Wheel Press Recorder

A component of the Wheel Shop Management Suite (WSMS)

User Guide

Contents

Introduction

Overview

Wheel Press Recorder is part of the Wheel Shop Management Suite. It is used to record wheel mounting charts and data for freight wheel sets. The program will automatically recognize several types of mounting chart misfits. However, **wheel shop personnel must review each chart for correctness** per Association of American Railroad requirements.

Layout

Wheel Press Recorder contains two main screen areas. The menu bar located across the bottom of the screen and the client area above the menu bar. The menu bar is used to access important features, like returning to the home screen. For more details see the topic on the Menu Bar. The client area is for displaying data and changes based on the current operation.

System Requirements

This application has minimum system requirements as described below. These requirements must be met for the application to operate as designed.

This application supports the following Microsoft Windows operating systems.

- Windows 8.1 (x86 and x64) [1]
- Windows 10 (x86 and x64) [1]

The application requires the Microsoft .Net Framework (4.6.2 or later) which can be obtained from https://dotnet.microsoft.com/download

The application requires the following hardware at a minimum.

- 2.0 GHz Processor

- 1 GB installed RAM

- 100 MB available disk space

- Ethernet Card

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[1] When installed on a 64 bit operating system, the application will run in a subsystem of Windows called WOW64 (Windows-on-Windows 64 bit). WOW64 is included on all 64 bit versions of Windows and is designed to make differences between the operating systems transparent to the user.

Getting Started

Installing Wheel Press Recorder

You will need Administrator rights to install Wheel Press Recorder.

Make sure you have the latest version of our Wheel Press Recorder Setup program. Contact our support team for assistance. To install Wheel Press Recorder, run the setup program and follow the on screen prompts as described below:

Click NEXT to continue.

Accept the license agreement and click NEXT.
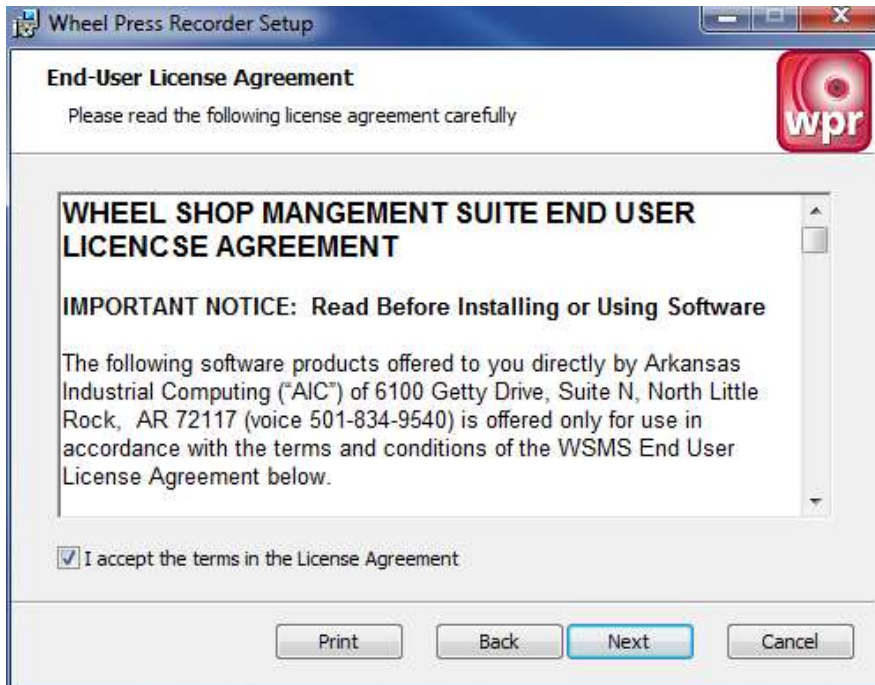
Select the location where you would like to install Wheel Press Recorder to and click NEXT.

Click INSTALL to being the installation.
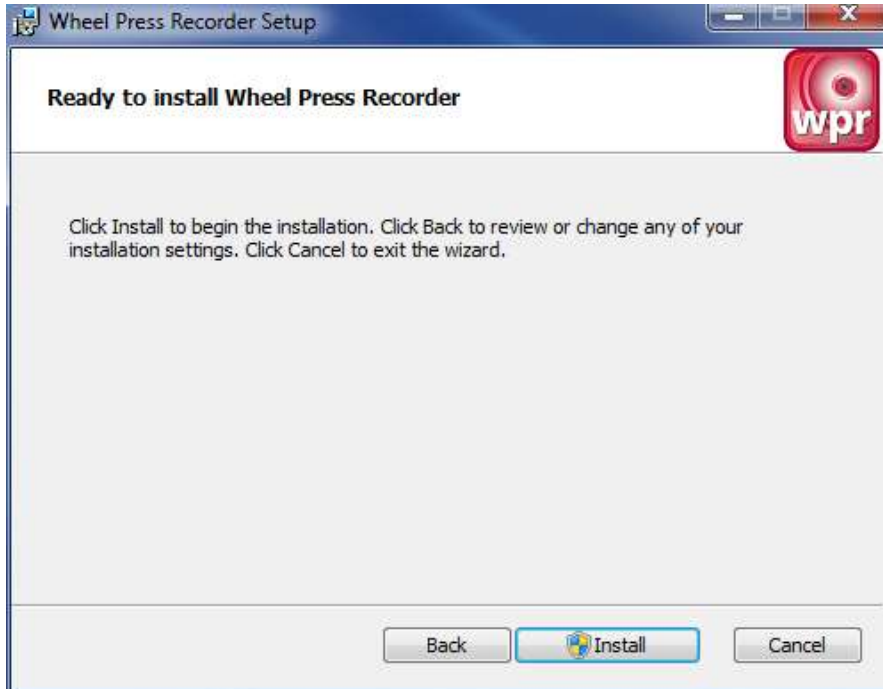
You may be asked to allow the setup program to install Wheel Press Recorder on your computer. Click YES.
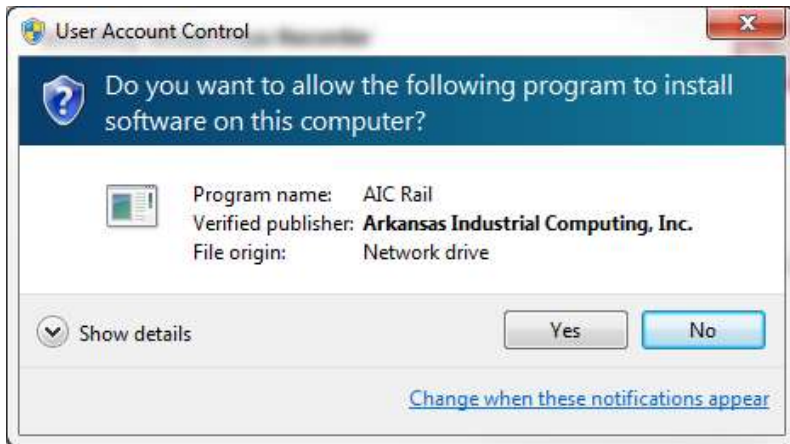
When the installation has completed, click FINISH to close the setup application.

Initial Setup

Once you have installed Wheel Press Recorder you can double click the desktop shortcut to start the application.
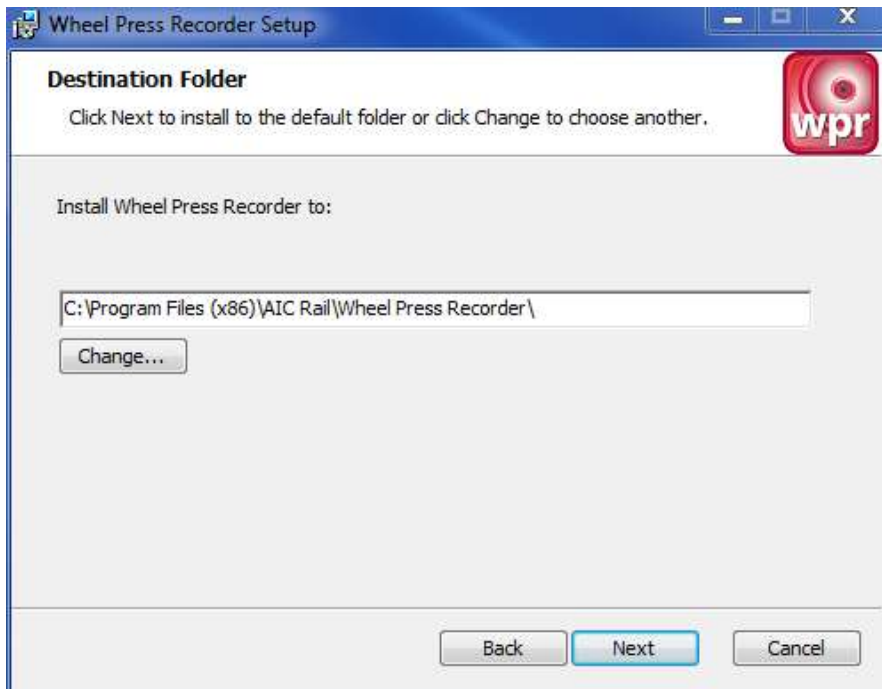
Wheel Press Recorder requires access to an instance of the WSMS database which can be installed on the same computer or any computer with network access and the required permissions. The first time you run Wheel Press Recorder you will be prompted to enter your database connection information.
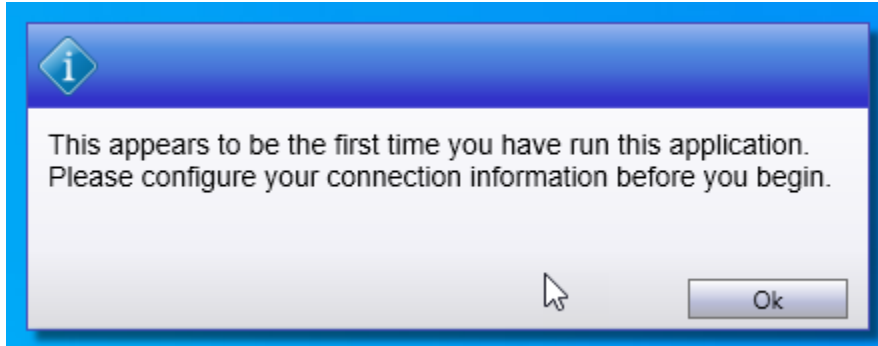
Refer to the section on Connection Settings for more information on configuring the database connection.

Login

Each user is given a unique username and password for the WSMS system authentication and accountability. You must provide your shift, username and password each time the application starts before you can begin using it. Your login also determines what functions you have permissions to perform. If you do not have this information, contact your manager or a system administrator.

Menu Bar

The menu bar is used to access the home screen, as well as important tools like Documents, Chat, and Get Support.

Home

Navigate to the Home screen. For more information refer to the section on Home.

Documents

Opens the Document Viewer portal for viewing electronic documents. For more information refer to the section on Document Viewer.

Chat

Opens the Chat feature for communicating with other WSMS users or stations. User must possess 'CanChat' permissionsFor more information refer to the section on Chat.

Get Log Files

Used to retrieve the diagnostic log files so they can be sent to AIC Support team. After clicking Get Log Files you will be prompted for a folder and file name to save the information to a ZIP file. After saving this file, you can send it to AIC Support for help troubleshooting. For more information contact AIC Support.

Get Support

Used to submit a support ticket for the current station. Refer to the Get Support section for more information.

Clock

Displays the current time of day based on the computer date and time settings.

11:33 AM

Home

The Home screen provides access to the important settings and features of Wheel Press Recorder. Features are grouped together based on their purpose.

User

Displays the currently logged in user.
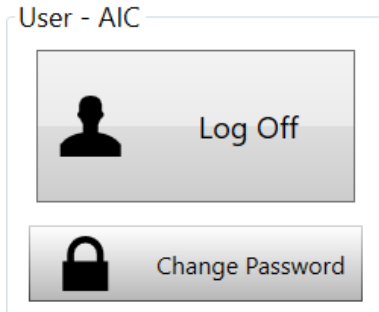
- Log Off - logs out the current user.
- Change Password – Opens the change password dialog to let the currently logged in user change their password.

Help

Provides information for getting help with the current application.
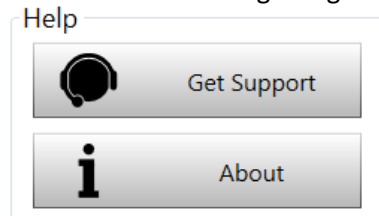
- Get Support - Opens the AIC Support website in the default web browser. This requires internet access be available at the station.
- About - Opens the About dialog that displays information about the current version of the application.

