

ABB MEASUREMENT & ANALYTICS | 2107720MNAA

# Plunger Analysis System (PAS)

## Cloud Application User Guide

**ABB** Report Support License Ana

### ABB Plunger Analysis System

Optimizes plunger, Detects faults, Improves well production.

**Features Available**

- FaultDetection**  
Detects the faults present in the plunger in order to optimize the well production.  
Proceed More Information
- Optimization**  
Optimizes the well production by analyzing the plunger and displaying averages of critical fields.  
Proceed More Information
- Operator\_Training**  
Provides a training simulation for the users to understand the ecosystem of plunger analysis.  
Proceed More Information

Enterprise workbench for optimization,  
fault detection, simulation, and training

---

# Contents

<b>Contents</b> .....	<b>2</b>
<b>List of figures</b> .....	<b>3</b>
<b>List of tables</b> .....	<b>3</b>
<b>Additional information</b> .....	<b>4</b>
<b>Safety</b> .....	<b>4</b>
<b>1 Introduction</b> .....	<b>5</b>
1.1 Product notice .....	5
1.2 Product information .....	5
1.2.1 Ordering .....	5
1.2.2 Customer accounts and members .....	5
1.3 Licenses packages .....	5
1.3.1 Basic Activation license .....	5
1.3.2 Operator Training license .....	5
1.3.3 License compliance .....	5
1.3.4 License renewal .....	6
<b>2 Application overview</b> .....	<b>6</b>
2.1 Software design .....	6
2.2 Features .....	6
2.3 Modes of access to the application .....	6
2.4 Main functions on the graphical user interface .....	6
2.5 Main functions through the API .....	6
2.6 Theory of operation .....	7
2.6.1 Input file format and location .....	8
2.6.2 Output file format, naming convention and location .....	8
<b>3 Prepare for application use</b> .....	<b>9</b>
3.1 Install supported web browsers .....	9
3.2 Prepare or collect trend files .....	9
<b>4 Activate PAS</b> .....	<b>10</b>
4.1 Access the application from the ABB business portal .....	10
4.2 Online feature activation .....	13
4.3 Verify license status and number of runs .....	14
<b>5 Startup</b> .....	<b>16</b>
5.1 Startup tasks .....	16
5.2 Start the application .....	16
5.3 Get online help .....	17
5.4 Create input and output directories .....	18
5.5 Run fault detection for single file analysis (GUI Mode) .....	18
5.6 Configure fault detection with non-default values .....	23
5.7 Run optimization for single file analysis (GUI mode) .....	24
5.8 Start the operator training feature .....	29
5.9 Analyses Report (optional) .....	29

## List of figures

Figure 2-1: PAS GUI mode processing a single input file .....7

Figure 2-2: PAS API mode processing a single input file .....8

Figure 3-1: PCCU Collect screen ..... 10

Figure 4-1: myABB business portal login page..... 11

Figure 4-2: myABB business portal home page ..... 11

Figure 4-3: Locating PAS on the myABB portal ..... 12

Figure 4-4: Select login credentials ..... 12

Figure 4-5: PAS processing credentials ..... 12

Figure 4-6: PAS login page ..... 13

Figure 4-7: Non-Activated Features ..... 13

Figure 4-8: Online activation from the PAS home page ..... 14

Figure 4-9: License: Online Activation screen..... 14

Figure 4-10: License Status ..... 15

Figure 4-11: Basic\_Activation license details..... 15

Figure 4-12: Activated feature (Optimization) ..... 16

Figure 5-1: PAS home screen ..... 17

Figure 5-2: PAS main screen (all features activated) ..... 17

Figure 5-3: ABB Plunger Analysis System help screen ..... 18

Figure 5-4: Fault Detection file upload screen ..... 19

Figure 5-5: Browse for the input file for analysis..... 19

Figure 5-6: Input file selected for fault detection analysis ..... 20

Figure 5-7: Fault Detection dashboard with single file analysis results ..... 20

Figure 5-8: Basic parameter description available onscreen ..... 21

Figure 5-9: Graphic display of the well flow ..... 22

Figure 5-10: Full page graphic view of fault detection results (Default - Casing Sensor) ..... 22

Figure 5-11: Data point on graph..... 23

Figure 5-12: Fault settings..... 24

Figure 5-13: Optimization file upload screen in GUI mode ..... 25

Figure 5-14: Browse for the input file ..... 25

Figure 5-15: Start optimization in GUI mode..... 26

Figure 5-16: Optimization dashboard with single file analysis results..... 26

Figure 5-17: Well settings..... 27

Figure 5-18: Optimization dashboard with single file analysis results (Example 1) ..... 27

Figure 5-19: Optimization dashboard with single file analysis results (Example 2) ..... 28

Figure 5-20: Full page graphic view of Optimization results (Example 1)..... 28

Figure 5-21: Operator Training System home page ..... 29

Figure 5-22: Download Operator Training System simulation results ..... 29

Figure 5-23: PAS Report icon ..... 30

Figure 5-24: PAS Report page ..... 30

## List of tables

Table 0-1: Related documentation.....4

Table 2-1: PAS features.....6

Table 2-2: Default trend file locations .....8

Table 2-3: Output file naming conventions.....9

Table 5-1: Startup tasks.....16

Table 6-1: General error categories ..... 30

---

## Additional information

Additional free publications are available for download at [www.abb.com/upstream](http://www.abb.com/upstream).



[Plunger Analysis Software homepage](#)

**Table 0-1: Related documentation**

Documents	Document number
Plunger Analysis System (PAS) API: Script-Based Access	<a href="#">2107724</a>
Plunger Analysis System (PAS) API: Sample Code for Access and File Conversion	<a href="#">2107722</a>
Digital Oilfield User Manual	<a href="#">2106300</a>

## Safety

For first-time implementations which include installing and configuring ABB Totalflow devices, consult the device user manuals for details about safety.

The analysis results from the Plunger Analysis application provide optimal configuration information that can be used by operators to fine tune an existing plunger application operating on an ABB Totalflow device. Changes to the plunger application must be done by experienced or advanced users to prevent equipment damage, unintended production shutdown, or personal injury as a result of plunger configuration changes.

---

# 1 Introduction

This guide describes the activation and startup procedures for the ABB Totalflow Plunger Analysis System (PAS) cloud application. PAS is a Software as a Service (SaaS) offering. It features optimization, fault detection and operator training functions.

## 1.1 Product notice

The cloud ABB Totalflow PAS application offers the same functionality as previous PAS versions. The Optimization, Fault Detection, and Operator Training feature from the prior version have been retained unchanged. Support for these previous versions also remains the same.



**IMPORTANT NOTE:** Previous PAS licenses are not valid for the new application. Licenses obtained for customer demos can be transferred to support access to the cloud PAS. To obtain cloud PAS licenses, see section [1.2.1 Ordering](#).

## 1.2 Product information

Each of the PAS features requires a valid license number for operation. Software licensing management is handled from an online customer portal. After purchase, ABB creates a customer account, generates the licenses that are required for feature activation, and adds account members authorized to use the application. Licenses are sent to the customer via email. They must be activated online.

### 1.2.1 Ordering

For product orders or license renewals, please contact ABB Totalflow sales support:

1-800-442-3097 (USA)

1-918-338-4880 (International)

[US-IAMA.order@us.abb.com](mailto:US-IAMA.order@us.abb.com)

### 1.2.2 Customer accounts and members

ABB creates a customer account. The customer must provide information for at least one of the users on the account. The following information must be provided:

- Member email address
- Member first and last name
- Corporate mailing address

## 1.3 Licenses packages

Activation licenses define which features are enabled in PAS. They allow access to all authorized users using the browser to access PAS. License activation must be completed online.

For PAS API access, licenses must be activated from the browser.

### 1.3.1 Basic Activation license

The Basic Activation license authorizes the use of the Optimization and Fault Detection features. This option supports analysis for one well at a time when using GUI mode. The user can start the analysis from the user interface accessed from the browser. Multi-file analysis or batch (mode) analysis is not supported in GUI mode. Basic activation requires the purchase of a set number of runs to define how many times analyses can be performed. The license can be activated monthly (monthly subscription). Once the expiration date is reached, no optimization or fault detection will be allowed even if the total number of purchased runs has not been used. A new monthly license must be activated to continue to use the number of runs purchased. Monthly basic licenses are available for: 1,500, 7,500, 15,000, 30,000, or 60,000 runs.

### 1.3.2 Operator Training license

The Operator Training license authorizes the use of the Operator Training feature. This type of license is available as a monthly, quarterly or annual subscription.

### 1.3.3 License compliance

License compliance or usage tracking will be automatically managed for all activated licenses on a license compliance system on the Internet. Users can track the status of their license and the number of runs

available from the License activation screen as described in section [4.3 Verify license status and number of runs](#).

### 1.3.4 License renewal

Contact ABB sales support to renew licenses. For contact information, see section [1.2.1 Ordering](#).

## 2 Application overview

### 2.1 Software design

PAS is a cloud application with features that can be used together or separately. The system is designed for web browser access on cloud services. All analysis and processing of input files is done on the cloud so the user can access its services independently of the device used for access (thin client). The application supports web browser clients (user interface) or software clients in custom or third-party software (programming interface or API).

### 2.2 Features

PAS is designed to optimize the operation of the ABB Totalflow Plunger Control application in measurement or remote control devices by analyzing the Plunger Control application trend files. [Table 2-1](#) describes the features available with PAS.

**Table 2-1: PAS features**

Feature	Description
Fault Detection	Detect and identify errors that can affect the optimal operation of the plunger system.
Optimization	Determine optimal parameter or set point values to fine tune the configuration of a plunger system.
Operator Training System	Provide a training or simulation tool to understand how a plunger system works. The tool helps to understand the effect of choosing different set points or parameters values on a plunger system behavior or operation.

### 2.3 Modes of access to the application

PAS features are available on the graphical user interface (GUI) using a web browser, or on the Application Programming Interface (API):

- The PAS Graphical User Interface displayed on the browser is for user-application interaction. This interface supports single file analysis (one well at a time) triggered by the user. A single trend file containing the well data is used as the input in a single analysis run. All required functions (uploading and performing the trend file analysis, configuring settings, results display, and download) are available to the user from the browser.
- The API is used for client software-to-application interaction. A custom or third-party client software triggers the analysis of single or multiple files. The custom or third-party client software logic performs all the required tasks for the analysis. It sends the input file(s), provides configuration parameters, requests analysis, and fetches and saves results in the required file format. Custom client applications' logic can perform efficient analysis of multiple wells by requesting analyses in parallel.

### 2.4 Main functions on the graphical user interface

PAS enables users to:

- Configure: Several configuration menus are available depending on the features used.
- Upload trend files: The operator specifies the path to the trend files to be analyzed.
- Analyze trend files: The application performs the appropriate algorithms for fault detection or optimization and generates results.
- Download results: Analysis results are stored in files that can be downloaded and saved for later viewing or reporting.
- View results for single file analysis: Results are presented in graphical view to facilitate analysis and highlight issues affecting the plunger system health and performance.

### 2.5 Main functions through the API

Access to the API is for third-party client software. Customers must develop their own client applications to process and format input trend files, send requests for analysis for single or multiple wells, fetch and display

results, and format outputs to meet the requirements of the systems they integrate with for result interpretation.

## 2.6 Theory of operation

PAS requires the Plunger Control trend files data for the input analysis requests. PAS checks the files before executing the analysis to determine if the files are the correct type and format, have valid data, etc.

Trend files are collected directly from the ABB Totalflow device (either a remote controller or a flow computer configured for Plunger control) or obtained from SCADA systems.

Trend files obtained directly from ABB devices are the original files with the plunger application data as logged by the device. Trend files from a SCADA system have the same data as the original trend file but can contain additional configuration data (such as well settings) that may have been entered after the trend file was collected from the device and stored in the SCADA system.

[Figure 2-1](#) and [Figure 2-2](#) show high level diagrams of the data flow when using PAS GUI interface and API interface respectively.

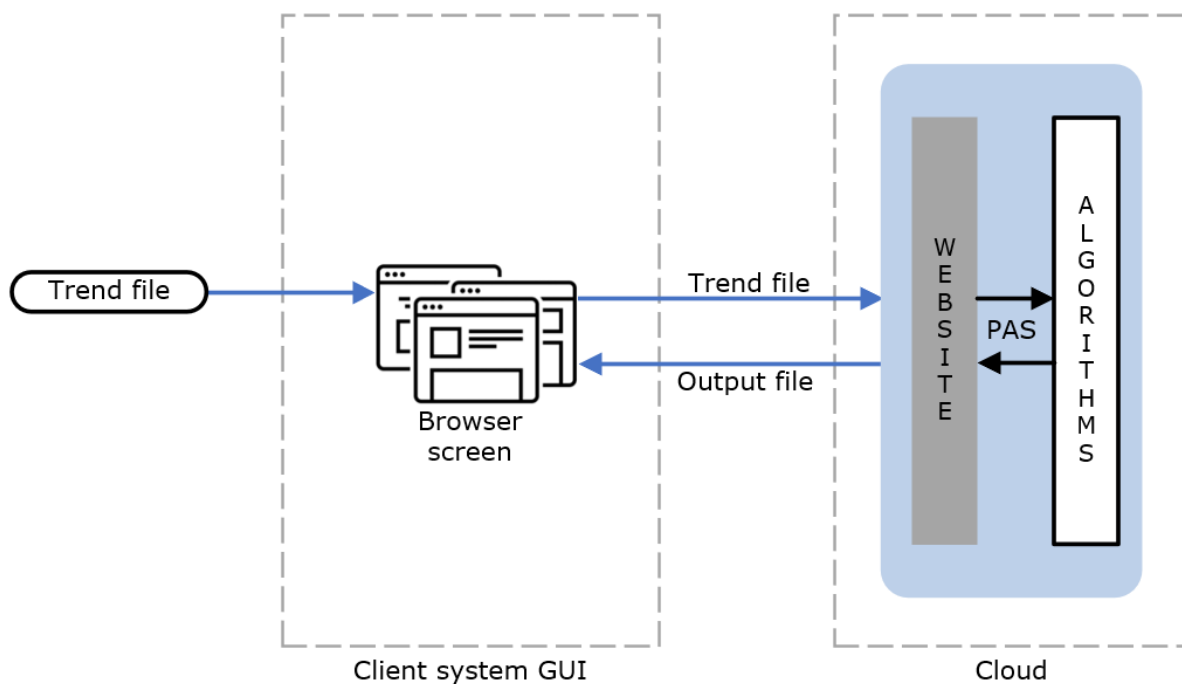
In the Totalflow device, the trend system application logs the plunger control data on a trend file. The trend file must contain data values for five (5) required parameters for analysis:

- Casing pressure
- Tubing pressure
- Line pressure
- Flow rate
- Arrival time

Collect plunger trend files from the Totalflow devices and copy those files into the system that is used to access PAS.

