QAD Adaptive Applications

User Guide

QAD EQMS Applications: Gauge Management

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Gauge Management User Guide
Change Summary

The following table summarizes significant differences between this document and previous versions.

Date/Version	Description	Reference	Changed By
SEPT 2019/v2019	Initial version	--	RQT
SEPT 2020/v2020.1	Updated versioning	--	RQT
MAR 2021/v2021	Updated linkage	--	RQT
MAY 2021/v2021	Added a section for Commands	p. 66	RQT
MAY 2021/v2021.1	Updated versioning	--	RQT
FEB 2022/v2022	Updated versioning	--	RQT
SEPT 2022/v2022.1	Updated versioning	--	RQT
MAR 2023/v2023	Updated versioning	--	RQT
MAR 2024/v2024	Updated versioning; Modified Gauge Calibrations.	p. 35	RQT
SEPT 2024/v2024.1	Updated versioning; Modified Gauge Calibrations.	p. 35	RQT
MAR 2025/v2025	Updated versioning; Modified Gauge Sub-Types	p. 20	RQT
SEPT 2025/v2025.1	Updated versioning	--	RQT

Chapter 1

Introduction

Overview

Gauges are direct reading instruments used for measurements; these measurements can be for pressure, force, surface level, wall thickness, depth of liquid, diameter of holes, height of plates, and so many other things. While mostly used in manufacturing settings, gauges are used by any industry that requires precise physical measurements.

The Gauge Management module helps ensure the accuracy of measuring devices by facilitating a calibration management process. Through close monitoring and comprehensive analysis of the performance of the gauge system, the Gauge Management module provides confidence in, and evidence of, control over all the gauges used to maintain the high quality of products.

About This Guide

This user guide focuses on:

- Setup required for the Gauge Management module
- Different forms of document organization in the Gauge Management module
- Security and roles for the Gauge Management module
- Instructions for the various Gauge Management tasks

Note: This guide does not provide field descriptions for the Gauge Management modulefields. Field help is provided in the software.

Gauge Management Module Setup Guide

This section describes the processes of the Gauge Management module. The list below is arranged by the order in which the processes should be completed, starting with the setup operations and continuing with the main functions.

Setting Up the Gauge Management Module

Cost Accounts

Use Cost Accounts to associate costs with groups defined on the general ledger for categorizing and tracking costs. See "Cost Accounts" on page 12.

Cost Logs

Use Cost Logs to document the occurrence of a cost to the organization, as well as to help determine a cost of quality metric. See "Cost Logs" on page 13.

Gauge Status

Use Gauge Status to define the list of acceptable statuses for a gauge. See "Gauge Status" on page 15.

Gauge Types

Use Gauge Types to categorize generic types of gauges that have similar characteristics (e.g. micrometers, height gauge). See "Gauge Types" on page 16.

Gauge Sub-Types

Use Gauge Sub-Types to create more specified categorization of gauges, such as sizes, tolerances, specific calibers, and more (e.g. 0-3 inch micrometer). See "Gauge Sub-Types" on page 20.

Using The Gauge Management Module

Gauges

Use Gauges to track individual gauge assets and to record calibrations and studies for individual gauges. See "Gauges" on page 25.

Gauge Studies

Use Gauge Studies as a gauge analysis technique to identify possible sources of variation in a measurement system. See "Gauge Studies" on page 28.

Gauge Calibrations

Use Gauge Calibrations to provide a calibration and approval workflow for managing gauges, internally or externally. See "Gauge Calibrations" on page 35.

Asset Usage Log

Use Asset Usage Logs to document usage for gauges if using usage-based calibration scheduling. See "Asset Usage Log" on page 40.

Getting Started

Before you can begin using the Gauge Management module, it is important to understand the basics of how to navigate and use the QMS system. The system is intuitive, but some layouts, features, and best practices require a more thorough understanding. See the User Interface user guide for additional information about the QMS software.

Chapter 2

Setting Up the Gauge Management Module

Introduction

Some preparation is required before you can create, calibrate, or study gauges.

Gauge preparation involves setting up the organization of gauges by type and status, as well as supplying cost accounts. These tasks are generally performed by the Gauge Administrator, Gauge Champion, or the Gauge Maintenance role.

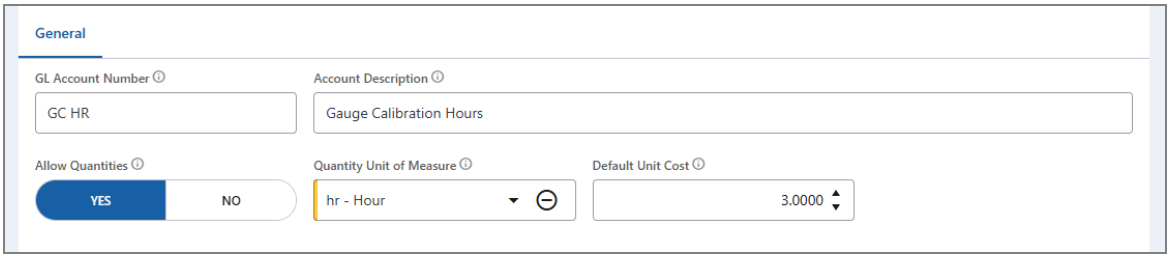
Cost Accounts

Cost accounts are typically tied to the general ledger and allow you to associate costs with groups defined on the general ledger for categorizing and tracking costs.