System

Provides access to configuration and setup for the current station.
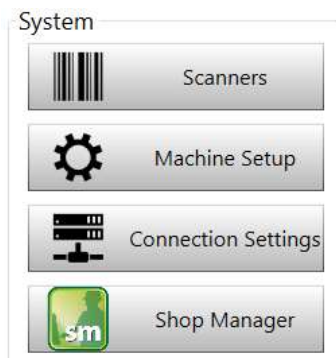
- Scanners - Opens the scanners dialog to troubleshoot problems with your barcode scanner, or to configure a new scanner or barcode label. Refer to the section on Scanners for more information.
- Machine Setup – Opens the settings dialog to configure settings for this machine. For more information refer to the section on Settings.
- Connection Settings – Opens the Connection Settings dialog to configure the database connection information for the WSMS database. For more information refer to the section on Database Connection Settings.
- Shop Manager – Launches the Shop Manager application, if it is installed. Refer to the Shop Manager User Guide for information on Shop Manager.

Production

These are the most common functions and will be available to all users that have access to log in to the application.

- Press – Navigate to the press screen to record data and mounting charts for the current wheelset. Refer to the section on the Press screen for more information.
- History – Navigate to the History screen to review data for the wheelsets that have been mounted from this machine. Refer to the section on History screen for more information.
- Trends – Navigate to the Trends screen to view the force trends for the most recent wheelsets. Refer to the section on Trends screen for more information.
- View Logs – Opens the current diagnostic log file in Notepad. Used primarily by AIC Support for troubleshooting problems.

Maintenance

Provides access to the Downtime feature, sensor calibration, and for exiting the application.

- Downtime – Navigates to the Downtime screen for managing the current machine status. Refer to the section on <u>Downtime</u> for more information.
- Calibrate Sensors – Navigate to the Calibration screen for calibrating the force and distance sensors that are used to record the mounting charts. For more information refer to the <u>Calibration</u> section.
- Unsynched Data –This button only appears if there is data that has not been saved to the database. Clicking the button navigates to the Unsynched Data screen for viewing and managing the unsynched data. See the section on Unsynched Data for more information.
- Exit – Closes the application and returns to the Windows desktop. The user must have 'ExitApplication' permission to be able to exit the application.

Machine Inspections

Provides access to the Machine Inspections feature for recording periodic setup, maintenance, and validation inspections. Machine Inspections let you record electronically what you previously had to keep up with on paper. For more information on Machine Inspections refer to the sections on <u>setting up Machine Inspections</u> and performing Machine Inspections

Barcode Scanner and Labels

Diagnostics

Test and diagnose issues with barcode scanners. While on this tab, scan a barcode with one of the barcode scanners connected to the machine. If the scanner is set up properly, you should see the barcode and scanner information populate.
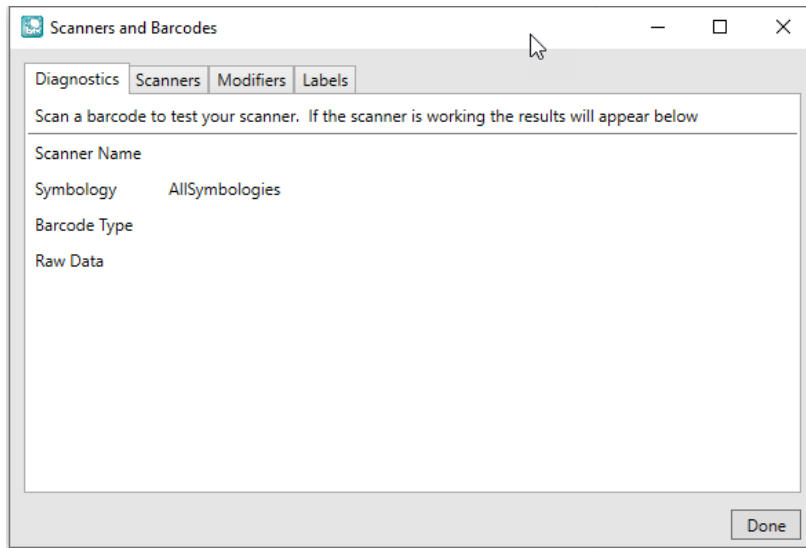
- Scanner Name – The name assigned to the scanner that read the barcode. If more than one scanner is configured this name should be unique to help you identify the scanner.
- Symbology – The Symbology of the barcode that was scanned. It will either show the symbology like **DataMatrix, Code128, PDF417, etc.** or it will show **Unknown** If the symbology cannot be detected. When the symbology cannot be detected the scanner most likely is not configured to transmit the AIM ID prefix that identifies the barcode symbology. This may cause the barcode to be misidentified or not identified at all.
- Barcode Type – The label definition type that was matched to the barcode being scanned. If the Barcode Type is Unknown, it means the barcode that was scanned is not matching any of the known label definitions, either because the data is in the wrong format or the symbology does not match. Refer to the section on Labels for more information.
- Raw Data – The character string that was read from the barcode, not including the symbology AIM ID prefix if it exists.

Scanners

View and configure barcode scanners.
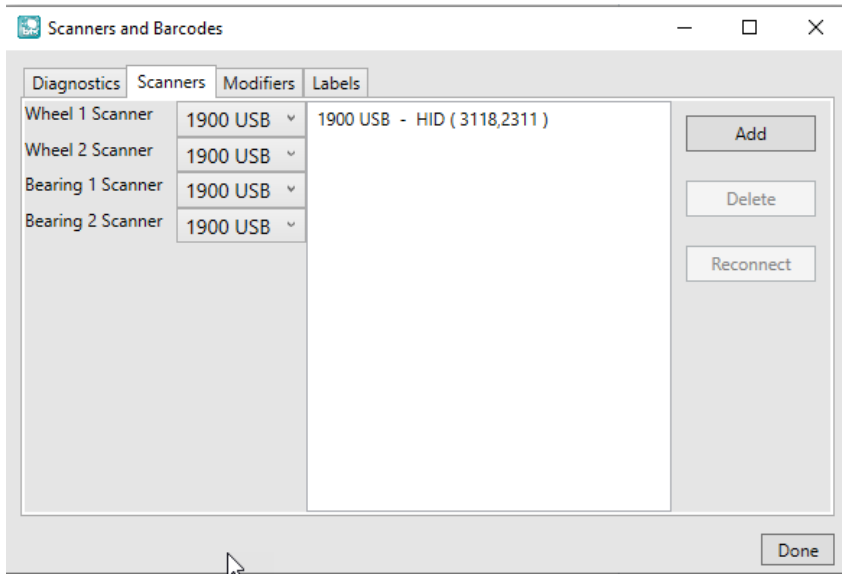
- Add – Configure a new barcode scanner for use with the application.
- Delete – Remove the selected barcode scanner from use.
- Reconnect – Disconnect the selected barcode scanner and attempt to reconnect.
- Component scanner settings – If more than one scanner is configured, you can specify to only scan certain components with a specific canner. Select the scanner name next to each component. If you only have one scanner, you can select that scanner for all components, or leave it blank.

Adding a Scanner

To add a new scanner, Click Add. In the popup dialog, enter a name to identify the scanner and select the scanner interface type (HID, RS232, etc).
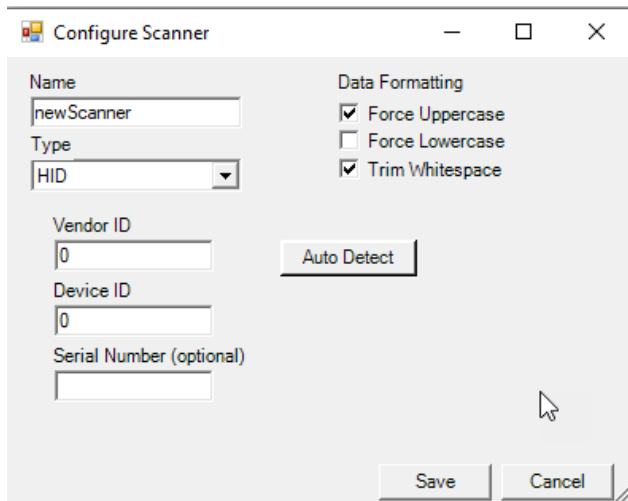
Specify any data formatting you want to apply to the raw barcode data using the checkboxes in the top right corner. By default, all barcodes will be UPPER CASED and whitespace will be removed from the beginning and end of each barcode and each value that is parsed out.

Depending on the Type selected, you will need to enter some parameters that are required to connect to the scanner. In most cases you can use the Auto Detect feature to automatically detect these parameters.

- Click Auto Detect button
- Scan a barcode (other than a programming barcode) with 15 seconds.
- A message will appear below the Auto Detect button to indicate if the auto detection was successful. The parameters should populate automatically.

Note: For USB barcode scanners, the Serial Number parameter is optional if you are only using one scanner at the station. Leaving it blank will allow you to replace a scanner without having to reconfigure it, as long as the make and model are the same. If using more than one scanner (example: Wheel A and Wheel B or Left and Right) the serial number is required to distinguish between the scanners.

Modifiers

Sometimes component manufacturers make mistakes with their barcodes, or fail to follow the AAR S-920 specification. You should always report issues to the manufacturer so they can correct the issues immediately. Depending on the error, we may be able to modify the barcode data so it meets the correct format using a Regular Expression find/replace on the barcode data.
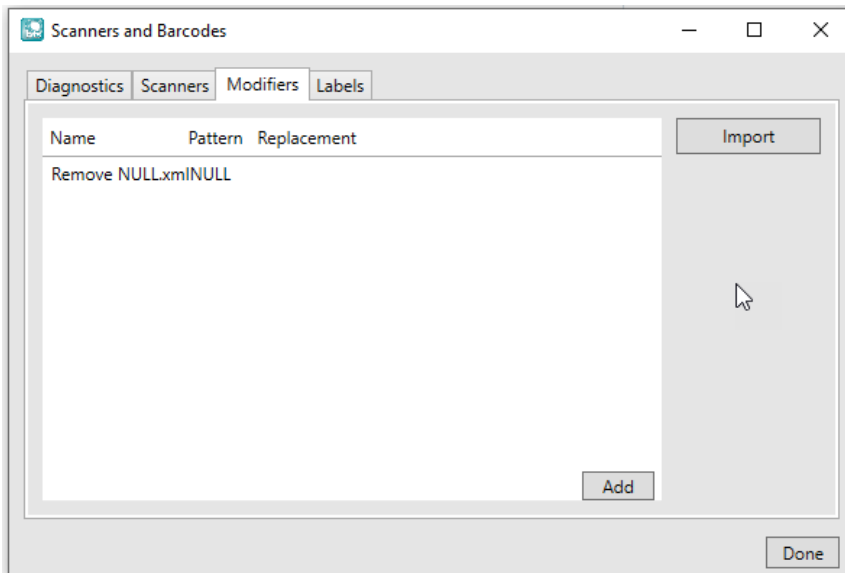
Advanced users may be able to create these Modifier themselves by click Add to create a new Modifier.
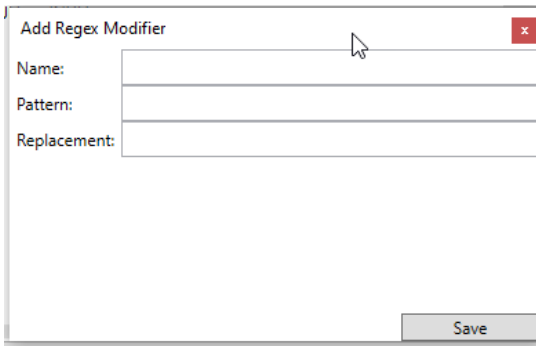
- Name - A descriptive name that helps identify the problem this Modifier is trying to address.
- Pattern – The Regular Expression pattern used to find the problems in the barcode data that need to be fixed.
- Replacement – An expression or text that you want to use to replace the data that matches the Pattern.

After you save your changes, this information will be saved to a file on the local machine only. You will have to repeat this process at each machine that requires it, or you can copy the file and use the Import option.

Import lets you add a Modifier to the system using a Modifier file that was already generated, either by another user, or more likely by AIC Rail.