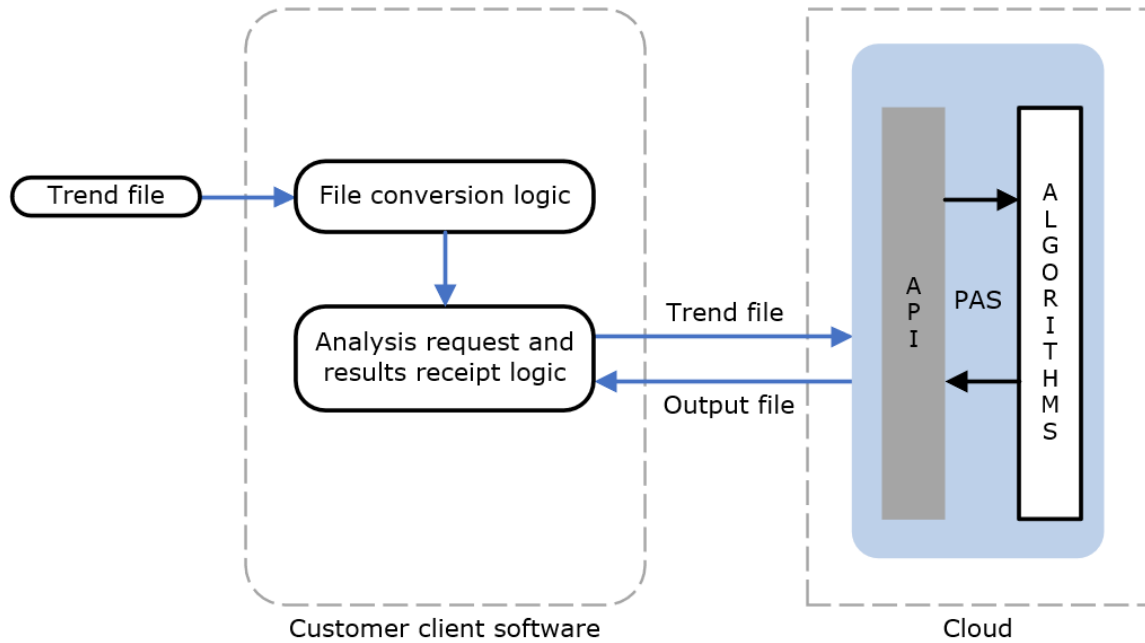
In GUI mode ([Figure 2-1](#)), upload and analyze one input file at a time. If the analysis is successful, the analysis result is immediately available on the graphical interface (browser). The output files can also be downloaded or saved in a folder on the system used to access the application.

**Figure 2-1: PAS GUI mode processing a single input file**



In API mode ([Figure 2-2](#)), a custom or third-party application sends the input files and requests the analysis. PAS returns the results which the client app stores and distributes to other software or systems. The precise logic of the client software depends on the customer implementation and requirements.

**Figure 2-2: PAS API mode processing a single input file**



To ensure the analysis can run and provide useful results, review the requirements for input files and the format for the output files in the following sections.

### 2.6.1 Input file format and location

The graphical interface available on the browser supports input files in both .csv and .json formats. The API accepts only .json formats. For information on how to convert files from .csv to .json format, see [Additional information](#) for a link to the document: Plunger Analysis System (PAS) API: Sample Code for Access and File Conversion. Additional information about file formats is also available in the online PAS help files.

The plunger trend files can be collected from the ABB Totalflow device using the PCCU or WinCCU collection utility. For the procedure to collect files using PCCU, see section [3.2 Prepare or collect trend files](#).

Collected files can be uploaded for analysis from the default PCCU or WinCCU output directories (see [Table 2-2](#)), or any other folder defined by the user. If using another system to access PAS, copy the trend files to an appropriate location or folder on that system. Please note that:

- For single file analysis (GUI mode), the application provides the opportunity to select the file by browsing to the location of the file.
- For the API mode, provide the path to the input directory and output directories in the third-party client software. This is defined by the customer implementation.

The location for trend files stored on third-party systems depends on the type of system and is therefore customer-specific. Consult the system administrator for the file location or request files exported in .csv or .json format to be copied on the desired input directory.

**Table 2-2: Default trend file locations**

Interface used for collection	Default location for collected trend files
PCCU	C:\PCCU\spreadsh\archive\ <station id&gt;<="" td=""> </station>
WinCCU	C:\WinCCU\lotermdb
Third party management system or database	Customer-specific. Manually export .csv or .json files to the required system.

### 2.6.2 Output file format, naming convention and location

In GUI mode, PAS writes the results in XML, Microsoft Excel® (.xls), and .json formats. Viewing results requires third-party software such as XML viewers, Microsoft Excel®, or a .json viewer.

For the Operator Training System feature, simulation results can be exported into files with .csv format.

In API mode, the analyses results are written on files in .json format only.



Output file naming conventions vary depending on the feature, PAS access, and format specified. For details, see [Table 2-3](#). Note that file name conventions show variable name elements in bold. The time stamp is always unique. The File Name reflects the name of the input files uploaded for analysis. Non-bolded name elements are generic and are always the same. Rename files as necessary after downloads to distinguish files for different analyses.

**Table 2-3: Output file naming conventions**

Mode or operation	Feature	Output file format	Output file naming convention
GUI	Optimization	XML	<WellName>.Ex
		Excel	SetpointsSettings.xls
		json	optimization_OutputFile_<FileName><Timestamp>.json
	Fault Detection	XML	<WellName>.Ex
		Excel	SetpointsSettings.xls
		json	faultdetection_OutputFile_<FileName><Timestamp>.json
	Operator Training System	csv	OtsTrendDataFile.csv (default generic file name)
API	Optimization	json	optimization_OutputFile_defaultName<Timestamp>.json
	Fault Detection	json	faultdetection_OutputFile_defaultName<Timestamp>.json

For browser access, output files are saved in a local folder specified by the user or in the browser default download folder. Configure the browser to prompt for the location of the files if you do not want the files to be automatically saved in the downloads folder in your local system.

For PAS API client applications access, the location of the output files is defined in the logic of the software.



**IMPORTANT NOTE:** PAS offers the option to obtain output or results files in .json format from the browser on an optional Report page. This page displays every completed analysis and provides links to download both the input file and its associated output file. The Reports is an option to request at the time of license purchase. For details see section [5.9 Analyses Report \(optional\)](#).

## 3 Prepare for application use

This manual assumes that the plunger and the trend system applications have been enabled and properly configured in the device. PAS is typically used after the plunger control application has been running in Totalflow devices for a period of time.

### 3.1 Install supported web browsers

Chrome™ version 86 and later support access to the PAS cloud application.



**IMPORTANT NOTE:** Network administrators must ensure PAS users have secure access to the Internet. A firewall protecting a customer premise network must have port 443 enabled for access to online feature activation and application usage.

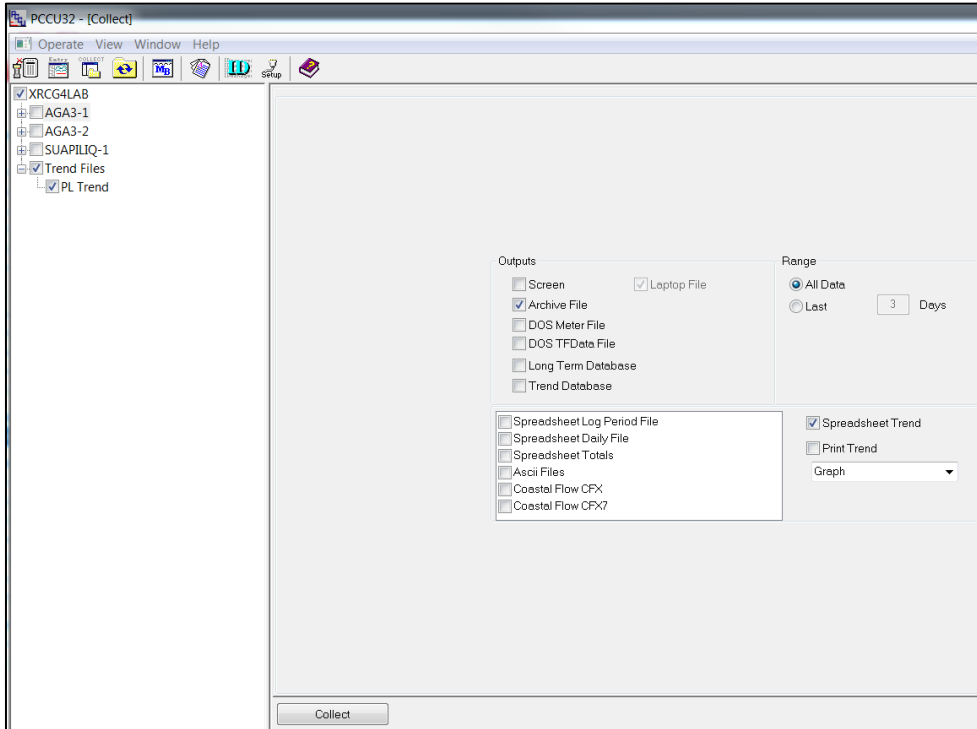
### 3.2 Prepare or collect trend files

Trend files need to be collected to be available for input to the Plunger Analysis System. The following procedure describes how to use PCCU to collect the plunger trend file, in the appropriate format, from an ABB Totalflow device.

To obtain the trend file:

2. Click **Collect Historical Data**. (If already connected, click the **Collect** icon on the PCCU toolbar menu).
3. At the Collect screen ([Figure 3-1](#)), on the tree view, check the **Trend Files** checkbox and the **PL trend** (or trend file name) checkbox(es).

**Figure 3-1: PCCU Collect screen**



4. Under Outputs, check **Archive File**.
5. Click **Collect**.
6. To retrieve the collected file, use the file explorer to browse to C:\PCCU\spreadsh\archive. The file should be located under the folder named with the same name as the Totalflow device (Station ID).
7. Copy the file to the location where it will be uploaded to PAS.

## 4 Activate PAS

When the application is launched for the first time, none of its features are activated. To begin using the features, they must be activated using the correct license key or activation code as supplied at the time of purchase.

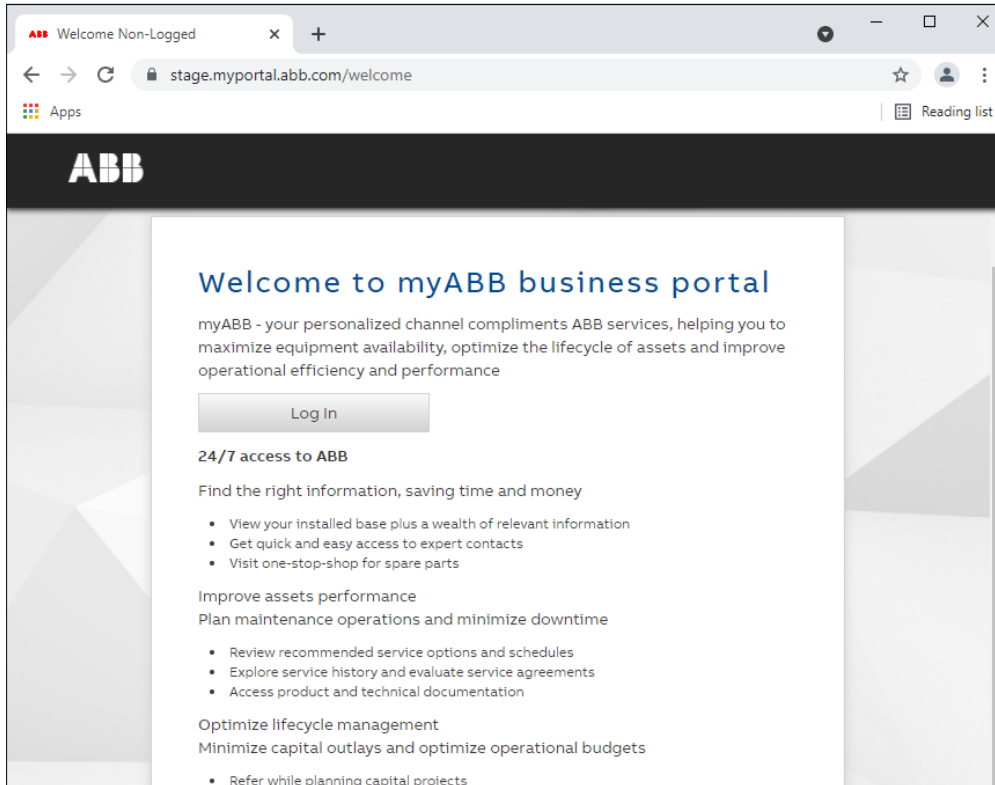
### 4.1 Access the application from the ABB business portal

Customer user credentials can be created through MyABB portal. These credentials can be used to access PAS from the portal.

