



WireScan 3 Model LPA58™ User's Manual

Patents: US 6,496,271 B1
US 6,885,463 B2
US 7,719,695 B2

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1.0 Product Overview

1.1 LPA58 Kit

- ✓ Manual
- ✓ WireScan 3 Software

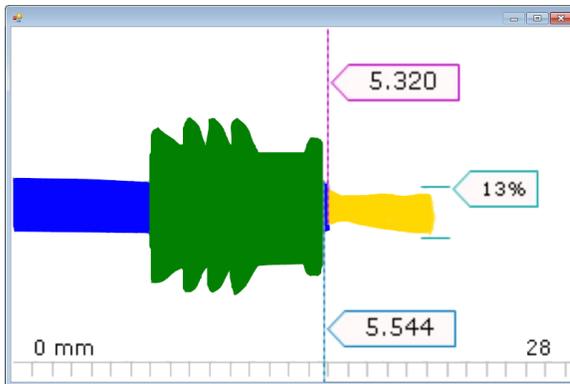
Available for download at: www.OESTechnologies/downloads/



Standard or Machine specific interface cable options available



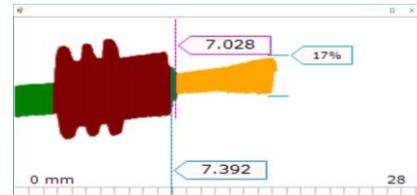
Communication cable



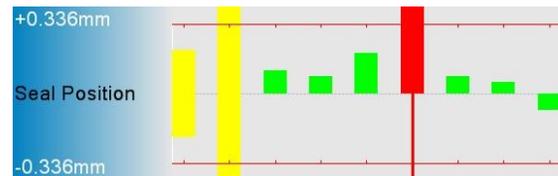
1.2 Feature and Function

The LPA58 is a dynamic optical sensor that inspects for wire strip and/or seal defects on automatic wire processing machines. This non-contact high speed inspection occurs between the wire stripping and crimping station immediately following the seal insertion process.

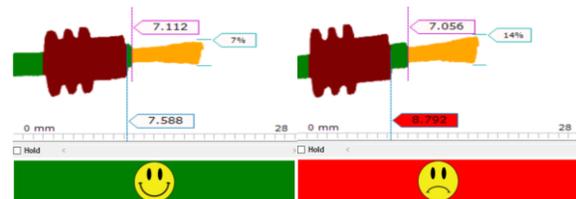
The wire is inspected as it passes through the sensor window. The optical beam is interrupted along the 28mm sensing window and a high resolution profile image is captured. This profile image of the wire and/or seal are then analyzed by algorithms for determination of PASS or FAIL.



A selection of analysis algorithms and tolerances are configured for the desired level of inspection, sensitivity, and quality control that is applied to every part produced.



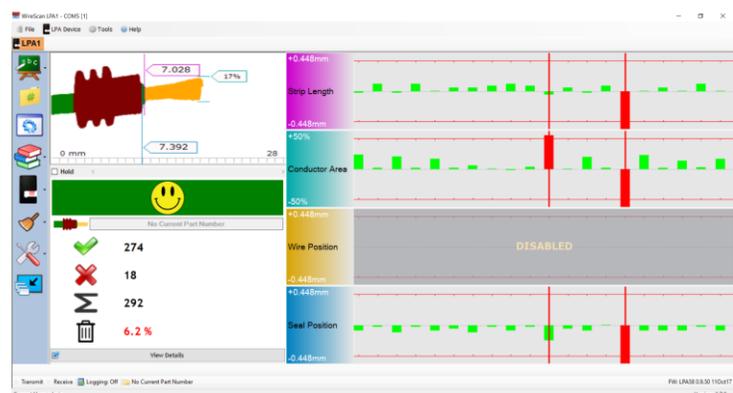
The resulting PASS or FAIL for each inspection is displayed on the WireScan 3 operator Interface.



WireScan 3 is the user interface application software supplied with the LPA58 and provides a visual image of each wire produced.

WireScan 3 is then installed on the wire processing machine PC and operates on PC with Windows XP or newer operating system.

The LPA58 is designed for adaptability to a wide range of wire processing machine models. The LPA58 is attached to the machine with a mounting bracket to position the LPA58 such that the end of the wire passes through the 28mm sensing window.

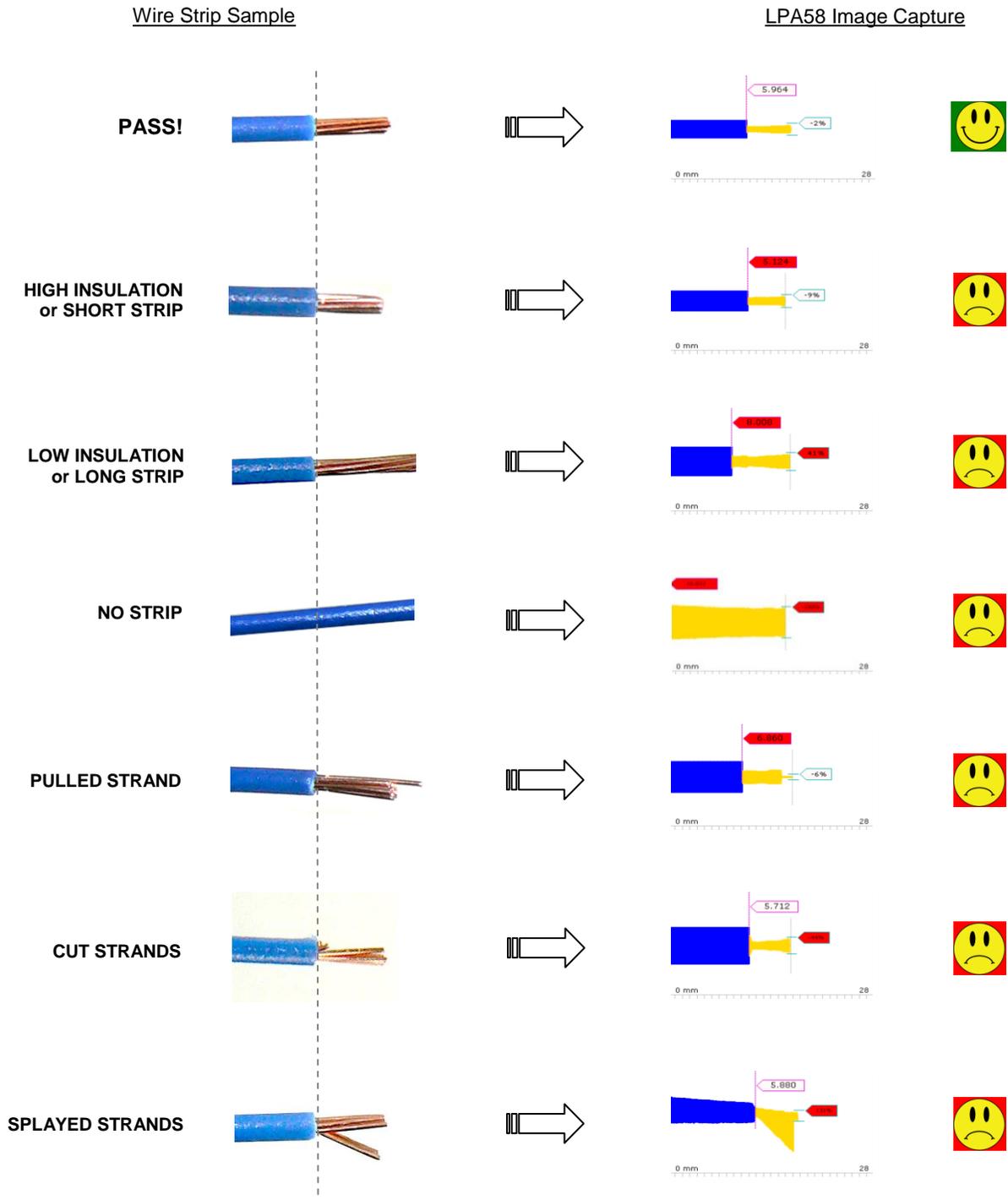


An electrical interface cable connects the LPA58 with the wire processing machine for control of defects. The I/O is configurable through WireScan 3 software configuration routines.