Labels

View and configure barcode label definitions. Label definitions help the system to identify different types of barcode labels. For example WIP ID labels vs 1D Component ID labels vs 2D Component labels (Wheels, axles, etc).
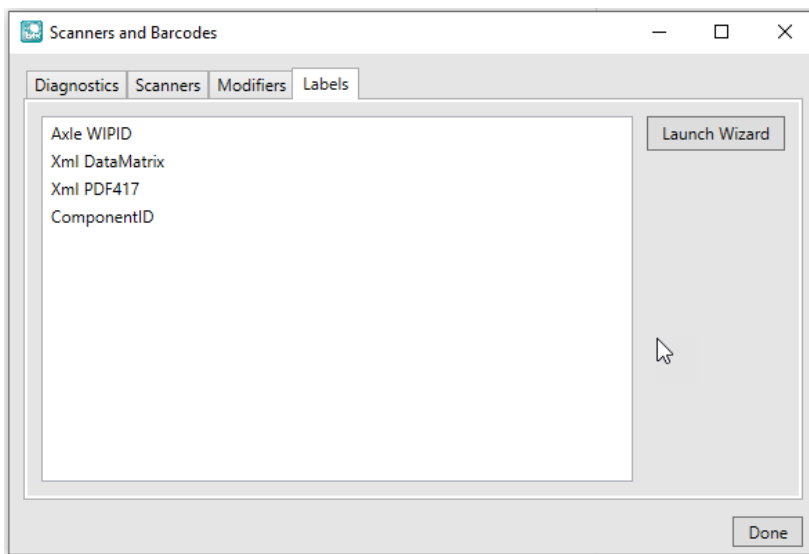
- **Launch Wizard** – The only way to configure a label definition is with the Label Definition Wizard. Click Launch Wizard to start the label definition wizard.

Label Definition Wizard

The first page of the Label Definition Wizard lists all of the current definitions and provides controls to add, edit, remove, etc.
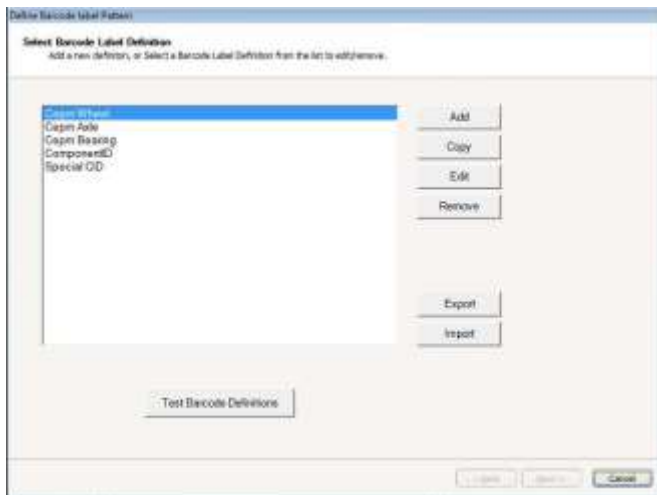
- Add – create a new label definition
- Copy – create a new label definition by copying the selected label definition
- Edit – Modify the selected label definition
- Remove – delete the selected label definition
- Export – save the current label definitions to a file so it can be imported to another system
- Import – select a file that was exported from another system to import into your system
- Test Barcode Definition – go to the Test Label Definition screen to scan a label and verify it is properly detected.

Add Label Definition

To add a new barcode label definition, click ADD. You will then add the label definition description and properties such as the Symbology and Barcode type. Click NEXT, to configure the barcode label.
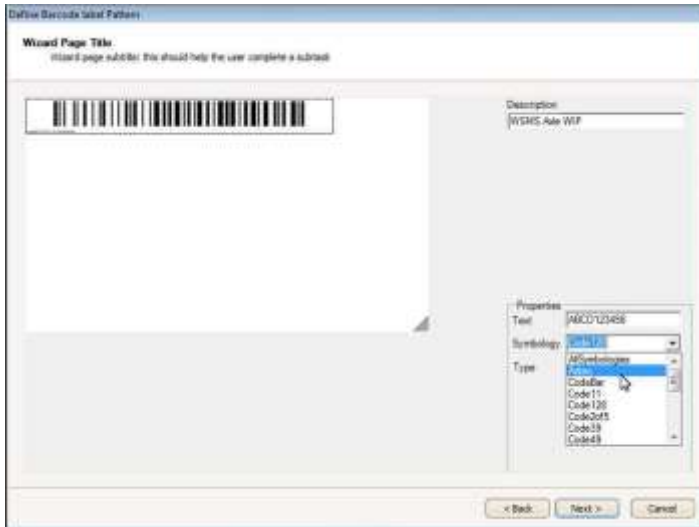
Configure Barcode Label

Add a new label definition or select and existing label definition and click Copy or Edit.

Configuring the barcode label requires describing the data that will be in the barcode. Define what data elements are contained in the barcode in order from left to right of the barcode raw data. Define individual properties of the data and what the data looks like in the "What does the data look like?" box. Use the Help button to guide you through the correct syntax.

Select the correct barcode symbology.

Help

Enter the data as it appears in the barcode.

If the data is not always the same use a wild-card to represent the data.
@ matches any letter A-Z
# matches any number 0-9
* matches anything (letter, number, special character)

If the number of characters varies you can specify a maximum and minimum number of characters with {n,m}
where n is the minimum number of characters and m is the maximum number of characters. If there is no maximum, do not include m.
Examples: #{1,3} will match 1, 12, 123, but not 1234.
7{1,} will match 7, 77, 777, 7777, 77777, etc.
A{2,4} will match AA, AAA, or AAAA but not A or AAAAA.
@{2,} will match any group of letters with at least two letters.

OK

Test Barcode Label

Once you have configured your barcode label you can test the definition. Scan an example barcode label. If the barcode label configuration contains more than one barcode you must scan all barcodes. Click "Back" to make any changes, or "Next to save the configuration.
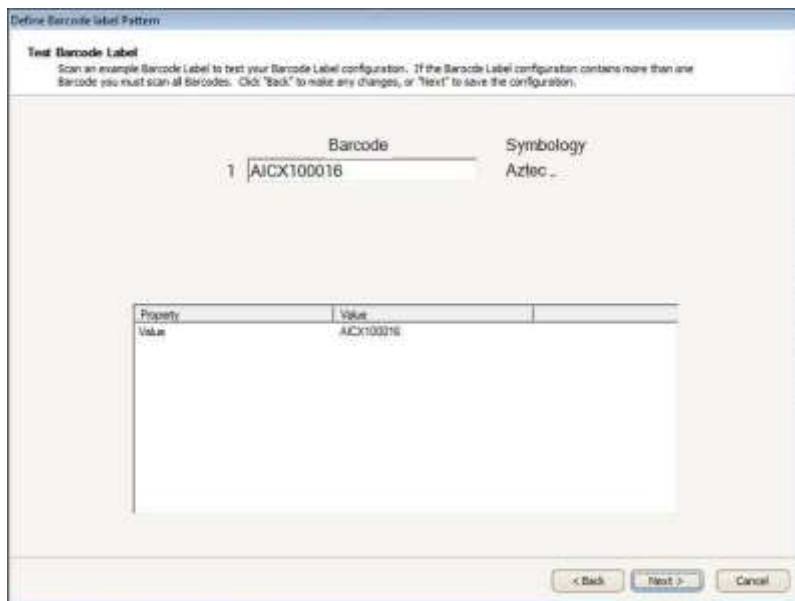
Database Connection Settings

Access to an instance of the WSMS database is going to be required, which can be installed on the same computer or any computer with network access and the required permissions. The first time you run the application you will be prompted to enter database connection settings.
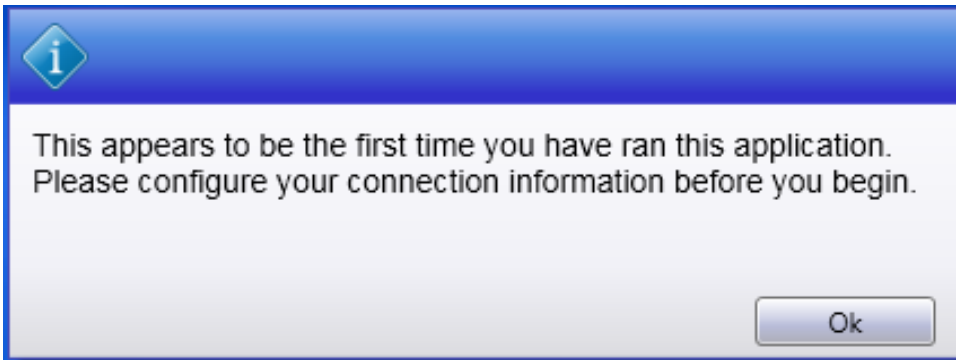
Click **OK** to display the Connection Settings dialog. Enter Server Name, User, password.

A list of available databases will appear after typing the security information. Select the desire database. If you are unsure about the Server Name, User or password, contact your IT Department or our support team.

Click **TEST CONNECTION** to verify your settings. If the information you enter is correct, you will see the
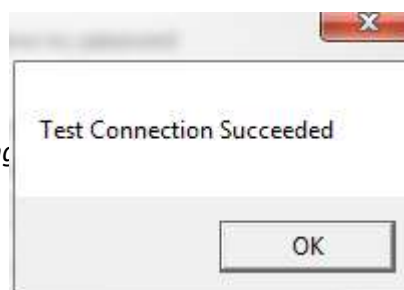
following dialog, click **OK** to continue.

Once you have configured the Database Connection information click the **Shop Name** drop down to select the location for which you want to configure this installation. WSMS can support multiple locations or 'shops' hosted in one database. To isolate the data and settings to your location you must provide this information.

After you have selected the Shop Name click on **Machine Name** and select the machine you are installing on. Some settings are stored per machine so this setting will be used to differentiate each installation.
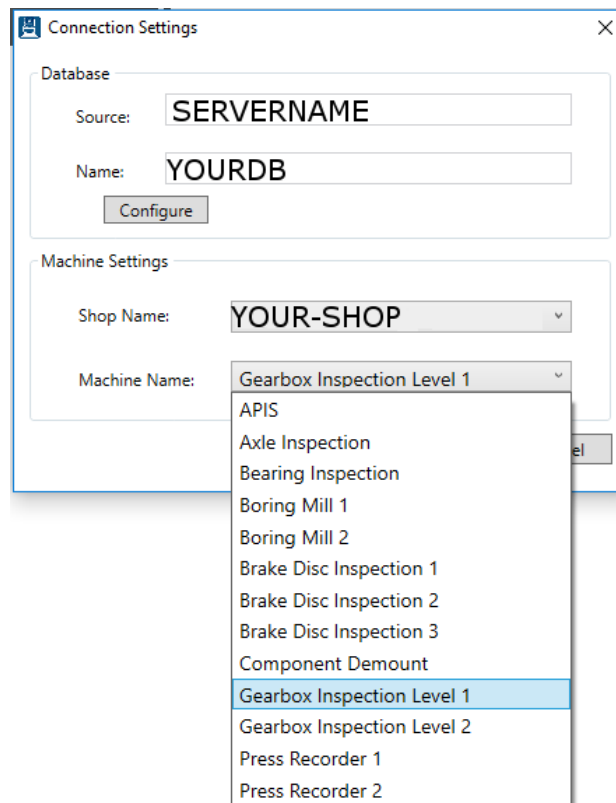
Click **OK** to save your changes.

Once you have entered your database settings the application may require a restart for the connection settings to take effect. Click **YES** to restart.
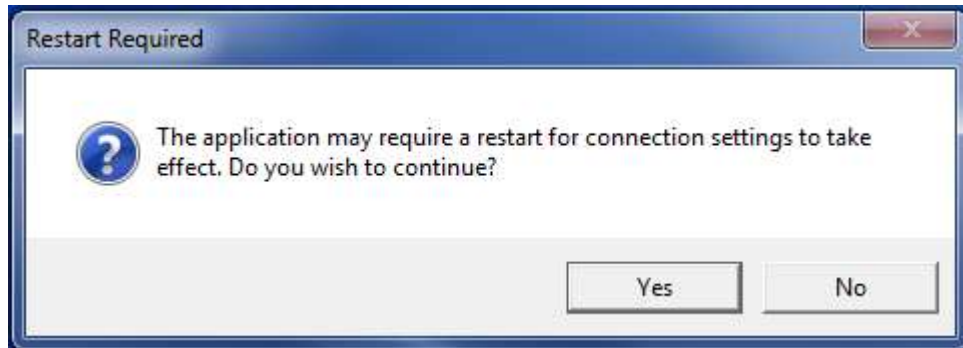
You will then be taken to the Log On screen. After configuring the database connection, the Log On screen will be the first screen you see each time you run the application.

Machine Settings

The settings dialog allows you to view and edit application settings that affect the behavior and appearance of the application.

Press Config

The Press Configuration tab contains settings that affect the user interaction with the application as well as settings that affect chart recording.