To access the PAS application:

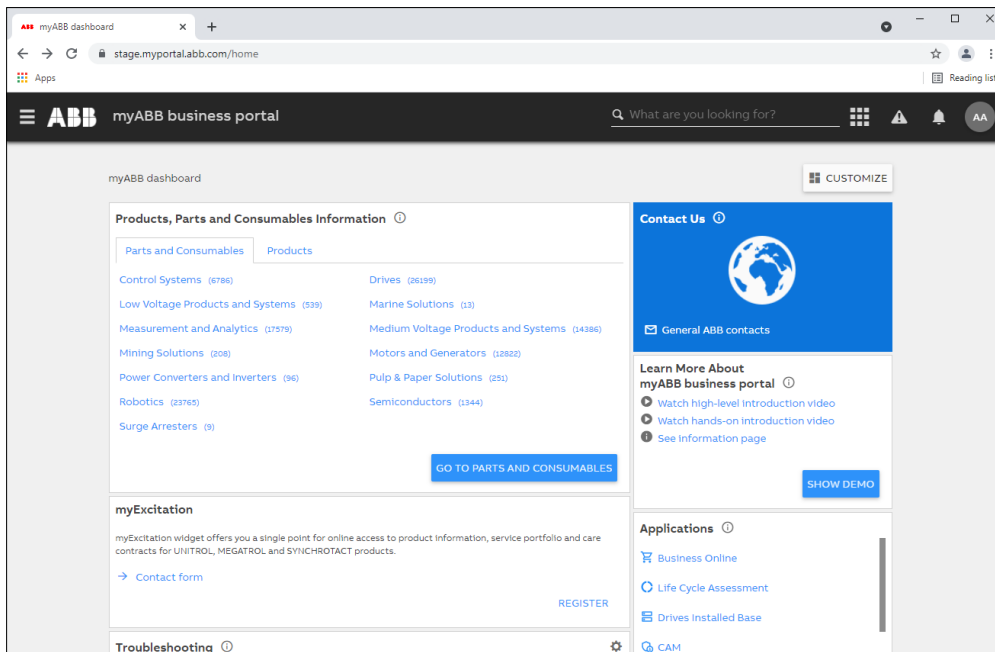
1. Start the web browser.  
<https://stage.myportal.abb.com/welcome>. The myABB business portal displays.

**Figure 4-1: myABB business portal login page**



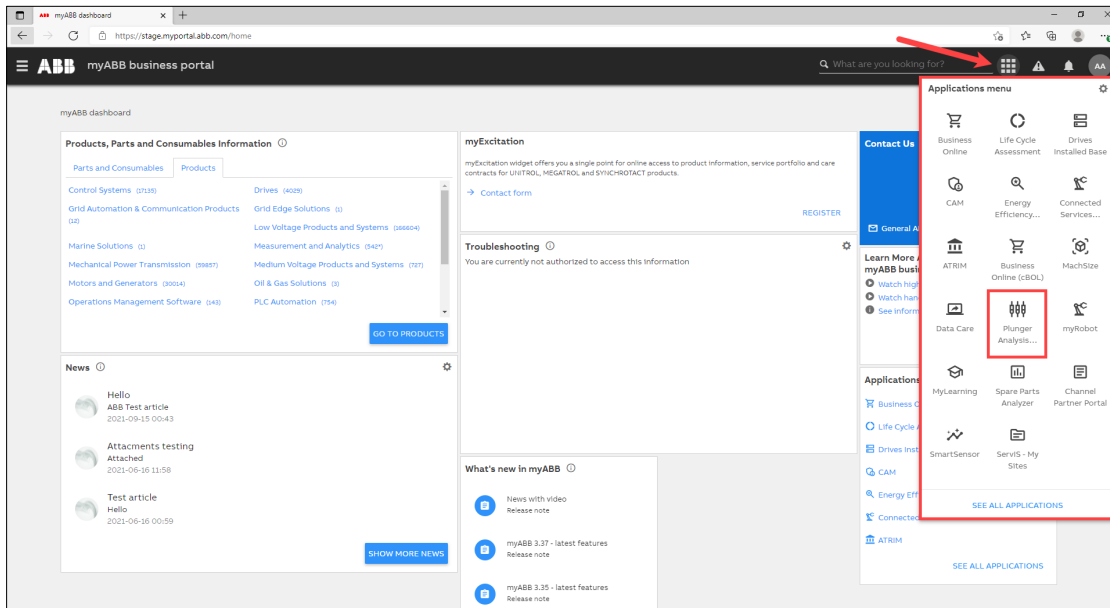
3. Click **Log In**
4. Type credentials. The main portal page displays.

**Figure 4-2: myABB business portal home page**



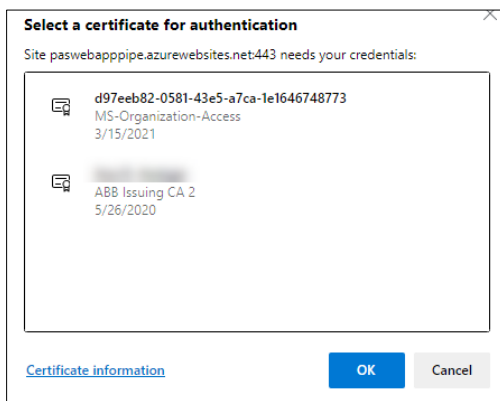
5. Click on the applications icon, then locate and select PAS in the displayed ABB application list (Figure 4-3).

**Figure 4-3: Locating PAS on the myABB portal**



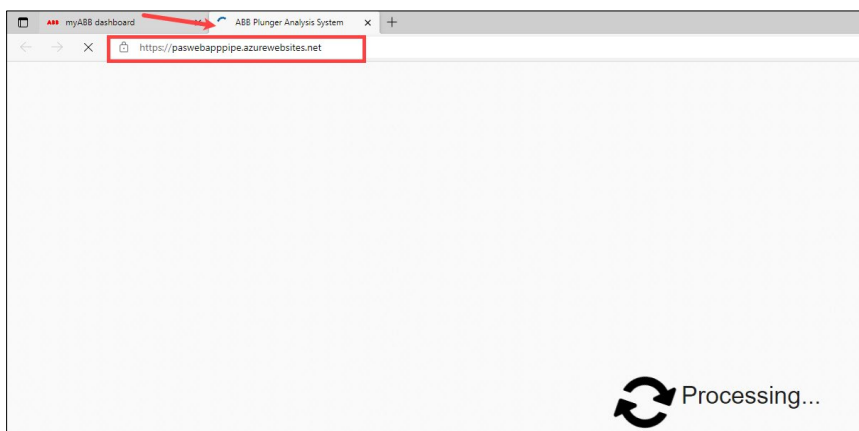
6. Select required credentials, then click **OK** (Figure 4-4).

**Figure 4-4: Select login credentials**



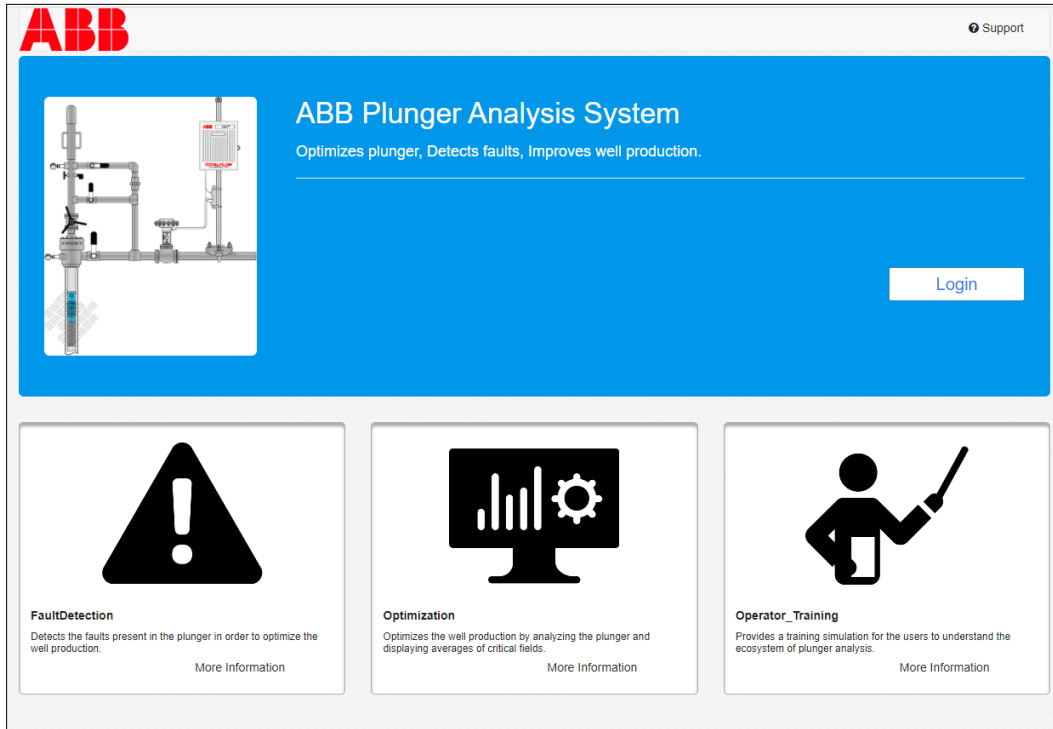
7. Wait for authentication. Note that the browser is redirected to the URL: <https://paswebapppipe.azurewebsites.net> (Figure 4-5).

**Figure 4-5: PAS processing credentials**



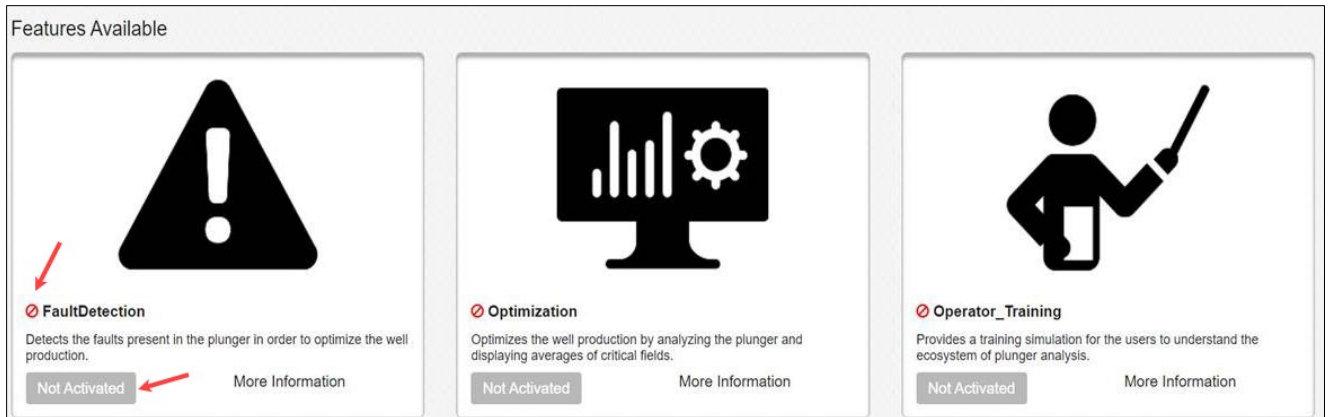
8. Verify that the main PAS login screen displays (Figure 4-6).

Figure 4-6: PAS login page



9. Click **Login**.
10. Type credentials: User ID and Password. At first time login, features may not be available for use. This is indicated onscreen on each feature tile (Figure 4-7). Access to the feature is denied and a button labeled: Not Activated, displays.

Figure 4-7: Non-Activated Features



11. Proceed to online activation if necessary. See section [4.2 Online feature activation](#). If features are already activated, go to section [5](#).

## 4.2 Online feature activation

Online activation requires network and Internet access to the ABB service or business portal. You must be logged in to activate features. This procedure assumes you have logged successfully into PAS.

Use this procedure to activate one feature or package at a time. Ensure that the appropriate activation code is used for the required feature.

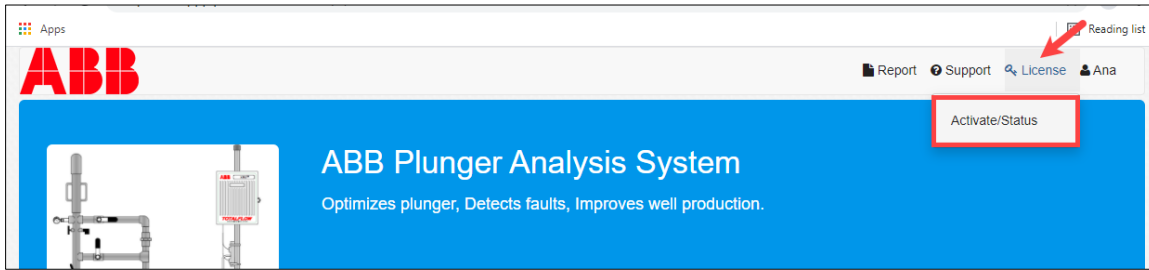


**IMPORTANT NOTE:** Online activation authorizes access to both the GUI and the API.

To activate the features after logging in:

1. Click **License** and then **Activate/Status** ([Figure 4-8](#)).

**Figure 4-8: Online activation from the PAS home page**



2. At the License: Online Activation screen, click **License Activation** ([Figure 4-9](#)).

**Figure 4-9: License: Online Activation screen**

3. Select the desired feature name:
  - a. For optimization and fault detection, select **Basic\_Activation**.
  - b. For the training feature, select **Operator\_Training**.
4. Type the credentials:
  - a. Account ID: email address registered for the customer account. This address is a unique address generated by Flexera for each customer account. It is provided along with the license keys.
  - b. User Name: authorized account member corporate email address
  - c. License key: also referred to as the activation code for the feature



**IMPORTANT NOTE:** Each activation license has its own key or activation code. Make sure to use the correct key issued for the feature. Each time a license is renewed, a new activation code is generated. Keep track of the activation codes.