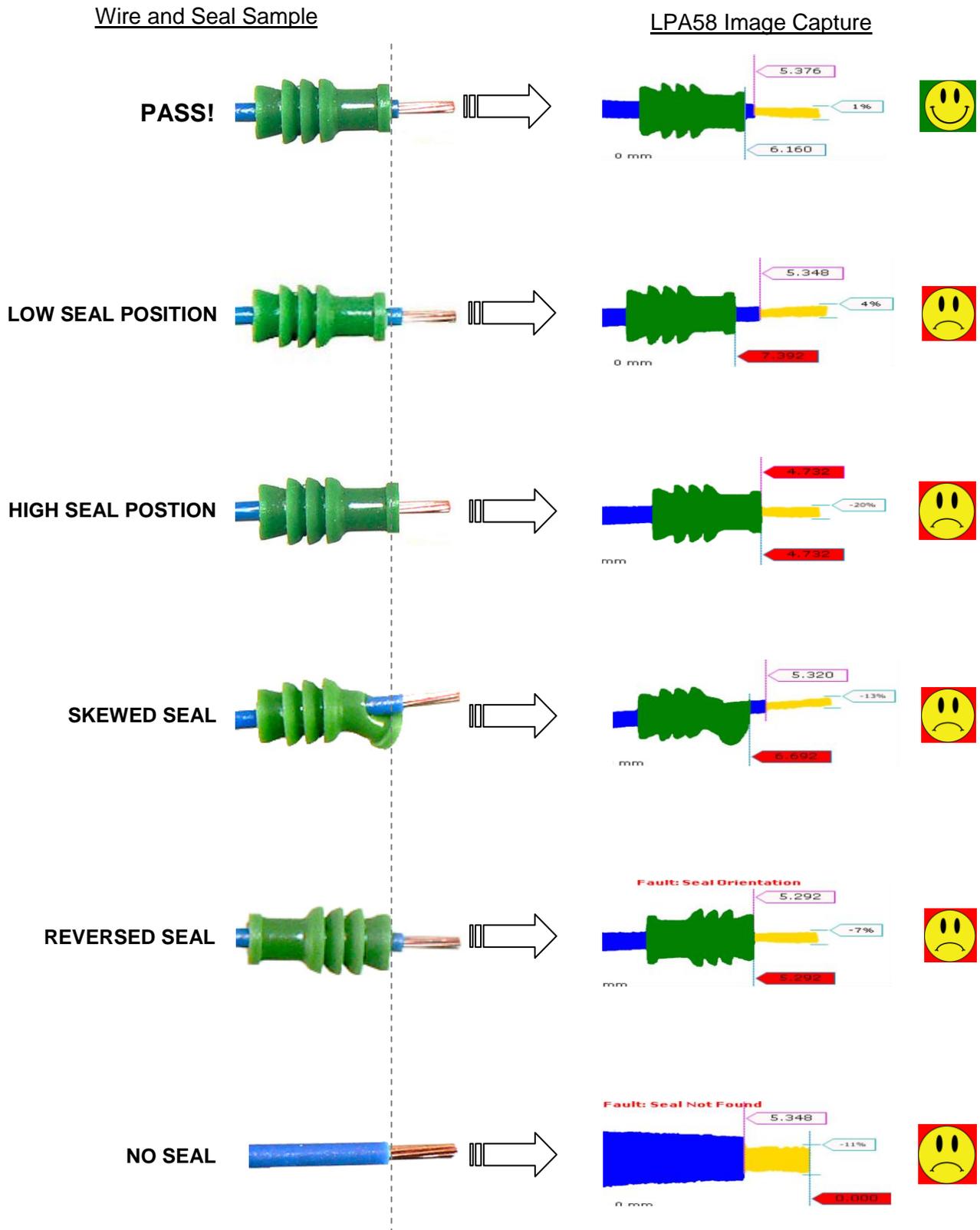
2.0 Typical Defects Detected

***The LPA58 performs the Strip and Seal inspections simultaneously during the machine cycle.

2.1 Capabilities - Wire Strip Inspection



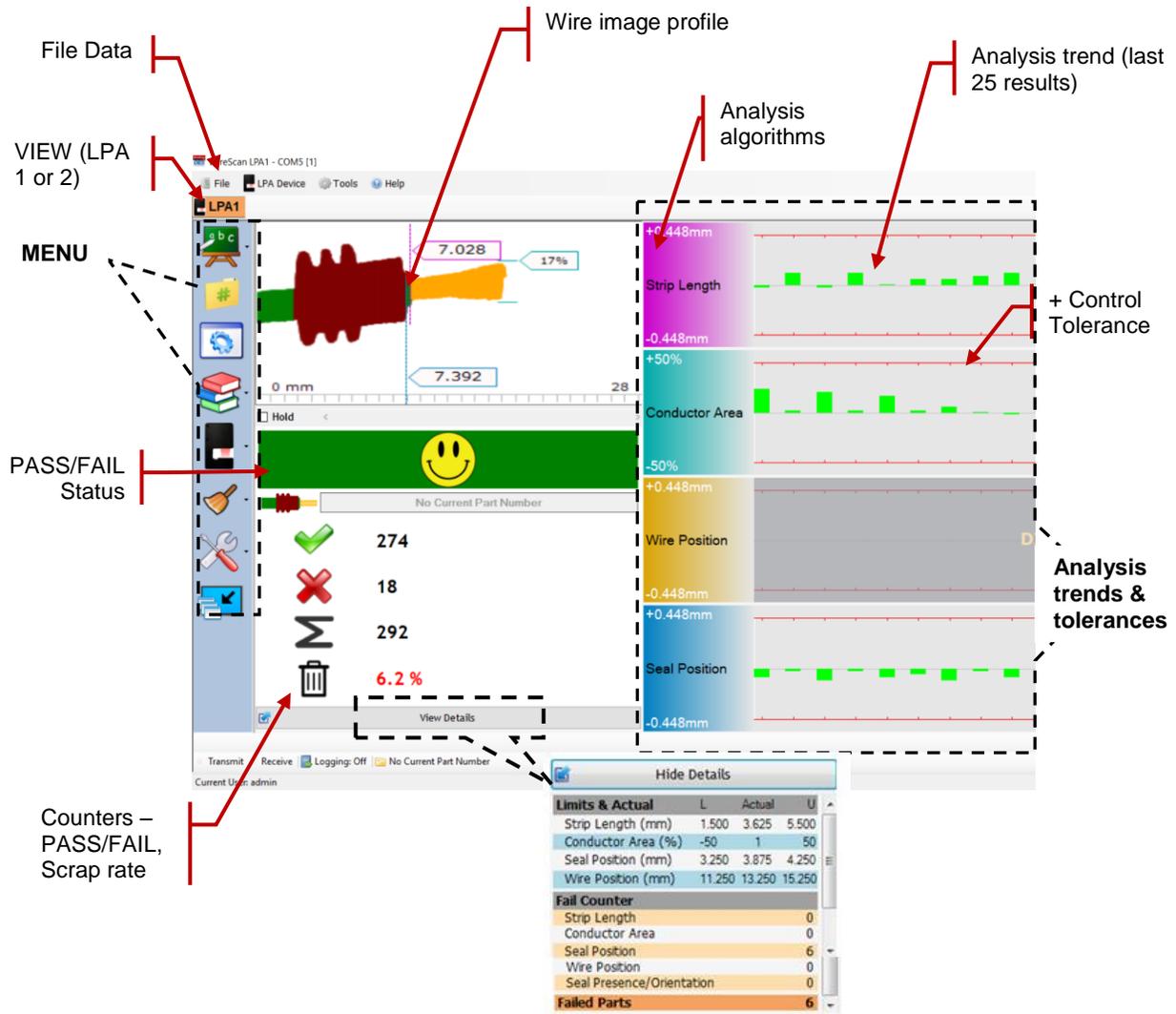
2.2 Capabilities - Seal Insertion Inspection



3.0 Operation

3.1 WireScan 3 Operator Interface

Example of wire and seal inspection **PASS**:

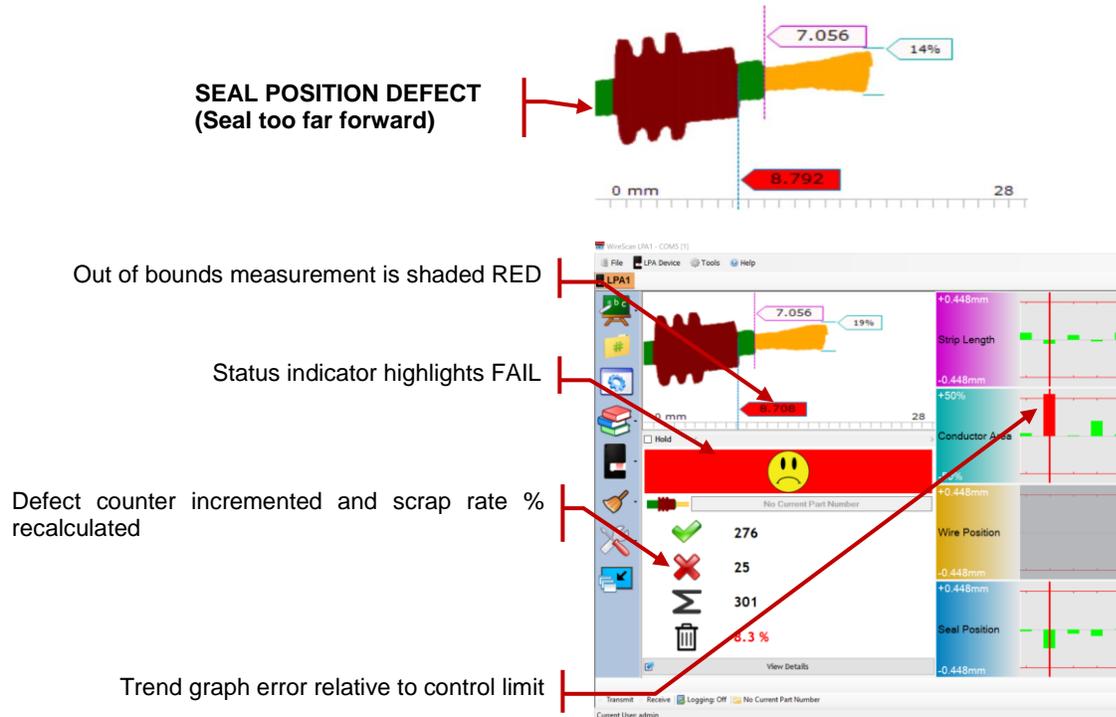


3.2 Production Mode

In Production, the LPA58 will inspect 100% of wire samples produced.

Defects are displayed on WireScan 3. The LPA58 electrically interfaces with the wire processing machine to control defects. All data is logged to a production file for traceability.

A FAIL condition is displayed:



3.3 Learning a new Setup



From the main menu select the LEARN icon. Select the LPA to set into learn mode or “Learn All LPA’s” when more than one LPA is installed on the machine. The profile image screen background colour is Yellow confirming the LPA58 is in the LEARN mode.

The LPA performs a learn with at least one sample, which automatically sets the targets and tolerances from the pre-configured SETUP parameters. The LPA58 reverts to production mode automatically. In production mode, the LPA58 inspects every wire produced relative to the characteristics of the learned wire for determination of PASS or FAIL.



Note a “Fail Learn” will occur if the LPA58 cannot detect the insulation or seal within the configured maximum samples. Fail Learn may also occur if the wire extends over the end of the sensing window of the LPA58 (See Inspection modes section 5.0).

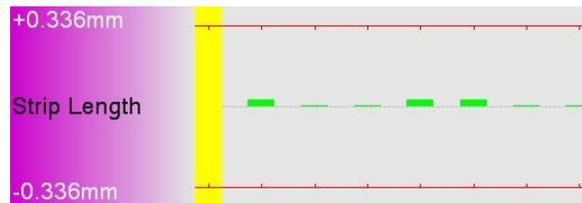
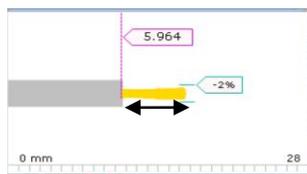


4.0 Inspection parameters

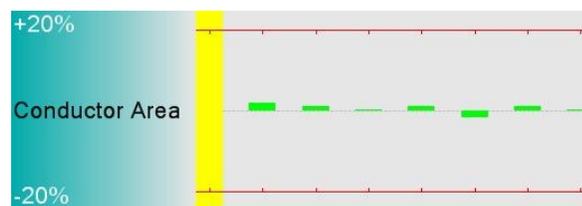
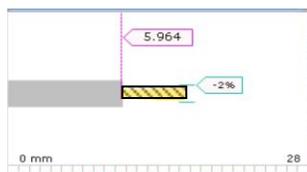
4.1 Strip Inspection Parameters

Three wire strip analysis algorithms can be enabled for inspection of wire strip quality:

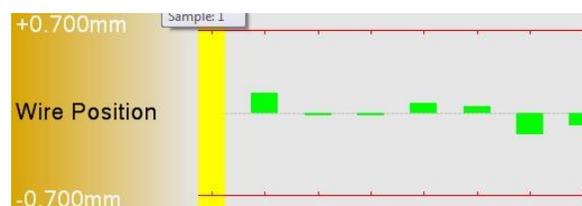
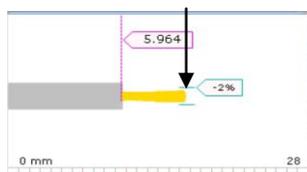
Strip Length – inspects the length from the end of the wire to the insulation shoulder relative to the target established from the learned reference sample. The +/- Tolerance Limits are configured separately with a resolution of 0.028mm increments for detection of high or low Insulation and pulled strands as examples.



Conductor Area – inspects the area or “mass” of the conductor from the end of the wire to the insulation shoulder and relative to the target established from the learned reference sample. The +/- Tolerance Limits are configured separately as a % increase or decrease in the conductor mass. Wire splay will increase conductor mass, and conversely missing strands will reduce conductor mass for detection and control of these defect conditions.



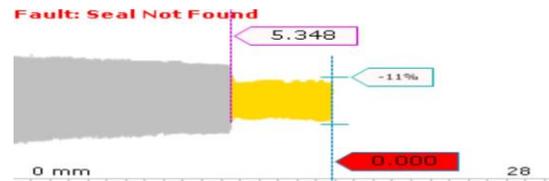
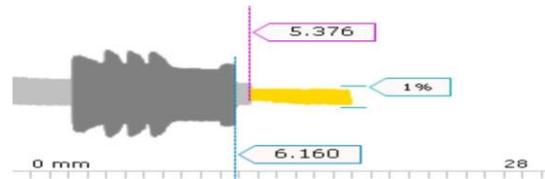
Wire Position – inspects the position of the end of the wire relative to the target established from the learned reference sample. The +/- tolerance limits are configured independently in 0.028mm increments of resolution. The variation in the wire position through the LPA58 inspection window is inspected for correct position of the wire for presentation to the terminal.



