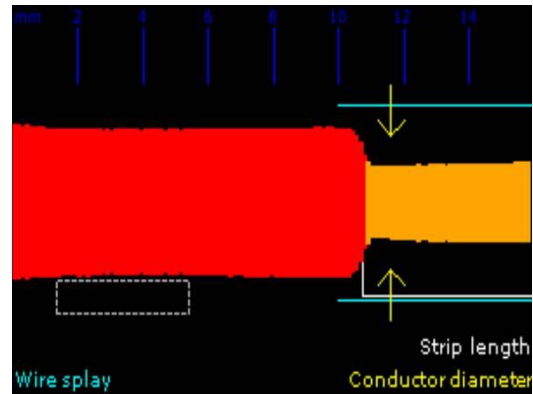
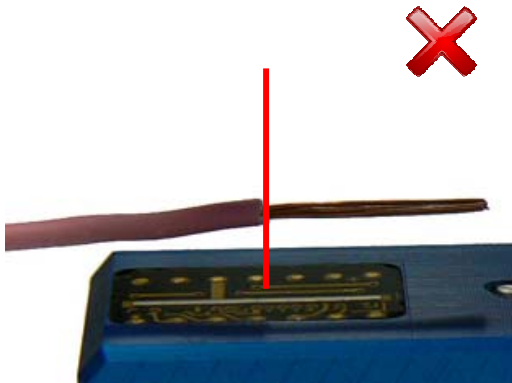
Over length Strip Inspection

This mode is for applications where a long strip (higher than 12mm) needs to be inspected and there is no seal applied.

The parameters that can be inspected in this mode are: Conductor diameter, Strip length and Wire Splay.

In this mode the end of the wire must extend beyond the end of the Sensor Head line array. The wire should be placed so the insulation shoulder is always visible. See the pictures below.





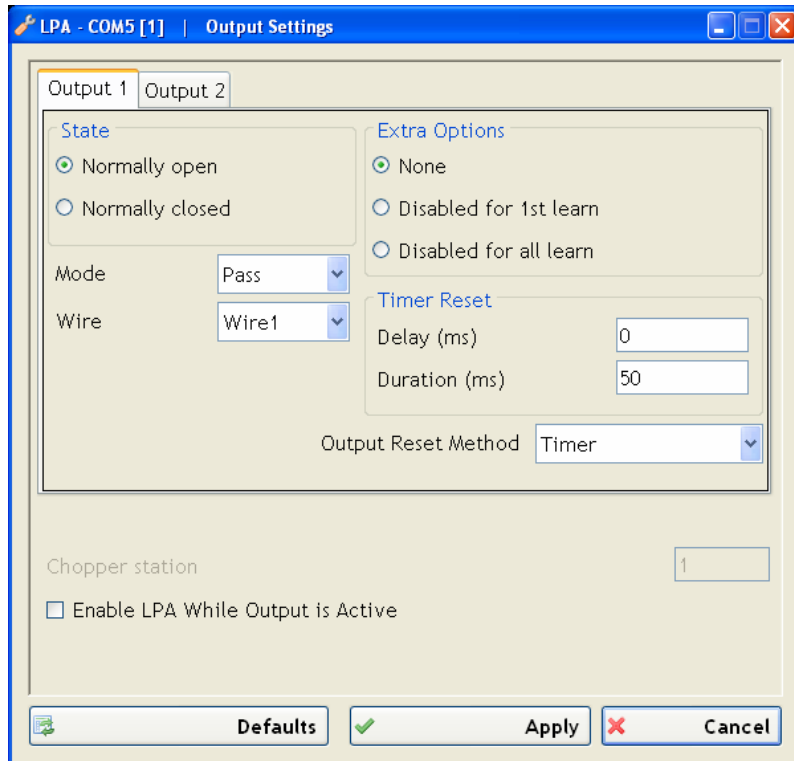
Output Settings

The **LPA56B** has two fully configurable outputs to provide integration flexibility with all machine types.

Each output can have the State, Mode, Wire, Reset method, and Extra Options configured.

State, defines the output state when not activated. It can be Normally Open or Normally closed.

Mode, the relay can be activated after an inspection passes, fails or scans a part. A chopper function has also been integrated so the **LPA56B** can trigger the chopper when a failed part has reached the chopper station.



Chopper Station, this option is only enabled when an output has been configured in chopper mode. This refers to the number of stations the wire has to go through before it reaches the chopper.

Wire, when the **LPA56B** is in Doubles mode, wire 1 and wire 2 refer to the first and second wire scanned respectively. The relay can be activated according to wire #1's decision, wire #2's or both.



Extra options, There are three predetermined extra options: None, Disabled for 1st learn, and Disabled for all learn.

None: when the **LPA56B** is in learn mode the system will pass every learn piece unless a major failure occurs. Major failures are considered to be:

- When inspecting for seal: a part without a seal present or a seal on backwards.
- When on strip and/or seal mode: a presentation failure occurs.

Disable for 1st learn, when the **LPA56B** is in learn mode, the unit will not activate the outputs after the first part in learn mode. Every other part in learn mode will be inspected against a running target from the learn pieces.

Disable for all learn, this option means the **LPA56B** will not activate the outputs during learn mode, the outputs will work as in production mode.

Reset method, Currently there is only one reset method; reset by timer. The outputs will reset after the configured Delay and Duration have been reached.

Delay; refers to a time added after the part has been inspected before it activates the output.

Duration; is the amount of time the output will remain active after a part has been inspected.

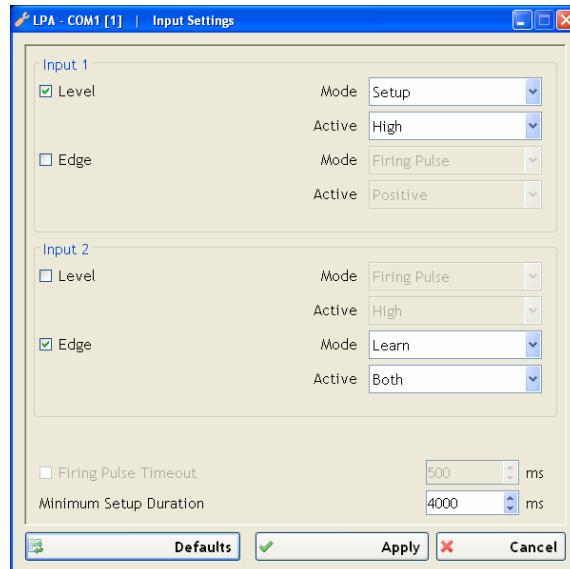
Enable LPA while output is active, when this option is not checked the **LPA56B** will ignore every part run through the unit while any output is active. This option allows the system to ignore the swing back on applications where a firing pulse is not available.

Input Settings

The **LPA56B** has two configurable inputs (Input 1 and Input 2). Each can be assigned to three different functions: Learn, Firing Pulse or Setup.

Learn - This input will allow the user to set the **LPA56B** into learn mode without the need of a PC or PDA. The input can be wired to a push button so the operator can manually enter learn mode or it can be wired to a machine output so the machine can control when the unit is put into learn mode.

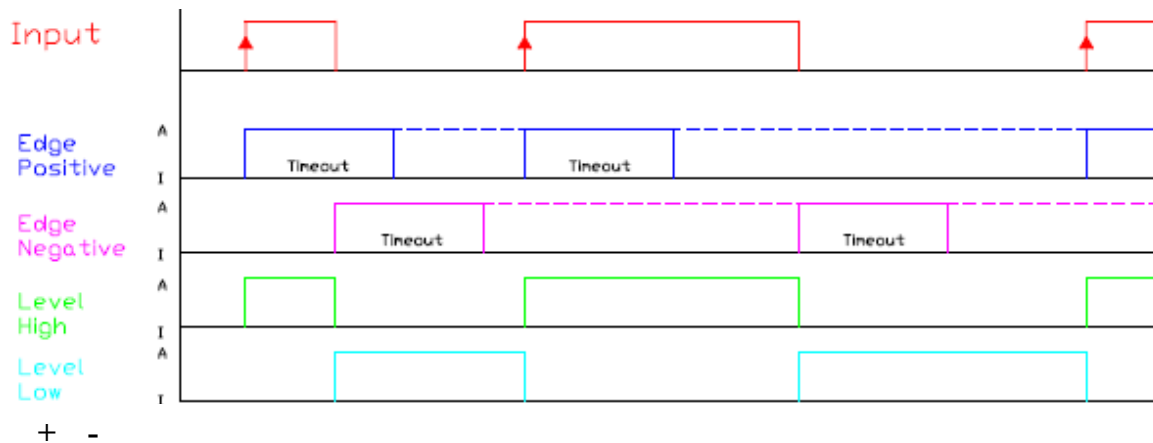
Firing Pulse – This input is an option to enable the inspection only following an input signal or inspection pulse. The **LPA56B** will remain enabled until it captures an image unless the “Firing Pulse Timeout” is enabled. In this case the **LPA56B** will remain enabled until it captures an image or the timeout is reached, which ever comes first. The Firing Pulse Timeout is set to 500 ms by default.



This method is typically used to enable the inspection prior to the presentation of wire to be inspected and not during the “swing-back”.

Setup input – This mode can only be configured as level sensitive and the level must be held for a predetermined duration of “Minimum Setup Duration”, which is set to 4 seconds by default. This input will put the **LPA56B** into Setup Tool mode without the need of a computer. While in this mode the **LPA56B** will capture every image but will not analyze it. This mode is typically used during installation to ensure the Sensor Head is in the right position before running the machine. (Refer to *Setup tool*)

Each input can be configured to be sensitive on Edge (active positive or negative) or Level (active high or low) as shown below.



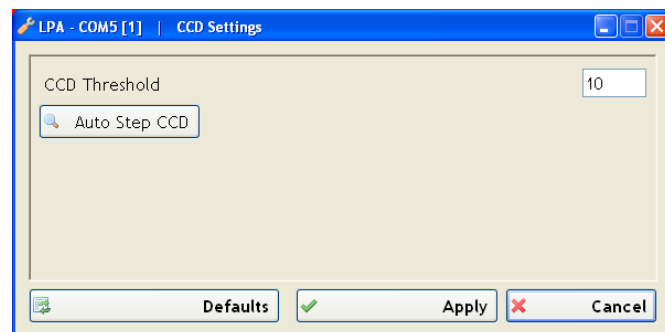
The dotted lines represent the behavior of the input set on active mode without “Firing Pulse Timeout” enabled.