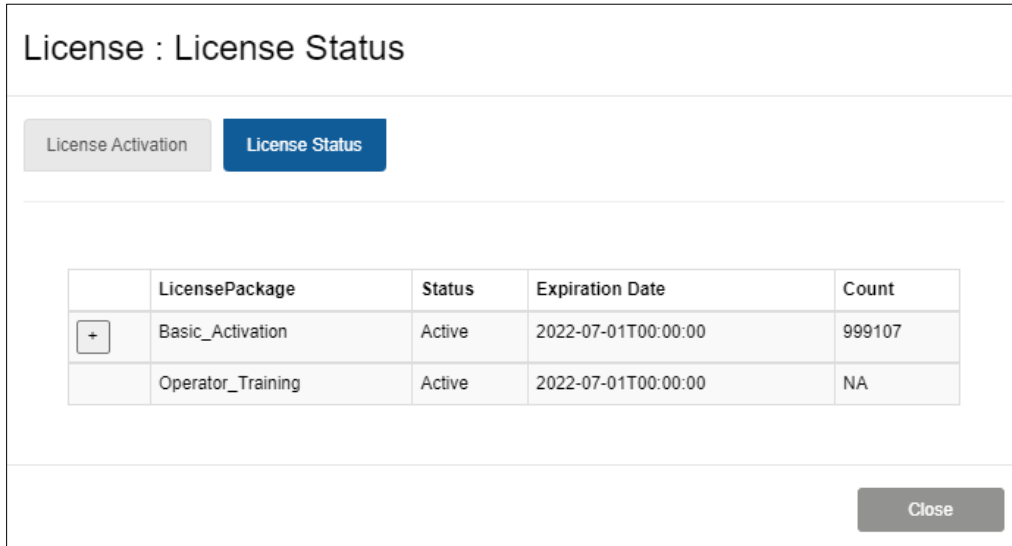
6. To verify license status and number of runs, see section [4.3 Verify license status and number of runs](#).
7. To begin using the feature, see section [5](#).

Once licenses are activated, you can check the number of runs available for that license. The number of runs is the number of times that PAS is allowed to performed analysis from the GUI or the customer client application.

To verify the status of the licenses and number of runs:

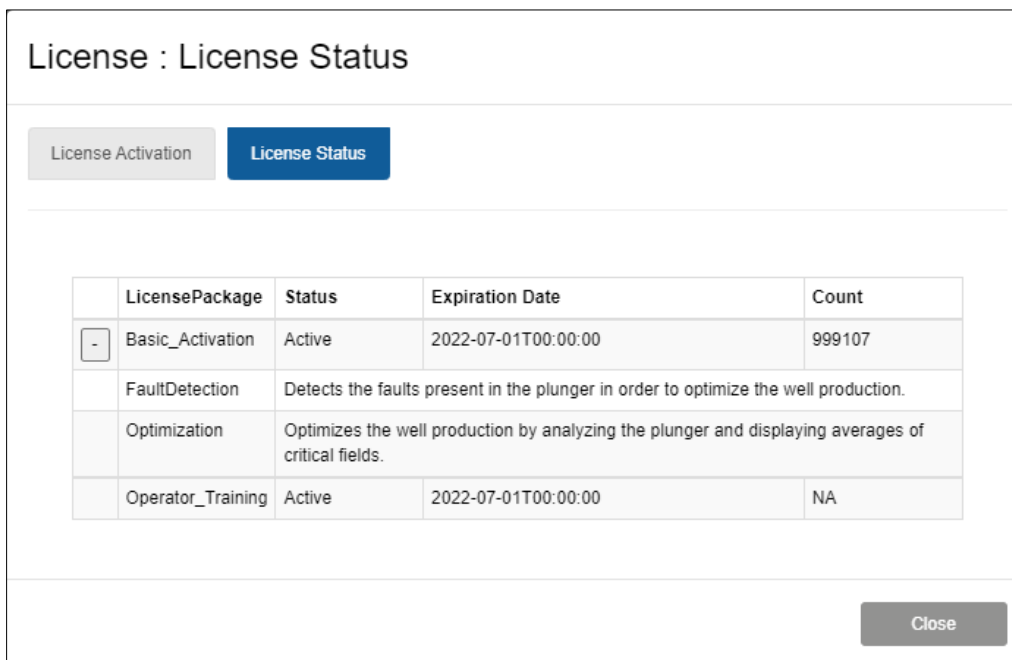
1. On the top right side of the main page, click **License** and then **Status**. The License Status screen displays with details about each license package ([Figure 4-10](#)).
2. A license that is valid will show: Active. The expiration date and the number of runs (Count) display also. [Figure 4-10](#) shows the example of a license with an expiration date of July 1, 2022 with the permission to execute 999,107 analyses.

**Figure 4-10: License Status**



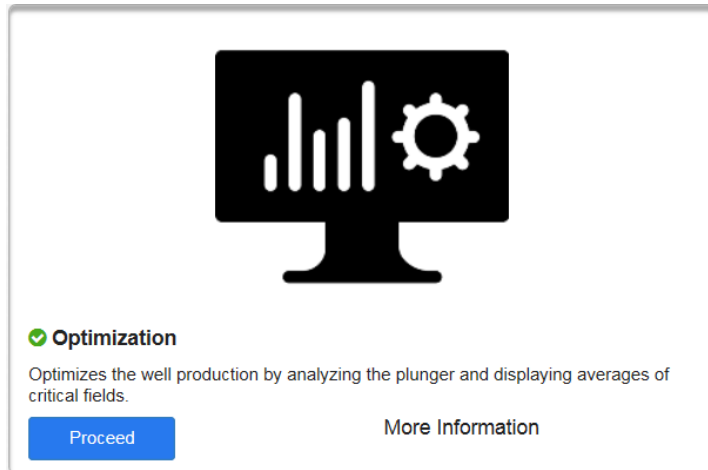
3. Click the plus sign next to the license for additional details.

**Figure 4-11: Basic\_Activation license details**



4. Click **Close** when done.
5. With active licenses, the features are now available for use. [Figure 4-12](#) shows the activated Optimization feature as an example. A check mark is now displayed next to the feature name and a Proceed button is now available to access the application.

**Figure 4-12: Activated feature (Optimization)**



## 5 Startup

The procedures included in this section describe how to start PAS and its features. Details on the interpretation of analyses, parameter description and advanced use of the application are available in the online help.

Choose the procedure(s) based on what features have been purchased. If both Optimization and Fault Detection are purchased, in some cases it may be helpful to run the Fault Detection analysis first to quickly gain an overall sense of the health of the plunger system. Detecting critical faults and taking corrective action before running an optimization analysis will result in more accurate data in the input files; this in turn will produce more accurate recommendations for tuning the plunger system.

The procedures for running batch analysis from the command line are also included to support legacy operations. These procedures require the definition of batch profiles (paths to the input and output directories where input and output files are saved, respectively).

### 5.1 Startup tasks

**Table 5-1: Startup tasks**

Tasks	Notes
Ensure features are activated.	See section <a href="#">4.3 Verify license status and number of runs</a> .
Ensure file(s) to be analyzed have been collected and are available for upload in the input directory.	See section <a href="#">3.2 Prepare or collect trend files</a> , for details. If several files need to be analyzed, plan carefully to maximize the number of executions purchased. Every time an analysis is run, the licensing compliance center will subtract the number of runs by one.

### 5.2 Start the application

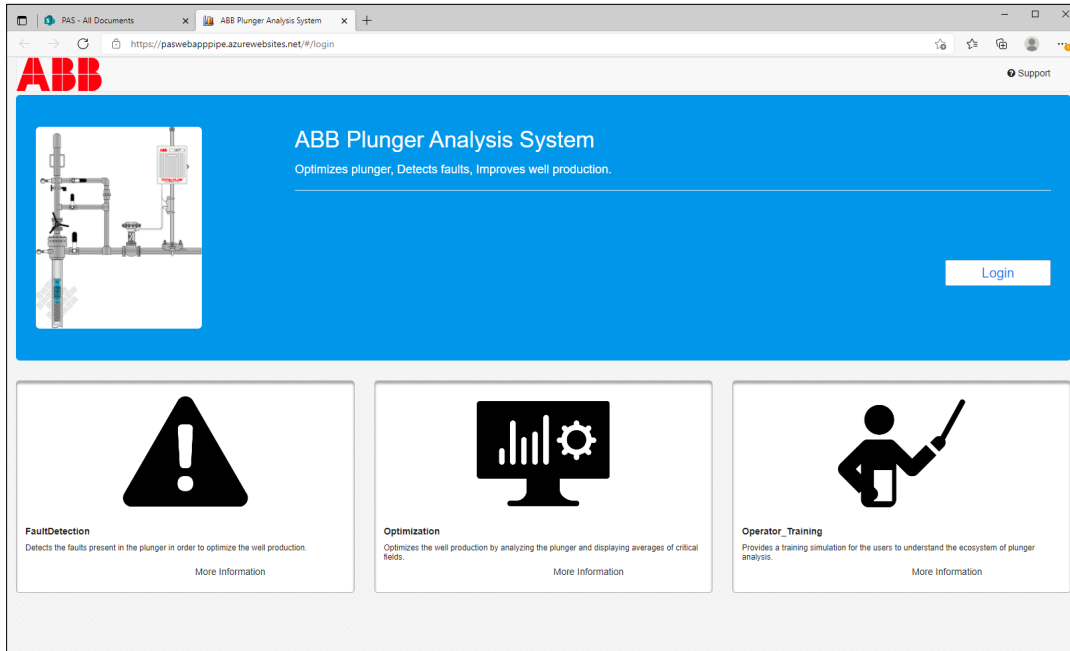
The application can be started from the myABB service PAS link or by going directly to the URL provided when the account and credentials are activated. The URL may not be an on an absolute domain but be custom for the users of the account.

To start:

2. Go to the provided ABB portal or provided URL.

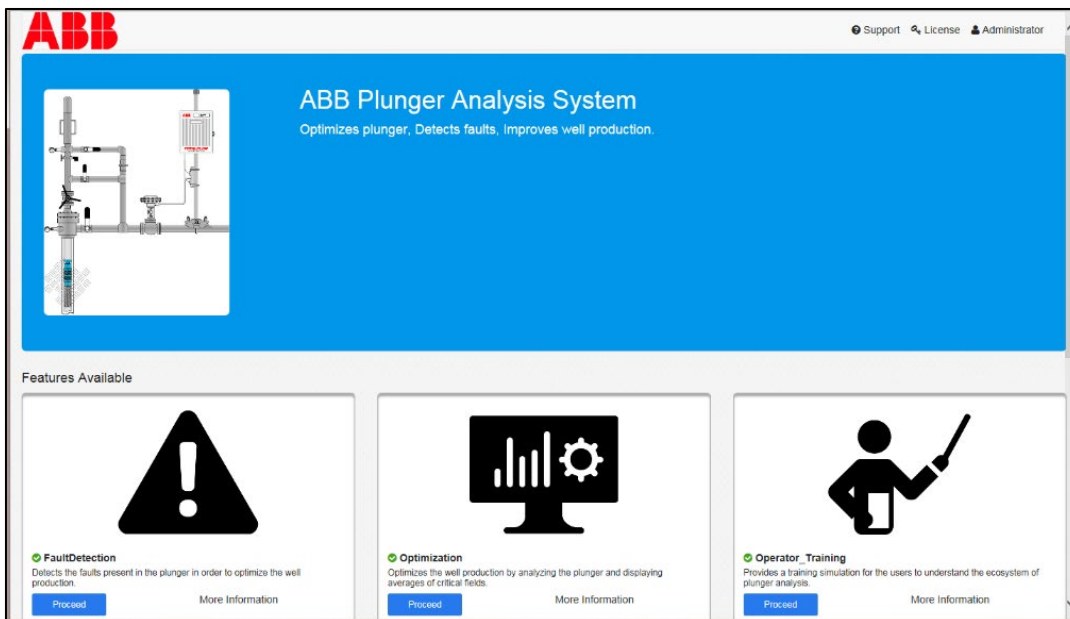


**Figure 5-1: PAS home screen**



3. Click **Login** on the PAS main screen. Provide credentials.
4. Ensure that the required features are activated. Activated features should have a green check mark next to the name and display the Proceed button (Figure 5-2). If not, follow the procedure described in section 4 [Activate PAS](#).