These costs are not always monetary; they can be associated with hours of labor, boxes of material, gallons of liquid, and more. However, while you can associate a quantity with a cost account, quantity details should be described in cost logs. See "Cost Logs" on the next page.

A cost account can be made from gauge calibrations. See "Gauge Calibrations" on page 35.

Fig. 1: Cost Accounts screen

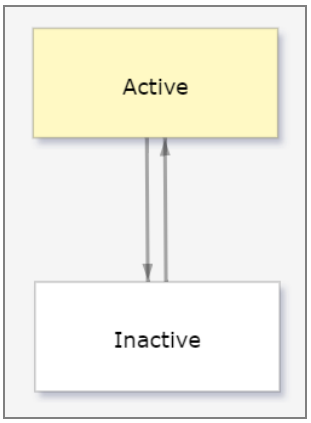


Cost Account States

This section defines each state available in the workflow for the Cost Accounts process. See "State Change Security" on page 55 to learn more about how these states transition.

Active (Default). A cost account that is actively used. In this state, the gauge usage is accumulating.

Inactive. A cost account that is no longer in use. In this state, the gauge usage is not accumulating.



Cost Accounts Tasks

Adding a New Cost Account

1. Select Cost Accounts from the left navigation panel. Then, click the Add New button in the toolbar.
2. Enter values for the GL (General Ledger) Account Number and Account Description fields.
3. Set the "Allow Quantities" toggle field to YES if you want a specific quantity to be used for all cost log entries that use this cost account. Two new fields appear: Quantity Unit of Measure and Default Unit Cost.
4. Select the quantity unit of measure that the future cost log entries will use for their quantities. For example, if the cost account is for gauge calibration hours, then select the "Hour" quantity unit.
5. Enter the default unit cost for the cost account. This value will be used as the default value when adding a cost with this account.
6. Click Save to save the new record. When selecting the next state, click Active.

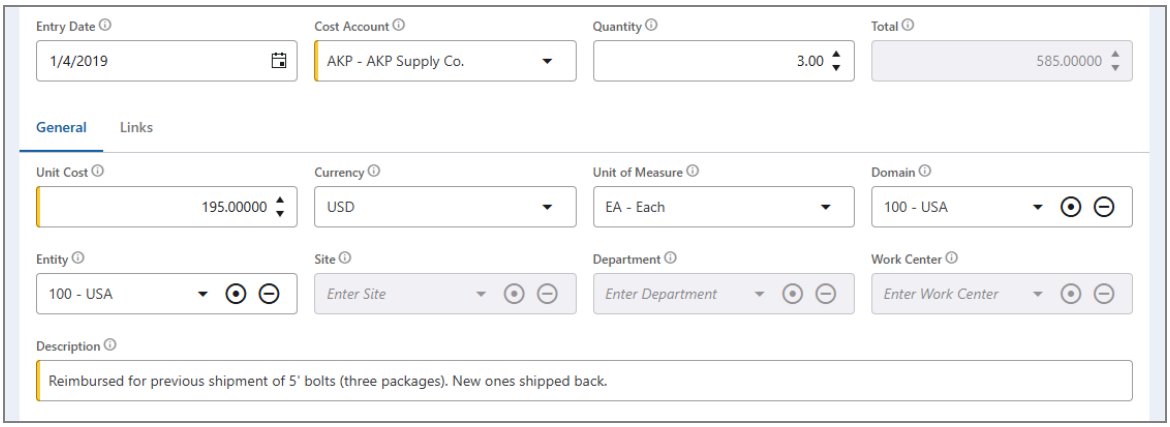
   Note: You can toggle between Active and Inactive as needed. When the state is Inactive, the account cannot be used for new records.

Cost Logs

Cost logs document the occurrence of a cost to the organization and are typically used to help determine a cost of quality metric, such as hours of labor or boxes of materials.

A cost log entry can be made from several processes, including Gauge, Maintenance Work Orders, Containment Actions, CAPA & NCR, and more. See "Gauges" on page 25.

Fig. 2: Cost Logs screen, General tab



The General tab is used to define the basic details of a cost log. The Site, Department, and Work Center fields will populate automatically, depending on the information entered in the Links tab.

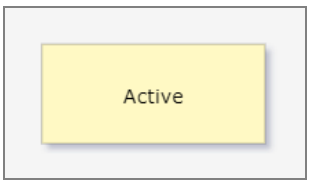
Fig. 3: Cost Logs screen, Links tab

The Links tab contains a link to the process from which the cost log was created. The Site, Department, and Work Center fields in the General tab will automatically populate from this process.

Cost Logs States

This section defines each state available in the workflow for the Cost Logs process.

Active (Default). The cost log is active. This is the only state available for cost logs.