CCD Settings

CCD Threshold

The *CCD threshold* sets the sensitivity of the receiver. The default setting is 10.

A larger value will increase the sensitivity; conversely a smaller number will decrease the sensitivity.



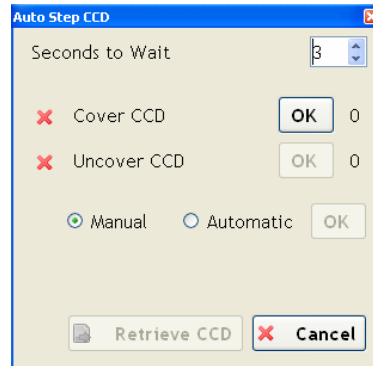
Auto Step CCD

This method calculates the appropriate CCD threshold for a given **LPA56B** by calculating the lowest usable threshold with just ambient light (Cover CCD step) and the highest possible thresholds when the unit has ambient light and the laser on.

This method compensates for the effect of ambient light and does not saturate the CCD.

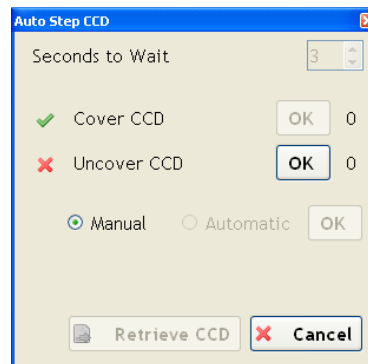
Instructions

1. Click on Auto Step CCD.
2. Cover the laser beam as shown on the picture and click on "Cover CCD OK" while still covering.



NOTE: Uncovering the CCD during this step might make the calculation fail. An error message will come up and the Auto Step should be canceled and restarted from step 1.

3. When "Uncover CCD OK" becomes enabled, remove the laser beam obstacle and click OK



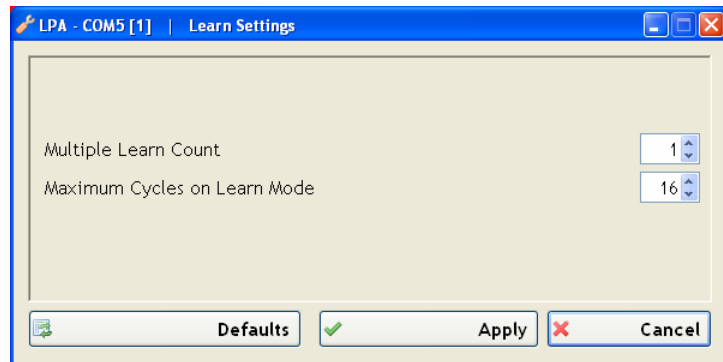
NOTE: Covering the CCD during this step might make the calculation fail. An error message will come up and the Auto Step should be canceled and restarted from step 1.

4. The "Retrieve CCD" button will automatically enable after the **LPA56B** is done calculating the CCD Threshold. Click on Retrieve and the CCD Threshold value will be saved and displayed on the screen.

Learn Settings

The **LPA56B** can learn from one up to 16 samples to calculate the target. The number of desired parts to learn is called the *Multiple Learn Count*.

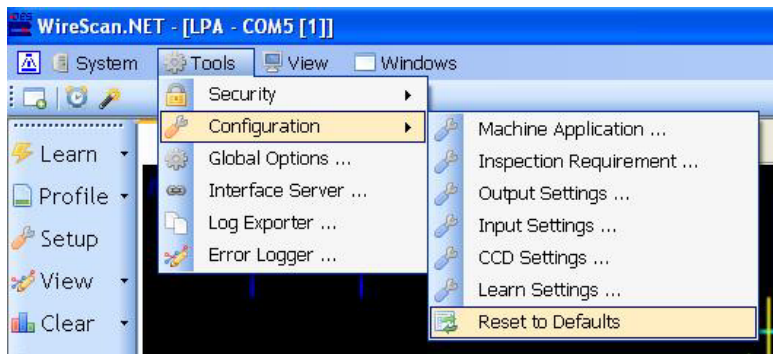
The maximum number of samples the **LPA56B** will allow the machine to run in order to learn is called *Maximum Cycles on Learn Mode*. If the maximum cycles are reached and the system has not successfully learned, an error message will prompt the user.



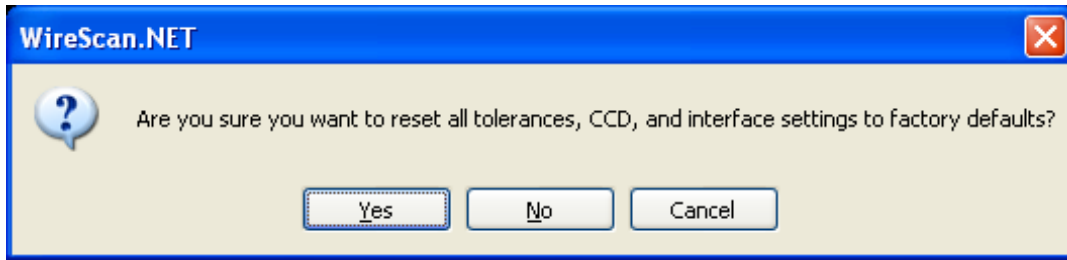
Reset to Defaults

Click on this option to reset all the *Configuration* and *Setup* parameters to their default value.

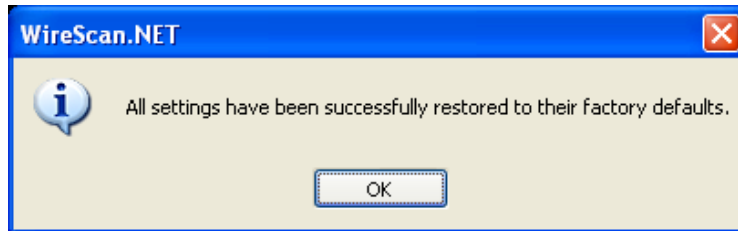
This step is always required on new units or after loading a new firmware version with AutoGen.



The software will prompt you to confirm you want to load all default values and then click OK.



A confirmation message will come after all values have been loaded.



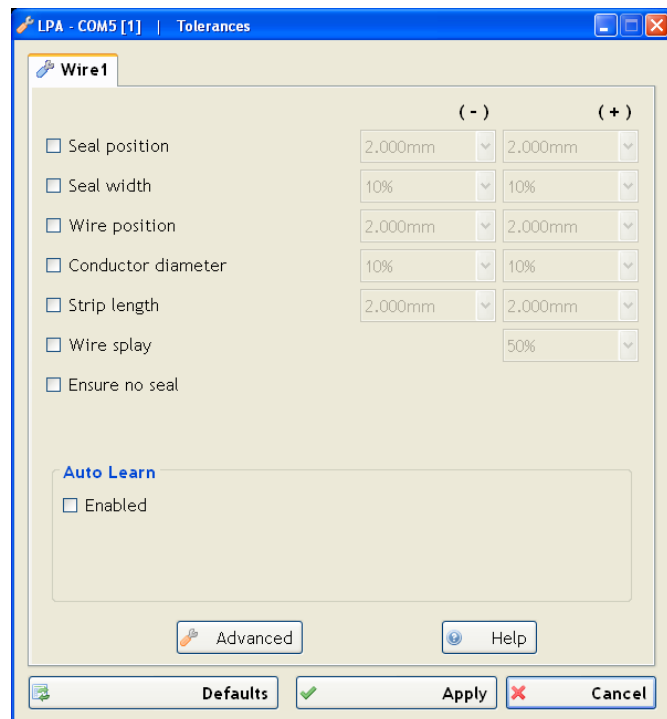
Avoid running parts through the **LPA56B** while reading or writing any configuration parameter. Doing so may result in data loss.

Setup

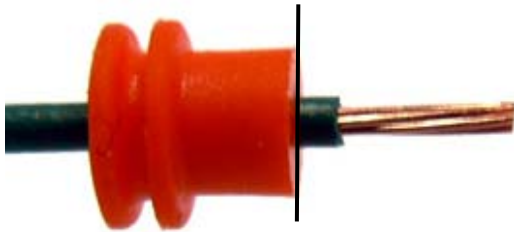
The setup window is where the inspection parameters are enabled/disabled, according to the quality requirement and part components.

This window will automatically block the inspection parameters that are not applicable depending on the inspection requirement selected.

By default all inspection parameters are disabled so every part scanned by the **LPA56B** will be considered a pass.

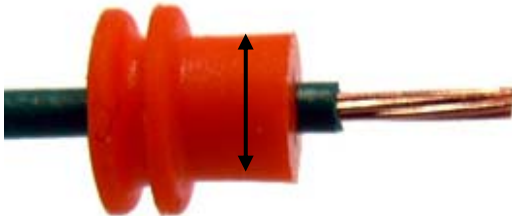


Seal Position



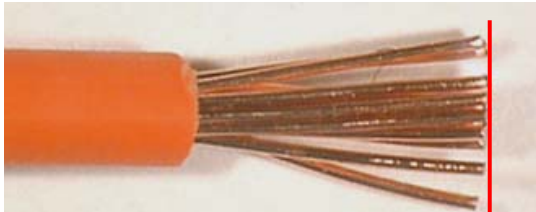
The Seal Position is controlled within the +/- tolerances entered (in millimeters) from the reference position determined in the learn mode. The reference point of the seal position is the leading edge of the seal shoulder.