User Interface

- Language – select the language that will be used to display text to the user.
- Show on-screen keyboard – When Yes, all data entry fields will pop up a virtual keyboard to let the user enter data without requiring a physical keyboard. We recommend turning this on for touch screen displays and off for non-touch enabled displays.
- Make chart big while recording – When Yes, the mounting chart will display full screen while the chart is being recorded. It will automatically exit full screen if the mounting is finished.
- Wait before resetting for next wheelset – Specify the number of seconds to wait after the wheelset and mounting charts are saved to the database before the screen is reset for the next wheelsets. This can provide extra time to review the data before the screen is cleared.
- Press View – The press screen can be customized for each machine. If using a custom press screen, select it here.
- Inspection – If inspection elements are being collected in addition to the component elements, select the inspection definition. For more information about Inspections refer to the Shop Manager user guide or contact AIC Rail.
- Reset Sequence Number – Each wheel mount records a sequential number to indicate the order that wheels were mounted. This setting determines when the sequential number is reset.
    - Time of day – The sequence number resets at the specified time of day.
    - First logon of the day – The sequence number resets after the first logon that occurs after midnight.
    - Every logon – The sequence number resets any time a user logs in.
    - Every shift change – The sequence number resets when a user logs in and selects a shift number that is different than the shift number selected by the previous log in.
- Prompt for Back to Back – Specify the wheelset interval that you want the operator to be prompted to measure the back to back and record whether it was within limits or if it was out of limits. Set the value to zero (0) to never prompt.
- Misfits must be acknowledged – When selected, the user will receive a message on the screen after both wheels are pressed and before the data is saved that must be acknowledged before the system will continue.
- Remounts must be acknowledged – When selected, the user will be prompted each time a wheel is detected to already have been mounted on a different wheelset. The user must confirm the wheel is actually a remount or enter a different wheel.
- Require components to be demounted – When selected, if the system detects that the wheels or axle are associated to another wheelset without the demount being recorded, the user will

be prompted and they will not be able to save without either demounting the component or entering a different component. This is helpful if your operators are prone to scanning the wrong components.

- All Required data must be entered – When selected, the system will wait for all data elements marked as required to be entered and that there are no validation or business rule violations before it will be ready to record a chart.

- Check for recalled components – When selected, wheels and axles will be validated against the list of recalled components. If a wheel or axle is found to match one of the recall criteria the operator will be notified, the component will be flagged, and the wheelset will be placed on hold.

- Ignore duplicate components – This settings tries to prevent un-intentional data entry errors by comparing the wheel and axle data entered against other records in the database. If a record is found that contains the same information as the wheel or axle entered, the user is notified that they are trying to enter a duplicate wheel or axle. If the component record is older than the specified number of months, the user will not be prompted and the conflict will be automatically resolved.

- Ask operator how to handle duplicates – Related to the above setting, if the duplicate component record in the database is older than the specified number of months the user will be prompted to either load the existing record from the database, or to continue with the duplicate information.

- Run Unattended – If your wheel press is fully automated and requires no operator, WPR can be set to automatically log in and disable all operator prompts. Only enable this for fully automated presses.

- Unattended User Name – select a user account that will be automatically signed in and linked to all mounting operations saved to the database. Leave this blank if you do not want a user name.

Recorder Settings

These settings configure which data acquisition tags are used for force and distance sensors, as well as the digital inputs and outputs that will interface with the press recorder controller (PLC).

- Force Transducers – WPR supports both single ended and double-ended presses. You must configure all available force sensors. At a minimum, you must specify the 'Filtered Value Tag' which is the tag that will contain the force value that will be recorded for the chart. The other tags are optional any are only required if the controller also supports calibration from WPR. If the other tags are not specified, the calibration of the transducer must be handled by the controller (PLC).
- Distance Transducers – WPR supports both single ended and double-ended presses. You must configure all available distance sensors. At a minimum, you must specify the 'Filtered Value Tag' which is the tag that will contain the distance value that will be recorded for the chart. The other tags are optional any are only required if the controller also supports calibration from WPR. If the other tags are not specified, the calibration of the transducer must be handled by the controller (PLC).
- Controller Settings – If selected, WPR will write data to these tags before each press.
- Controller Results – If selected, WPR will read these tags to determine when to enable recording.
- Outputs – Custom outputs can be configured so that WPR will write data to these tags before each press.

Data Elements – Component Settings

Use the Elements options to configure what data is required and if it should have a default value for new components. Data Elements marked as required must have a value before the component will save. To set a Default Value enter the value of "=lastvalue" to have the data from the last component populated.

You also have the option to type certain conditions as to when this element value is required.

| Press Configuration | Data Elements | Reports | Charts | Data Acquisition | Plugins | Search/History | Machine Insp |

Required	Element Id	Display name	Default Value	
☐		tion	⌄	
☑		CID	⌄	☐ Hidden
☐		Customer	⌄	
☐		Work in progress Id	⌄	☐ Hidden
☐		Location	⌄	
☐		Disposition	⌄	
◼	AIC004	Back-to-Back	⌄	
◼	AIC010	BM Operator	⌄	
◼	AIC020	Mount Shop	⌄	
◼	AIC021	Mount Month	⌄	
◼	AIC022	Mount Year	⌄	
◼	AIC006	OK	⌄	
☐	C011	Purchased Core	⌄	

▲ WHEELSET

Condition Field

▷ WHEEL

▷ AXLE

Component Validation

Component Validations are similar to Business Rules, but they only apply to the station where they are created. Create custom validation rules to require specific requirements related to the component properties or inspections. For example, you can create rules that require an axle Pass MPI and UT inspections, but only for secondhand axles.
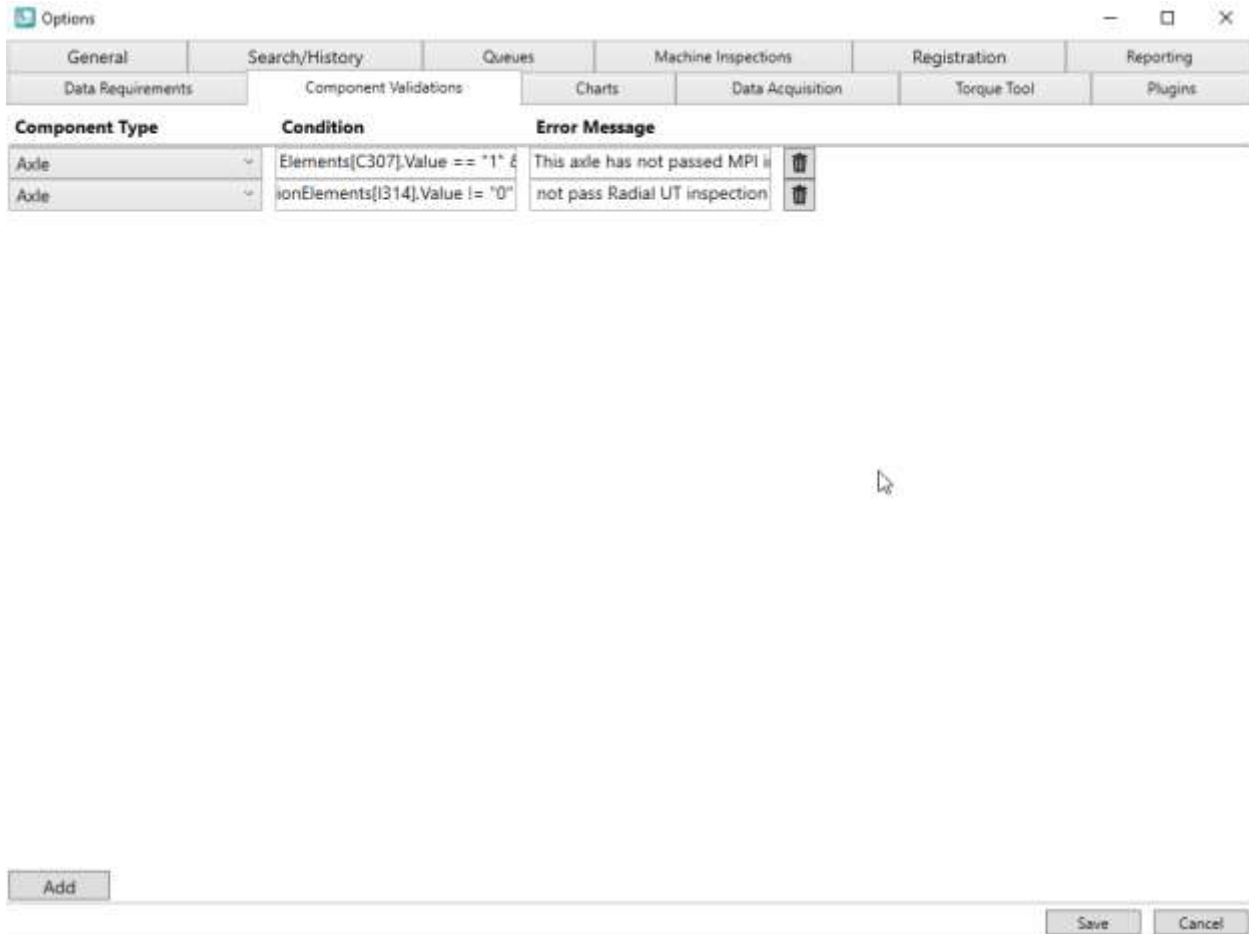
Click Add in the bottom left corner to create a blank Validation, and then specify the Component Type, Condition expression, and the Error Message to display when the validation rule is violated.

Click the Delete icon to the right of the Validation rule to remove a rule.

For help writing the Condition expression, contact AIC Support.

Reports

The Wheel Press Recorder can be configured to print after the wheelset is saved to the database and before resetting for the next wheelset. The list of available reports is managed through Shop Manager. Refer to the Shop Manager user guide for more information on reports.

- Good Wheelset Report – specify the report to print for a wheelset if no misfit is detected. Check the box if you want to print this report automatically after each wheelset. Otherwise, you can manually print from the History screen.
- Misfit Wheelset Report – specify the report o print for a wheelset if it has one or more misfits. Check the box if you want to print this report automatically after the wheelset. Otherwise, you can manually print from the History screen.

Charts

Configure the layout and appearance of the mounting charts and trend charts.

Mounting Charts

Configure the appearance of the mounting charts, including orientation, colors, and font sizes.

- General – Set the horizontal and vertical axis type (force, distance, time), Colors for the data cursor, template, and background, and the title font settings
- Pens – Set the color, thickness, and style for the data series (min force line, max force line, and actual force line)
- Axis – Set the color, style, thickness, intervals for the major and minor axis, and label font and settings for the specified axis type (force, distance, time)

Trend Charts

Configure the appearance of the trend chart on the Trend screen.

- General – Set the colors for the background and chart, and the title font settings
- Pens – Set the color, thickness, and style for the data series (min force line, max force line, wheel 1 force line, wheel 2 force line)
- Axis – Set the color, style, thickness, intervals for the major and minor axis, and label font and settings for the specified axis type (force axis and wheelset interval axis)

Data Acquisition

To interface with electronic sensors and devices such as the Force and Distance transducers or stack lights for status indication, you must configure how the application will interact with the sensor. You must configure a Tag for each input sensor or output device.

Devices

Before you can configure the tag, you must first specify the communications device and how you will communicate with it. The preferred method is ModbusTCP or OPC (OLE for Process Control) but there are other options as well.