Cost Logs Tasks

Adding a New Cost Log

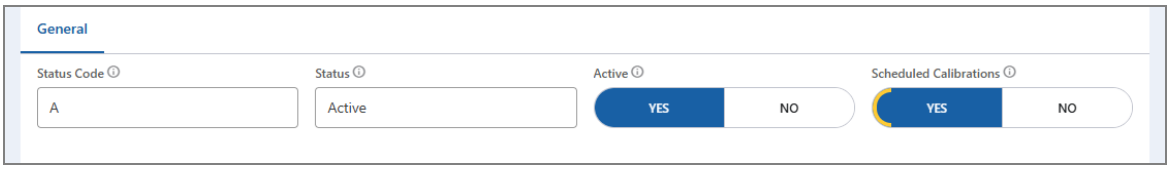
1. In the relevant Gauge record, navigate to the Calibration/Service tab. Then, click the Add New Item button in the Gauge Maintenance/Service field; a new screen appears.
2. Use the Cost Account field to link the cost log to the appropriate cost account. If the cost account allows quantities, then the Unit of Measure and Unit Cost fields automatically populate.
3. Select a quantity, if the cost account allows quantities.
4. Select a unit cost if the cost account does **not** allow quantities.
5. Enter a detailed description of the cost log entry.
6. Click Save to save the new record.

Gauge Status

Gauge statuses define the list of acceptable statuses for a gauge and determine if it is considered active or inactive for the purposes of accumulating gauge usage. Examples of gauge statuses include Active, Out for Calibration, Missing, Scrapped, etc.

Gauge statuses are used in the Gauges process. See "Gauges" on page 25 for more information.

Fig. 4: Gauge Status screen

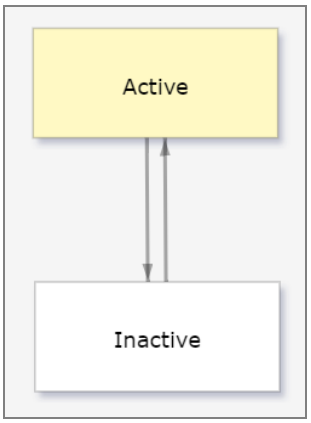


Gauge Status States

This section defines each state available in the workflow for the Gauge Status process. See "State Change Security" on page 55 to learn more about how these states transition.

Active (Default). A gauge status that is actively used.

Inactive. A gauge status that is no longer in use.



Gauge Status Tasks

Adding a New Gauge Status

1. Select Gauge Status from the left navigation panel. Then, click the Add New button in the toolbar.
2. Enter values for the status code and name.
3. Set the "Active" toggle field to YES if this status is active. This informs the system that any gauges this status is assigned to are in service.
4. Set the "Scheduled Calibrations" field to YES if you want to maintain scheduled calibrations when a gauge is at this status. If this field is set to NO, scheduled calibrations will be removed at this status (e.g. gauge missing, retired, etc.).
5. Click Save to save the new record. When selecting the next state, click Active.

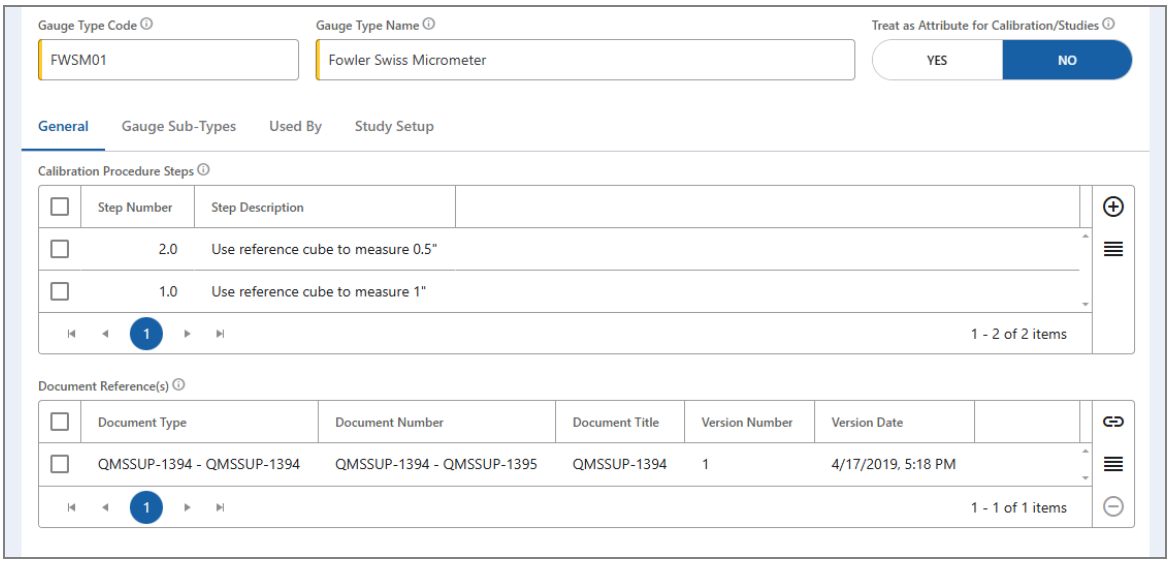
   Note: You can toggle between Active and Inactive as needed. When the state is Inactive, the gauge status cannot be used for new records.

Gauge Types

Gauge types allow you to categorize generic types of gauges that have similar characteristics. Examples of this general categorization include micrometer, caliper, and plug gauge.