Seal Width



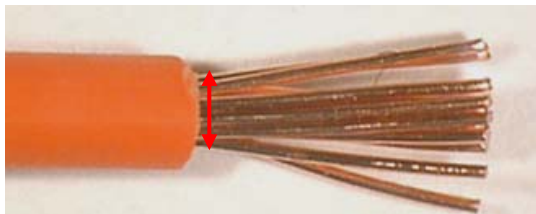
The seal width is controlled within the +/- value entered (%). The reference % is determined in the learn mode. The seal width is calculated as a percentage of the overall maximum diameter being 100%. The +/- tolerance provides some level of control of pierced seals and/or seal variation at the front end

Wire Position



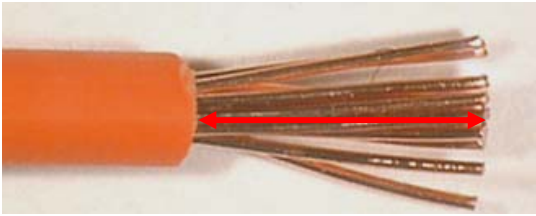
The Wire Position is controlled within the +/- tolerances entered (in millimeters) from the reference position determined in the learn mode. The reference point is the end of the wire

Conductor Diameter



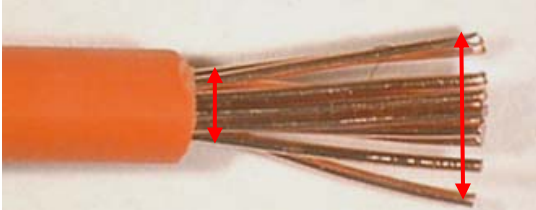
The Conductor Diameter is controlled within the +/- value entered (%). The reference % is determined in the learn mode. The conductor diameter is calculated as the normalized measurement of the conductor diameter next to the insulation. The +/- tolerance provides some level of control of multiple missing strands.

Strip Length



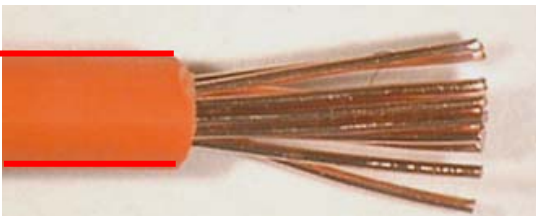
The Strip Length is controlled within the +/- tolerances entered (in millimeters) from the reference position determined in the learn mode. The reference point is the end of the wire.

Wire Splay



Wire Splay is controlled within the maximum (+) value entered in %. The reference % is the insulation diameter. The splay sampled at the end of the wire is calculated as a percent of the insulation diameter.

Ensure no Seal



Ensure no Seal is enabled if the machine is processing stripped wire only and no seal is applied. The **LPA56B** will fail any wire inspections with seal present or excessive insulation deformation.

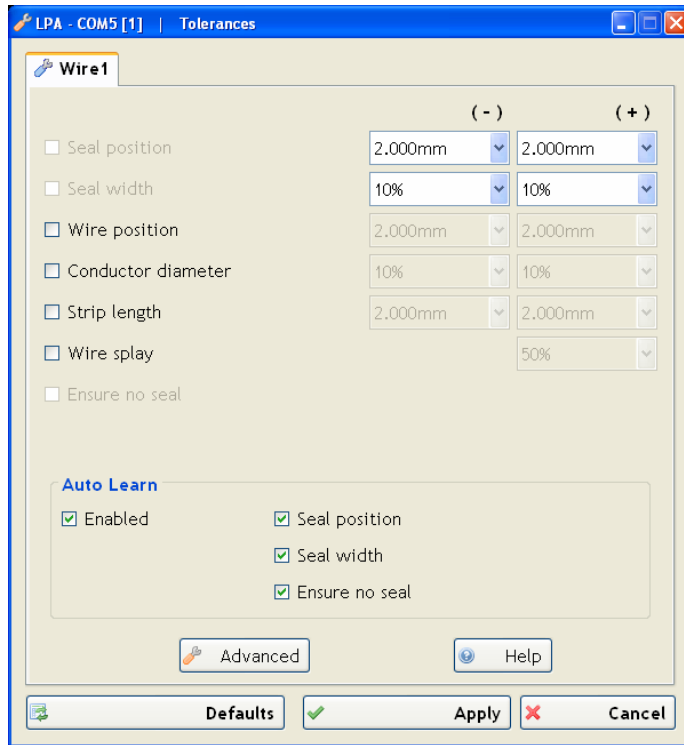
Auto Learn

When Auto Learn mode is enabled, it is possible to automatically enable Seal Position, Seal Width and ensure no seal, depending on the presence or absence of a seal on the learn part.

When the **LPA56B** is in Auto Learn mode, and learns a part with a seal on, it will automatically enable Seal Position and Seal Width if they are enabled on the Auto learn section, and disable Ensure No Seal. Otherwise it will disable Seal Position and Seal Width and enable Ensure No Seal, if it is enabled in the auto learn section.

For this mode to work correctly, the learn samples need to have a very stable presentation.

Run mode is not affected by this mode.



Wire1

(-) (+)

☐ Seal position 2.000mm 2.000mm

☐ Seal width 10% 10%

☐ Wire position 2.000mm 2.000mm

☐ Conductor diameter 10% 10%

☐ Strip length 2.000mm 2.000mm

☐ Wire splay 50%

☐ Ensure no seal

Auto Learn

☒ Enabled ☒ Seal position

☒ Seal width

☒ Ensure no seal

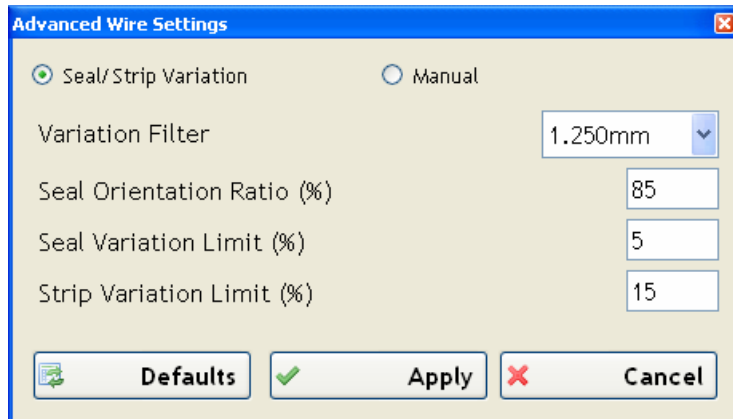
Advanced Help

Defaults Apply Cancel

Advanced

The Advanced wire settings contain information about the proportions/ratios of the wire-seal combination. These values allow the **LPA56B** to determine the presence of a seal and the position of the insulation shoulder and seal neck.

OES does not recommend changing the values in this screen. We have calculated the values which cover many wire and seal types. For special setup see Troubleshooting.



Advanced Wire Settings

☒ Seal/Strip Variation ☐ Manual

Variation Filter 1.250mm

Seal Orientation Ratio (%) 85

Seal Variation Limit (%) 5

Strip Variation Limit (%) 15

Defaults Apply Cancel

Run mode

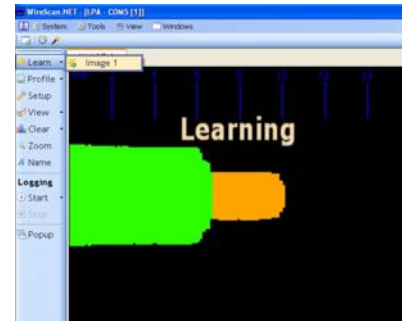
Learn

After a connection has been established and the configuration and setup have been set, put the **LPA56B** into learn mode.

There are three methods to send the **LPA56B** into learn mode:

Through software:

Click on Learn in the software command bar. To determine if the **LPA56B** is in learn mode, look for the learn text displayed over the software image.



Through hardware

Push the learn button (learn input) or activate the learn interface (if available). To determine if the **LPA56B** is in learn mode, check the Sensor Head LEDs, the yellow LED will be on solid.



Manually

Cover the CCD or obstruct the laser beam for approximately 4 seconds. Remove the obstruction when the **LPA56B** has acknowledged its learning mode by software (text message) or by hardware (yellow LED).

Run parts through the **LPA56B** and measure all inspected parameters on the sample part. Ensure the part is within the quality specification. Remember, this will be the reference for every production piece analysis.

Run several production pieces looking at the process variation on the trend graphs. Generate a failure and close the tolerances tight enough to capture all failures but not so tight that it generates false rejects on acceptable process variations. See pictures below.

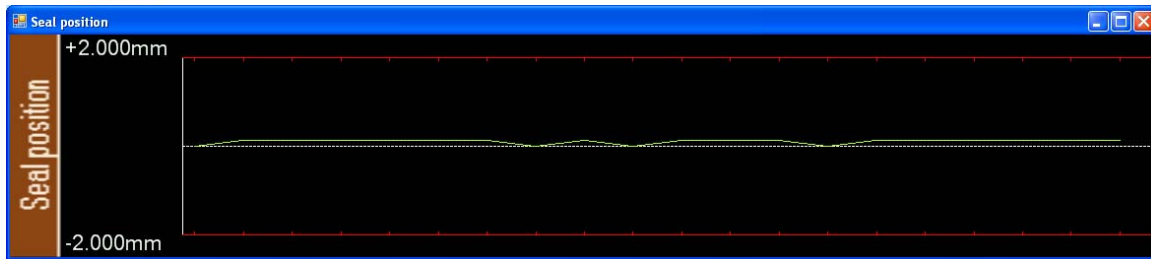


Figure 1. Production run of good pieces.

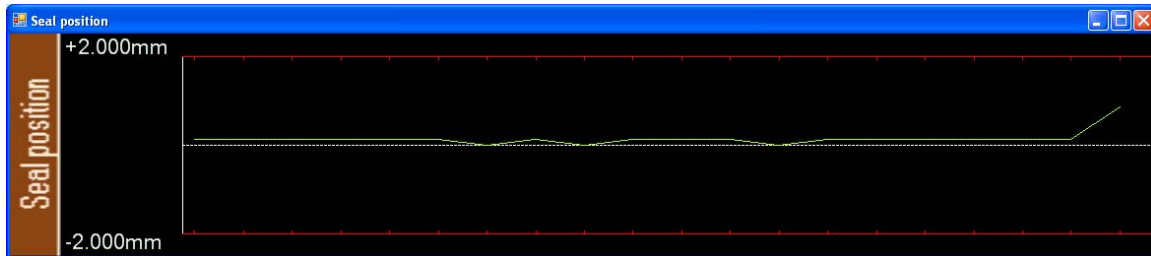


Figure 2. Generate a fail part

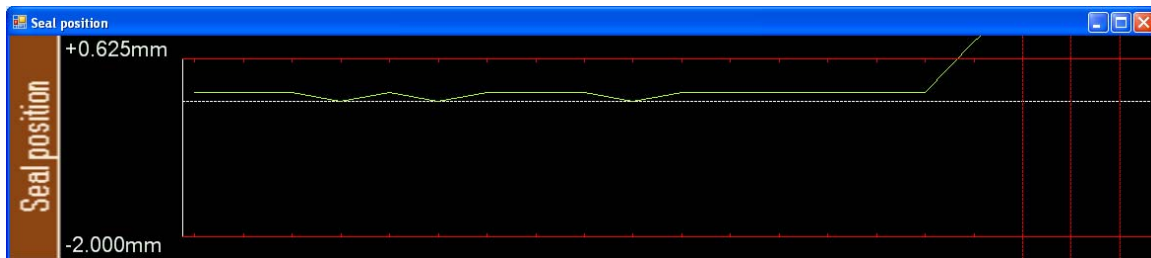


Figure 3. Close the tolerances to capture the defect.