**Figure 5-2: PAS main screen (all features activated)**

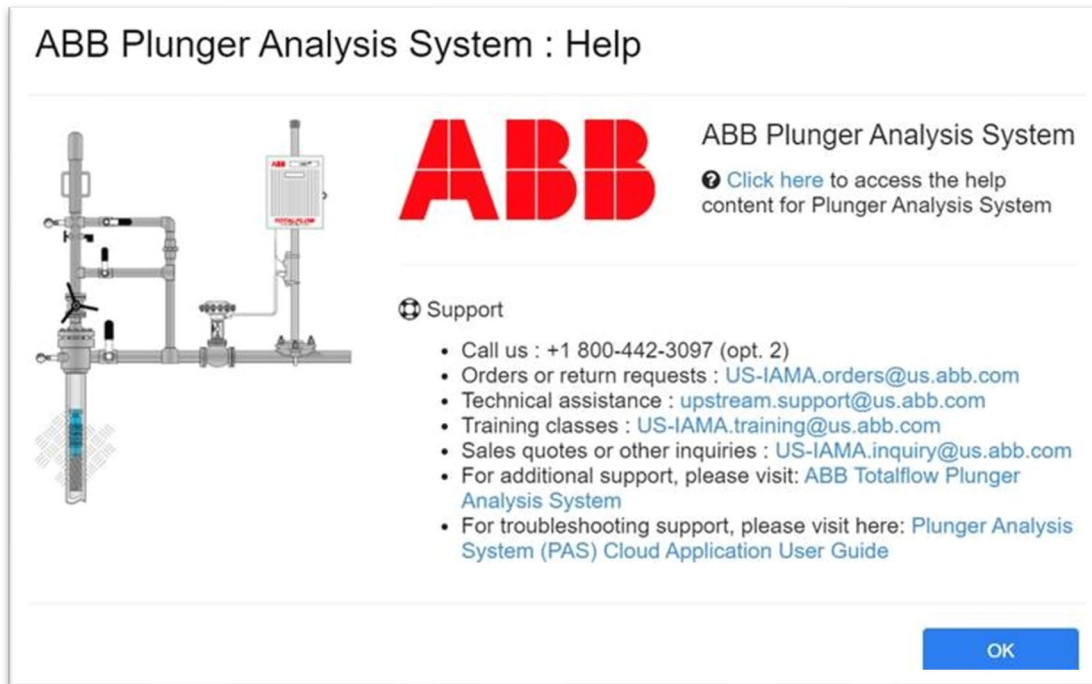


## 5.3 Get online help

Online help is available while running the application. To access help:

1. Click **Support** on the main application screen.
2. Click **Help** and the provided link to navigate to the content.

**Figure 5-3: ABB Plunger Analysis System help screen**



## 5.4 Create input and output directories

Input and output directories are the folders where the input files for analysis and the output files for results are saved, respectively. These directories can be created on the system where the application is accessed or on a mapped network drive. Create the input and output directory before starting an analysis from the browser (GUI) to be able to locate the files for upload or to save results.

1. Create the input directory folder where the analysis files will be uploaded from. Take note of the directory path.
2. Copy the input files into the input folder.
3. Create the output folder where output files or analysis results will be saved. Take note of the directory path. Results can be downloaded into this folder for viewing after analysis is complete.



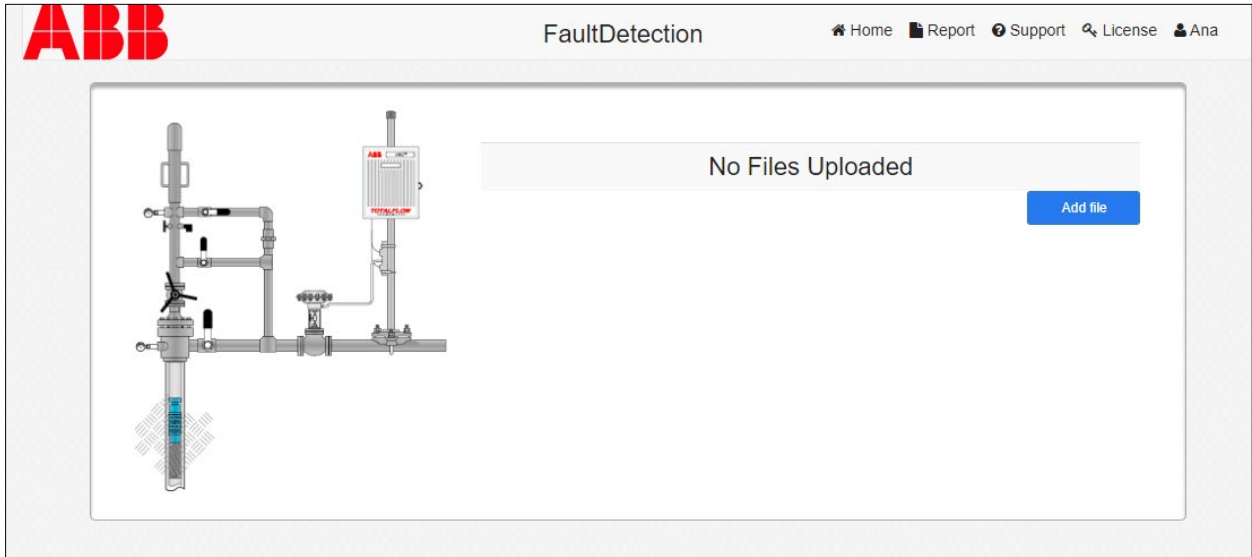
**IMPORTANT NOTE:** If planning to support analyses from custom or third-party client applications, make sure to define the paths for the input and output directories for optimization and fault detection. The location of files for client software use depends on the customer implementation and systems.

## 5.5 Run fault detection for single file analysis (GUI Mode)

Perform this procedure to use the browser to analyze and view results for a single input file. Please note that this procedure uses the default configuration parameters. If you wish to configure different parameters, see section [5.6 Configure fault detection with non-default values](#).

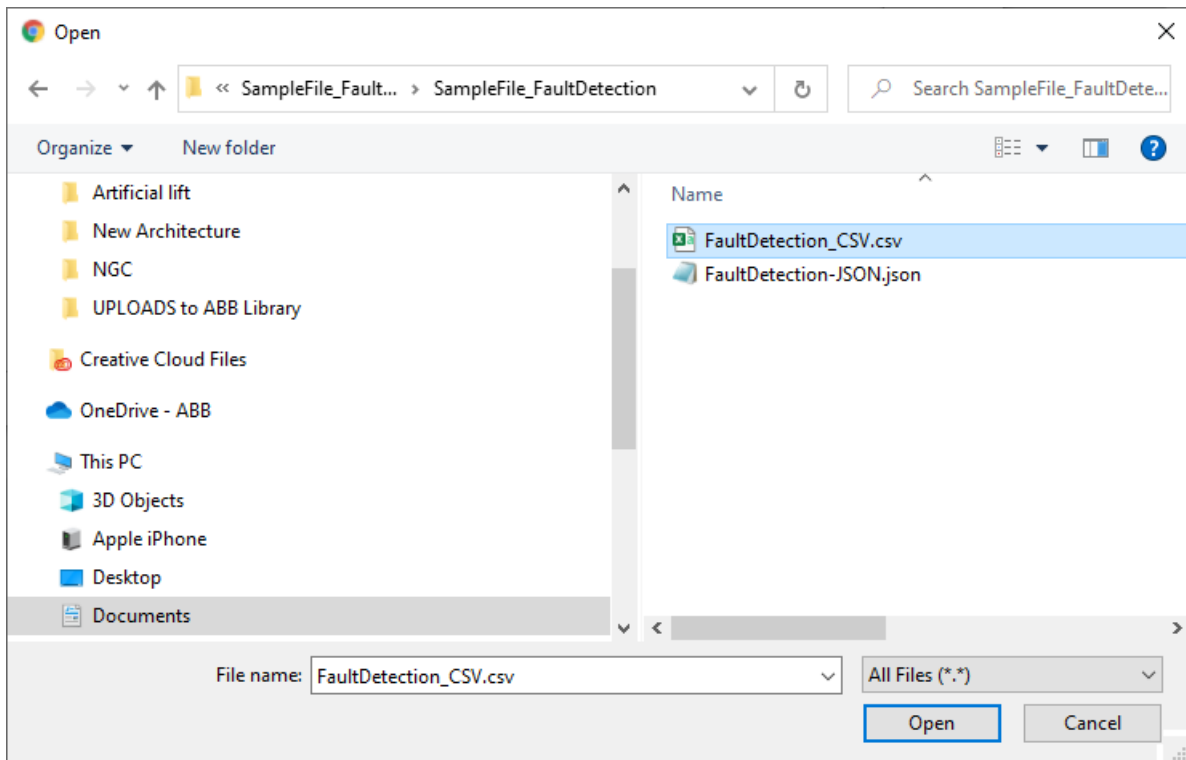
1. On the main screen, from the Fault Detection feature, click **Proceed**.
2. Verify that the Fault Detection file upload screen displays ([Figure 5-4](#)).

**Figure 5-4: Fault Detection file upload screen**



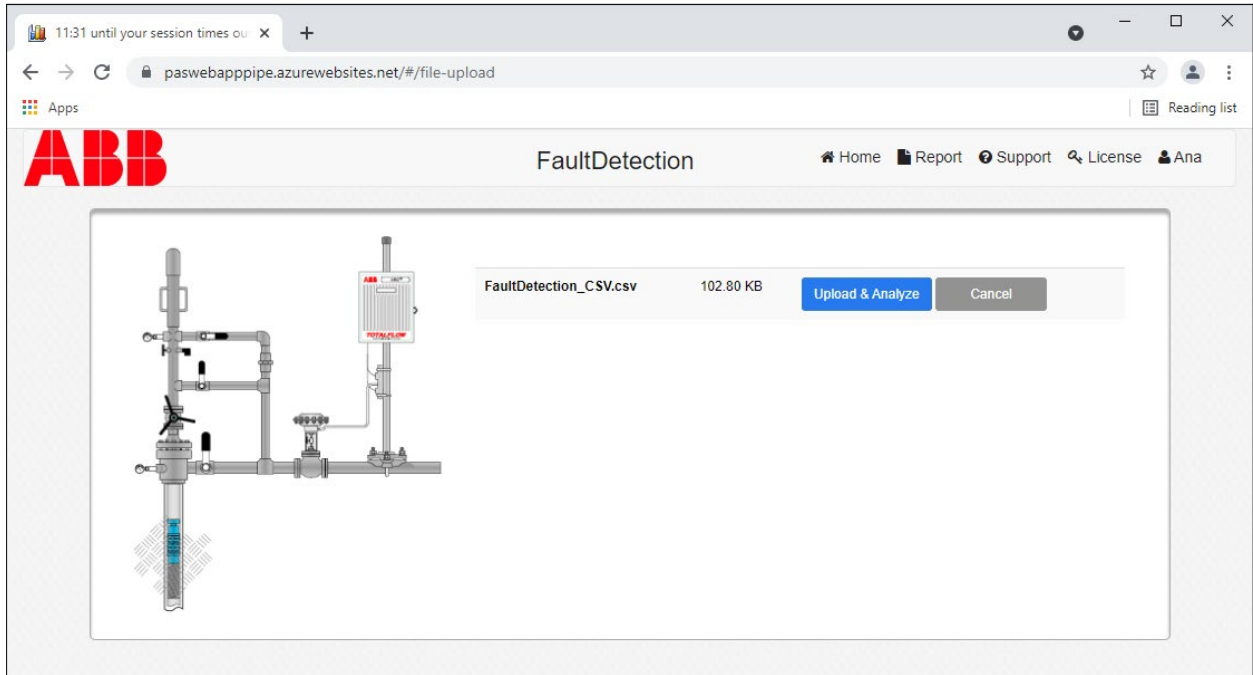
3. Click **Add file**.
4. Browse to the input directory (where the input files were stored), then locate and select the input file (Figure 5-5).

**Figure 5-5: Browse for the input file for analysis**



5. Click **Open**. The selected file displays onscreen.

**Figure 5-6: Input file selected for fault detection analysis**



6. Click **Upload & Analyze**.
7. When the application analyzes the file successfully, the main Fault Detection screen should display with the analysis results ([Figure 5-7](#)).



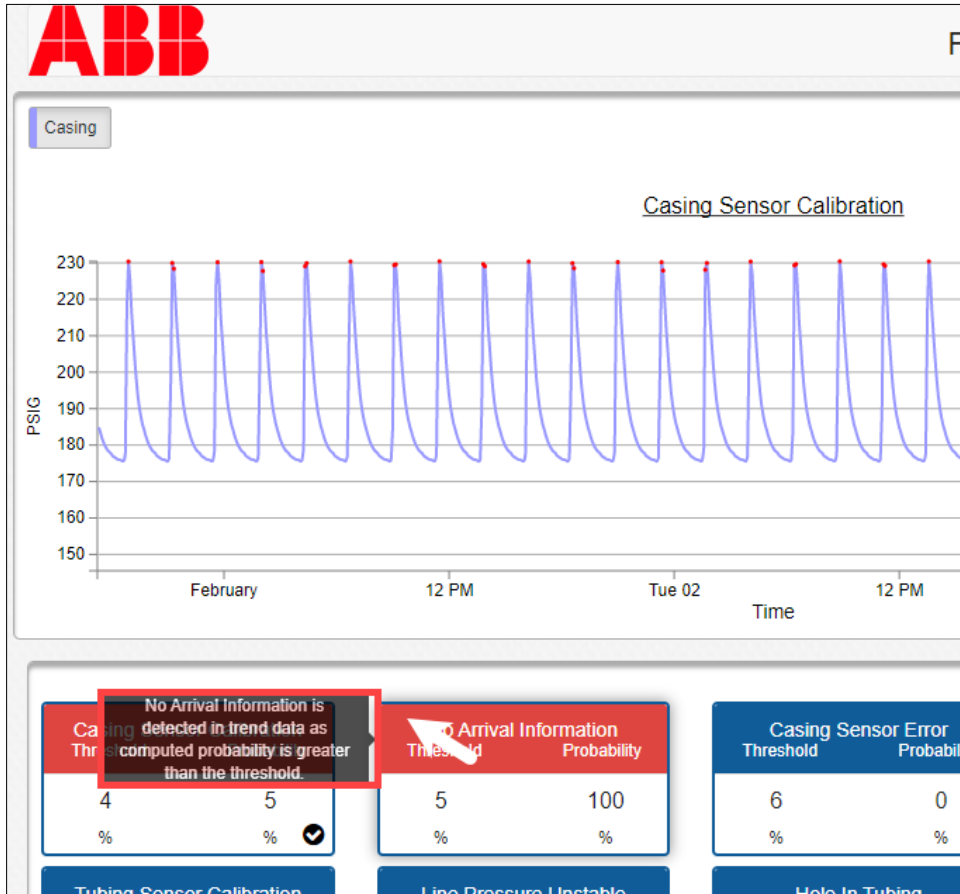
**IMPORTANT NOTE:** Single file analysis results are displayed on the screen. Navigating to another screen will clear the results. To keep a record of the results, ensure the results are downloaded and saved for later viewing.