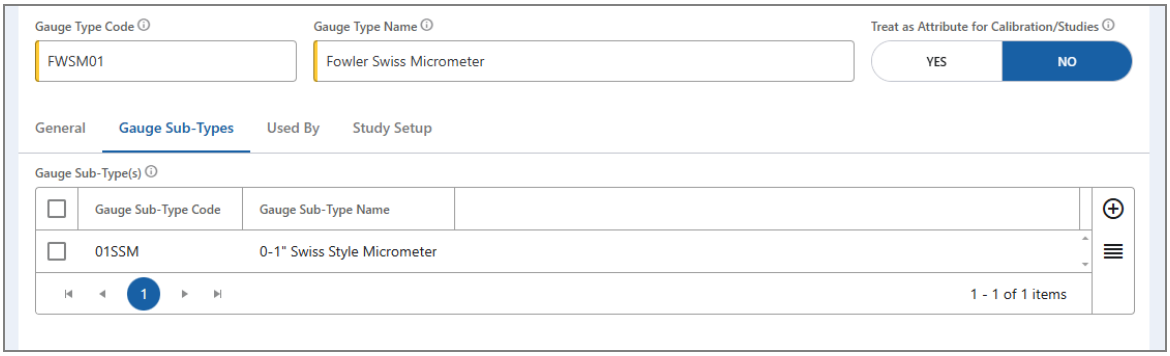
Within these types, you can configure calibration procedures and reference documentation. Gauge types are used in the Gauges process; see "Gauges" on page 25.

Fig. 5: Gauge Types screen, General tab



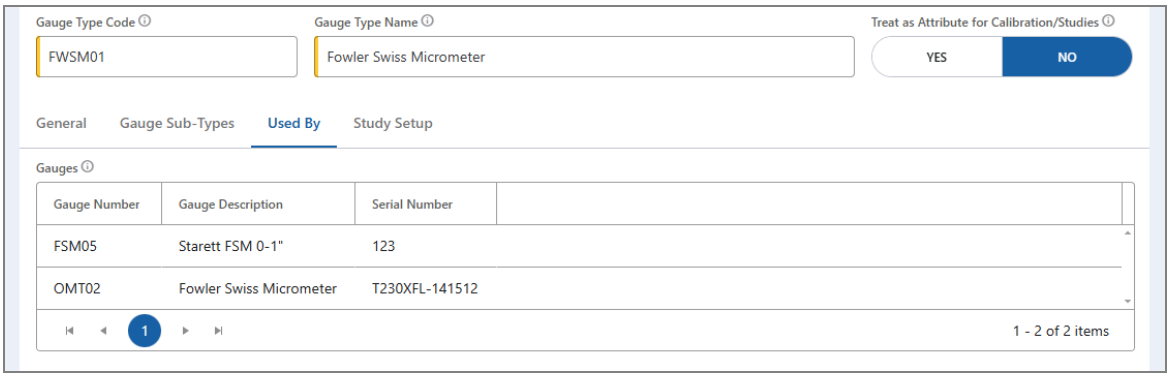
The General tab contains all of the basic information about a gauge type. It also includes a Calibration Procedure Steps field, which functions as a checklist of steps that should be followed to conduct a gauge calibration.

Fig. 6: Gauge Types screen, Gauge Sub-Types tab



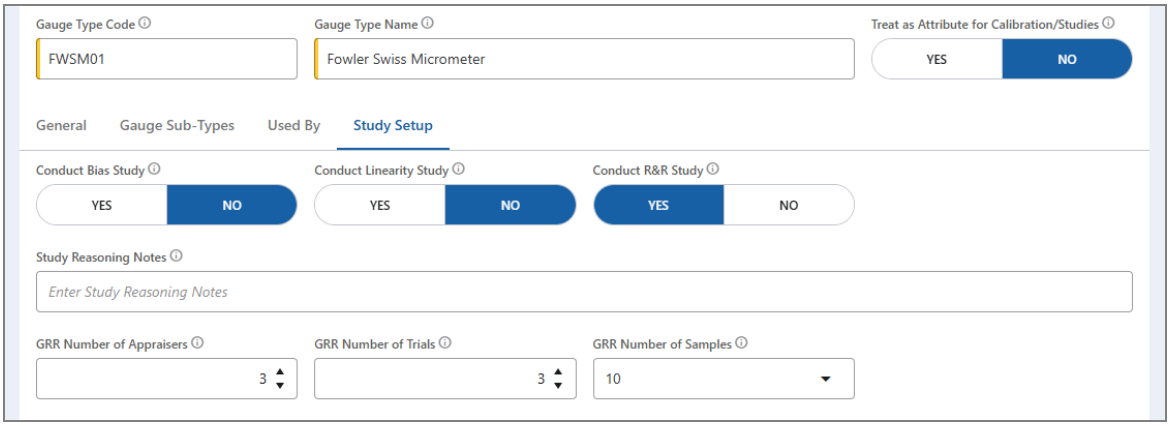
The Gauge Sub-Types tab contains a list of sub-types for the selected gauge type. You can either link to existing sub-types or create a new one directly from the field. See "Gauge Sub-Types" on page 20 for more information.

Fig. 7: Gauge Types screen, Used By tab



The Used By tab contains a list of gauges of the selected gauge type. This list is created automatically.