A profile can be saved with these tolerances to ease future production runs. See the Profiler option for more information.

At this point ensure the interface is configured properly for the current machine by selecting the correct input and output settings from the configuration menu and proceed to enable the strip or seal inspection on the automatic machine.

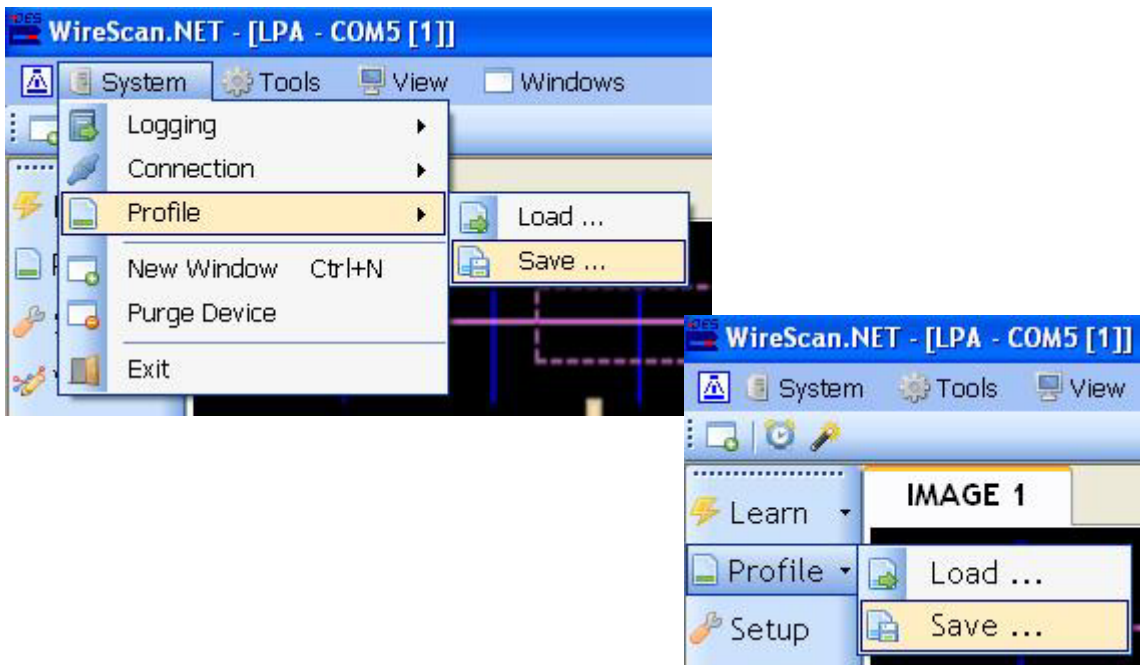
Software features

Profiles

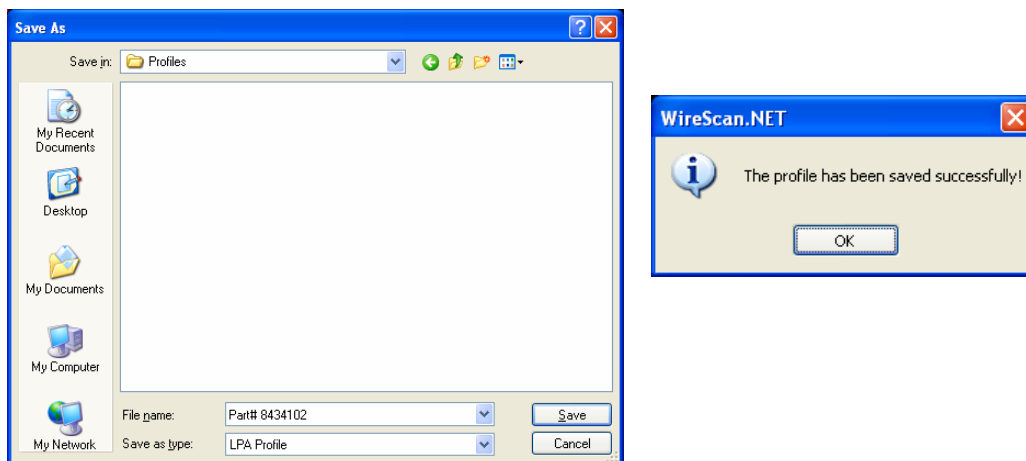
Profiles are files that can contain all the *configuration* and *setup* settings for a particular part. The profiles can be very useful to standardize the configuration of parts throughout plants by just loading a file onto the **LPA56B**. The Profiles also make production changeovers much easier and faster.

Create a profile

1. Set all the configurations and setup to the desired values.
2. Click on Profile/Save - found on the command bar or under the system main menu.

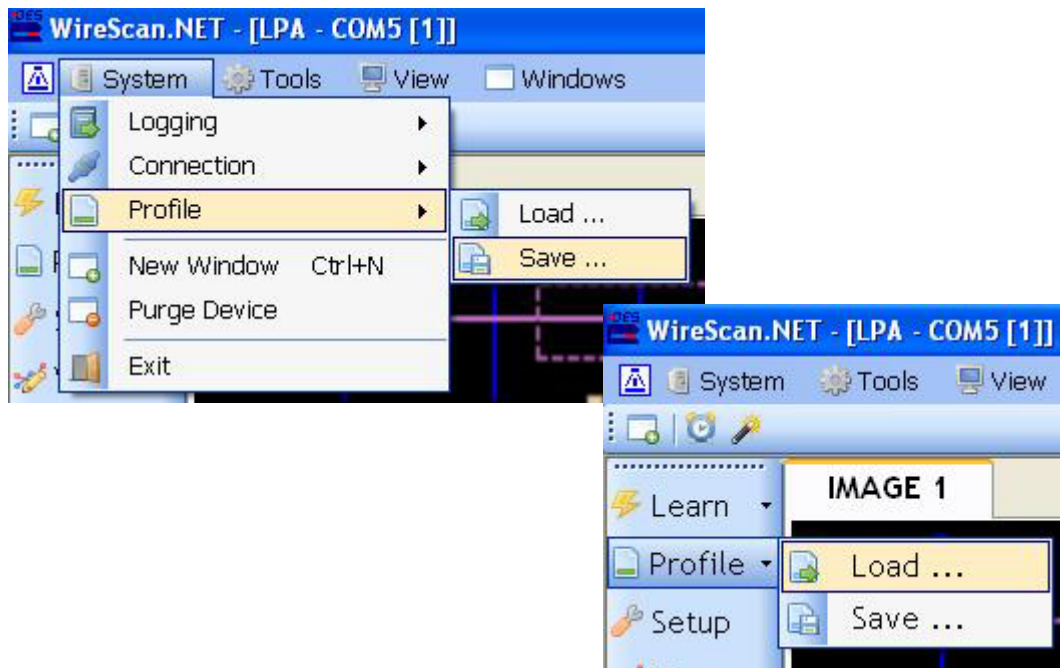


3. Select the path where the profile will be saved and click save

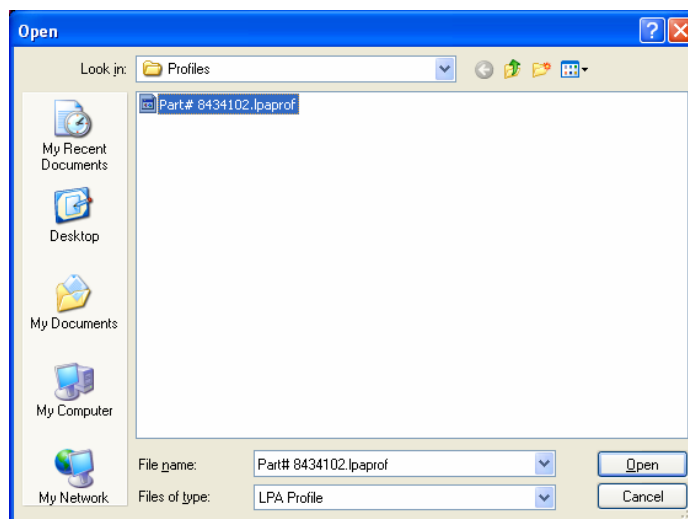


Load a profile

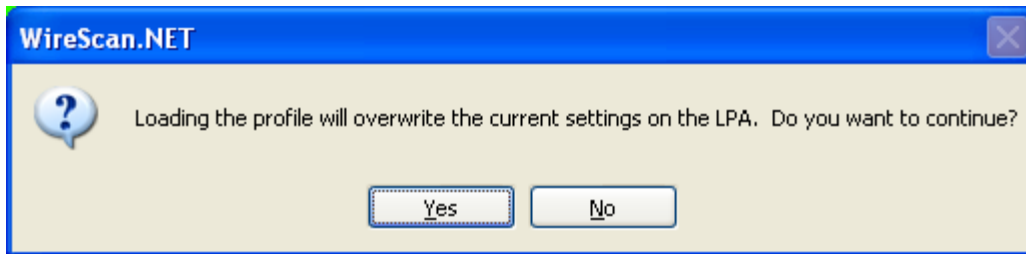
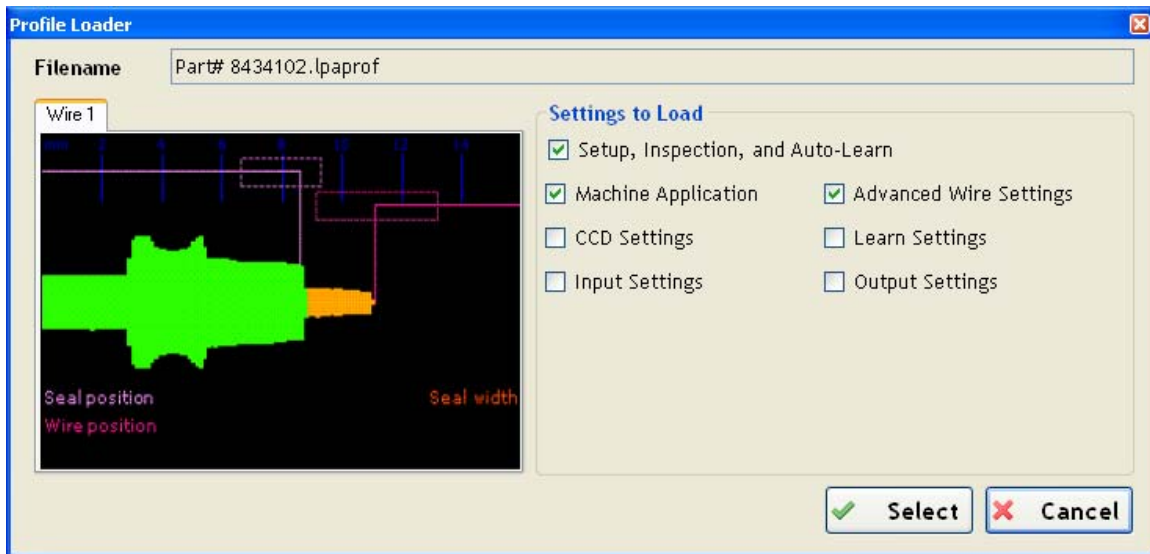
1. Click on Profile/Load - found on the command bar or under the system main menu.