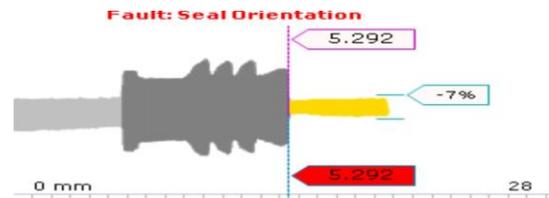
4.2 Seal Inspection Parameters

Seal inspection detects for seal presence, seal orientation (reverse seal), seal position and skewed or deformed seal insertion defect conditions.

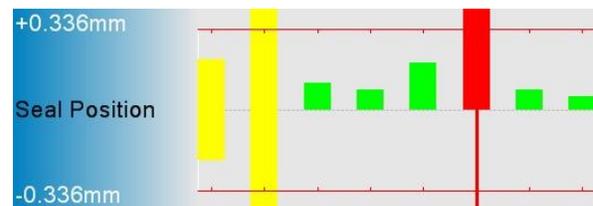
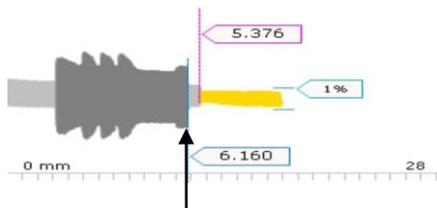
Seal Presence – detects missing seal condition.



Seal Orientation – detects seal installed backwards.

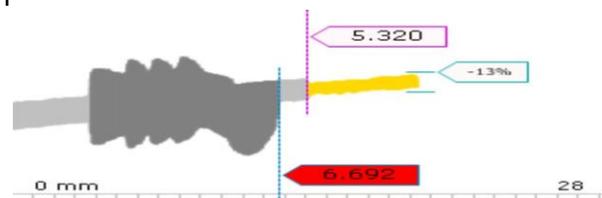


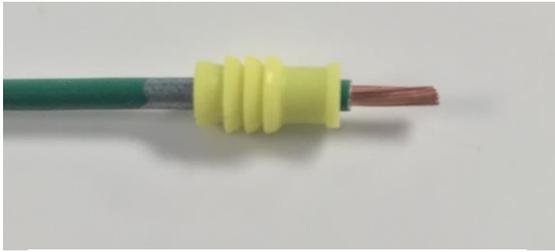
Seal Position - is optionally enabled for detecting high or low seal position relative to the end of the wire. The +/- tolerance limits are configured separately in 0.028mm increments. Seal position exceeding the tolerance limit will result in seal position FAIL.



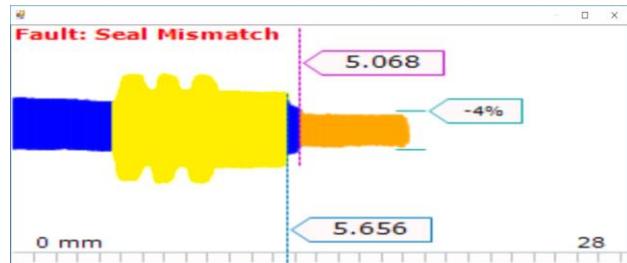
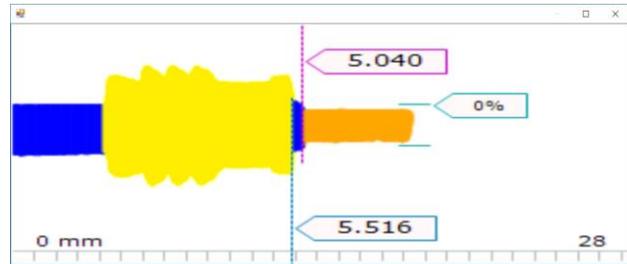
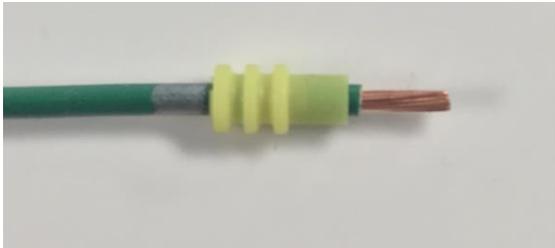
Seal Mismatch and Seal Length - are optionally enabled for detecting variations within the seal such as Skewed or deformed seal insertion. The +/- tolerance limits are configured separately in 0.028mm increments for the length and as a % of change for the Seal Front and Back width. Seal variation exceeding the tolerance limits will result in seal mismatch FAIL.

Skewed or deformed seal insertion condition





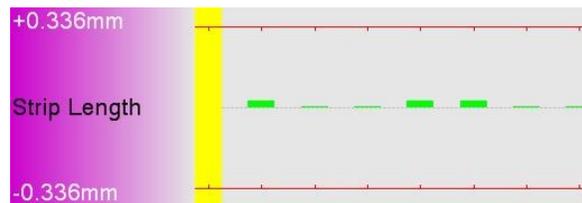
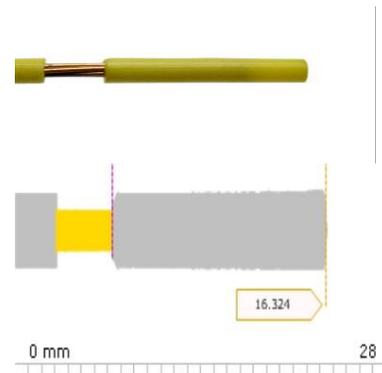
Seal change or variation condition



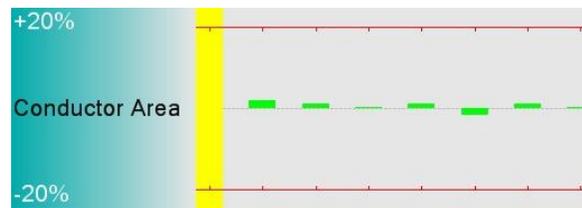
4.3 Partial Strip Inspection Parameters

Monitors partial insulation removal where the insulation slug remains on the end of the wire. Partial strip inspects for the position of two insulation shoulders – Strip start position and Strip end position. Tolerances on the two insulation are applied for monitoring and control as required.

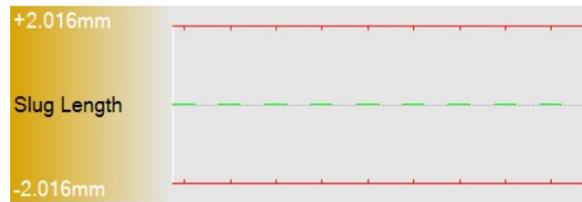
Strip Length – inspects the conductor window length from the end of the insulation shoulder to the start of the insulation slug relative to the target established from the learned reference sample. The +/- Tolerance Limits are configured separately with a resolution of 0.028mm increments for detection of movements on the insulation slug.



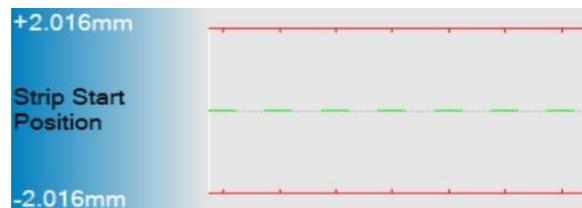
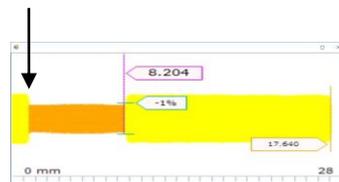
Conductor Area – inspects the area or “mass” of the exposed conductor from the insulation shoulder to the start of the insulation slug relative to the target established from the learned reference sample. The +/- Tolerance Limits are configured separately as a % increase or decrease in the conductor mass. Multiple cut strands will decrease the conductor area



Slug Length – inspects the insulation slug length relative to the target established from the learned reference sample. The +/- Tolerance Limits are configured separately with a resolution of 0.028mm increments for detection of strip length variations.



Strip Start Position – inspects the position of the end of the wire relative to the target established from the learned reference sample. The +/- tolerance limits are configured independently in 0.028mm increments of resolution. The variation in the wire position through the LPA58 inspection window is inspected for correct position of the wire for presentation to the terminal.



5.0 Inspection modes

The LPA58 has 5 different inspection modes: Strip inspection only, Seal inspection only, Strip and Seal inspection, Big seal and Partial strip mode. Each inspection mode can work with all different machine applications of strip and/or seal according to length, size, quality requirement, etc.

5.1 Strip inspection only

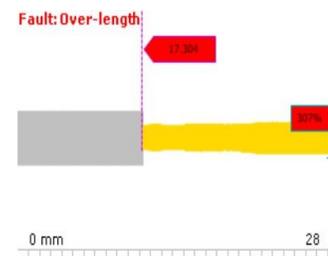
Strip inspection only is used to inspect strips of up to 24 mm long (the maximum length may vary depending on the machine type) when no seal is being applied.



The part can be inspected for Strip length, Conductor Area and Wire Position to detect possible quality failures with long/short strip, pulled strands, splayed strands, multiple cut strands.

For Strip inspection only the wire should be presented displaying at least 2 mm of insulation and with the wire end not exceeding the end of the inspection window.

Wire End Presentation - the position of the end of the wire through the LPA58 sensing window is important for reliable performance. When the end of the wire exceeds the inspection window, the LPA58 will display an “Over-length” error message.



5.2 Seal inspection only

Seal inspection only is used to inspect seals of up to 24 mm long (the maximum length may vary depending on the machine type) when no strip quality test is required.



The part can be inspected for Seal Position, Seal Width and Seal Length to detect possible quality failures with seal position variation, skewed/pierce seal, seal orientation and seal variations (mismatch).

5.3 Seal and Strip inspection

Seal and Strip inspection is used in applications where the strip length and seal length combinations are less than 24 mm (the maximum length may vary depending on the machine type).

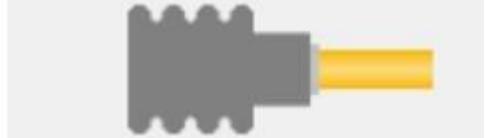


The part can be inspected for Seal Position, Seal Width, Seal Length, Strip Length, Conductor Area and Wire Position to detect possible quality failures with seal position variation, skewed/pierce seal, seal orientation and seal variations (mismatch), long/short strip, pulled strands, splayed strands, multiple cut strands.

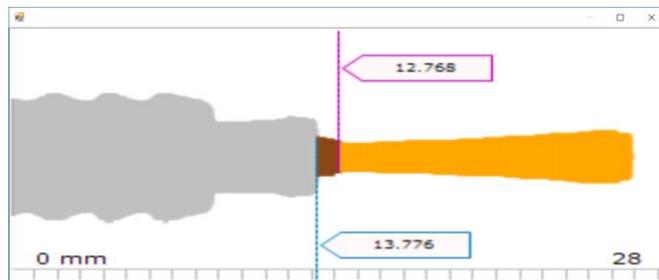
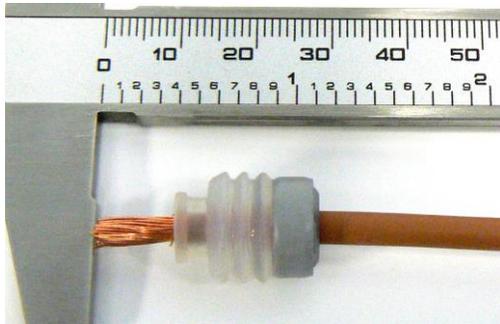
5.4 Big Seal Inspection

Big seal mode is used in applications where the strip length and seal length combination exceed 24 mm (the maximum length may vary depending on the machine type) or where the back of the seal is not visible to the LPA58.