Fig. 8: Gauge Types screen, Study Setup tab



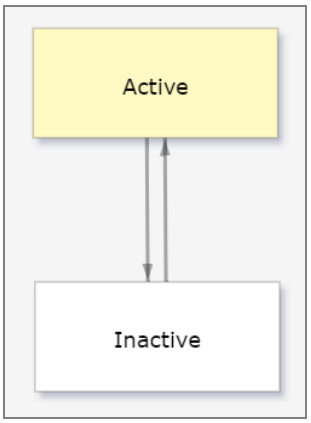
If you want to conduct a bias, linearity, or repeatability & reproducibility (R&R) study from the selected gauge type, then use the Study Setup tab. Bear in mind that if the gauge type is set as an attribute, then the bias and linearity toggle fields cannot be set to YES.

Gauge Types States

This section defines each state available in the workflow for the Gauge Types process. See "State Change Security" on page 55 to learn more about how these states transition.

Active (Default). A gauge type that is actively used.

Inactive. A gauge type that is no longer in use.



Gauge Types Tasks

Adding a New Gauge Type

1. Select Gauge Types from the left navigation panel. Then, click the Add Item button in the toolbar.
2. Enter values for the gauge type code and name.
3. Add one or more calibration procedure steps. See "Adding Calibration Procedure Steps" on the facing page for more information.
4. If you have any related controlled documents:
    a. Click the Link button in the Document References field. A new window appears.
    b. Select the check box beside any relevant document.
    c. Click OK.
5. Set the "Treat as Attribute for Calibration/Studies" toggle field to YES if gauges for this type are attribute gauges (that is, they typically provide a non-numerical result, such as Pass/Fail).
6. Navigate to the Study Setup tab. Select the appropriate studies that should be conducted. If a study does not need to be conducted, then explain your reasoning in the Study Reasoning Notes field.
7. Enter the default number of appraisers, trials, samples, and standards that will be used when completing an R&R study for this gauge type.

    Note: Each field has a range of valid values. View the description icons to see each range.

8. Navigate to the Gauge Sub-Types tab. Click the Add New Item button to add any sub-types that connect to this gauge type. See "Gauge Sub-Types" on the facing page for more information.
9. Click Save to save the new record. When selecting the next state, click Active.

    Note: You can toggle between Active and Inactive as needed. When the state is Inactive, the gauge type cannot be used for new records.

Adding Calibration Procedure Steps

Fig. 9: Gauge Type Calibration Procedure Steps screen

1. Open the Gauge Type detail screen that you want to edit.
2. In the Calibration Procedure Steps field, click the Add New Item button. A new screen opens.
3. Select the sequence in which this step should be completed.
4. Enter a description of the procedure step.
5. Click Save.
6. Repeat Steps 2-5 for each calibration procedure step.
7. Back in the main detail screen, click Save to save the record. When selecting the next state, click Active.

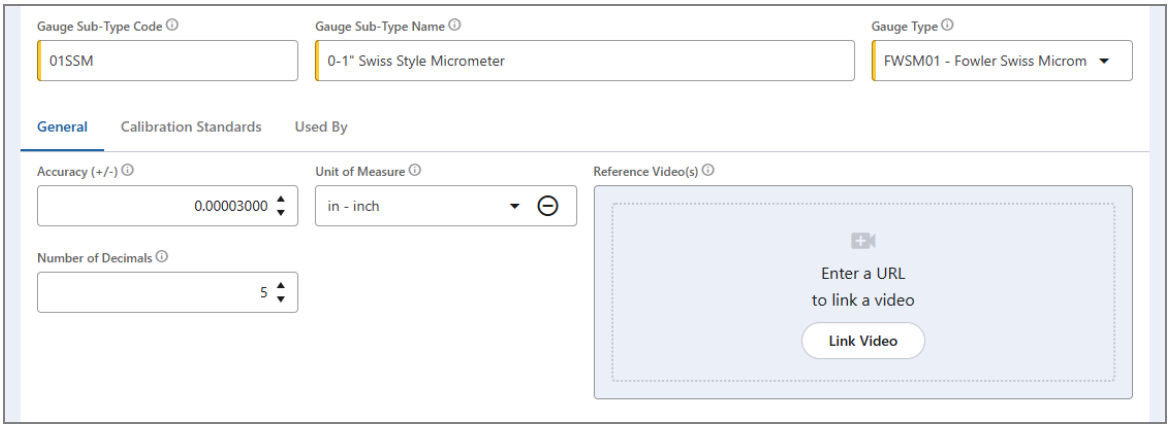
Gauge Sub-Types

Gauge sub-types exist for more specific categorization of gauges, which can include sizes, tolerances, calibers, and more. Gauges of the same sub-type should have the same calibration standards.

Gauge sub-types are used in the Gauge process, and are also used to configure calibrations. See "Gauges" on page 25.

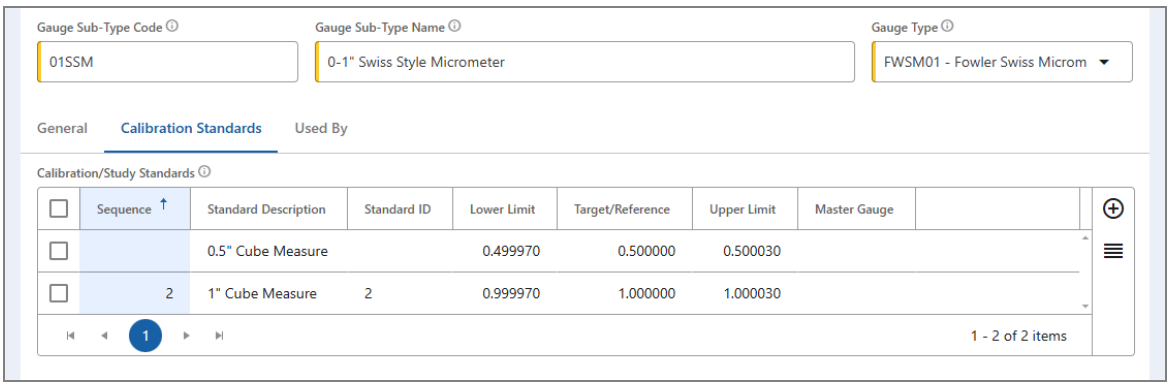
This process contains commands. See "Commands" on page 66 for more information.