2. Select the profile to load and click Open



3. Select the settings to load on the **LPA56B** and click Select

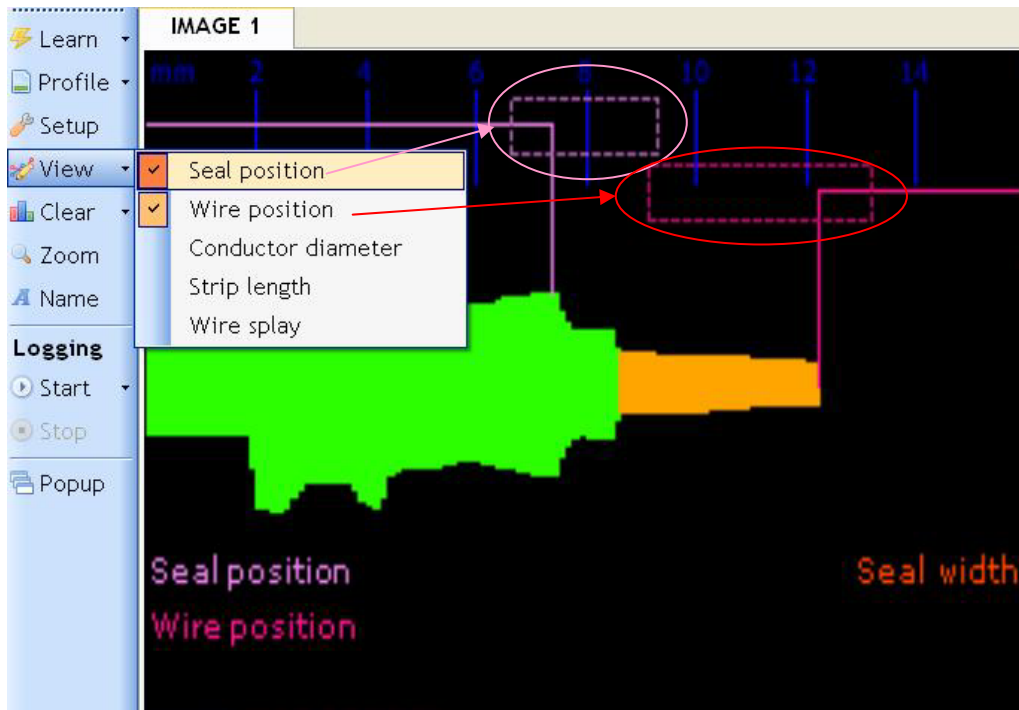


4. Confirm the **LPA56B** is in the right position for inspecting the new part
5. Set the **LPA56B** in Learn mode.



Note that after changing the inspection requirement mode, the sensor head position might need to be adjusted according to the inspection requirement. See the "Inspection requirement mode" section of the manual.

View



There are viewing aids available for each inspection algorithm, which display the current measured values in relation to the tolerances over the current image, as shown above. The text under the image will flash, highlighting which parameter(s) have failed on a given part.

These viewing aids are automatically enabled and disabled, synchronized to the inspection parameters in the setup window, but can be enabled or disabled manually by clicking on the command bar - View and checking as desired.

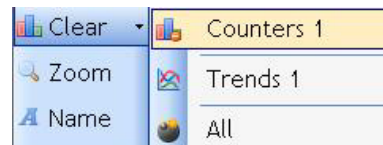


Note that checking disabled parameters will show the value of the given parameter over the display image but the pass/fail decision will only be affected by the inspection parameters enabled in the setup window.

Clear

The clear command allows the user to clear all counters and/or trend graphs while running an **LPA56B**.

Clearing All will also clear the Minimum, Maximum and Average running calculation of the trend graphs.

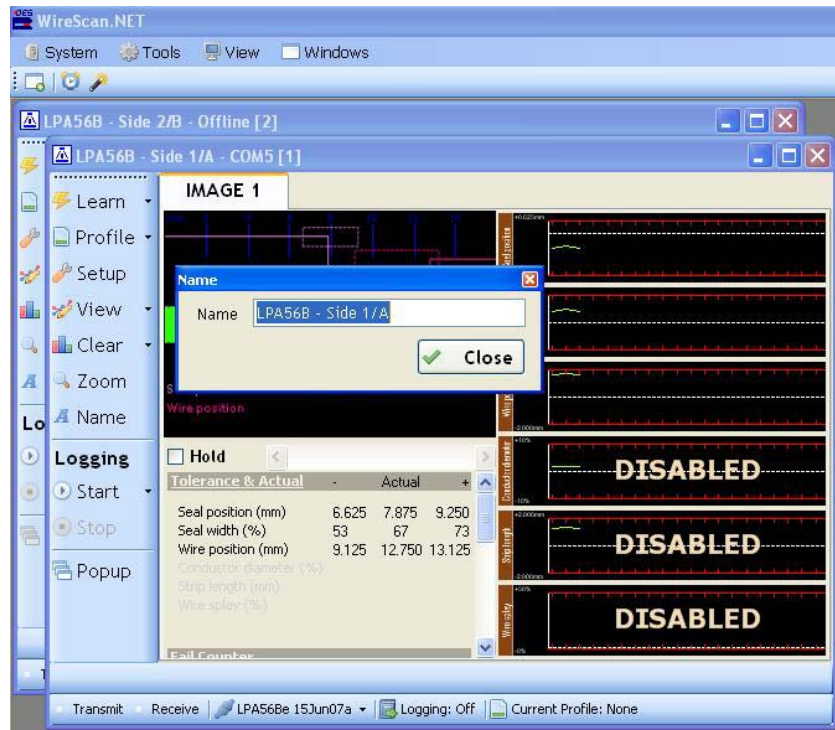


Zoom

Clicking on the zoom command and the wire display or trend display magnifies the selected area in a new window. To terminate this mode, just close the zoom window.

Name

The Name command, allows the user to assign a name to each device. This option proves very useful to differentiate between devices when multiple units are connected. This name will be displayed on top of the window and in the pop-up window (Further described in the “Pop-up” section of the manual).



Logging

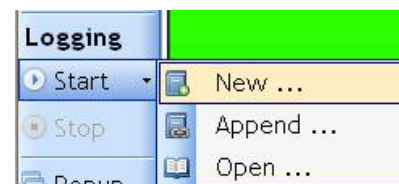
WireScan.NET software has a data logging feature which can be enabled to log data received from the **LPA56B** for each wire after an inspection. These data will be saved on the PC into a file for historical review and analysis.

A comment bar is available to add comments while logging or viewing a file.

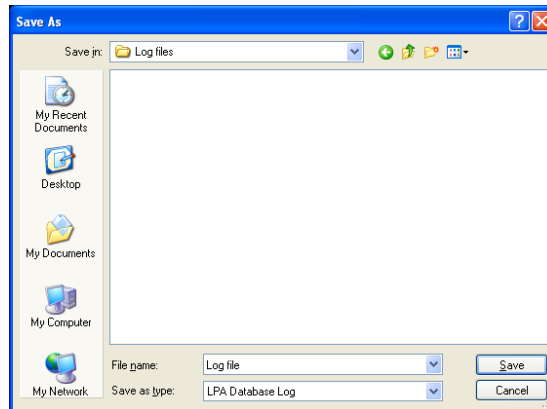
Create a log file

To create a log file:

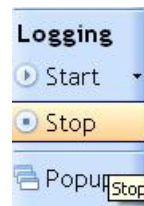
1. Click on Logging / Start / New.



2. Select the path where the profile will be saved and click Save



3. To close/finalize a log file, click on the Stop Button



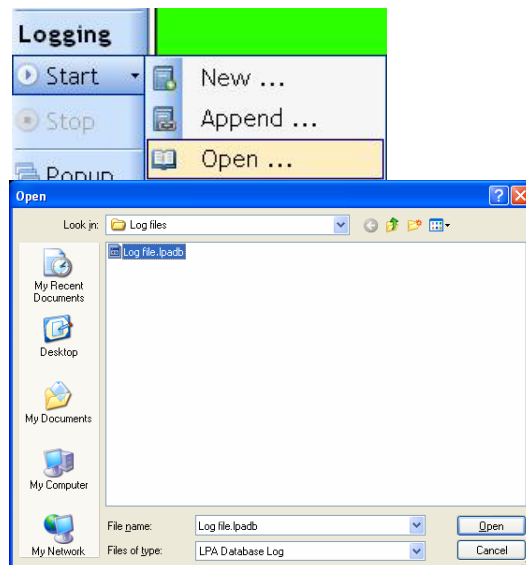
Append a log file

Appending a log file adds data at the end of an existing log file without deleting the files original contents.