To add a new Device, click New and specify a Name and the Device Type along with the connection information.
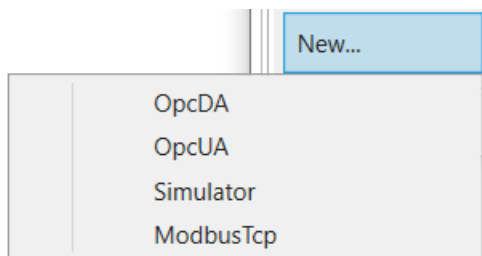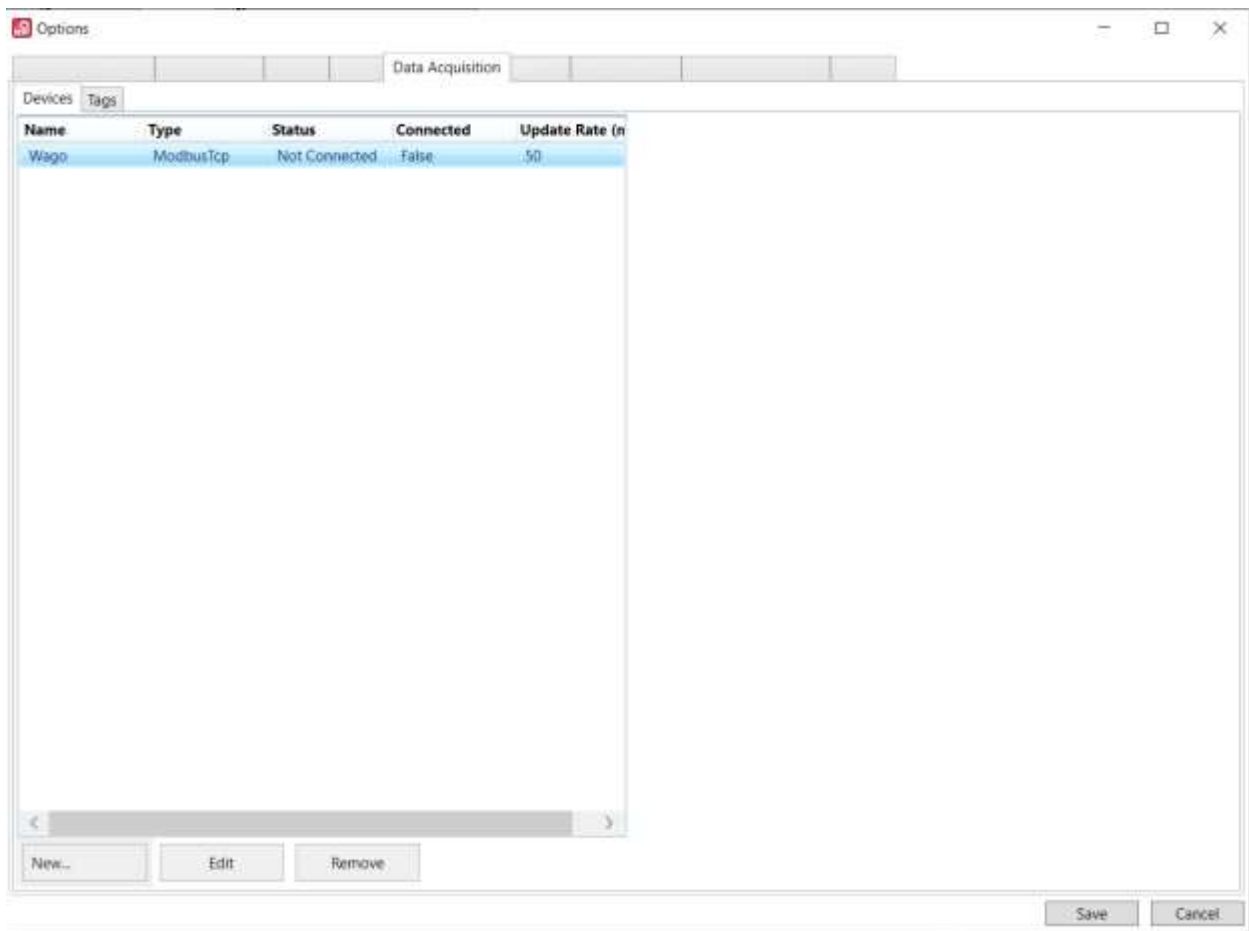
Name	Type	Status	Connected	Update Rate (in	Device Type	ModbusTcp
Wago	ModbusTcp	Not Connected	False	50	Name	Wago
					IP Address	192.168.72.44
					Port	502
					Update Rate (ms)	50

Tags

After you have specified the communications device, you must next configure each of the sensor/output Tags that you will communicate with. Use the Tag Manager to add/edit tags.

Name	Raw Value	Description	Device	Address	Data Type	Deadband	Eng. Value	Filtered Value
Pressure1.Filte	0		Wago	12288	System.Single	0.25	0.0000	0.0000
Pressure1.Scal	106.48		Wago	12296	System.Single	0	0.0000	0.0000
Pressure1.Offs	-1.312684		Wago	12298	System.Single	0	0.0000	0.0000
Pressure1.Filte	175		Wago	12368	System.Single	0	0.0000	0.0000
Pressure1.Dea	0.5		Wago	12300	System.Single	0	0.0000	0.0000
Distance1.Raw	0		Wago	12321	System.Int16	0	0.0000	0.0000
Distance1.Filte	0		Wago	12290	System.Single	0.1	0.0000	0.0000
Distance1.Scal	404.8		Wago	12302	System.Single	0	0.0000	0.0000
Distance1.Offs	-1.267292		Wago	12304	System.Single	0	0.0000	0.0000
Distance1.Dea	0.25		Wago	12306	System.Single	0	0.0000	0.0000
Recorder Reac	False		Wago	12880	System.Boolean	0	0.0000	0.0000
Pressure1.Raw	0		Wago	12320	System.Int16	0.25	0.0000	0.0000

New	Edit	Copy	Remove

After you have defined your tags, you can specify more details about the tag, clicking the "Edit" button. It will show a section on the right side where you can enter some extra information, such as Min. and Max. value.

ne	Raw Value	Description	Device	Address	Data Type	Deadband	Eng.
e1.Filte	0		Wago	12288	System.Single	0.25	0.00
e1.Scal	108.48		Wago	12296	System.Single	0	0.00
e1.Offs	-1.312684		Wago	12298	System.Single	0	0.00
e1.Filte	175		Wago	12368	System.Single	0	0.00
e1.Dea	0.5		Wago	12300	System.Single	0	0.00
e1.Raw	0		Wago	12321	System.Int16	0	0.00
e1.Filte	0		Wago	12290	System.Single	0.1	0.00
e1.Scal	404.8		Wago	12302	System.Single	0	0.00
e1.Offs	-1.267292		Wago	12304	System.Single	0	0.00
e1.Dea	0.25		Wago	12306	System.Single	0	0.00
er Read	False		Wago	12880	System.Boolean	0	0.00
e1.Raw	0		Wago	12320	System.Int16	0.25	0.00

Identification

Name: Pressure1.FilteredValue

Type: Single

Description:

Device: Wago

Address: 12288

Data Properties

Deadband: 0.25

Filter (%): 0

Min Value:

Max Value:

☐ Trigger   Edit

Scaling

w   Edit   Copy   Remove

Accept   Discard
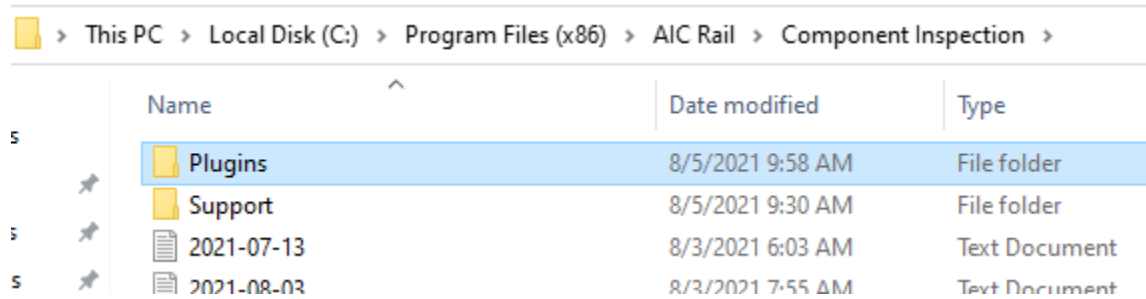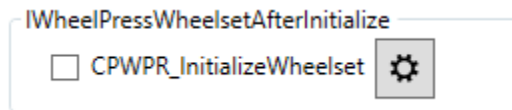
Plugins

The WSMS applications come with various plugin points in their code where custom behavior can be injected to fit them to your specific needs. In order to use a plugin, you will need to copy a plugin file, supplied by us, into the Plugins folder for your application. This folder needs to be located in the same directory as your application's executable file, typically C:\Program Files (x86)\AIC Rail\APPLICATION NAME.

If the Plugins folder does not exist, you may need to create it.

Once you have your plugin file in place, you can use the Plugins tab in the settings window to enable and configure your plugins. Each of the sections on the settings screen corresponds to a plugin point within the current application, and any plugins in your file will show under the corresponding section. To enable it, simple check the box next to its name.

If your plugin includes any configuration options, they can be accessed by clicking on the cog button next to the plugin name. Since not all plugins require configuring, this may not have any effect on your system.

Search and History

Select which data elements are displayed in the list of Search and History results.

- Select a data element from the list of Available fields.
    - Click Add to include it in the results.
- Select a data element from the Selected fields.
    - Click Remove to remove it from the results
    - Click Move up to reposition the field before all fields below it.
    - Click Move down to reposition the field after all fields above it.
    - Set the Header to change the column name for the selected field.
    - Set the width to adjust he column width
    - Set the format to adjust how the data is displayed (applies to numeric and date/time fields)

Machine Inspections

Configure the inspections to be performed in the machine station to ensure quality and good performance during production. It has same functionality as a normal inspection with some variations.

- <u>Name</u> – Set a name for the Inspection.
- <u>Inspection Definition</u> – Select a preconfigured inspection definition for that machine.
- <u>Inspection View</u> – Select a preconfigured user interface for collecting component and inspection data.
- <u>Downtime Reason</u> – Specify a default reason for the machine to be down. Check the box "disable downtime on Machine Inspection" to not put the machine on downtime during this inspection.
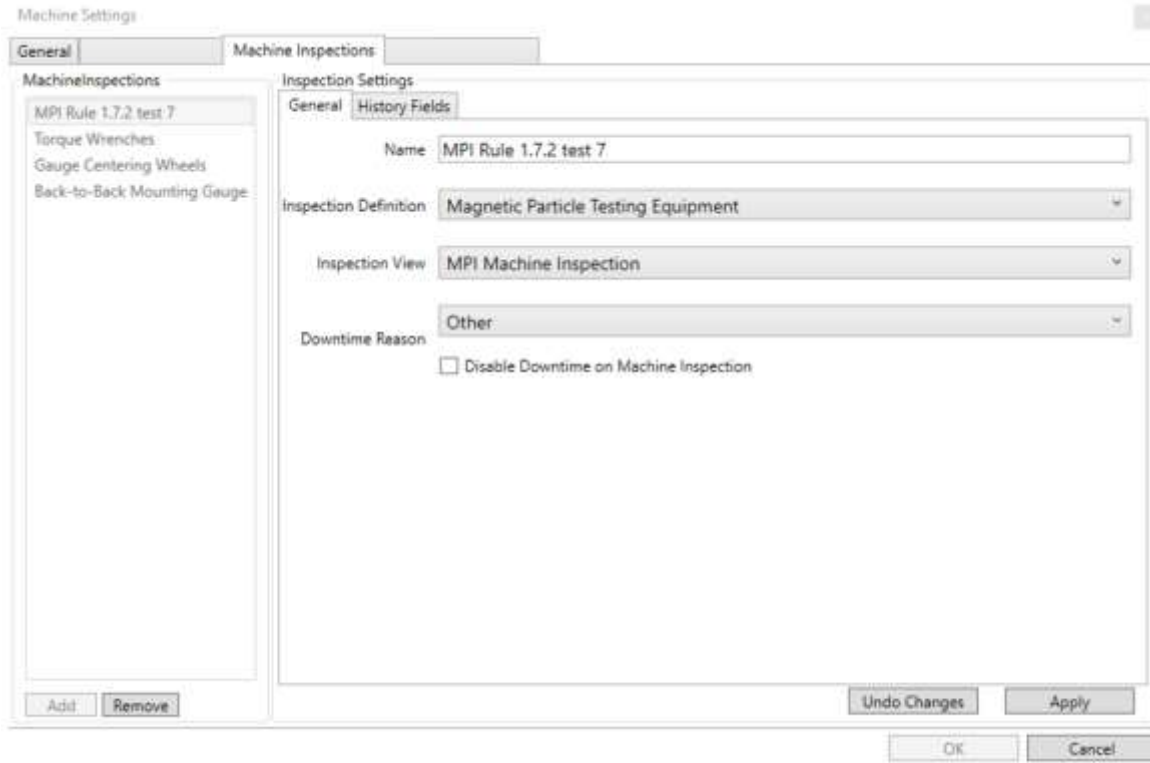
You will be able to register a new Machine inspection from the main menu in the application by clicking on the name of the inspection. To look at the previous inspections, click on the number at the right side, it will take you to the History search tab.

Queues

Queues work in two ways, the queue from where to load a component into your stations and a queue to set the component after saving.

Depending on the station, the queue list will vary, depending on the number of components the station starts with or ends with, and queues available for that station.

In case you have multiple components to load from a queue, you can also set the order they are to be loaded into your process.

After saving you can determine where to send your components depending on the disposition status. A "good assembly" can go to a different queue, than a "rework assembly" or "scrap assembly", although is possible to assigning all your assemblies to the same queue whether they are good or scrap.