Fig. 10: Gauge Sub-Types screen, General tab



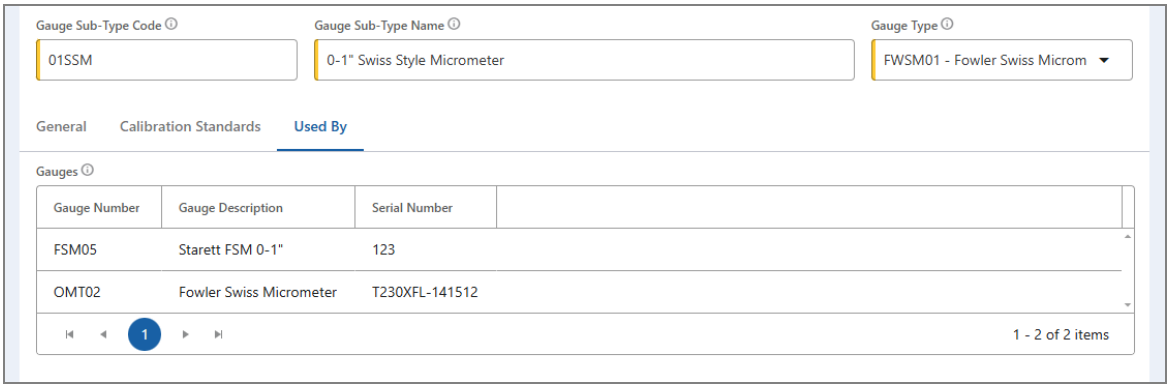
The General tab is used to define the basic details of a gauge sub-type. This includes the option to upload a video that supports the gauge sub-type. Videos must be in .mp4 format or a YouTube link.

Fig. 11: Gauge Sub-Types screen, Calibration Standards tab



The Calibration Standards tab allows you to add the standards that the selected gauge sub-type should be calibrated against when a gauge calibration is conducted.

Fig. 12: Gauge Sub-Types screen, Used By tab



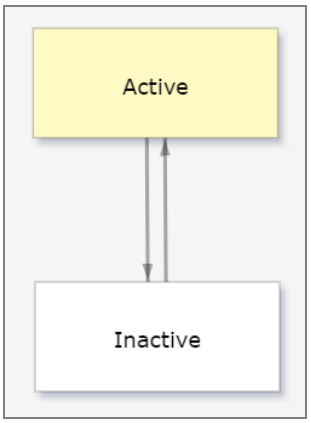
The Used By tab contains a list of gauges currently using the selected gauge sub-type. This list is automatically populated.

Gauge Sub-Types States

This section defines each state available in the workflow for the Gauge Sub-Types process. See "State Change Security" on page 55 to learn more about how these states transition.

Active (Default). A gauge sub-type that is actively used.

Inactive. A gauge sub-type that is no longer in use.



Gauge Sub-Types Tasks

Adding a New Sub-Type

1. There are two ways to add a new gauge sub-type:
    a. In a Gauge Types detail screen, navigate to the Gauge Sub-Types tab. Then, click the Add New Item button.
    b. Select Gauge Sub-Types from the left navigation panel. Then, click the Add Item button in the toolbar.
2. Enter values for the gauge sub-type code and name. Note that the Display Expression field combines the two values; this is how users will look up this sub-type.
3. Select the gauge type this sub-type belongs to. If the sub-type is created directly from a gauge type as described in Step 1.a, then this field is automatically populated.
4. Enter a value for the accuracy of the sub-type. This is the expected/acceptable +/- value from the calibration standard and is used to default the upper and lower limits for those target/reference values.

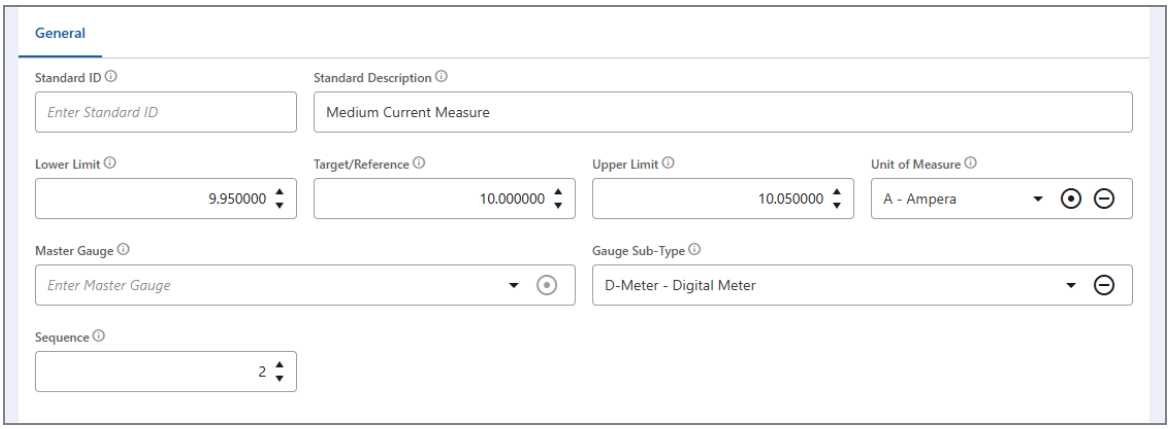
    Note: Typically, the accuracy is present on the certificate that comes with the gauge when purchased.