**Figure 5-7: Fault Detection dashboard with single file analysis results**



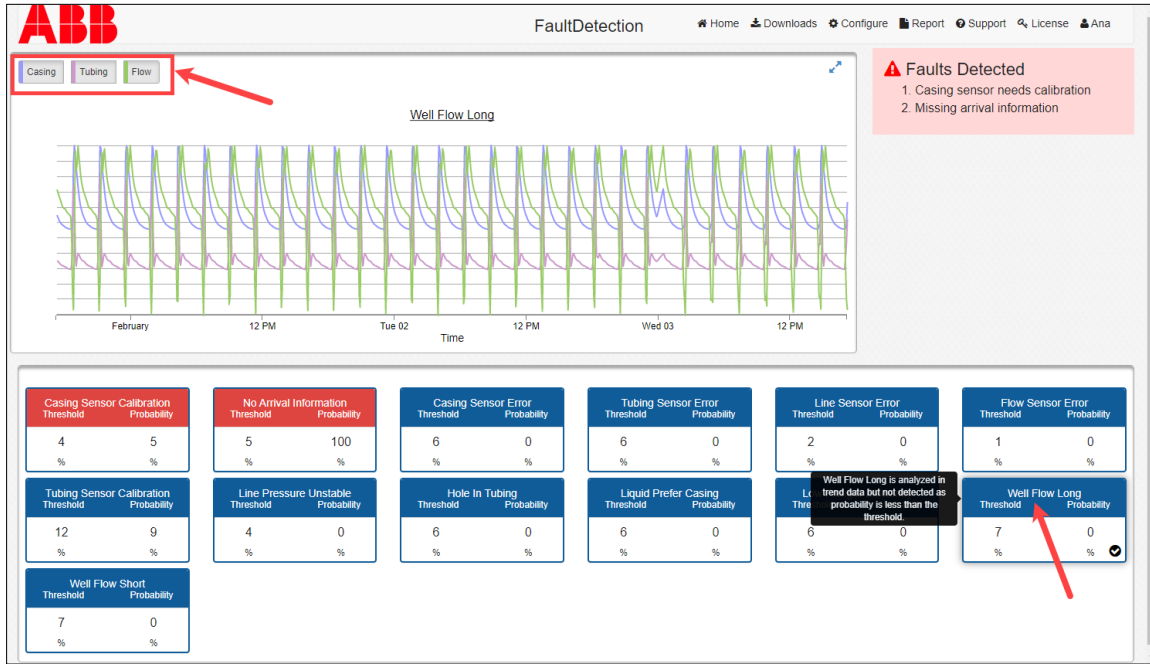
8. To store analysis results, click **Downloads**.
9. Choose the required format (.xml or Microsoft Excel® file format).
10. Save the output file in the output directory when prompted. If the browser is not configured for a user-specified folder, the files are automatically saved in the laptop's Downloads directory.
11. For additional details about interpreting results, go to the online help. Click **Support**. For a quick description of the parameters monitored for the analysis, right click on the box (Figure 5-8).

**Figure 5-8: Basic parameter description available onscreen**



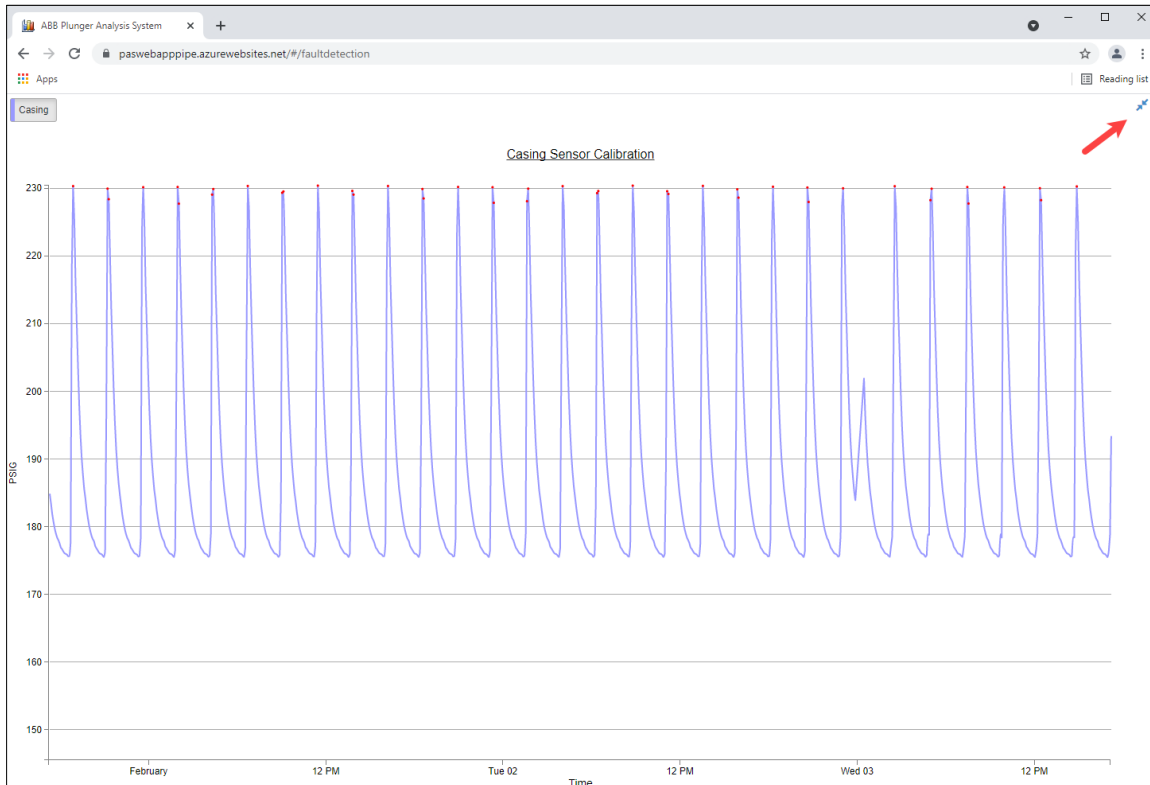
12. To view graphic display for variables other than the screen default, click on the variable box. Observe that the graph reflects the variables related to the selected parameters.

**Figure 5-9: Graphic display of the well flow**



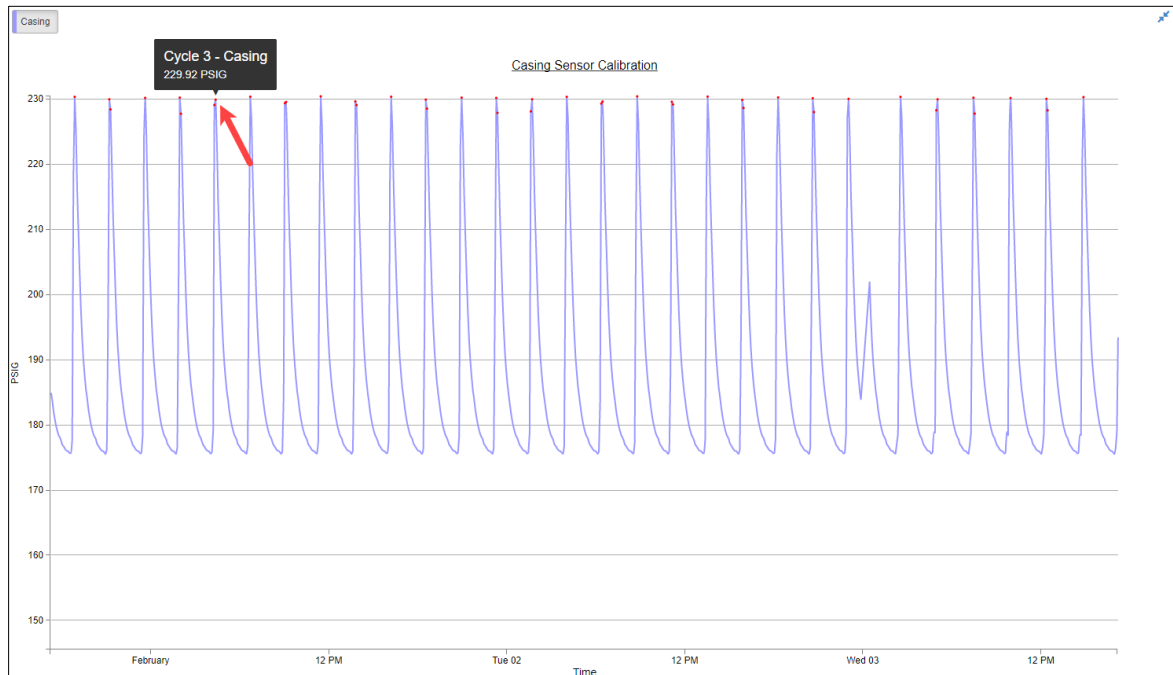
13. To view greater graphic detail, click on the expand icon on the graphic view. The graphic for the selected variable uses the full page.

**Figure 5-10: Full page graphic view of fault detection results (Default - Casing Sensor)**



14. Hover on the graph to display specific values.

**Figure 5-11: Data point on graph**



## 5.6 Configure fault detection with non-default values

Fault detection is configured with default settings for the parameters used in the analysis. Change these if required.

To change default settings:

1. Select **Configure**.
2. Select **Fault Settings**.

**Figure 5-12: Fault settings**

Faults
Casing Sensor Error
Tubing Sensor Error
Line Sensor Error
Flow Sensor Error
Arrival Sensor Error
Casing Sensor Calibration
Tubing Sensor Calibration
Line Pressure Unstable
Valve Leak
Missed Arrival
No Arrival Information
Hole In Tubing
Liquid Prefer Casing
Low Plunger Efficiency
Well Flow Long
Well Flow Short
Well Loading

Severity Levels: Custom

Casing Sensor Error

Severity: Med

Threshold: 6 %

Save Cancel

3. Click on the decided parameter and configure severity level and threshold values as needed.
4. Click **Save**.
5. Run fault detection with the new parameters if necessary.

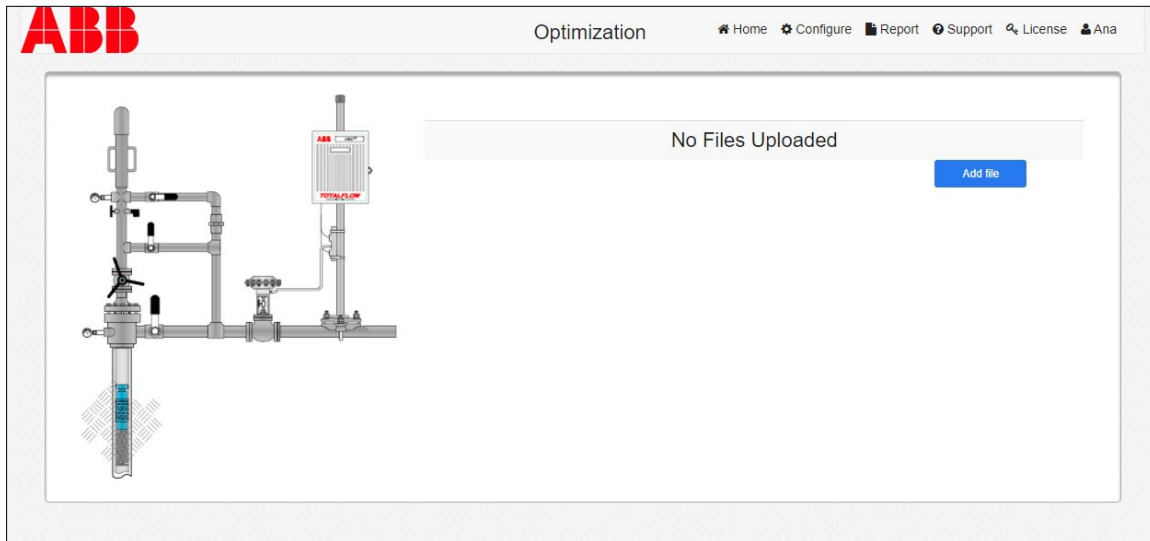
## 5.7 Run optimization for single file analysis (GUI mode)

Perform this procedure to use the browser to analyze and view results for a single input file:

1. On the main screen, from the Optimization feature, click **Proceed**.
2. Verify that the Optimization file upload screen displays ([Figure 5-13](#)).