The part can be inspected for Seal Position, Seal Width, Strip Length, and Wire Position to detect possible quality failures with seal position variation, skewed/pierce seal, seal orientation and seal variations (mismatch), long/short strip, pulled strands, splayed strands, multiple cut strands.



For big seal inspection, the wire should be presented displaying at least two ribs of the seal and the wire end not exceeding the end of the inspection window.



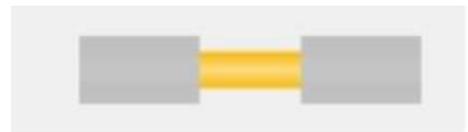
5.5 Partial Strip Inspection

Partial strip inspection is used to inspect partial strips when the slug is left attached to the wire.

The part can be inspected for Insulation shoulder position, slug length, strip length (distance between insulation shoulder and slug) and conductor diameter to detect possible quality failures with long/short strip, slug too attached to the insulation and multiple cut strands.

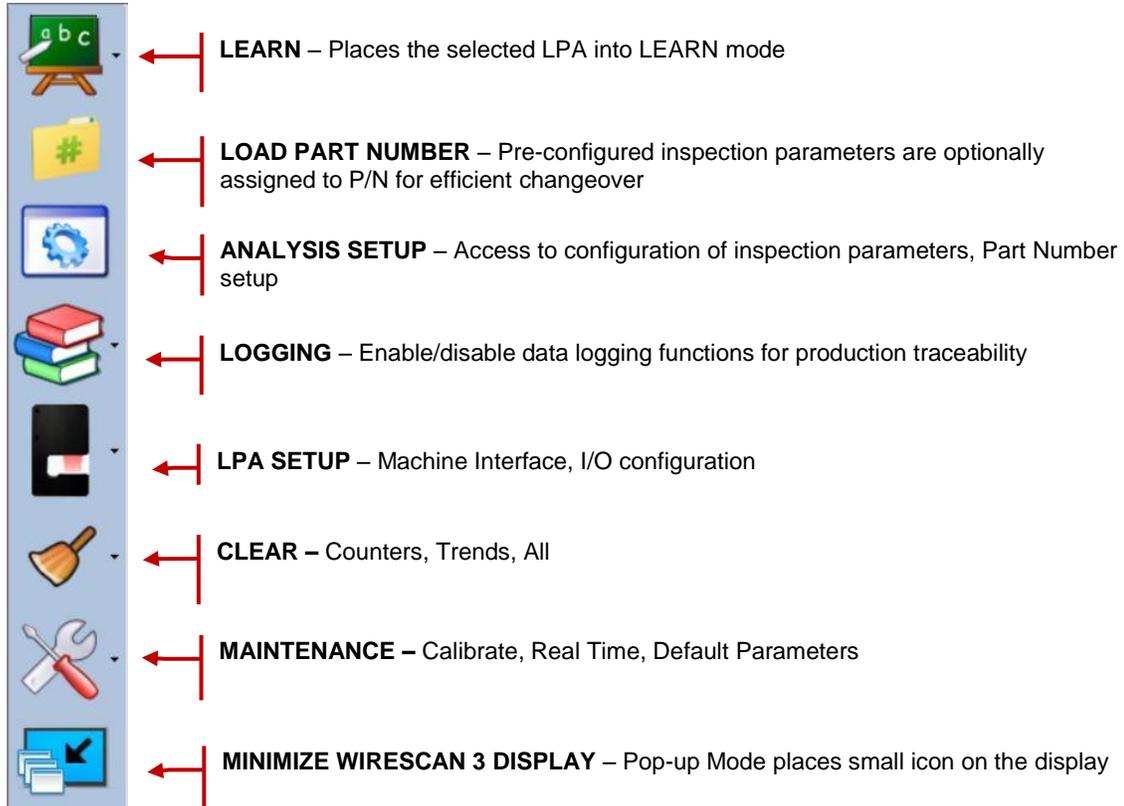
For partial strip inspection, the wire should be presented displaying at least 2 mm of insulation and with the wire end not exceeding the end of the inspection window.

For long strip applications, where the insulation shoulder is not visible, then Strip start position will always be 0, Conductor area should be disabled and the strip length (conductor window) is measured from pixel 0.



6.0 Menu Options

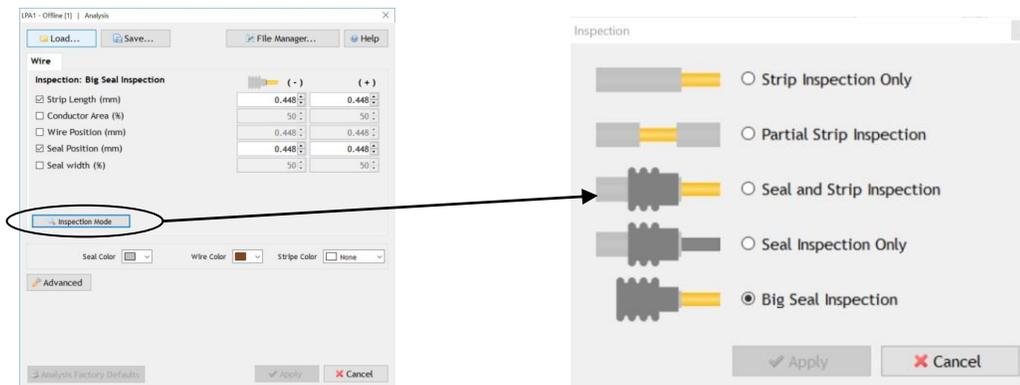
The Menu option icons are defined as follows:



7.0 Setup

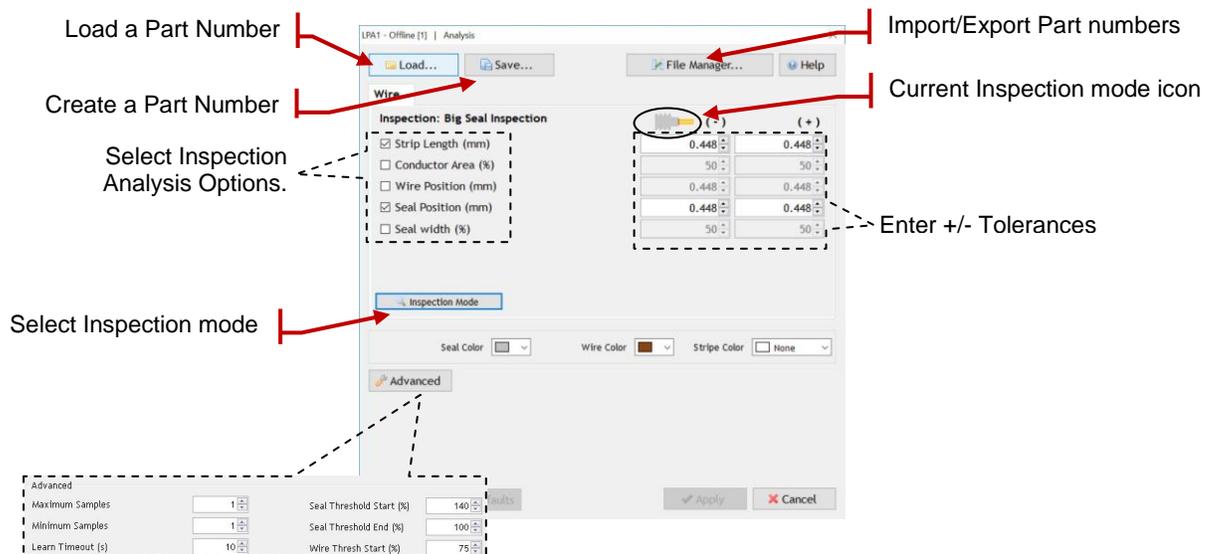


For different parts, the LPA58 inspection parameters could be reviewed and re-configured as required. For example, setup change from wire strip inspection to wire Strip and Seal inspection or tolerance settings.



7.1 Analysis Options, Tolerances and Advanced Settings

Configure the inspection mode and tolerances for the new process. Press the APPLY to load the parameters.



7.2 Advanced Settings

Maximum Samples – refers to maximum number of samples the LPA58 can be in learn mode. During these samples, the LPA must learn or the software will display a “Failed to learn!” message.

Minimum Samples – refers to the number of good samples the LPA58 require to calculate the learn target.

Learn Timeout – Refers to the maximum time the LPA58 will scan for a part after the learn command is received. The learn command can be received through the software, keypad button on the unit or by discrete input pulse (must be configured to Learn function). If no part comes through the LPA will display a “Failed to learn!” message and exit learn mode.

Seal Threshold Start (%) – Refers to the minimum required change in width required from the insulation diameter to the back of the seal.

Seal Threshold End (%) – Refers to the minimum required change in width required from the insulation diameter to the front of the seal

Wire Thresh Start (%) – Refers to the minimum required change in width required from the insulation diameter to the conductor diameter.

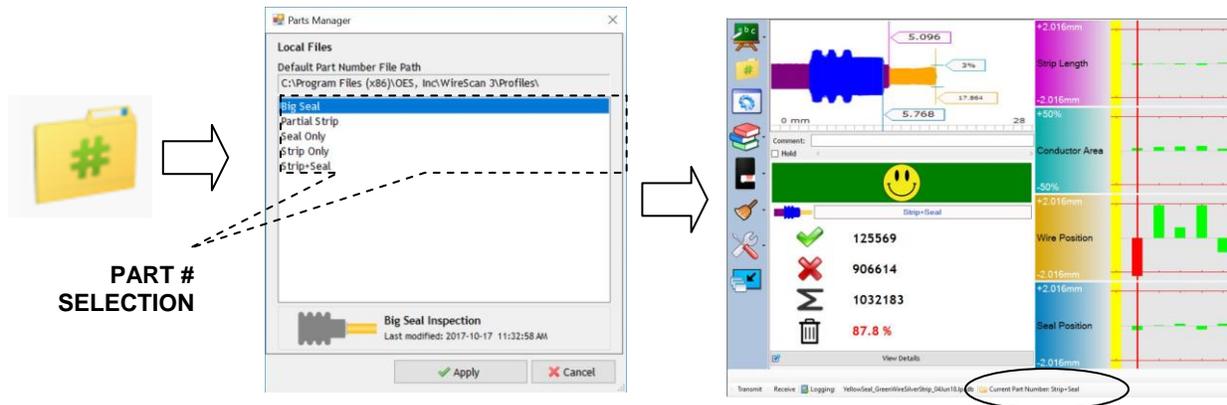
8.0 Part Number

Part Numbers can be optionally created to save the inspection mode, tolerance parameters and advanced settings for a particular part that is produced. Part number selection following machine changeover automatically loads the pre-configured analysis and tolerance settings into the LPA58. Part number selection error proofs the changeover and simplifies the process for the operator. An unlimited number of part numbers may be created.