Machine Settings

General | Component Settings | Search and History | Machine Inspections | Report Printing | Plugin | Queues

Auto Select After [0]   seconds

Load from queue

Component	Queue Name	Order
WHEELSET	[⌄]	[1]

Save to queue

(⌃) WHEELSET

Save Scrap WHEELSET To: [⌄]

Save Good WHEELSET To: [⌄]

Save Rework WHEELSET To: [⌄]

Save Hold WHEELSET To: [⌄]

(⌃) Axle

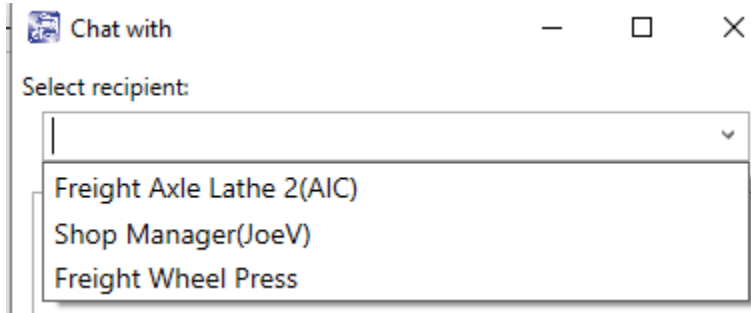Save Scrap Axle To: [⌄]

[Save]   [Cancel]

Chat

The Chat button can be used to communicate with other WSMS applications in your system. Users must be assigned to a group with the 'UseChat' permission in order to initiate a chat session.

Click the Chat button to open the Chat dialog. You can select a recipient from the drop-down.

The name of each station currently available is listed, and if a user is currently logged in, their name will appear in parentheses next to the station. You can send a message to a station even if no one is logged in, and it will display the next time someone is at the station. Messages you send will be shown in orange, and messages you receive will be shown in white.
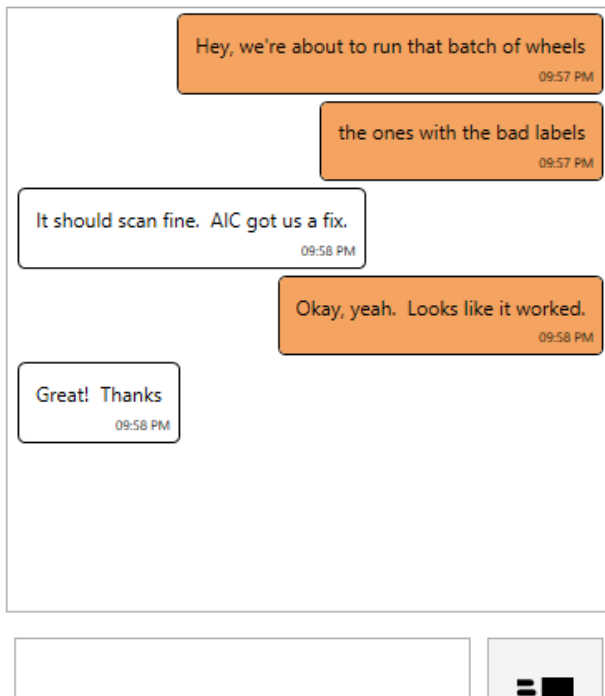
Get Support

The Get Support feature will collect relevant information about your problem and attempt to submit a support ticket online (**ticket submission requires the WSMS6 Service to be running and have internet access**). Clicking the button will open the support dialog as shown below:

Name (Required): Your name, or the name of the relevant contact person.

Email (Required): The best email address to which we should respond with updates about your issue.

Phone Number: The best phone number in case urgent action is required.

Can we notify anyone else?: Include email addresses for any additional people who might need to be included on the conversation. You can enter multiple email addresses, separated with commas (,).

Description: Please include as much detail about the problem as possible. Information such as what you were attempting to do, which screen you were on, and any error messages that you received will help us resolve the issue more quickly.

We'll grab your logs and settings. Are there any other files you think we need?: We'll automatically package your logs, application settings, and take a screenshot. Use this dialog to include any additional files that we might need (ie. A document you're trying to import).

Clicking the Send button will attempt to submit the ticket to our support site. If your system is unable to submit the ticket, you'll get an error message prompting you to save the files locally. Once you select a location and file name, we'll create a .zip file containing the information you submitted and any files that would have been attached to your ticket. You can contact AIC Rail Support via email at support@aicrail.com and attach the .zip file or call us at 501-834-9540, and we'll give you more instructions on how to get use these files.

Document Viewer

Under this section you can find all the documents sorted by category that were added on **Shop Manager™.**

Button on top (Top Menu, Back) are to navigate through the folders and 'Close' button on bottom is to exit Documents

Downtime

Use the Downtime feature to track equipment efficiency. If the station is not able to be used because of machine repair, operator staffing issues, material shortage, or some other reason you can enter these downtime events to track the frequency and duration of issues.

Set out of service

To start a downtime event, you must first select a reason from the list of Downtime Reasons (configurable in Shop Manager). The operator can optionally enter a comment to explain in further detail why the station is down. Then click 'SET OUT OF SERVICE' to start the downtime event. The date and time the downtime event was started will be recorded along with the operator that initiated it and the reason selected.

Return to service
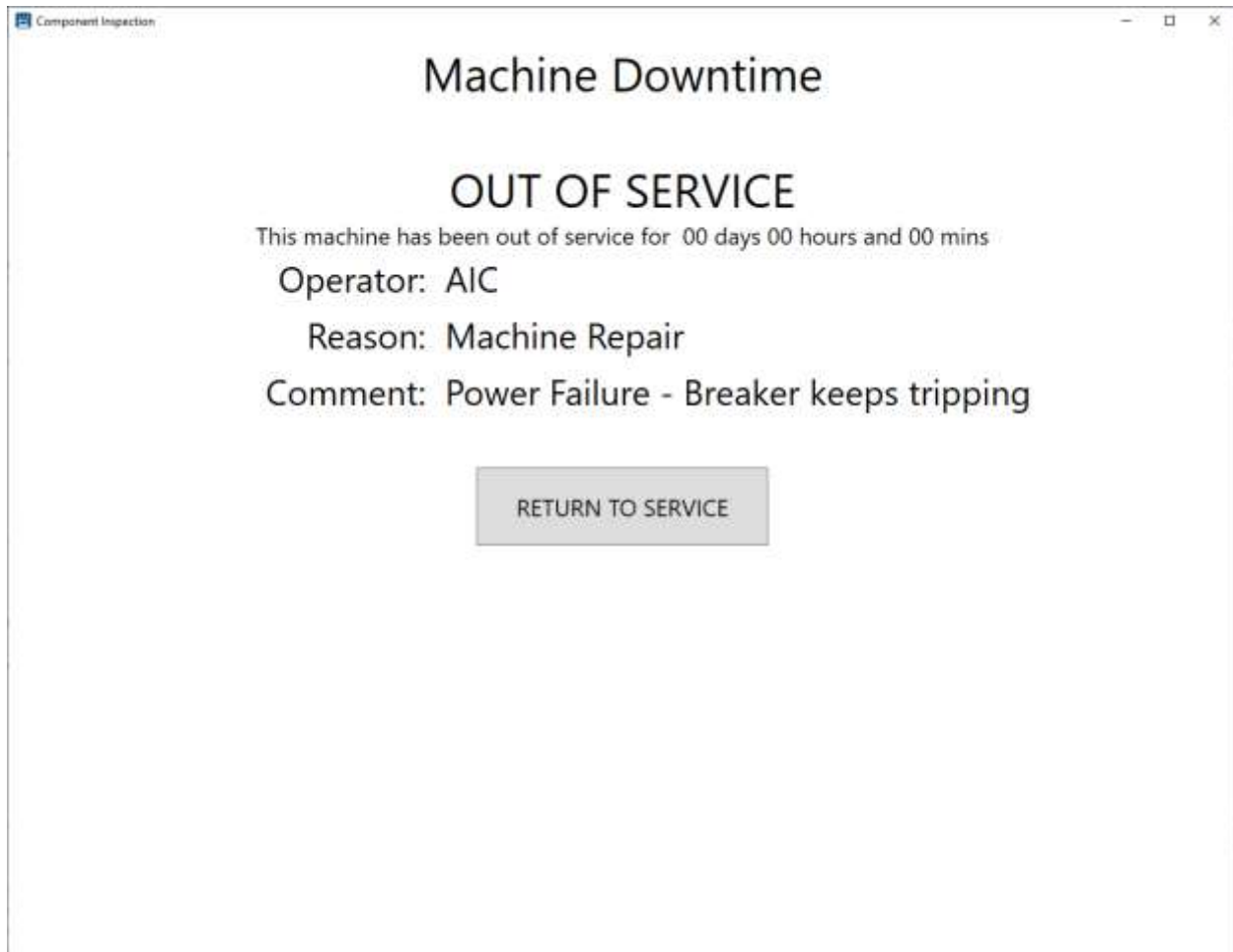
To end the downtime event and return the station to service simply click 'RETURN TO SERVICE'. The date and time the machine returned to service will be recorded and the total time the machine was down can be calculated for the event

Calibrate Sensors

The calibrate menu item will take you to the Calibration screen. The currently logged on user must have permissions to calibrate, or this menu item will be disabled.

The calibration screen allows you to calibrate the force and distance transducers. It also shows you the current value based on the most recent calibration. To calibrate the force or distance transducer, press the corresponding button and follow the steps in the calibration wizard.

Distance Calibration

Step 1

Fully retract the hydraulic cylinder. Measure the amount of cable that extends from the base of the transducer.

Enter the length of the cable that extends from base of the cylinder and click "Read"

| 0.9 | Read |

Current transducer value : 1605.0

Enter a value when the ram is fully retracted and then select the Read Button

Step 2

Extend the hydraulic cylinder to the furthest distance it would be extended during a typical mount.

For example, if the cylinder typically has to extend 12 inches to mount the first wheel but it would extend 18 inches to mount the second wheel, Extend the cylinder approximately 18 inches.

Enter the length of the cable that extends from base of the cylinder and click "Read"

| 9 | Read |

Current transducer value : 1605.0

Enter a value when the ram is extended and then select the Read Button

Step 3

If the transducer value fluctuates rapidly this will cause your calibrated value to also fluctuate which could make your mounting charts look 'noisy'. You can adjust a software filter to try and smooth out the transducer signal.

Adjust the Filter value between 0 and 50 % and then click Update to see the affect.

Filter value: 1 % Update ← Enter a filter value and then select the Update Button

Calibrated value: 9.01

Once you have adjusted the signal to reduce the fluctuations in the calibrated value, click Next.

Note - for systems with encoder distance transducers this value should always be "1". The higher the value applies more filtering of the signal value.

Step 4

Verify your calibration by extending or retracting the hydraulic cylinder and compare the measured amount of cable extending from the base of the transducer with the value below.

Transducer value: 1605

Calibrated value: 9.01

When you are done reviewing your calibration, click Finished to save and exit or Start Over to restart the calibration wizard.

Force Calibration

Step 1

Isolate the master gauge and pressure transducer by closing the shut-off valve.

Step 2

Connect a hand pump or portable hydraulic unit that will be used to pressurize the transducer and Master Gauge for calibration and testing.

Step 3

Apply hydraulic pressure until the master gauge reaches the first or second divisional mark (typically 10 or 20 Tons).

Using the "dead zone" area near zero is not recommended because most gauges are not accurate in this range.

Enter the value that appears on your Master Gauge and click "Read"

| 0 | Read |

Current transducer value : 7640.0

Enter a low-end force value and then select the Read Button

Step 4

Increase the hydraulic pressure until the master gauge reaches a divisional mark near the maximum force you typically press.

For example, if the average mounting force of your wheels is 150 Tons, you should use 160 or 180 Tons as your second value.

Enter the value that appears on your Master Gauge and click "Read"

| 180 | Read |

Current transducer value : 13568.0

Enter a high-end force value and then select the Read Button

Step 5

If the transducer value fluctuates rapidly this will cause your calibrated value to also fluctuate which could make your mounting charts look 'noisy'. You can adjust a software filter to try and smooth out the transducer signal.

Adjust the Filter value between 0 and 50 % and then click Update to see the affect.

Filter value: 5 % Update

Enter a filter value and then select the Update Button

Calibrated value: 176.52

Once you have adjusted the signal to reduce the fluctuations in the calibrated value, click Next.

Step 6
Verify your calibration by increasing or decreasing the hydraulic pressure and compare the value shown on your master gauge with the value below.

Some hydraulic gauges are mechanically dampened to prevent rapid changes from damaging the gauge. The electronic transducer however, may respond much more quickly. Make sure you maintain a constant pressure for several seconds to allow the Master Gauge time to settle out before comparing it to the recorder's value below.