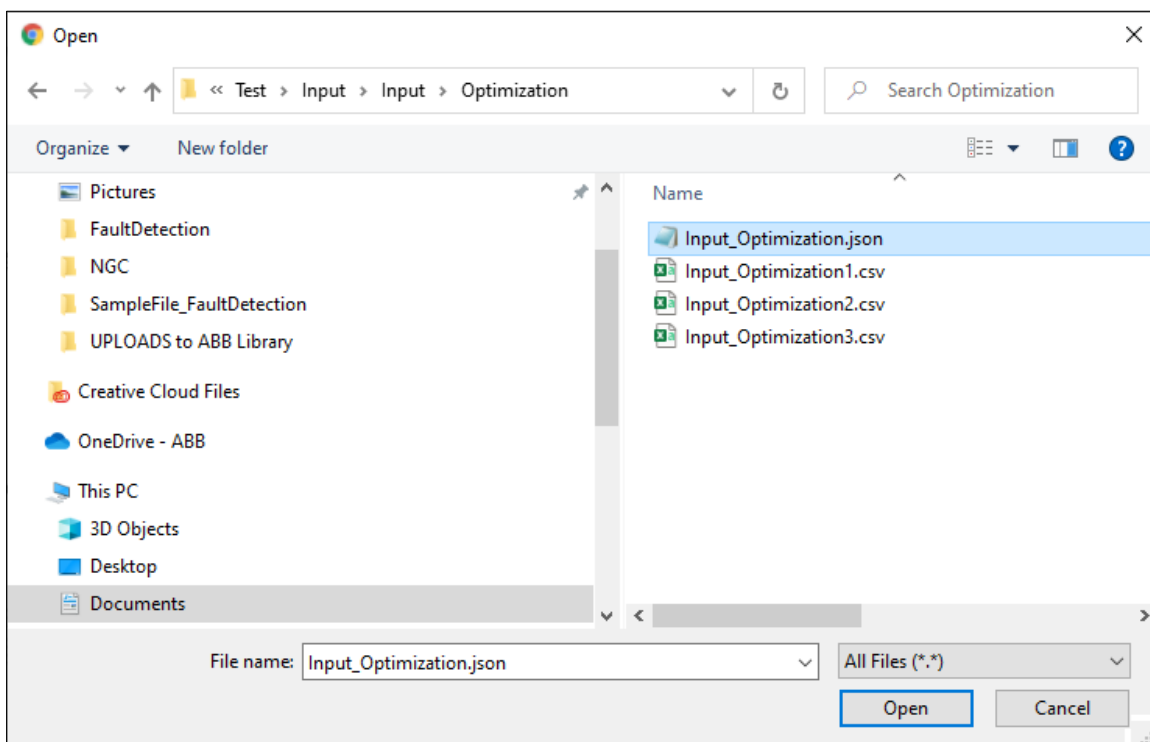


**Figure 5-13: Optimization file upload screen in GUI mode**



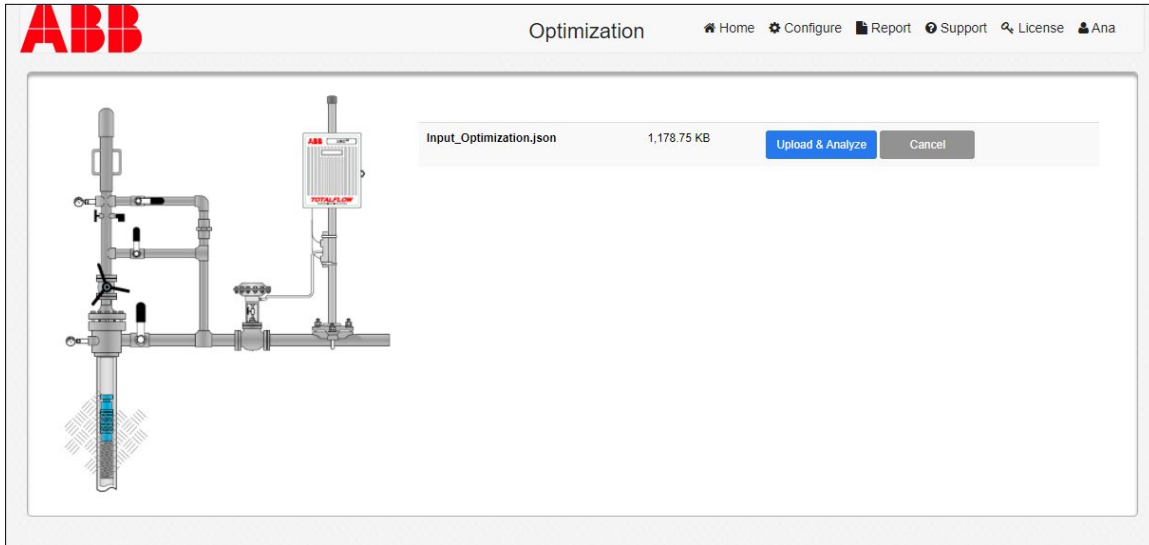
3. Click **Add file**.
4. Browse to the input directory, then locate and select the input file.

**Figure 5-14: Browse for the input file**



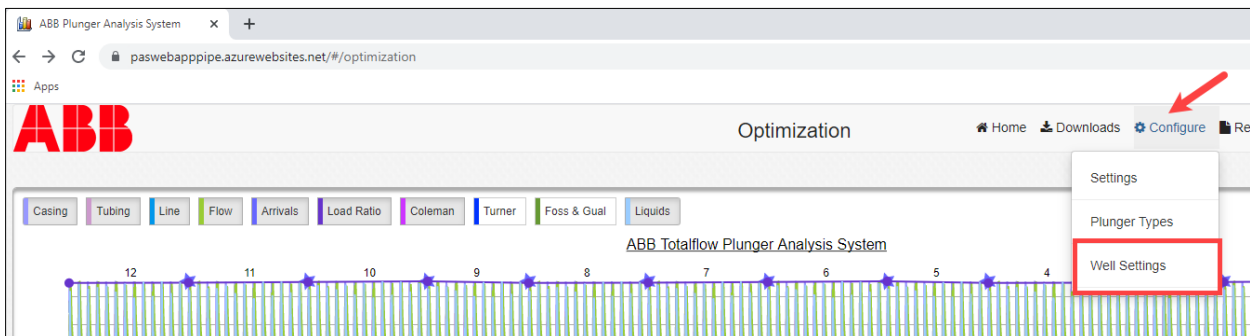
5. Click **Open**. The selected file displays onscreen.

**Figure 5-15: Start optimization in GUI mode**



6. Click **Upload & Analyze**. The first time the input file from a well is analyzed, the well settings dialog box may display and prompts the user to provide information that may be missing. If the well settings do not display, click **Configure**. See [Figure 5-16](#).

**Figure 5-16: Optimization dashboard with single file analysis results**



7. At the Well Settings window ([Figure 5-17](#)), select an existing well or create a new one.

**Figure 5-17: Well settings**

### Well Settings

Search Well

Well(s) ↓	✕
CHP_Demo	✕
CHP_Demo3	✕
SunilOptimization	✕
DemoWell	✕
#Introduction	✕
9/22/2008 9:07	✕
NormTest	✕
NormTest3	✕
Test	✕

Add New Well

Import Wells

**Selected Well: Plunger**

Tubing ID (inches)

Surface Temperature (°F)

End Of Tubing (feet)

Plunger Stop (feet)

Plunger Type

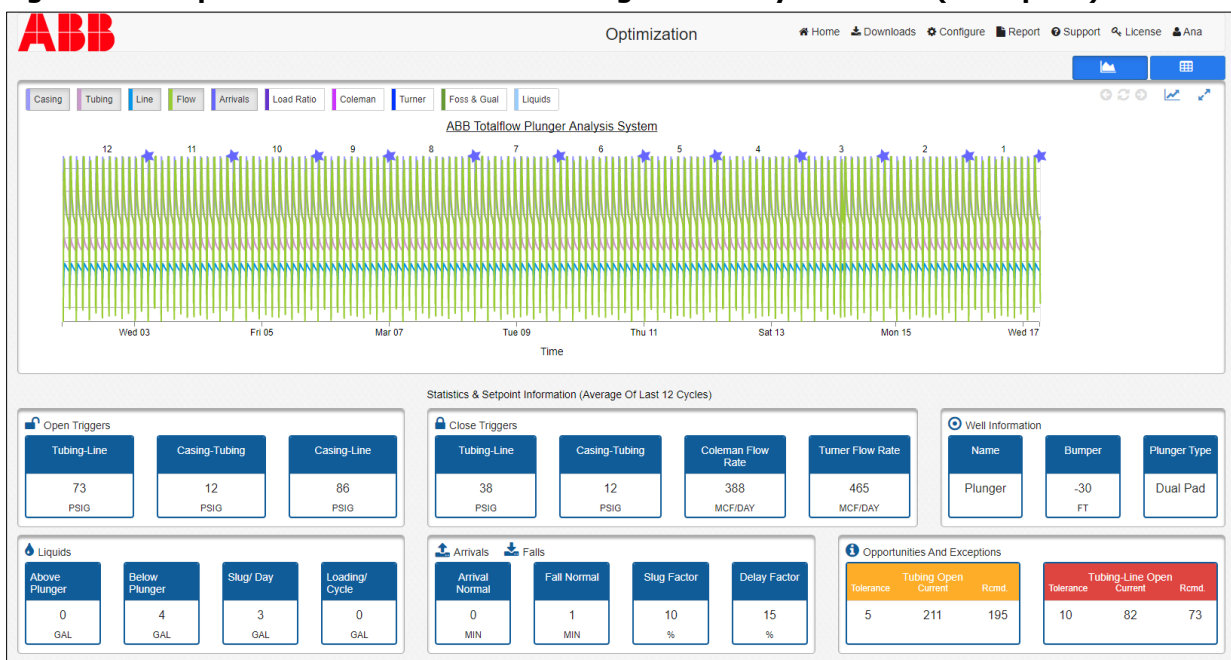
Casing ID (inches)

8. For each well, type the required parameters and click **Save**.
9. When the application analyzes the file successfully, the main Optimization screen displays with the analysis results ([Figure 5-18](#) and [Figure 5-19](#)).



**IMPORTANT NOTE:** If the input files for the same well are analyzed again, the well settings do not have to be typed again. The application is designed to keep the information for each well that is analyzed.

**Figure 5-18: Optimization dashboard with single file analysis results (Example 1)**

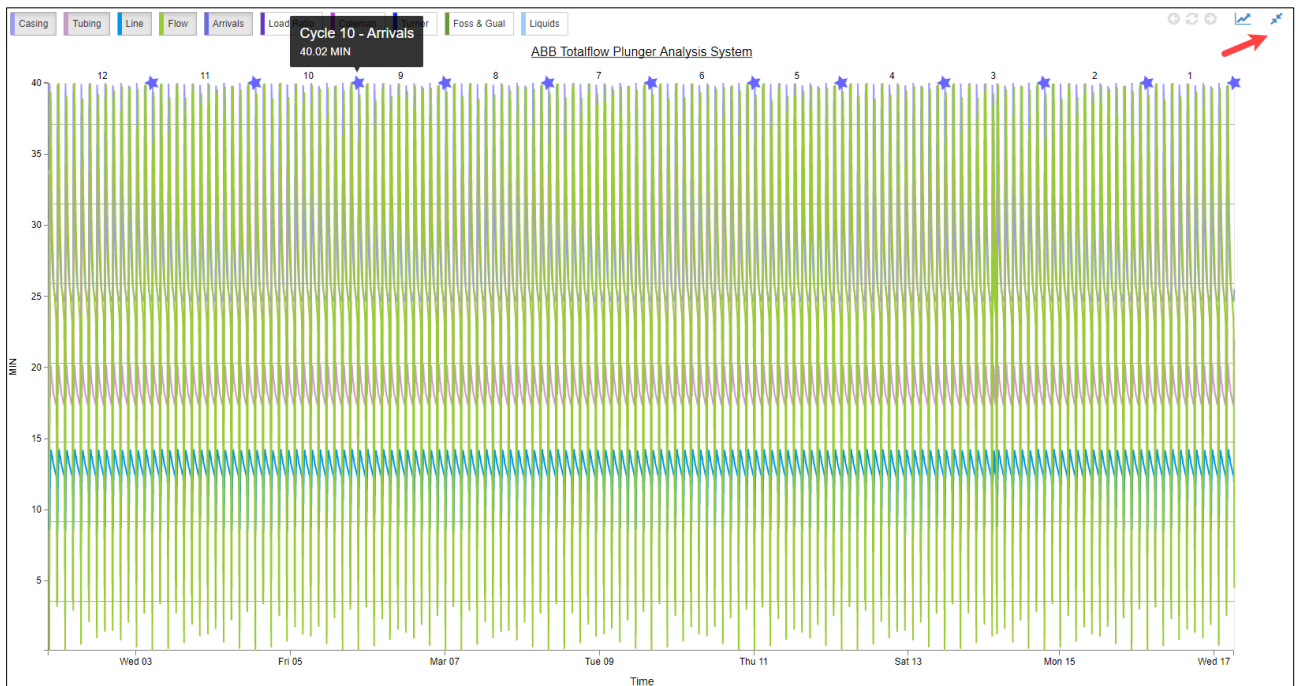


**Figure 5-19: Optimization dashboard with single file analysis results (Example 2)**



10. Review parameter values and setpoints after analysis (Note that information is based on average values over a certain number of cycles).
11. Review the Opportunities and Exceptions section onscreen.
12. To view greater graphic detail, click on the expand icon on the graphic view. The graphic for the selected variable uses the full page (Figure 5-20).