4. Determine the unit of measure and the number of decimals of accuracy that the gauge measures. The higher the number, the higher the accuracy restriction.
5. Navigate to the Calibration Standards tab. Add the standards that this gauge sub-type should be calibrated against. See "Adding a Calibration/Study Standard" on the next page for more information.
6. Click Save to save the new record. When selecting the next state, click Active.

    Note: You can toggle between Active and Inactive as needed. When the state is Inactive, the gauge sub-type cannot be used for new records.

Adding a Calibration/Study Standard

Fig. 13: Gauge Sub-Type Calibration Standards screen



1. Open the Gauge Sub-Type detail screen that you want to edit. Navigate to the Calibration Standards tab.
2. In the Calibration/Study Standards field, click the Add New Item ⊕ button. A new screen opens.
3. Enter a standard ID and description (e.g. 1 inch check).
4. Select a sequence.
5. Select the target value of the standard, followed by the upper and lower limits. These are the minimum/maximum values that the gauge should measure in order to pass this standard.

   Note: The upper and lower limits will default based on the Accuracy field of the Gauge Sub-type record.

6. Select the unit of measure and appropriate reference value.
7. Click Save.
8. Back in the main screen, click Save to save the record. When selecting the next state, click Active.

Chapter 3

Using the Gauge Management Module

Gauges

The Gauges process provides asset tracking of individual gauges and records calibrations, as well as other studies. With this process, you will know where a gauge came from, its purpose, where it is assigned and located, whether it is active or out of service, and more.

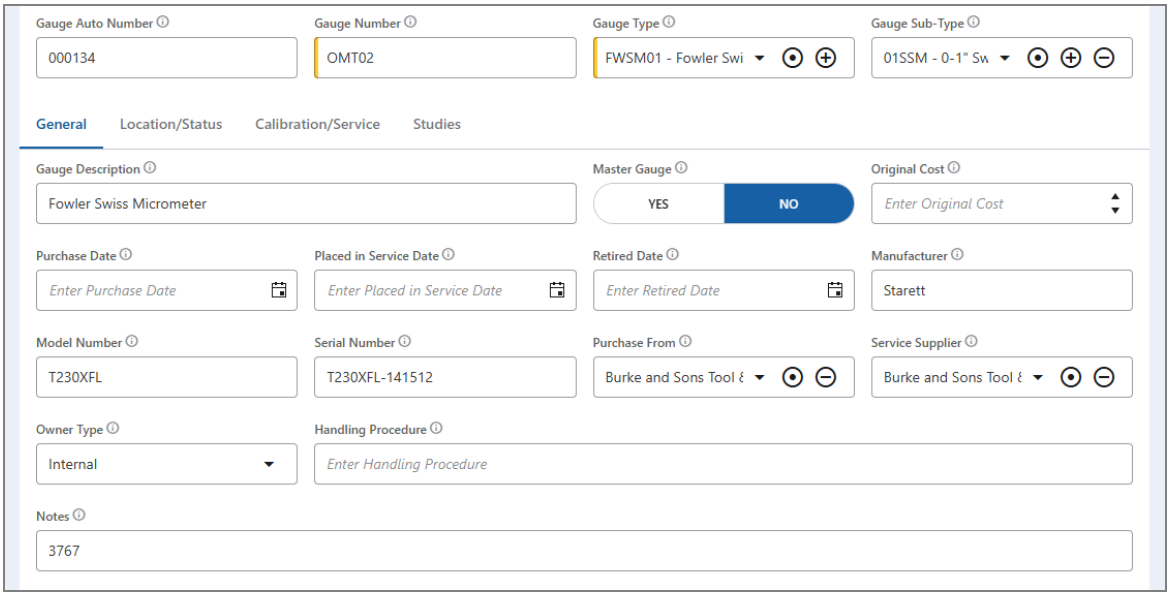
Gauges are organized by type and sub-type. A gauge's type is determined by its calibration procedure, while its sub-type is determined by its calibration tolerances.

Gauges are associated with most processes of the Gauges Management module, including:

- "Cost Logs" on page 13.
- "Gauge Types" on page 16.
- "Gauge Sub-Types" on page 20.
- "Gauge Studies" on page 28.
- "Gauge Calibrations" on page 35.
- "Asset Usage Log" on page 40.