Transducer value:13448 Calibrated value:175.22

When you are done reviewing your calibration, click Finished to save and exit or Start Over to restart the calibration wizard.

Machine Inspections

Machine Inspections are like our Component Inspections except they apply to the machines in your shop. Once you choose to inspect a machine you will see the data entry screen. From here you can enter any information used to document maintenance to the AAR and QA rules. You will also enter inspection data such as measurements, visual inspection indications, or confirmation of steps performed. The data that is collected is customized for each station and may vary based on the type of machine being inspected. Each station can also have multiple inspections (i.e., monthly and weekly maintenance). Product changeover check list and QA data requirements (calibration readings and inspection requirements).

There are multiple reports for the Machine Inspections to assist in verity that inspection was completed and when.

For more information about creating or modifying data collection screens please contact us.

Inspection History

To review the inspections performed at the current station for the day you can click on the "Today" section and it will take you to the History tab. You can specify any filters for operator, shift or a different date, and then click 'Get History'. The current date is selected by default.

MPI Rule 1.7.2

Get History will return a list of all inspections on the specified date that match the filters for operator and shift. You can use the predefine options do a date or select a custom date range. You must click the "Refresh" button to see the results.

A summary of the inspection totals will appear at the top of the list, with the total number unique inspections.

You can select a result by clicking on a row from the results list. The details for that inspection will appear at the right side. It will show who performed the inspection, shift, date and status.

Press

The Press screen is used to record mounting charts and enter component data.
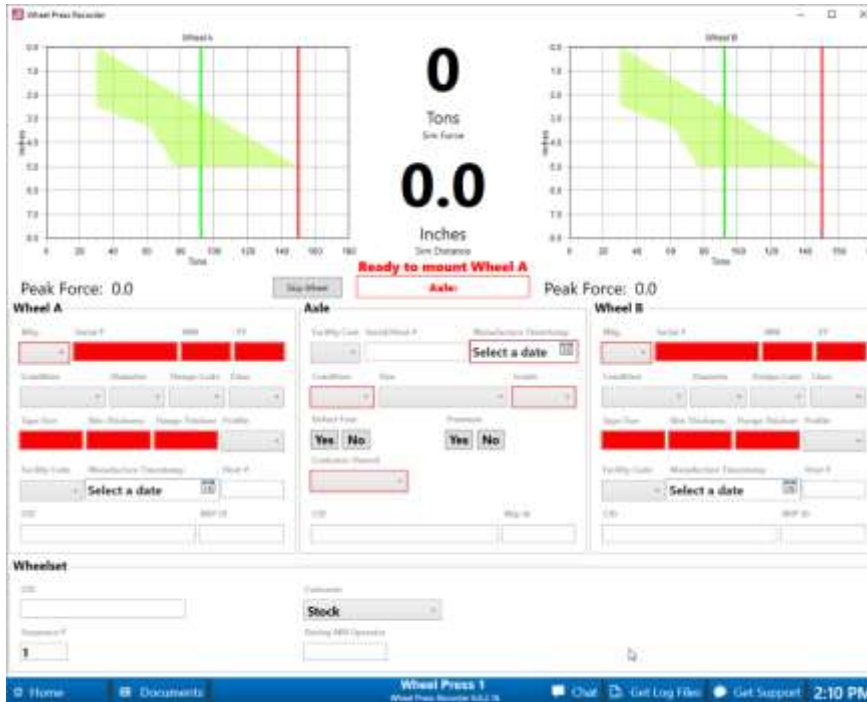
The mounting charts, current force and distance value, and status/error indicators occupy the upper secton of the screen. If there are validation or business rule errors, the first error will appear in red below the status message. Click on the box to view all errors.

The Data Entry area occupies the lower section of screen and can be customized to include or exclude data elements, adjust font sizes, layout of elements and more. For more information about data Customization, contact our support team.

Wheel mounting is performed according to a sequence of states that are defined below:

1. Offline – The application is starting up, or not running. All controller outputs are set to false.
2. Wait for Press Ready –If configured, the following controller outputs are set: RecorderReady = false, PressEnable = true, WheelsetRelease = false. If configured, WPR will wait in this state until the Press Ready and Wheelset Present inputs are true. One or both inputs can be required. If neither input is required, WPR automatically advances to the next state.
3. Wait for Data – If the 'All required data must be entered…' setting is enabled, WPR will wait until all required data elements are entered and there are no validation or business rule violations. Once all required data has been entered, or if this setting is disabled, WPR will advance to the next state.
4. First Wheel Initializing – If configured, the following controller outputs are set: PressEnable = true, MisfitDetected = false, WheelMismatch = false, WheelsetRelease = false. WPR will wait

for the current force value to be less than or equal to the 'Starting Force' value. The Starting Force value is the amount of force that will trigger the chart recording to begin. **The force must be below this value before the recorder is ready to record.**

5. First Wheel Ready – If configured, the following controller outputs are set: RecorderReady = true. WPR is ready to record the chart for the first wheel. WPR will wait for the force sensor value to be greater than the Starting Force setpoint and the distance to be greater than the 'Starting Distance' setpoint. Once both conditions are met, WPR will advance to the next state.

6. First Wheel Mounting – WPR is actively recording all force and distance points to the mounting chart. If the force value drops below the Starting Force setpoint before the distance has reached the False Start Distance setpoint, WPR will return to the First Wheel Ready state and wait for the starting conditions again. Otherwise, WPR will continue recording until the force value drops below the peak force by more than Ending Force Drop amount. For example, if the force builds to 94 tons, and the Ending Force Drop settings is set at 20 tons, then recording will end when the force drops below 74 tons. WPR will advance to the next state at the end of the mount.

7. First Wheel Done Recording - If configured, the following controller outputs are set: RecorderReady = false. WPR will check the chart for misfits, capture information about the mount (date/time, operator, etc) and then proceed to the next state.

8. Second Wheel Initializing – If configured, the following controller outputs are set: PressEnable = true. WPR will wait for the current force value to be less than or equal to the 'Starting Force' value. The Starting Force value is the amount of force that will trigger the chart recording to begin. **The force must be below this value before the recorder is ready to record.**

9. Second Wheel Ready – If configured, the following controller outputs are set: RecorderReady = true. WPR is ready to record the chart for the second wheel. WPR will wait for the force sensor value to be greater than the Starting Force setpoint and the distance to be greater than the 'Starting Distance' setpoint. Once both conditions are met, WPR will advance to the next state.

10. Second Wheel Mounting – WPR is actively recording all force and distance points to the mounting chart. If the force value drops below the Starting Force setpoint before the distance has reached the False Start Distance setpoint, WPR will return to the Second Wheel Ready state and wait for the starting conditions again. Otherwise, WPR will continue recording until the force value drops below the peak force by more than Ending Force Drop amount. For example, if the force builds to 94 tons, and the Ending Force Drop settings is set at 20 tons, then recording will end when the force drops below 74 tons. WPR will advance to the next state at the end of the mount.

11. Second Wheel Done Recording - If configured, the following controller outputs are set: RecorderReady = false, PressEnable = false. WPR will check both charts for misfits and prompt for acknowledgement (if enabled), prompt for back-to-back (if enabled), check for component recalls. If the MisfitDetected controller output will be set to true if a misfit was

detected and false if not. Once all checks are complete, WPR will automatically advance to the next state.

12. Save Wheelset – WPR will check for duplicate data, validation and business rule errors, remounts, etc. If all data is valid the wheelset will be saved to the database, any reports configured will be printed, and WPR will advance to the next state.

13. Data Save Complete – If configured, the following controller outputs are set: WheelsetRelease = true, PressEnable = true. Once the wheelset has been saved, the wheel release output will be set to true (if configured) to indicate it is ok to release the wheelset. WPR will advance to the next state.

14. Release Wheelset – If the Wheelset Present input is configured and enabled, WPR will wait for the Wheelset Present input to become false, indicating the wheelset has been released. If the Wheelset Present input becomes false, or if the input is not enabled, WPR will advance to the next state.

15. Reset – If there is a delay between wheelsets configured in the Settings, WPR will count down until the time has elapsed, and then it will clear out the previous wheelset data and mounting charts and reset for the next wheelset. WPR will automatically return to the Wait For Press Ready state.
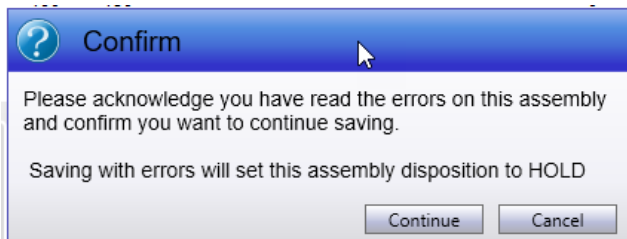
Save with Errors

After mounting the second wheel, a button will be visible between the charts to let you enable saving the assembly even if there are errors in the screen. This will bypass validation rules, business rules, and requirements. However, you are still required to fix any errors related to duplicate data, confirm remount status (if enabled), confirm recalls, etc.
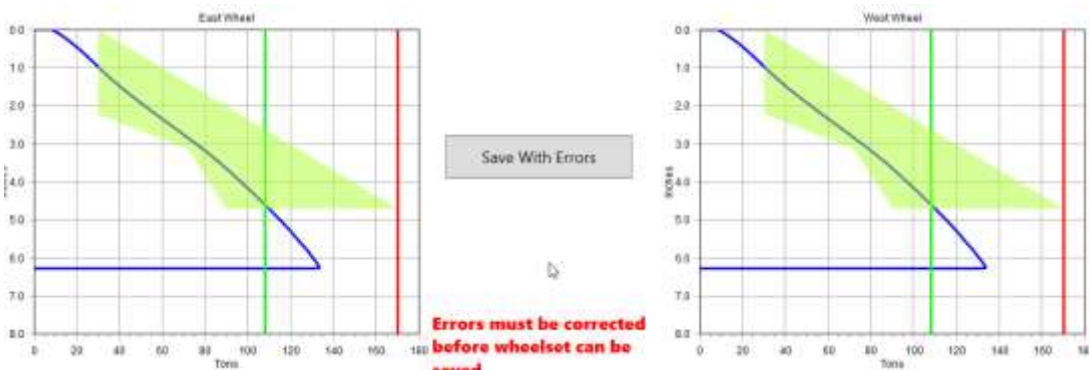
This option requires the user to be assigned to a group with the 'OverrideErrors' permission. If the current user does not have this permission a popup will allow a supervisor (someone with OverrideErrors permission) to enter their credentials and authorize the wheelset to be saved with errors.

After permission has been verified, the user will be prompted to confirm they want to save with errors.


Choosing Continue will bypass the error checks and continue the save process. The wheelset will be placed on HOLD and a note will be added to the wheelset to document that the user chose to save with errors.

Skip Wheel

Under normal operation the wheel press recorder will expect to record a mounting chart for both wheels before it automatically saves the data. There may be times when an unexpected error prevents the operator from recording the mounting chart. For example, if there is a problem with the distance or force sensor the wheel may be mounted but the recorder did not detect it and was unable to record a chart. In this case the recorder is still expecting to record a mounting chart for the wheel that was already mounted.

If enabled, the operator can use the 'Skip Wheel' below each chart to skip the current wheel to put the system back into the correct sequence. However, no mounting chart is recorded when the wheel is skipped and there is no way to go back to the previous wheel.

Peak Force: 0.0
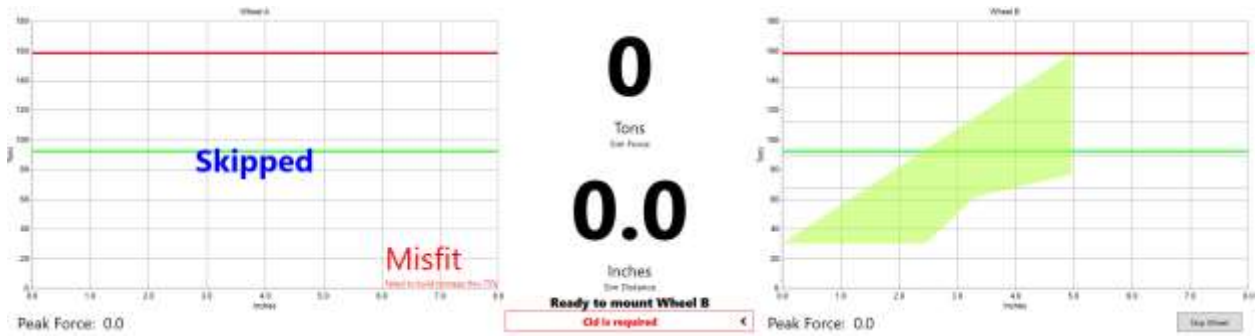
Remounts

In most cases, if a wheel is misfit, or the back-to-back is out of gage, both wheels must be demounted and re-mounted. If you are remounting both wheels, proceed using the normal mounting sequence.