**Figure 5-20: Full page graphic view of Optimization results (Example 1)**



13. To store the analysis results, click **Downloads**.
14. Choose the required format (.xml or Microsoft Excel® .xls format).
15. Save the output file in the output directory when prompted.
16. For additional details about interpreting results, click **Support** at the top page menu to get to the PAS help files.

## 5.8 Start the operator training feature

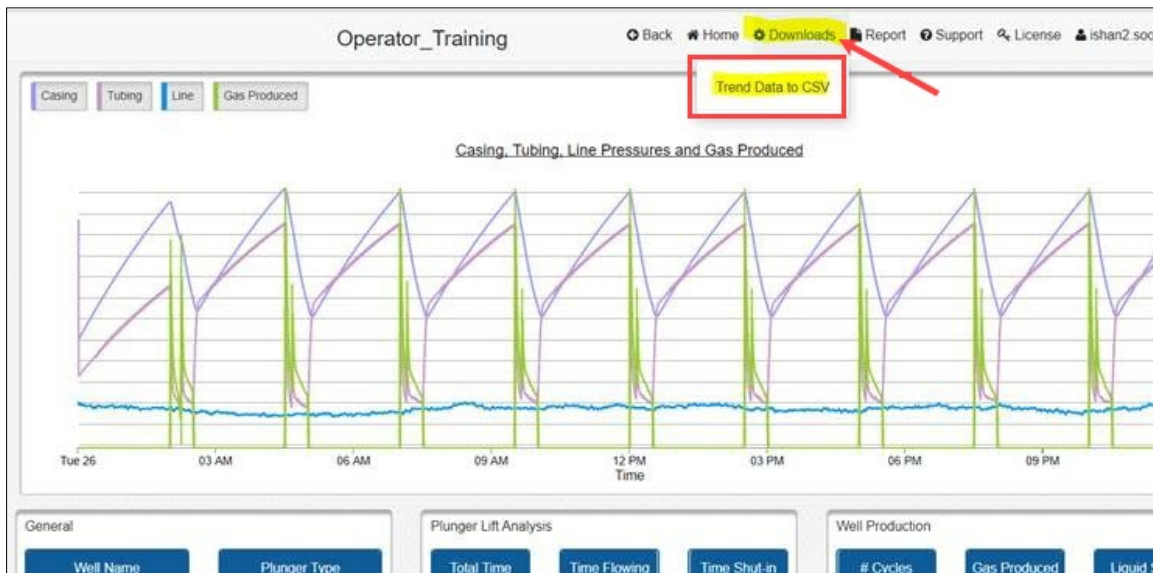
To start operator training:

1. On the main screen, from the Operator Training System feature, click **Proceed**.
2. Verify that the Operator Training System main screen displays (Figure 5-21).
3. Click **Support** and then **Help** for online help about the Operator Training Feature.

Figure 5-21: Operator Training System home page

4. To save Operator Training results click **Downloads** when results display (Figure 5-22). The simulation results are saved in a csv format file. The file name is generic. If you wish to differentiate different simulation results rename the file after download.

Figure 5-22: Download Operator Training System simulation results



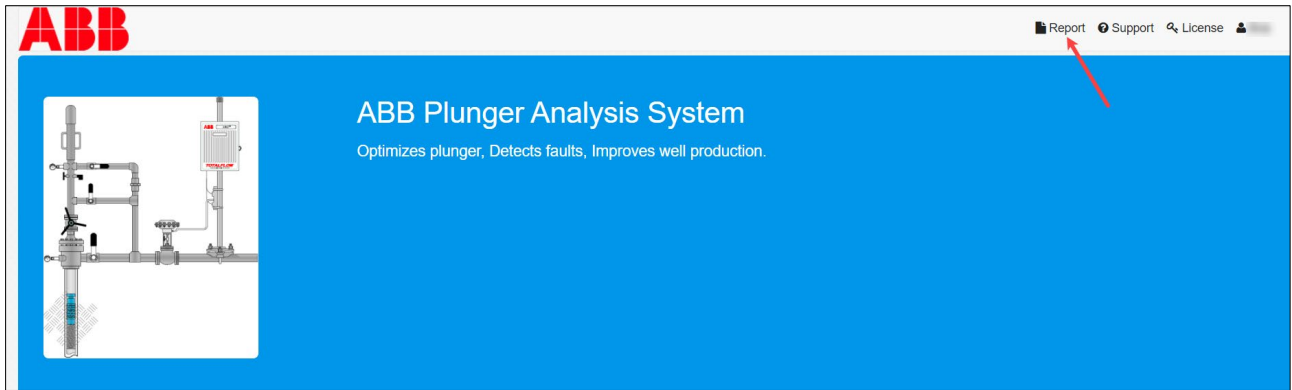
## 5.9 Analyses Report (optional)

The Report page displays detailed information about the analyses executed by the PAS application. The analyses logged are those from the GUI (browser) or those from a client application (through the PAS API). Customers must request access to Reports at the time of license purchase. It is not available unless selected as an option with the license. When requested, the report screen is available after successful log in. Each logged item provides the following information: User name, email ID, time stamp, feature used, Mode (API or GUI). It also provides links to download input data (in csv format files) and results report (in json format output files).

To display the report screen:

1. Click **Report**.

**Figure 5-23: PAS Report icon**



2. Verify that logged analyses display. If PAS has executed several analyses, use the scroll bar or the page function to locate the item of interest. [Figure 5-24](#) is an example of the Reports page. Note that some analyses are by specific users from GUI. There is also an analysis log for API access.

**Figure 5-24: PAS Report page**

Name	Email ID	Date and Time (mm-dd-yy hh:mm:ss)	Feature	Mode - API/GUI	Download Input Data	Download Report
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-23-21 17:12:42	OPTIMIZATION	GUI	optimization_InputFile_Input_Optimization2132769087616012983.csv	optimization_OutputFile_Input_Optimization2132769087616638222
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-23-21 17:10:51	OPTIMIZATION	GUI	optimization_InputFile_Input_Optimization1132769086503798298.csv	optimization_OutputFile_Input_Optimization1132769086504110486
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-23-21 17:10:16	OPTIMIZATION	GUI	optimization_InputFile_Input_Optimization2132769086159192486.csv	optimization_OutputFile_Input_Optimization2132769086159504943
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-23-21 17:09:46	OPTIMIZATION	GUI	optimization_InputFile_Input_FaultDetection3132769085863926457.csv	optimization_OutputFile_Input_FaultDetection31327690858654886
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-23-21 15:51:16	FAULTDETECTION	GUI	faultdetection_InputFile_Input_FaultDetection2132769038759575571.csv	faultdetection_OutputFile_Input_FaultDetection2132769038761295
VINAY PANDEY	VINAY.PANDEY@US.ABB.COM	09-23-21 08:12:05	FAULTDETECTION	GUI	faultdetection_InputFile_FaultDetection_ValidFile13276876324252795.csv	faultdetection_OutputFile_FaultDetection_ValidFile1327687632438
CN_PUBLICKEYCERTIFICATETEST	ABB@US.ABB.COM	09-23-21 06:19:51	OPTIMIZATION	API	optimization_InputFile_defaultName132768695901358102.csv	optimization_OutputFile_defaultName132768695903545414.json
MEHROTRA.AAKRITI	AAKRITI.MEHROTRA@ARICENT.COM	09-23-21 03:59:25	FAULTDETECTION	GUI	faultdetection_InputFile_Input_FaultDetection(1)132768611646256755.csv	faultdetection_OutputFile_Input_FaultDetection(1)13276861164658
MEHROTRA.AAKRITI	AAKRITI.MEHROTRA@ARICENT.COM	09-23-21 03:58:43	FAULTDETECTION	GUI	faultdetection_InputFile_Input_FaultDetection(1)132768611229970084.csv	faultdetection_OutputFile_Input_FaultDetection(1)13276861123131
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-22-21 16:46:04	OPTIMIZATION	GUI	optimization_InputFile_Input_Optimization2132768207636301607.csv	optimization_OutputFile_Input_Optimization2132768207636770504
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-22-21 15:50:29	OPTIMIZATION	GUI	optimization_InputFile_Input_Optimization1132768174282241487.csv	optimization_OutputFile_Input_Optimization1132768174282866561
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-22-21 15:45:32	OPTIMIZATION	GUI	optimization_InputFile_Input_Optimization132768171312468424.csv	optimization_OutputFile_Input_Optimization132768171313250000
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-22-21 15:45:05	OPTIMIZATION	GUI	optimization_InputFile_Input_Optimization1132768171039897333.csv	optimization_OutputFile_Input_Optimization1132768171040365993
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-22-21 15:40:12	FAULTDETECTION	GUI	faultdetection_InputFile_Input_FaultDetection1132768168117834255.csv	faultdetection_OutputFile_Input_FaultDetection1132768168118302
MANSI MATADE	MANSI.MATADE@US.ABB.COM	09-22-21 14:24:46	FAULTDETECTION	GUI	faultdetection_InputFile_Input_FaultDetection2132768122850883811.csv	faultdetection_OutputFile_Input_FaultDetection2132768122850996

3. To download the input file used for a logged analysis, click the link provided under the Download Input data column. Then, locate and click the folder to save the file. The input files are available in .csv format.
4. To download a report (results output files) for a logged analysis, click on the link provided under the Download Report column. The output file is in .json format.

## 6 Troubleshooting

[Table 6-1](#) describes the main categories of errors displayed for problems when running the software. Specific errors are displayed on the screen if issues occur. They provide the cause of the problem and describe the action to resolve the issue. Always take note of the error displayed or obtain a screen capture to send to technical support.

**Table 6-1: General error categories**

Error Message (if available)	Description	Example
<b>Error</b>	Generated during license activation. Displayed when license activation fails.	Several reasons can trigger an error: Incorrect credentials, non-existing account member IDs.

<b>Error Message (if available)</b>	<b>Description</b>	<b>Example</b>
<b>Invalid login</b>	Generated during login. Displayed when a non-authorized user tries to login.	The user has entered account login details not authorized for the use of the application.
<b>User already logged in, or previous session did not close properly. Please try after some time.</b>	Generated when an already-logged-in user attempts to login using another browser window.	User has an active session already in progress and opens a new window and attempts to login.
<b>Unexpected error</b>	Generated during session Timeout. Displayed in case of multiple tabs if active session window is already expired.	User working on single window or multiple windows, after 15 mins user session is expired
<b>Invalid File content. Please use valid file.</b>	Generated during file upload. Displayed when the application determines that the file selected for upload has not passed the basic input file requirements.	Input file is not the correct type, or it is too large. The maximum file size allowed is 4 MB.
<b>Invalid Input File Name. File Name cannot contain char: ^ , ;   ` / \ : = ? *</b>	Generated while processing a trend file: Displayed when the application is not able to import a trend file due to errors found on the data or its format.	The input file met basic requirements of type and size, but errors were found in the data or format.
<b>Error</b>	Generated during settings configuration. Displayed during configuration of general, advanced, well, plunger settings or other parameters in all features	The wrong value for a parameter has been typed, or the application is unable to save the values typed by the user.
<b>Error</b>	Generated when using the optimization feature. The optimization feature is not able to complete analysis or is unable to download calculation results (set points).	The optimization function is unable to calculate new set points because it has found incorrect parameter values, or the feature is unable to download the files to save results.
<b>Error</b>	Generated when using the fault detection feature. Displayed during fault detection analysis.	The fault detection function is unable to analyze faults.
<b>Error</b>	Generated when using the operator training feature. The operator training feature cannot complete a requested simulation.	The user has typed incorrect values or configured the simulation with inconsistent information.
<b>License has expired or all runs have already been consumed. Please contact ABB Totalflow support team.</b>	Generated when there are no runs left or the Basic Activation license has expired.	The user tried to execute a fault detection or optimization analysis. The features did not perform the analysis.
<b>Failed to process the request. Please retry after some time.</b>	Generated when the cloud server is taking too much time to process the uploaded file.	The user tried to execute a fault detection or optimization analysis and, after more than 2 minutes, the application has not generated a result. The screen displays "Processing the file" for an unusually long time until the error message is displayed.



---

**ABB Inc.**

Measurement & Analytics

Quotes: [US-IAMA.inquiry@us.abb.com](mailto:US-IAMA.inquiry@us.abb.com)

Orders: [US-IAMA.order@us.abb.com](mailto:US-IAMA.order@us.abb.com)

Training: [US-IAMA.training@us.abb.com](mailto:US-IAMA.training@us.abb.com)

Support: [upstream.support@us.abb.com](mailto:upstream.support@us.abb.com)

+1 800 442 3097 (opt. 2)

Additional free publications are available for download at:

[www.abb.com/upstream](http://www.abb.com/upstream)

**Main Office - Bartlesville**

7051 Industrial Blvd  
Bartlesville, OK 74006  
Ph: +1 918 338 4888

**Kansas Office - Liberal**

2705 Centennial Blvd  
Liberal, KS 67901  
Ph: +1 620 626 4350

**Texas Office - Houston**

3700 W. Sam Houston  
Parkway S., Suite 600  
Houston, TX 77042  
Ph: +1 713 587 8000

**Texas Office – Odessa**

8007 East Business 20  
Odessa, TX 79765  
Ph: +1 432 272 1173

**Texas Office – Pleasanton**

150 Eagle Ford Road  
Pleasanton, TX 78064  
Ph: +1 830 569 8062



We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents - in whole or in parts - is forbidden without prior written consent of ABB.

Windows® is a registered trademark of Microsoft.

2107720MNAA

Copyright© 2021 ABB all rights reserved