8.1 Load Part Number

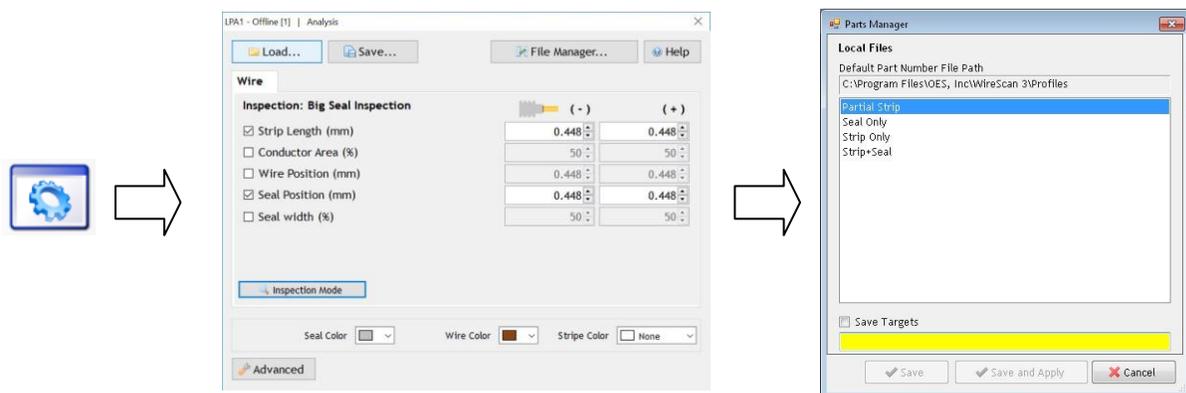


Select a part number and press, “APPLY”. The part number selection will automatically load the analysis and tolerance parameters. The part number is displayed on the operator screen:



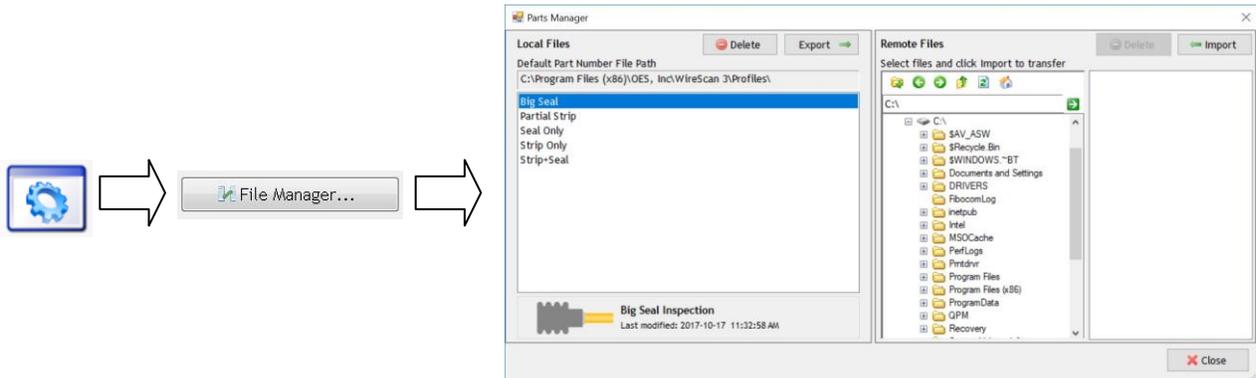
8.2 Create a New Part Number

A new part number may be assigned at any time. Once the inspection analysis parameters have been validated for a specific part, select the analysis setup and the click “SAVE”. Enter the part number in the yellow box and press “Save and Apply”. The part number is now saved and analysis parameters and Advanced settings will be loaded automatically when this part number is selected.



8.3 Export/Import Part Number

WireScan 3 part number data files may be imported or exported to establish global configuration parameters on multiple machines for standardized quality control. Select Analysis Setup, File Manager that will open a window to export or import files to, or from WireScan 3:



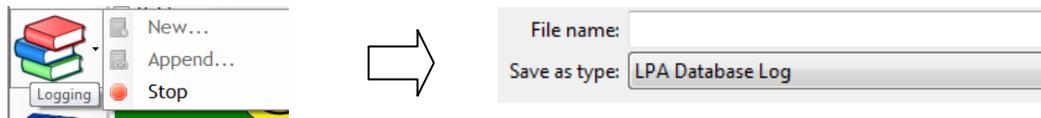
9.0 Data Logging & Traceability



WireScan 3 will create, append, open/replay, or export a data file:

9.1 Create / Append a File

Select Logging, select “New” or “Append, Enter or Select the log File name



Appending a log file, adds data to an already existent log file.

A comment bar will appear on the profile image screen for optional comment entry for the wire sample. This information is included in the log file.

The “Hold” feature will freeze the image profile for viewing and entry of comment. The slider is activated during Hold to sample view the last 20 profile images backwards from the “Hold” sample.

Hold is not needed to add comments. You can add the comments as it is logging or after logging is complete.



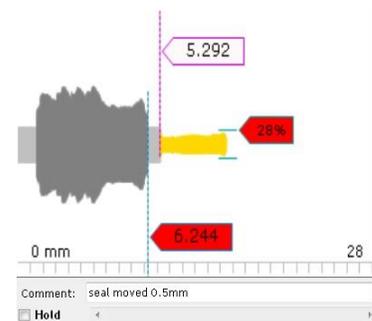
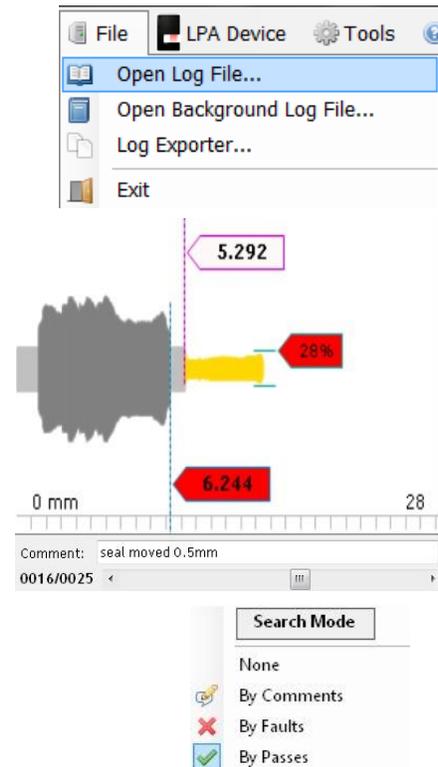
Note Log files are created for only one device. If you have multiple devices connected, you will need to create a Log file for each device.

9.2 Open/Replay a File

Click on File, “Open Log File”, and select the file to Open.

To add comments simply type the message describing the cycle in the comment entry and then hit enter key. This comment will then be tagged to this cycle. When reviewing a Log file or on hold the comment will always appear on this cycle.

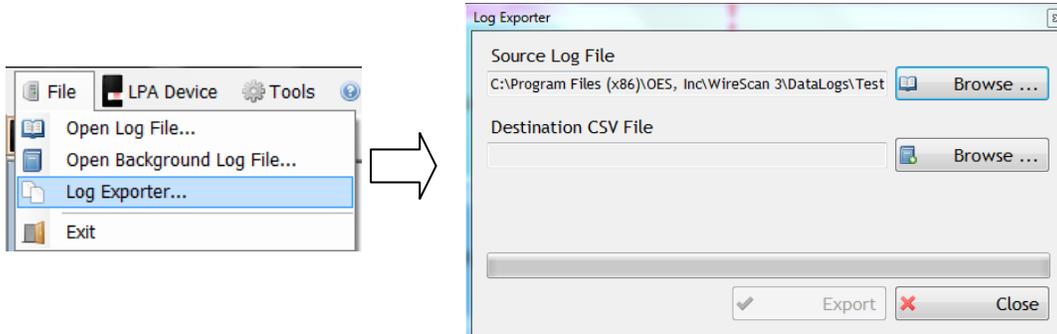
The Log file contains all of the data captured by the LPA58. The total number of inspection samples appears below the comment. Each inspection can be replayed by the < > arrow keys, or the slider can be used to select the sample. The comments are displayed and optionally added/edited into the log file. Right click on scroll bar for advanced replay options.



9.3 Export a File

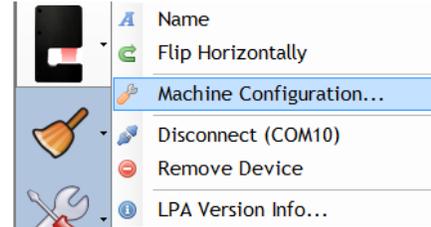
Click on File, “Log Exporter”, and select the file to Open. Files may be exported to CSV file.

WireScan 3 will create, append, open/replay, or export a data file:



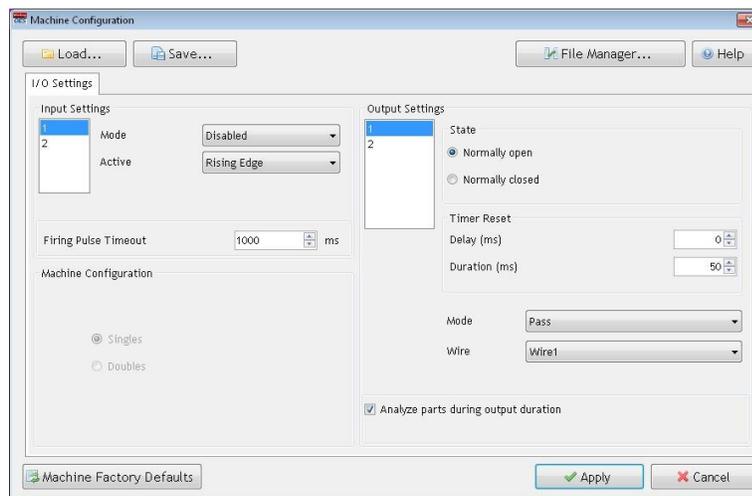
10.0 Machine Configuration

The LPA58 connects with the wire processing machine for control of strip and seal insertion defects. The LPA58 I/O is configured through WireScan 3. The LPA58 machine interface can be manually configured, or the interface may be loaded from a data base. File Manager provides capability to save, load, import or export machine interface configurations by machine model number for simple selection and configuration process.



10.1 Outputs

Configure Output 1 and 2 as required to achieve the desired output interface with the wire processing machine.



Pass – Output is activated after the Wire is scanned and passed the inspection.

Fail – Output is activated after the Wire is scanned and failed the inspection.

Data Valid Output – Output is activated after a Wire is scanned.

Disabled – Output is never activated.

Learn – Output is activated while the LPA58 is on learn mode.

Ready – Output is activated after a pass/fail decision has been made and deactivated with the next scan.

Wire 1 / Wire 2 / Wire 3 / ALL – Refers to the wire scanned on a machine with Multi-wire capacity.

10.2 Inputs

Inputs are configurable to enable/disable the LPA58 inspection relative the machine function and timing.

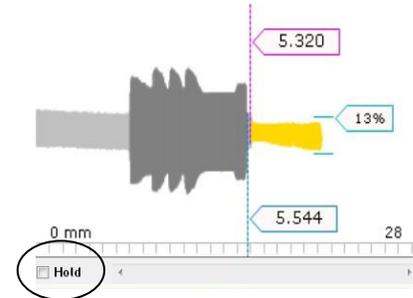
Firing Pulse - Enables the LPA58 inspection during the transfer of the wire sample through the inspection window. It is useful for machines with swing back function to only analyze the correct direction.