Open a log file

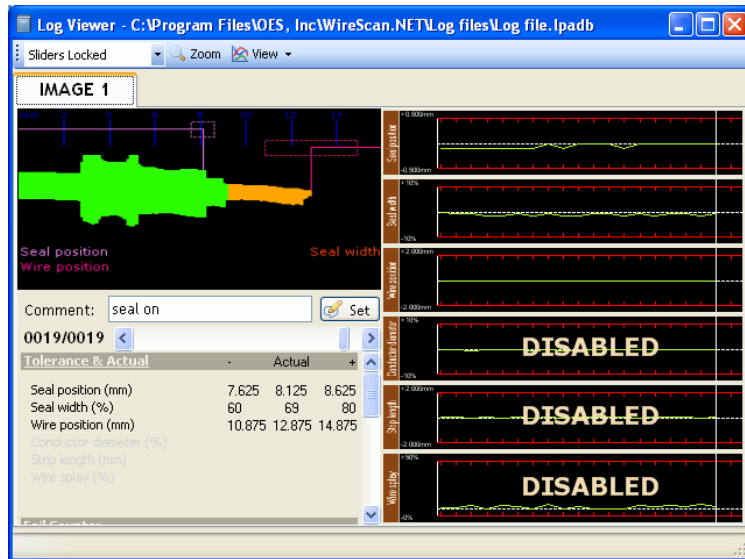
To view a log file

1. Click on Logging / Start / Open





2. Select the log file to open

3. A Log Viewer window will open per log file opened. So multiple Logs can be viewed simultaneously.



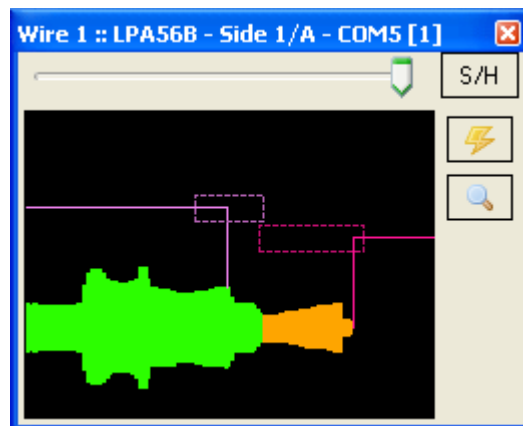
Popup

Popup is an always active window that will appear on top of every software application, including the wire processing machine software. This window contains:

The wire image, learn command , and a link to activate WireScan.NET .

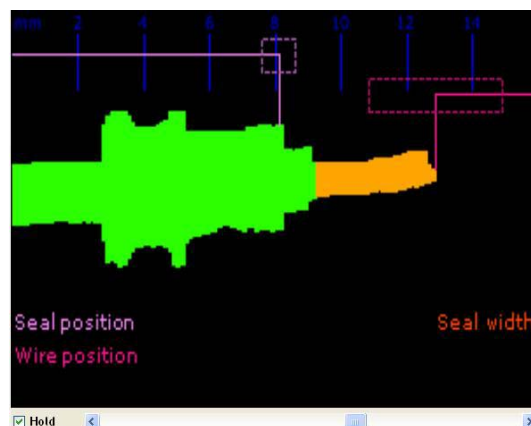
The size and location of the popup window is automatically remembered.

By clicking on the wire image in the popup window, this window can be zoomed to a predetermined position and size that will always be remembered.



Hold Feature

The Hold feature enables the user to review up to 10 wires while the machine continues to process wire. When the Hold feature is turned off, the system will resume with the current wire. You must check the Hold box and then scroll with the scroll bar.



Security

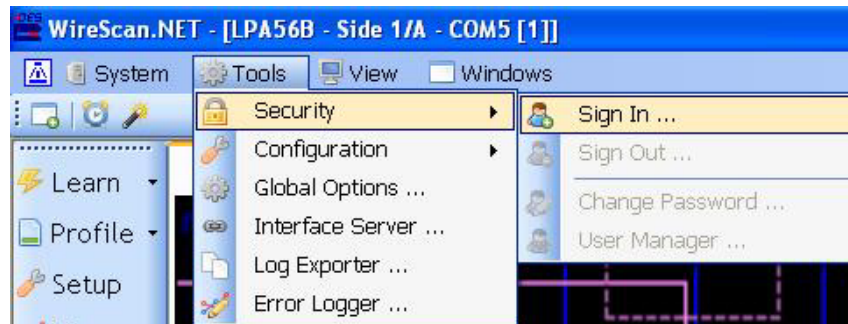
Security has been added to WireScan.NET so different users can access different capabilities. The system automatically starts as the default user, which gives all privileges the same as the administrator.

To change the default user privileges or create/edit another user, you will need to sign in as the administrator.

Administrator

To sign in as an administrator:

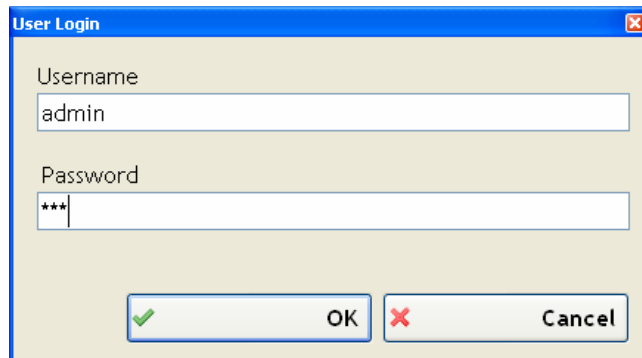
1. Click on Security, Sign In



2. To sign in as Administrator:

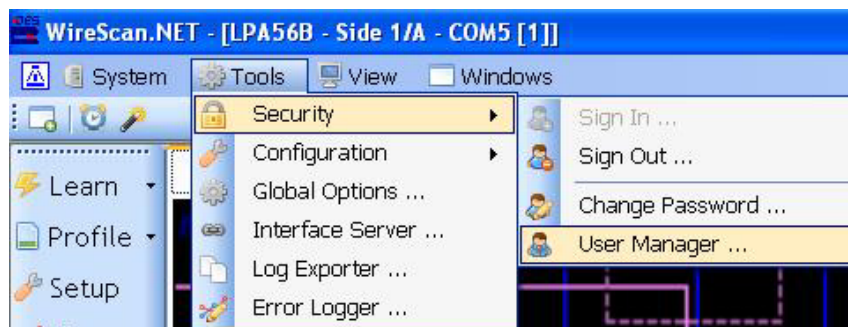
The username is admin
The default password is oes. (Both user name and password are lower case)

Click OK

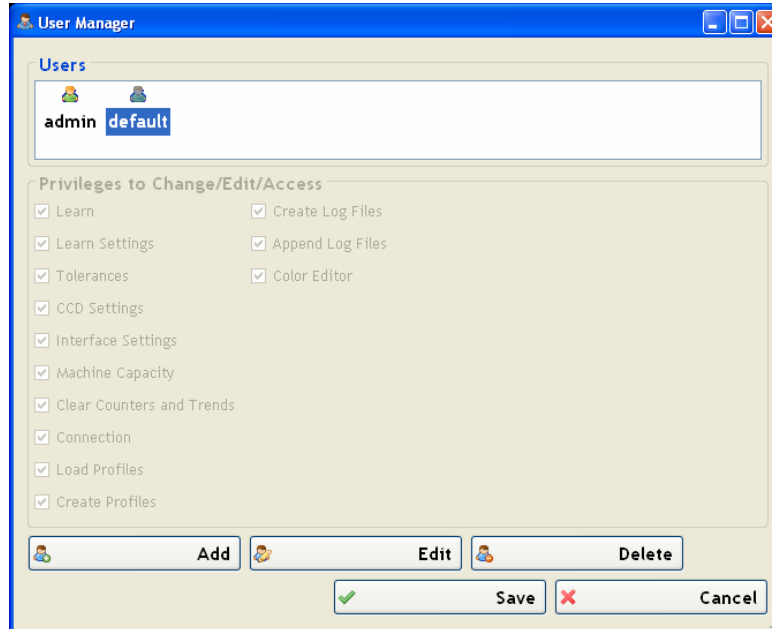


User Manager

1. Sign in as Administrator
2. Click on the User Manager

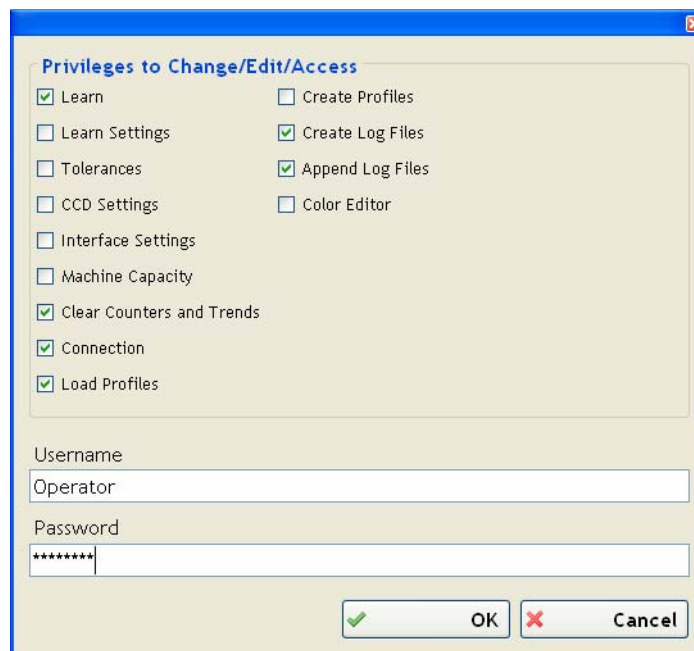


3. At the User Manager window, the users can be Added, Edited or Deleted.



To Add a User:

- Click on Add
- Add a username, password and assign the required privileges and OK.