If only a single wheel is removed and needs to be re-mounted, you must search for the wheelset from the History screen. Refer to the section on History for more information about locating a wheelset for remount.

Once you have selected to remount a single wheel, WPR will return to the Press screen. The wheelset, axle, and existing wheel data (including the chart) will be displayed on the screen. The wheel you have selected to remount will be cleared out and the mounting sequence will start at Second Wheel Initializing. At this point the state sequence will resume as normal from the Second Wheel initializing state. Refer to the state sequence above for more information.
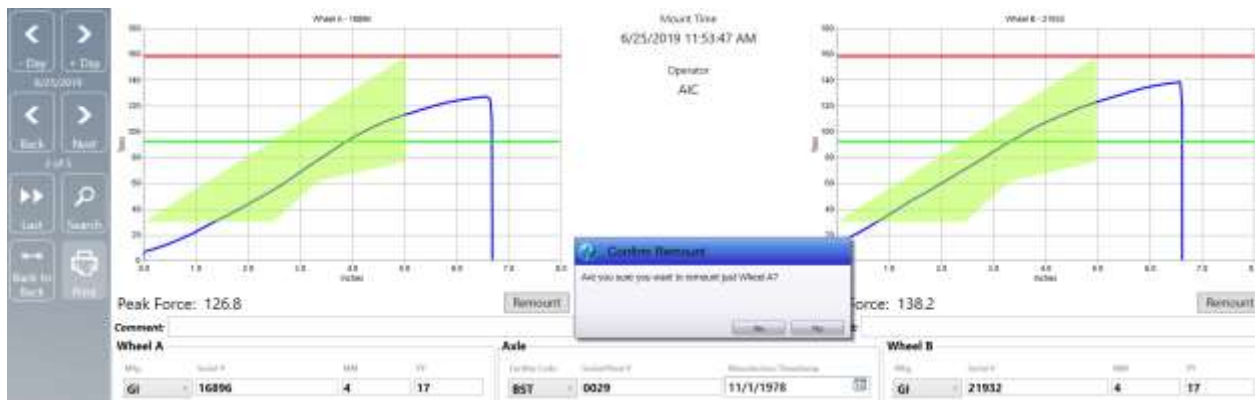
Search and History

The History tab will display a list of items completed at the current station for the specified day.

You can filter the history view further by using the parameters at the top of the screen. The Date field will let you select a specific date for which to search, and the arrow buttons on either side of the field will allow you to scroll forward or backward by one day at a time. The Operator button will toggle your results between showing history items for all users or only for you, based on your current login credentials. The Shift dropdown will filter the results to the specific shift selected or allow you to see work done for all shifts on the selected date. The refresh button will rerun the current history search; this is most useful when looking at data for the current day, as older data is unlikely to be changing in real time. Finally, the Print button will allow you to print a report based on the selected history item; to print, a report must be set up in the application settings (see individual application guides for instructions on setting up a report to print).

The Search tab allows you to search for assemblies by Cid, WIP ID, or component serial number.

Once you have selected a search method, type all or part of the relevant field into the search box and click "Search". For example, if you are using our Inbound application, items will receive WIP IDs prefixed with the load number followed by a dash and an indexer. On the search screen, typing in that load

number for a WIP ID search would return all the items from that load; typing in the load number with the dash and indexer would only return that one component.

Once your search is complete, the results will be displayed in the area below the search bar. The fields displayed in the results list can be configured in the settings menu (instructions for selecting search result fields can be found in the user guides for individual applications).

After selecting one of the search results, the details for your item will appear in the right-hand pane.

The Details tab will include any data fields recorded for the component or assembly. In the case of an assembly, similar data will be shown below the assembly information for each of its subcomponents. If an attempt to register has been made, clicking on the Registration Status will bring up a prompt with details of the attempt and any errors that were returned.

The Inspection History tab will list any inspections performed on the component, assembly, and/or the assembly's subcomponents. Expanding the inspection name will display the inspection elements that are recorded and their corresponding values.

If you are reviewing an assembly with mount data, a Charts tab will be displayed. Here you can review the mounting charts and information for any subcomponents that were mounted using the WSMS.

Trends

The Trends screen displays a historical chart of the peak mounting force of the previous wheelsets along with the minimum and maximum force. This can be useful to spot issues with your wheel boring system or other pressing issues. The force should trend toward the middle of the range defined by the minimum and maximum force lines. If the trend approaches one of those lines and does not correct itself, it could indicate a problem that will eventually cause misfits.
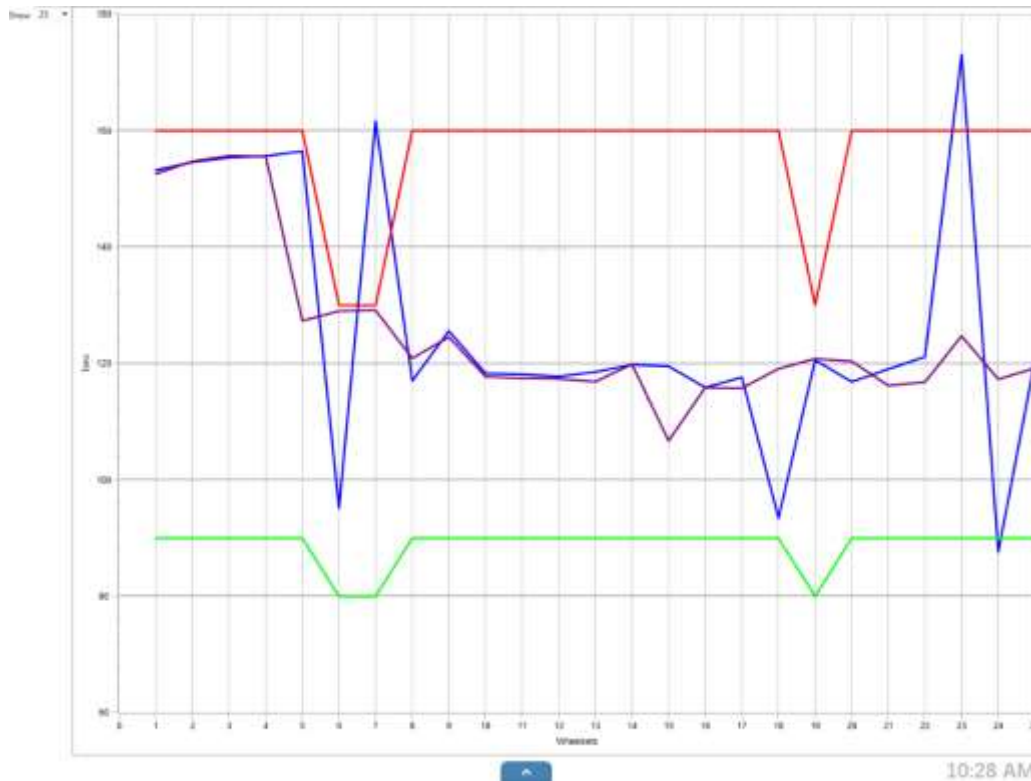
By default, the last 25 wheelsets are displayed, but you can change the number in wheelsets to show using the drop down in the upper left corner to the desired amount.

Appendix A: License

WHEEL SHOP MANGEMENT SUITE END USER LICENCSE AGREEMENT

IMPORTANT NOTICE: Read Before Installing or Using Software

The following software products offered to you directly by Arkansas Industrial Computing ("AIC") of 6100 Getty Drive, Suite N, North Little Rock, AR 72117 (voice 501-834-9540) is offered only for use in accordance with the terms and conditions of the WSMS End User License Agreement below.

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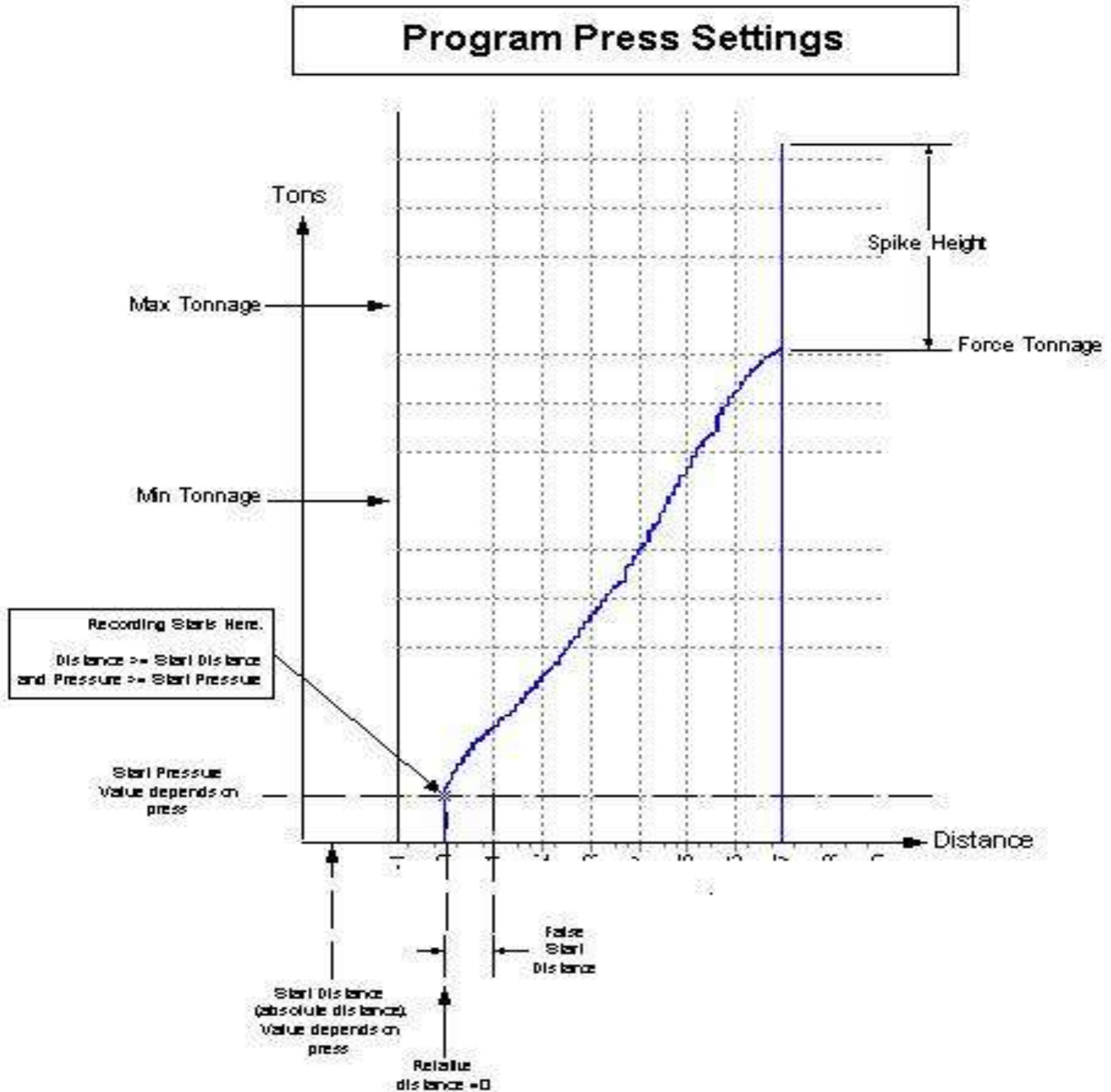
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Appendix B: Press Settings

Program Press Settings

Tons

Spike Height

Max Tonnage

Force Tonnage

Min Tonnage

Recording Starts Here.

Distance >= Start Distance
and Pressure >= Start Pressure

Start Pressure
Value depends on
press

Distance

False
Start
Distance

Start Distance
(absolute distance)
Value depends on
press

Relative
distance =0

Notes:
1. Must meet start distance (absolute distance) and start pressure to begin recording.
2. Once recording begins, if pressure drops to below start pressure before false start distance is reached, the recording stops and distance resets to 0. This is to prevent recording 'bumping'.
3. Once the false start distance is exceeded then the chart is stored as is.

Appendix C: Contact Information

AIC Rail
6100 Getty Drive
Suite N
Sherwood, AR 72117

Online Support
Visit our website at www.aicRail.com/WSMS for 24/7 technical information and available downloads
Email us at support@aicRail.com

Phone Support (Existing support contract or credit card required)
Call 1-501-834-9540 or 1-877-834-9540 (toll free)