Learn – Enables the LPA58 to learn a new setup by setting the unit in Learn mode.

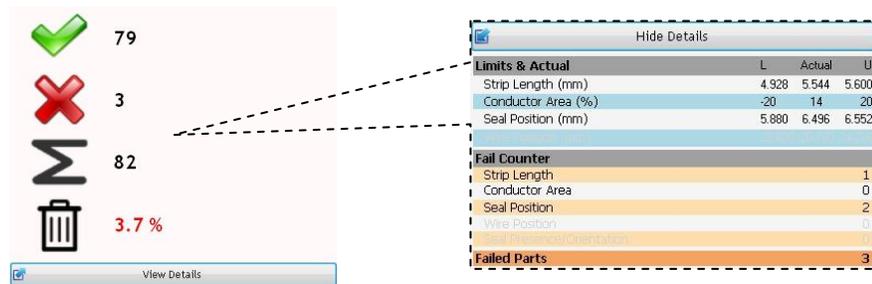
Disabled – Allows the LPA58 to analyse anything that passes through the sensing window.

11.0 Miscellaneous Features

Hold – enables the user to capture and hold an image during production, which freezes the profile image while the LPA58 continues to perform normally in production.



View Details – provides totals for each defect type for a more detailed list of PASS and FAIL by algorithm



Name LPA – the default “LPA1”, “LPA2” can be re-named to better describe the LPA sensors on the machine. Select LPA Setup, select “Name” and enter the new description for the LPA58.



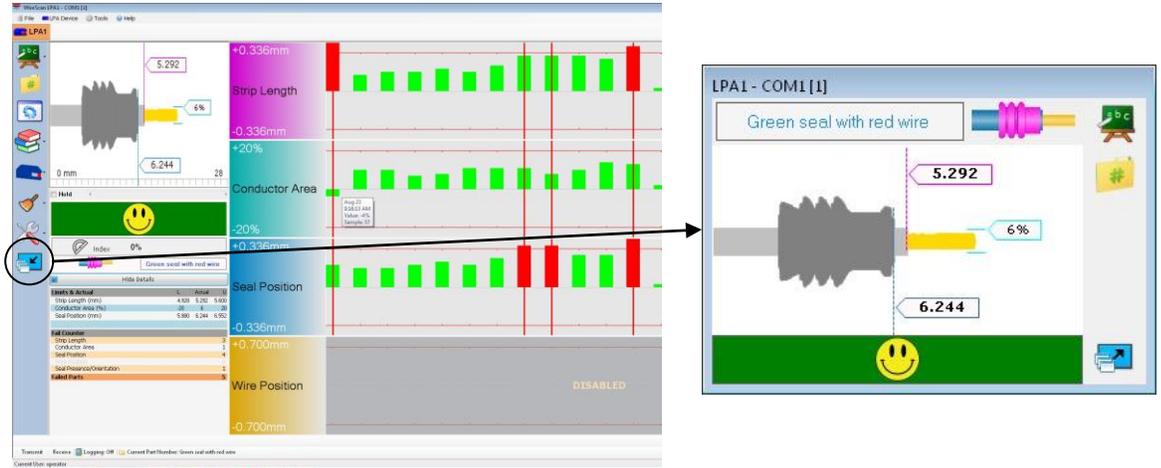
Clear Data – the data on the WireScan 3 interface is cleared by selecting the clear icon and selecting the information to be cleared.



Clear selection options – clear Counters, Trends, or All.

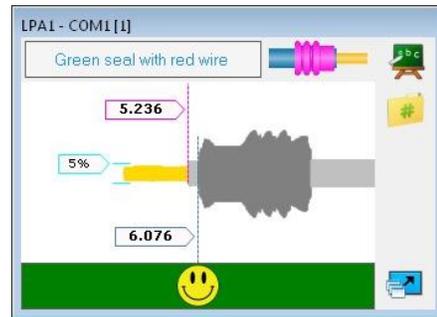
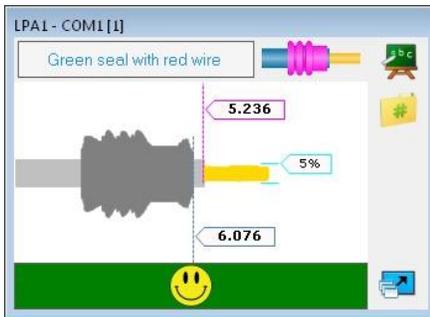
Pop-Up - WireScan 3 operator’s interface can be minimized to a small icon to be positioned on the wire processing machine’s PC. Pop-up allows the user to minimize the view and detail view with a mouse click.





NOTE The pop-up opacity can be adjusted - see program options 9.8.0

Flip Horizontally – two LPA58’s are typically installed on a machine for inspection of Side A and Side B. The image profile for each side can be displayed relative to the LPA mounting location and orientation on the machine. To flip the image select LPA Setup and select “Flip Horizontally”.



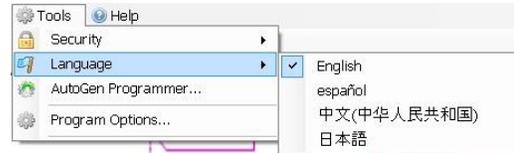
LPA version Info – Displays the LPA58 firmware and Software revisions

LPA Version Info...

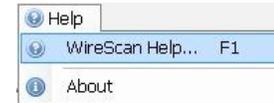


Product ID:	DEBUG 0.9.55 29May18
Board Version:	REV: A
FPGA Firmware Version:	0.4
Firmware Version:	0.9.55
Boot-loader FPGA Version:	0.3
Boot-loader Version:	0.9.2

Language - Language selection from Tools Menu. Select language of choice. Contact OES for additional language request.



Help - Select Help or F1 to access the WireScan 3 / LPA58 manuals.

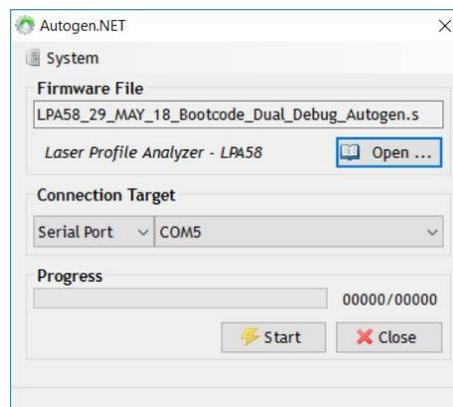


11.1 AutoGen programmer

AutoGen programmer is used to load new firmware revisions into the LPA58.



Select the Firmware file supplied by OES, the communication method and port. Then click Start, the program will start downloading. Do not power off or disconnect the LPA58 at this time. The progress bar will notify when the program has been fully downloaded.

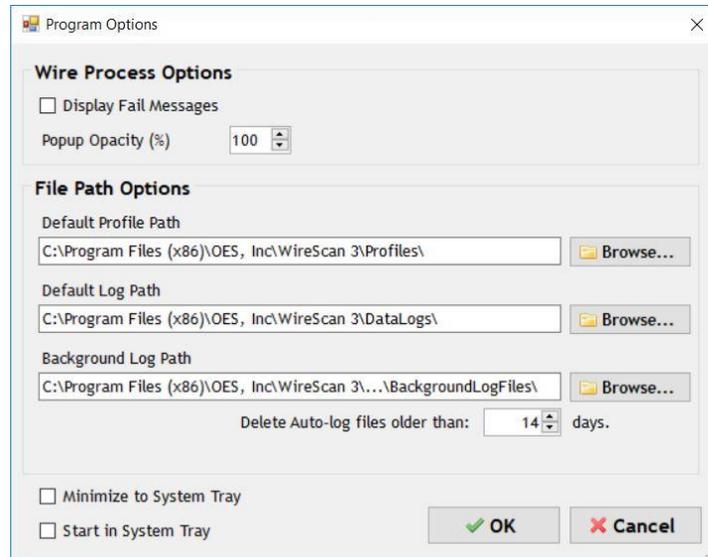


After downloading a new firmware, close the AutoGen Programmer screen. All previously connected devices will reconnect.

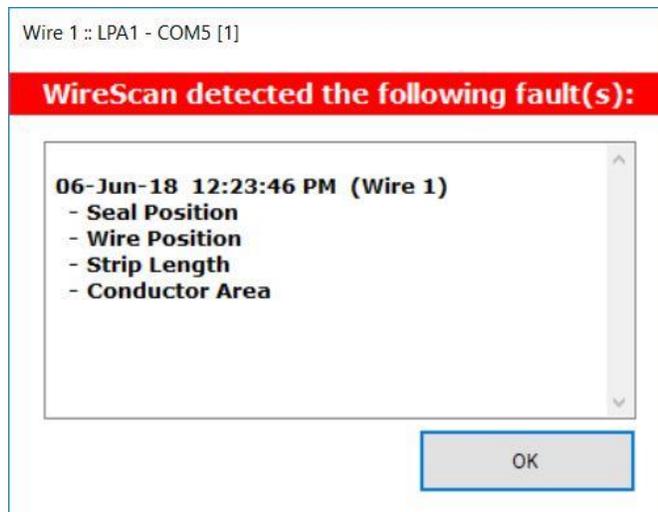
You must load Factory defaults to all devices with a new firmware, to properly initialize all parameters.

11.2 Program Options

Program options contains configuration on how the software looks, loads and stores/reads files.



Display Fail Messages – Will prompt the operator with a screen on top of the Machine software every time an error occurs.



Popup Opacity % - is the percentage of translucency on the LPA popup screen. Translucency is used to view the machine software interface being covered by the popup screen.

File Path Options – is the computer file location where the part numbers (profiles), user log files and background log files are stored.

Delete Auto-log files older than – configures the amount of data stored by the background logs to limit the amount of disk space used by WireScan 3.

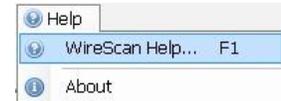
Minimize to System Tray – Minimizes the software to the system tray instead of the task bar.



Double click on OES WireScan icon to view the software.

Start in System Tray – When the software is initially opened, it minimizes automatically to the system tray.

Help - Select Help or F1 to access the WireScan LPA58 manual

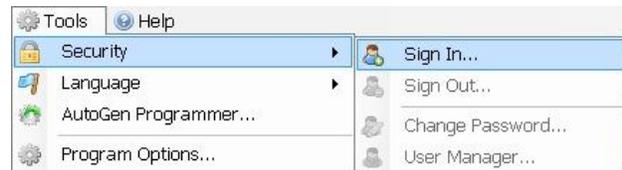


12.0 Security

Access to LPA58 configuration and data is controlled by password and typically by user function – for example Operator, Maintenance, Setup, and Quality personnel. The WireScan 3 security feature allows the user to setup the security levels and access control by password.