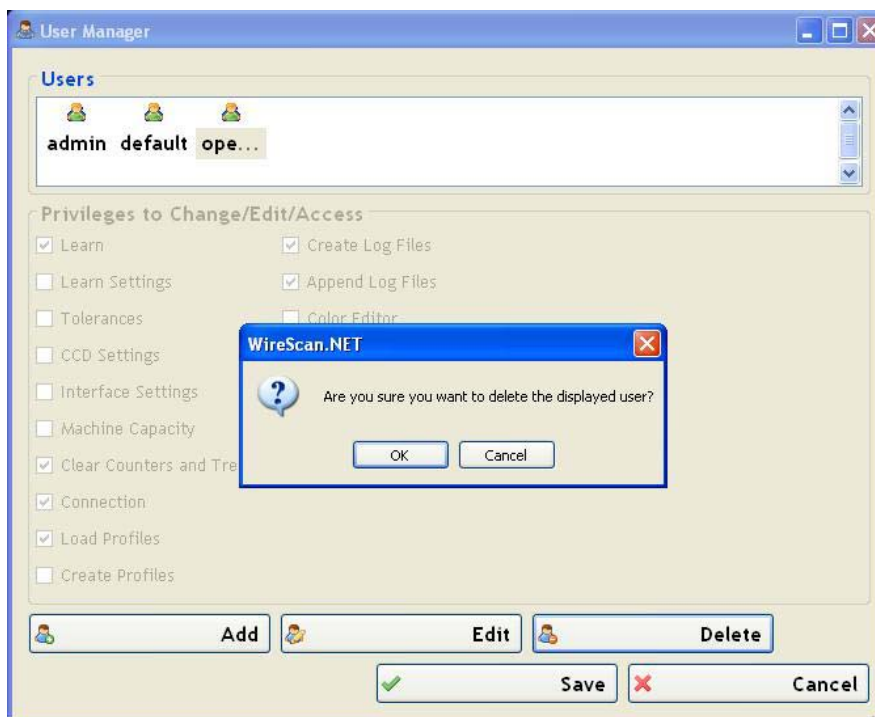
- Save changes before exiting

To Edit a User:

- a) Select the User to Edit
- b) Click on Edit
- c) Edit privileges and click Ok
- d) Save changes before exiting

To Delete a User:

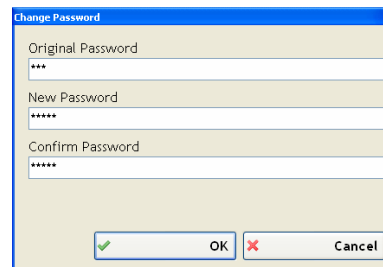
- a) Select the user to Edit
- b) Click on Delete and confirm



Change password

To change any user's password,

1. Sign in as the user with the current password.
2. Click on Change password
3. Enter the original and new password as prompted and click OK



Global Options

The global options refer to the information displayed on the image tab and how it is displayed.

Numerical Display

In this setting you can select what available information the user would like to see in the numerical display area.

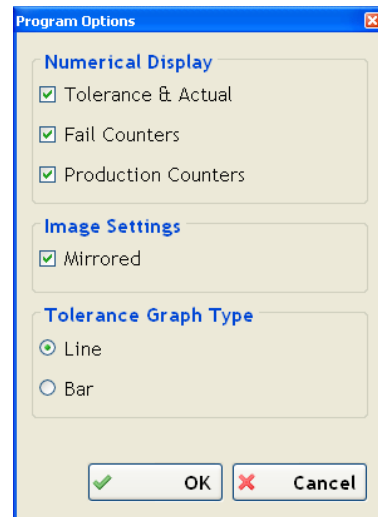


Image Settings

The wire image can be displayed as a mirrored or non-mirrored image. This depends on the user preference. By default, the image is displayed mirrored.

The following screen captures were taken of the same part, Figure 4a has the image setting, mirrored enabled and Figure 4b has it disabled.

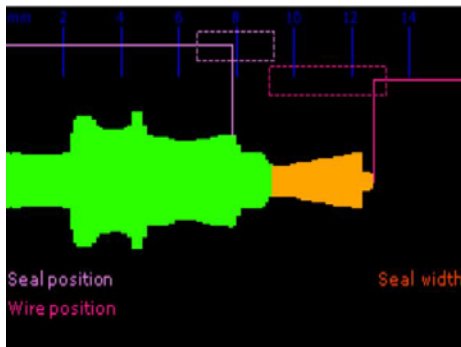


Figure 4a.Mirrored

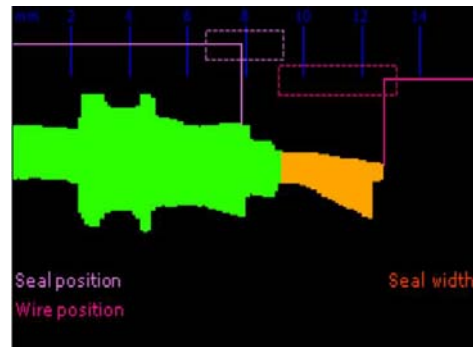


Figure 4b.Non Mirrored

The non mirrored image helps the user during setup mode, to make sure the presentation of the wire is correct. For example: the wire is straight traveling through the inspection window.

Tolerance Graph Type

The trend graphs can be displayed as lines or bars depending on user preference. By default, the trends are displayed as lines.

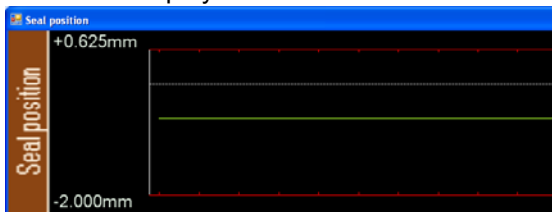


Figure 5a. Lines

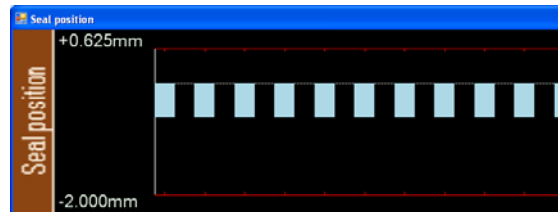


Figure 5b. Bars

Log Exporter

Log files can be exported into .CSV files. The file will contain the tolerance and actual value per entry, counters and comments.

To export a log file:

1. Click on Log Exporter
2. Select the log file to export and name and location for the exported file.



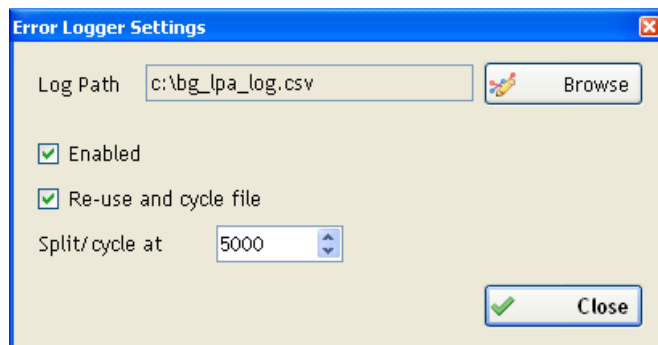
3. Click on Export.

Error Logger

The error logger can be set as a background logger that only needs to be enabled once and it will log every:

- Fail date and time
- Failure type

To avoid creation of large files; the file can be Split at certain cycles, generating a sequence of files by disabling the "Re-use and Cycle file".



By checking the "Re-use and cycle file", the file can be split and cycle every certain number of cycles, generating one file that will always contain the most recent entries. Older entries will be over written.

By default, the error logger is disabled and the re-use and cycle file option is enabled every 5000 entries.



Appendix A: Specifications

<i>Environmental</i>	
Operating Temperature	60 to 120°F (15 to 50°C)
<i>Electrical</i>	
Voltage supply	24VDC @ 200 mA +/- 10%
Discrete Inputs	24VDC
Electro-mechanical Output	24 VDC @ 0.5A - dry contact sink or source
Solid State Output	24 VDC @ 0.25A MOSFet output sink or source
Serial Communication	RS232
<i>Laser</i>	
Wavelength	658 nm
Class	2M
<i>Physical</i>	
Width	19 mm (0.75")
Length	146 mm (5.75")
Height	72 mm (2.83")



Appendix B: OES Product Warranty

1. The warranty coverage is for materials and labour for a period of two years from date of purchase.
2. The warranty is limited to the repair of OES, Inc. PRODUCTS only.
3. Any warranty repair performed during the two year period does not extend the warranty period.
4. OES warrants the products to be free from defects in materials and workmanship under normal use and service, but OES's obligations are limited to repair and replacement of the part(s) shown to be defective at the time of shipment. OES's liability shall not exceed the contract price for the goods claimed to be defective and OES shall not be liable for any special or consequential damages.
5. OES PRODUCTS returned for repair that are damaged by misuse, abuse, negligence, or accident (all determined by OES) will have the warranty voided and repair charges will be paid by the customer.
6. OES return policy for warranty and non-warranty repairs is as follows:

All goods claimed as warranty repair shall be returned by the customer to OES or OES Rep. prepaid by the customer, including customs brokerage charges, complete with the necessary customs documentation.

For complete engineering and technical support contact:



4056 Blakie Road London, Ontario, CANADA N6L 1P7
Telephone: (519) 652-5833, FAX: (519) 652-3795
e-mail: oes@oes-inc.com





Appendix C: Spare & Replacement Parts

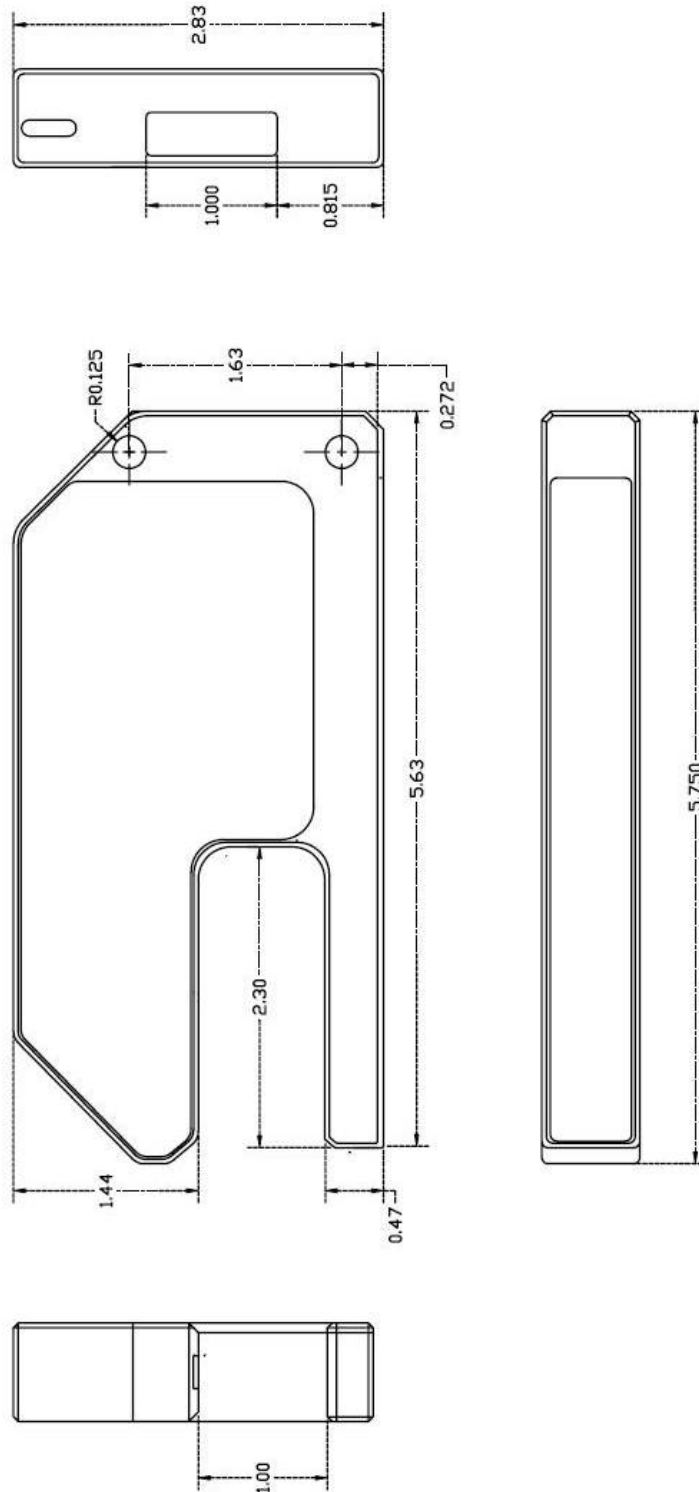
Cables

Qty	Description	Part #
1	LPA56B Standard Output Cable	L56B-SOC
1	LPA56B Standard Interface Cable	L56B-SIC
1	LPA56B Standard Interface Cable with Learn button	L56B-SIC-L
1	Serial communication cable	AU008A

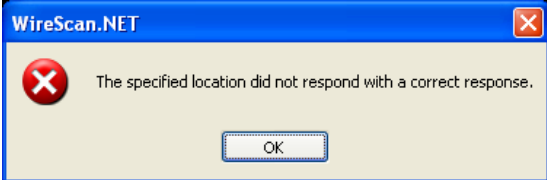
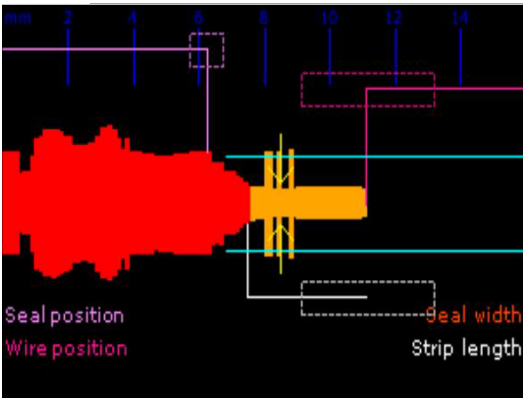
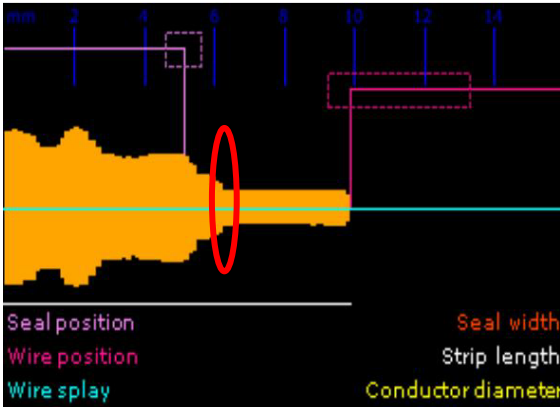
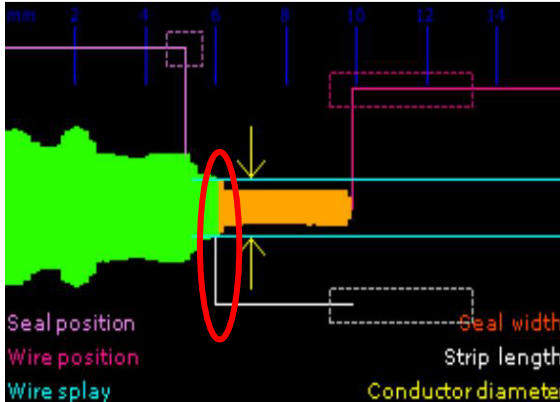
System Components

Qty	Description	Part #
1	Universal Mounting Bracket	AU510A
1	Universal Mounting Bracket	AU510B
1	Universal Adjusting Bracket	AU505D

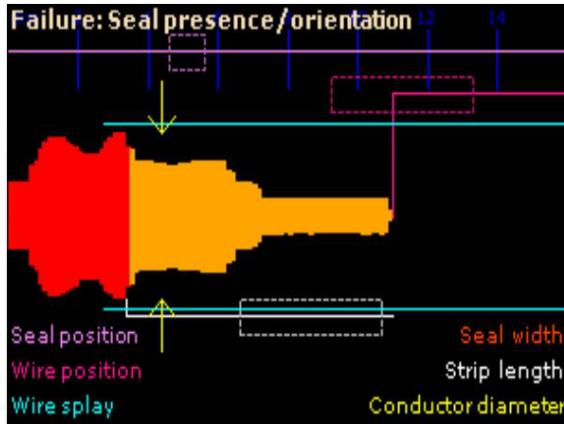
Appendix D: Processor Module Mechanical Details



Appendix E: Troubleshooting

Problem	Solution
<p>1. Fail to communicate with the LPA56B: The following error message comes up:</p> 	<ol style="list-style-type: none"> 1. Click OK, 2. Ensure all connections are correct 3. Ensure the LPA56B is energized. 4. Retry
<p>2. The wire image looks jagged:</p> 	<ol style="list-style-type: none"> 1. Clean sensor head receiver 2. Follow the auto step CCD to adjust the CCD threshold to a good value <p>Note: If the problem persists contact OES, Inc or an authorized Rep for assistance.</p>
<p>3. The LPA56B does not find the insulation shoulder.</p> 	<ol style="list-style-type: none"> 1. Go to the Setup window 2. Click on Advanced 3. Gradually reduce the Strip Variation Limit until the LPA56B finds the correct insulation shoulder. 

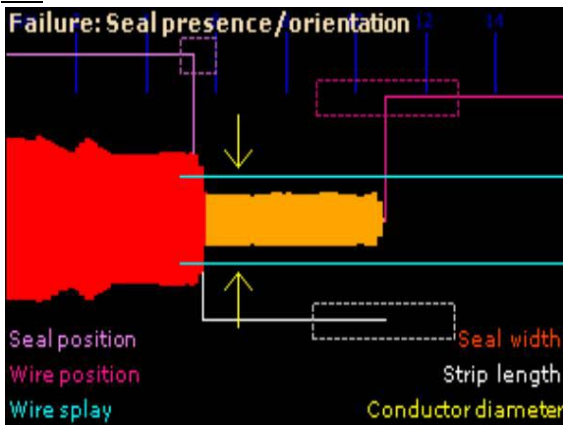
4. The **LPA56B** does not find the seal and/or finds it at the ribs failing on “Seal presence / orientation”



1. Go to the setup window
2. Click on Advanced
3. Gradually decrease the Seal variation limit until the **LPA56B** finds the seal at the correct location.

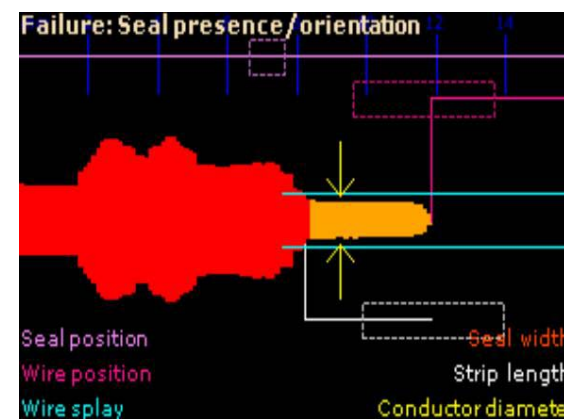
5. The **LPA56B** finds the seal at the correct location but fails on Seal presence / orientation.

When this error occurs, Seal position doesn't fail.



1. Go to the setup window
2. Click on Advanced
3. Gradually increase the Seal orientation ratio until the **LPA56B** doesn't fail with an orientation error

6. The **LPA56B** does not find the seal



1. Go to the setup window
2. Click on Advanced
3. Gradually decrease the Variation filter until the **LPA56B** finds the seal at the correct location.

The Variation filter value should never be longer than the seal neck length.



Appendix F: Configuration Values

Screen	Parameter	Default Value	Custom Value
1 – Machine Application	Machine Capacity	Singles	
2 – Inspection Requirement	Inspection Requirement	Seal and/or strip Inspection	
3 – Output Settings Applies for Output 1 and 2.	State	Normally Open	
	Extra Options	Disabled for all learn	
	Mode	Pass	
	Wire	Wire 1	
	Delay	0	
	Duration	50	
	Output Reset Method	Timer	
	Chopper Station	1	
	Enable LPA while output is active	Disabled	
4 – Input Settings	Input 1/ Level	Enabled / Setup / High	
	Input 1/Edge	Disabled / Firing Pulse / Positive	
	Input 2/Level	Disabled/Firing Pulse/ High	
	Input 2/ Edge	Enable / Learn/ Both	
	Firing Pulse Timeout	Disabled / 500	
	Minimum Setup Duration	4000	
5 – CCD Settings	CCD Threshold	10	
6 – Setup	Seal Position	Disabled / +2.00 / -2.00	
	Seal Width	Disabled / +10% / -10%	
	Wire Position	Disabled / +2.00 / -2.00	
	Conductor diameter	Disabled / +10% / -10%	
	Strip Length	Disabled / +2.00 / -2.00	
	Wire Splay	50%	
	Ensure no Seal	Disabled	
	Auto learn	Disabled	
Advanced	Mode	Seal/Strip Variation	
	Variation Filter	1.25 mm	
	Seal Orientation Ratio (%)	85	
	Seal Variation Limit (%)	5	
	Strip Variation Limit (%)	15	



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Notes

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