Sign In - The User must first sign in.
WireScan 3 is supplied with administrator default password:

User: admin
Password: oes

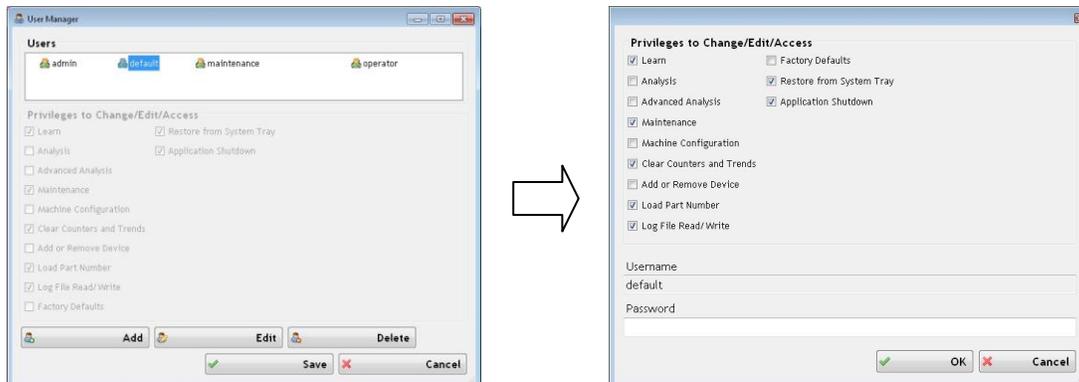


Successful sign in will enable entry to “change passwords” and “user manager”

Sign out - disables access to security functions.

Change Password – Allows the currently signed user to modify its password. OES recommends the admin password is customized at installation.

User Manager - Following successful password entry, the administrator may then access the “User Manager” to add, edit, or delete users, passwords, and select privilege.



13.0 Maintenance Features

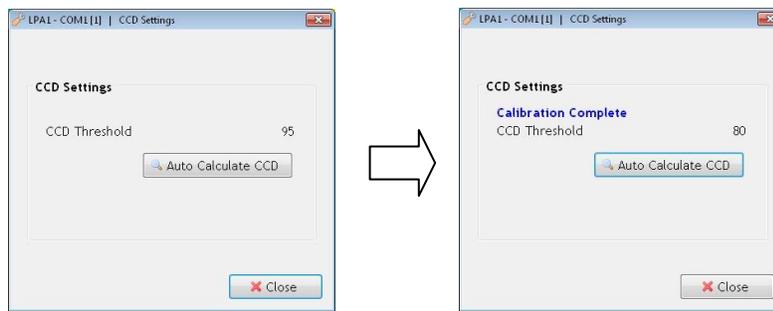


The LPA58 is a self-contained optical sensing device with integrated microcontroller electronics. There are no serviceable parts inside. OES recommends not removing the covers for any reason, which may result in damage, misalignment, and void the product warranty.

OES recommends the LPA58 product is routinely inspected for excessive dirt or fluid accumulation on the optical elements and around the sensing window. An auto calibration feature can be performed to compensate for any degradation of the optical components over time.

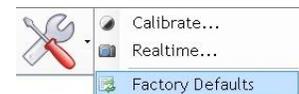
13.1 Calibrate

Auto calibration of the LPA58 sensor optics is a procedure that can be performed within 1 minute. Select Maintenance mode and select "Calibrate". Select Auto-Calculate the CCD.



13.2 Factory Defaults

Factory defaults sets all of the tolerance parameters back to a common set of parameters. This feature is used to re-establish the base line factory settings.



14.0 New Installation

New WireScan 3 installation involves 3 key steps;

1. Mechanical mounting of the LPA58 sensor at a location on the machine so wire strip and/or seal passes through the 28mm inspection window. See section 5.0 Inspection modes for instructions on how the wire should be presented according to the mode.
2. LPA58 electrical interface with the wire processing machine.
3. WireScan 3 software, which is the interface for the LPA58.

14.1 Mechanical Mounting

The mechanical mounting of the LPA58 to the wire processing machine is to orientate the position of the LPA58 so the wire passes through the 28mm sensing window.



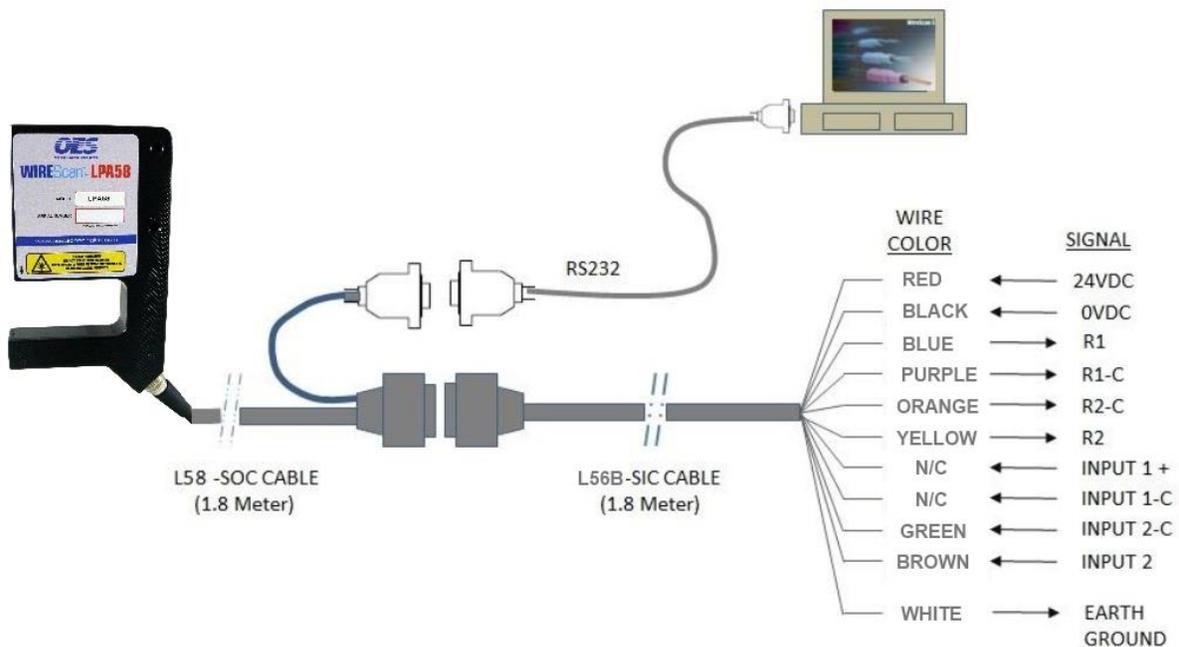
Note the following when investigating the mounting position of the LPA58:

- *The wire end may need pass within the LPA58 sensing window depending on the selected inspection mode.*
- *Machine timing – the LPA58 should be mounted at a location that ensures the inspection will occur early enough in the process for the LPA58 to provide an output in time to achieve the desired machine control.*
- *The Sensor Head should be positioned so there is no possibility of physical contact with the wire or the conveyor parts of the machine as the wire is transferred through the window and swung back through the sensor with terminal. Manually moving the arm through its trajectory to confirm that no crashes will occur.*
- *Wire should pass through the window as close to parallel with the sensing element as possible.*

14.2 Electrical Interface

The LPA58 connections to the wire processing machine are as follows:

- 24VDC supply power.
- I/O for machine for control of defects.
- RS232 serial cable connection to the machine PC.**



LPA58 is supplied with a 1.8 meter length electrical interface “L58-SOC” cable with two connectors – I/O cable connector and a serial cable connector.

An I/O “SIC” cable extends the machine interface cable, which is routed and connected to the machine 24VDC supply and control I/O.

An RS232 serial extension cable is routed to the machine PC and connected to an RS232 serial port.



NOTE a Serial to USB or Serial to Ethernet device may be used if the PC does not have an available RS232 serial port. Contact OES for more information.

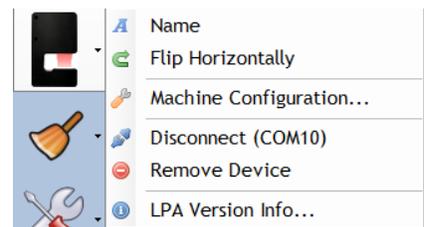
14.3 WireScan 3 Software

WireScan 3 software is installed on the wire processing machine computer with Windows platform. WireScan 3 communicates with the LPA58 by RS232 serial port and manages all functions of the LPA58 - Operator Interface, Configuration and Setup, Data Management (Logging and Export).



WireScan 3 is installed under Windows OS. WireScan 3 is compatible with XP, 7, & 8. WireScan 3 is not compatible with Windows 95, 98, 2000, and NT or any versions prior to these.

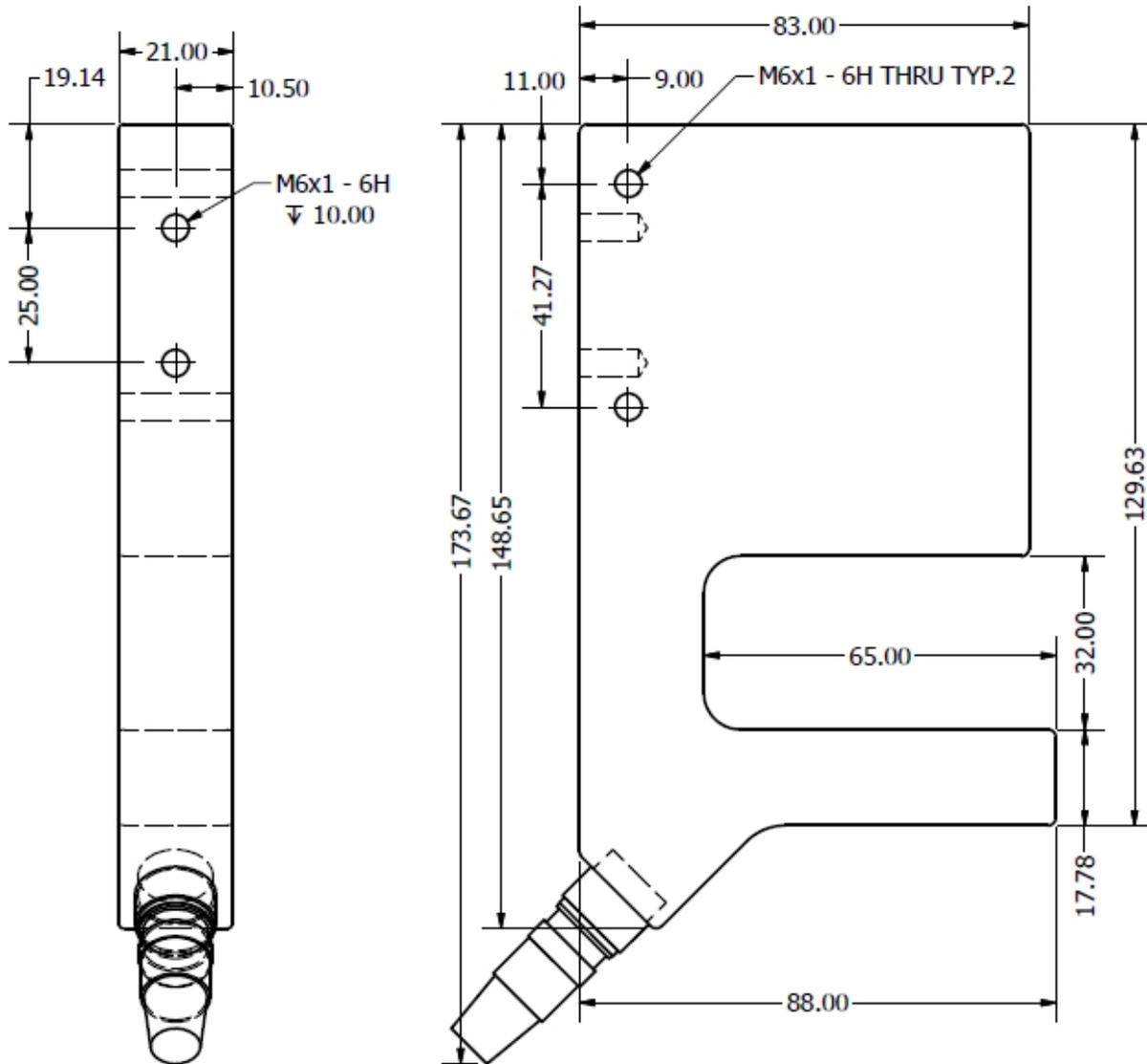
Add Device - Following successful installation of the LPA58 and WireScan 3, the communication between the LPA58 and WireScan 3 is manually established. Select “Add a Device” will display the PC communication port and will recognize the LPA if it is properly connected. Click on the device and press OK to open the communication port. An Icon will appear at the top of the screen to confirm the LPA has been added. WireScan 3 will manage multiple LPA’s. Click on the LPA icon to select the unit for monitoring. Once the LPA58 communication is established, the port will remain open unless manually closed.



To remove a device select the LPA device at the top of the screen, select **LPA Setup** and click “Remove Device”.

To disconnect and reconnect the serial communication select **LPA Setup** and click connect or disconnect.

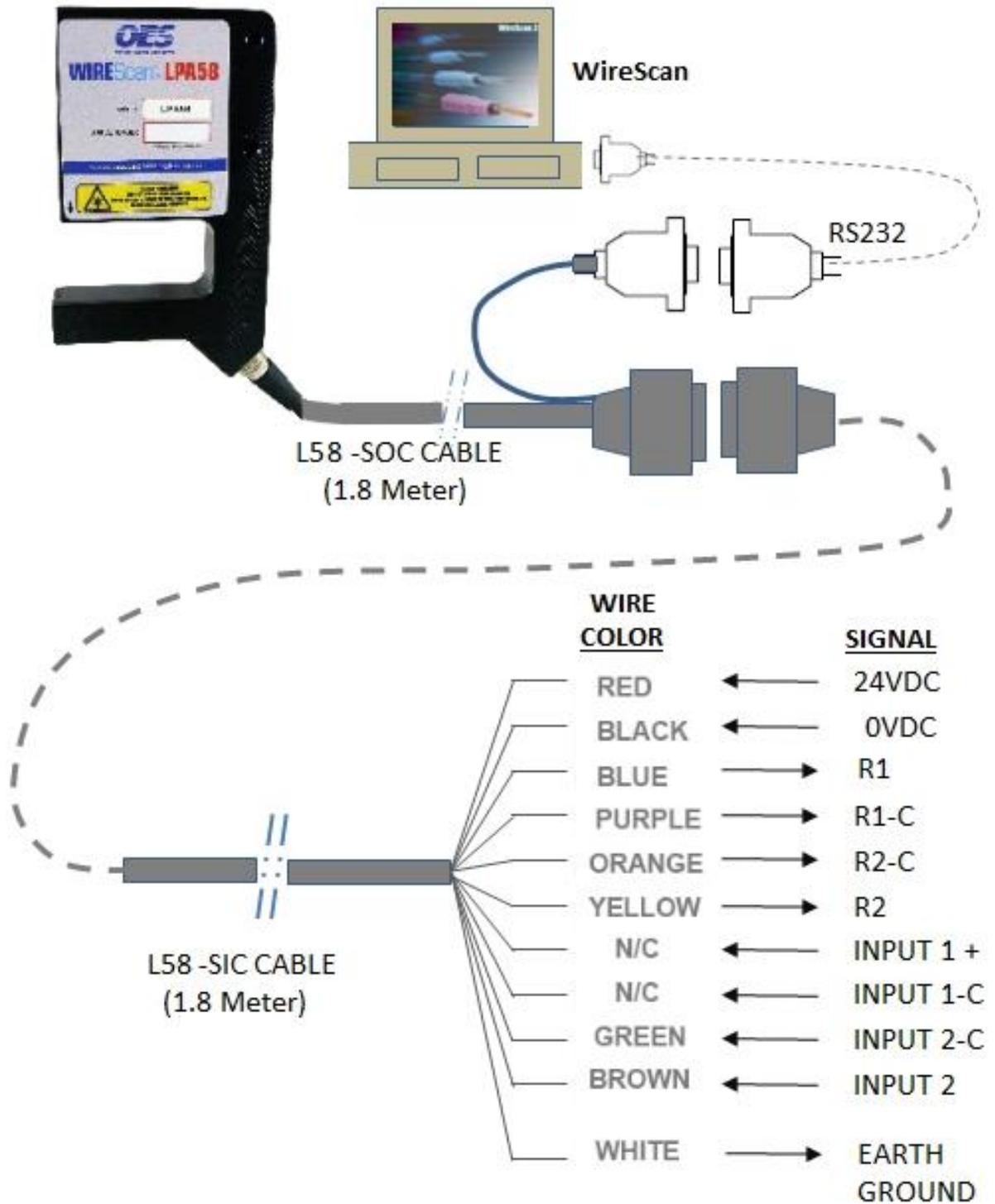
Appendix: Mechanical Specifications



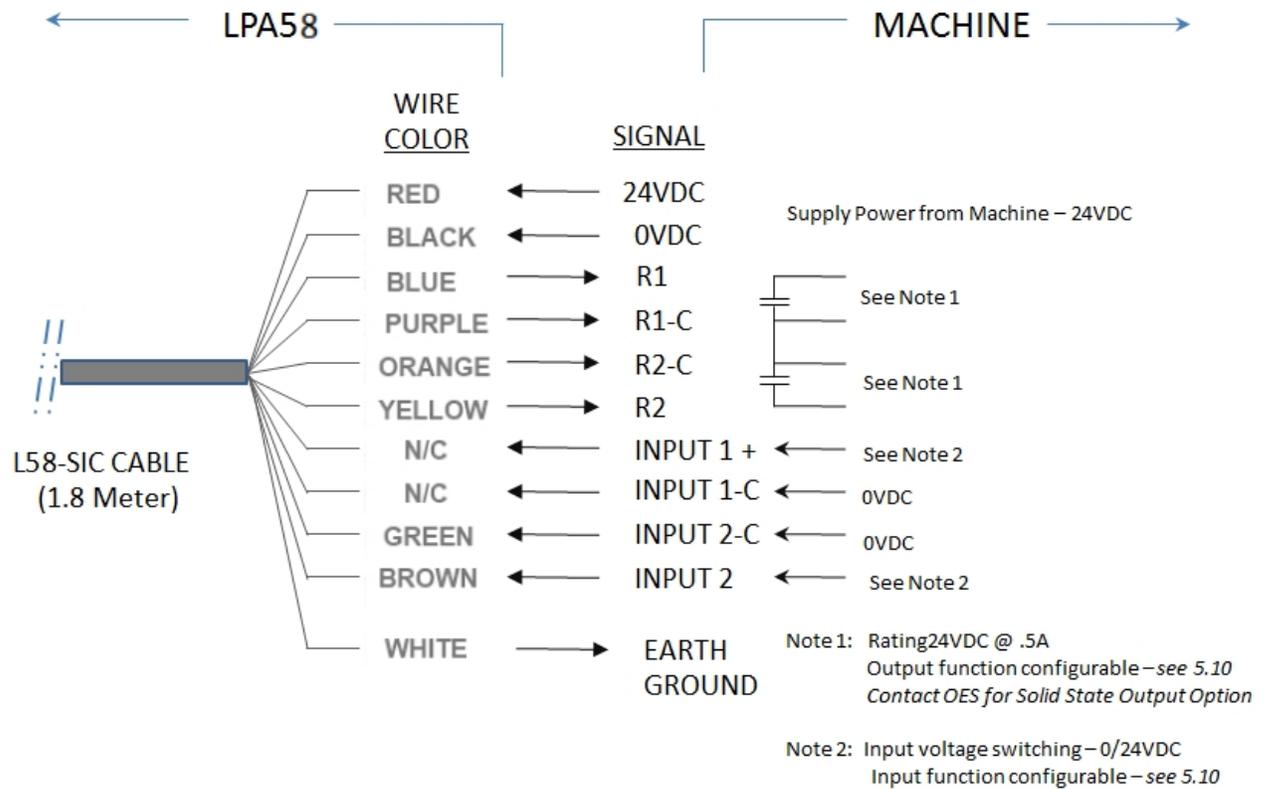
Appendix: Electrical Specifications

ENVIRONMENTAL	
Operating Temperature	0 to 60°C (32 to 140°F)
ELECTRICAL	
Voltage supply	24VDC @ 200 mA +/- 10%
Discrete Inputs (2)	24VDC
Electro-mechanical Outputs (2)	24 VDC @ 0.5A - dry contact
Serial Communication	RS232
LASER	
Wavelength	658 nm
Class	2M
DYNAMIC PERFORMANCE	
Inspection Window Length	28 mm (1.10")
Resolution – Length	0.028 mm (0.002")
WIRE & SEAL SIZE	
Typical Wire Size	16.8 mm ² – 0.05 mm ² (5 – 30 AWG)
Seal Diameter Range	2 - 12 mm (0.079" – 0.472")
PHYSICAL	
Width	21.0 mm (0.827")
Length	87.8 mm (3.46")
Height	143.0 mm (5.63")

Appendix: Electrical Connection Diagram



Appendix: Typical Machine Interface



Appendix: Configuration Worksheet

Screen	Parameter	Default Value	Custom Value
1 – Machine Configuration	Machine Capacity	Single Wire Inspection	
2 – Inspection Requirement	Inspection Mode	Strip and Seal Inspection	
3 – Output Settings (Output 1 & 2)	Default State	Normally Open	
	Mode	Pass	
	Wire	Wire 1	
	Time Reset Delay (ms)	0	
	Duration (ms)	50	
	Output Reset Method	Timer	
	Learn Options	Enabled during Learn	
4 – Input Settings	Input 1	Disabled	
	Input 2	Learn/Both	
Inspection Mode	Firing Pulse Timeout (ms)	500	
	Minimum Setup Duration (ms)	4000	
	Strip Length	+2.00 / -2.00	
	Conductor Area	+50% / -50%	
	Wire Position	Disabled	
	Seal Position	+2.00 / -2.00	

Appendix: Spare Parts and Options

Spare parts	Part number
USB Stick WireScan 3 Software User Manual	Available for download at: www.OESTechnologies/downloads/
Interface Cables Standard Interface Cable with flying leads Interface Cable with Learn button option	<p>L58-SIC</p>  <p>L58-SIC-L</p> 
Communication Cables Serial Communication Cable Serial to USB Adapter	<p>AU008A</p>  <p>AU003A</p> 
Mounting Bracket Options Mounting Bracket	Machine specific option – Contact OES

Appendix: Warranty

1. The warranty coverage is for materials and labor for a period of two years from the 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' obligations are limited to repair and replacement of the part(s) shown to be defective at the time of shipment. OES' 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 PRODUCT return policy for goods claimed to be warranty repair, is as follows:
 - OES PRODUCTS shall be returned to OES, Canada "Delivery at Place" (DAP) meaning the customer is responsible for the freight and delivery to OES Inc. Canada, OES pays customs duties and taxes.
 - OES PRODUCTS repaired or replaced by OES under warranty will be returned to the customer "Delivery at Place" (DAP) meaning OES pays for the freight and delivery to the customer destination, customer pays for customs duties and taxes.



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