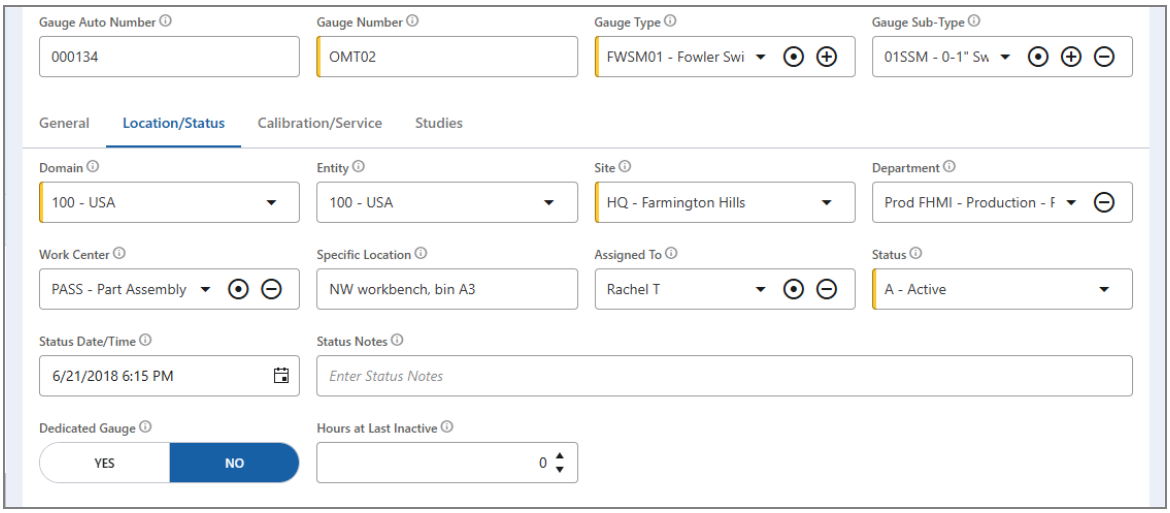
This process contains commands. See "Commands" on page 66 for more information.

Fig. 14: Gauges screen, General tab



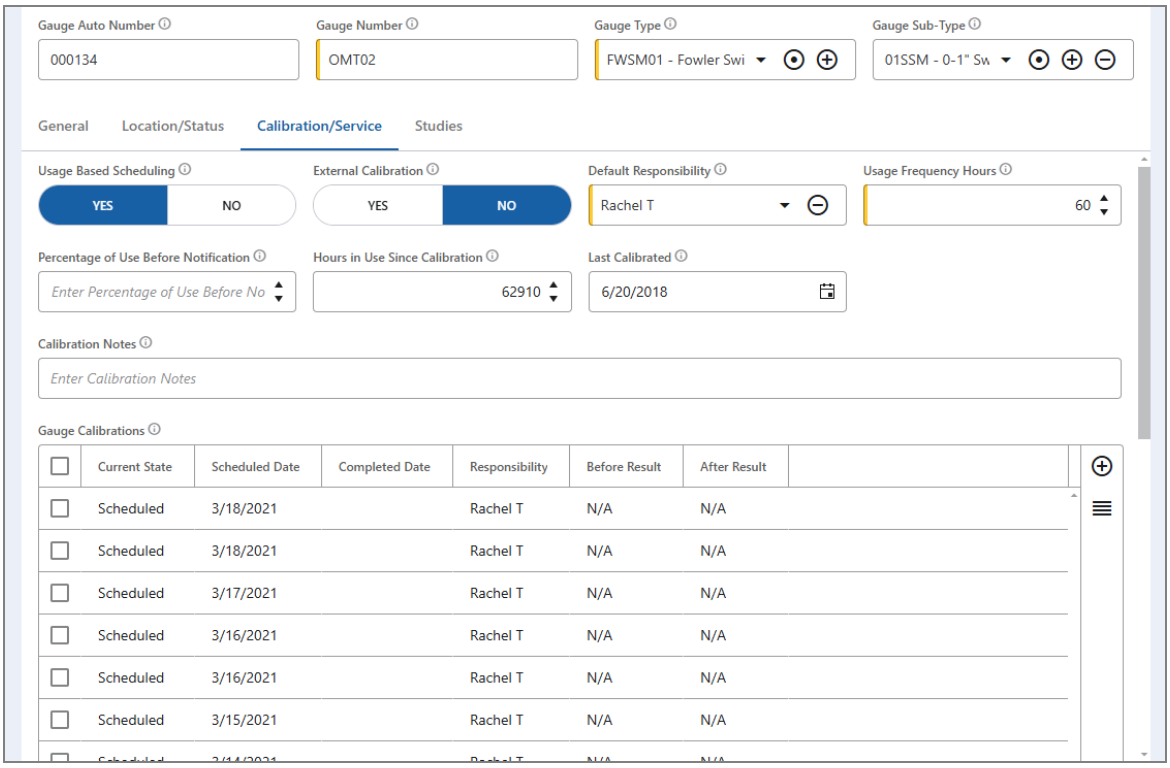
The General tab is used to define the basic details of a gauge, including the name and number, type and sub-type, manufacturer, and more. You can also designate a gauge as a master gauge, which is used to calibrate other gauges.

Fig. 15: Gauges screen, Location/Status tab



In the Location/Status tab, determine the location (in broad and specific terms) of the gauge, who it is assigned to, and whether it is active. You can also declare whether this gauge is dedicated to a specific item or customer.

Fig. 16: Gauges screen, Calibration/Service tab

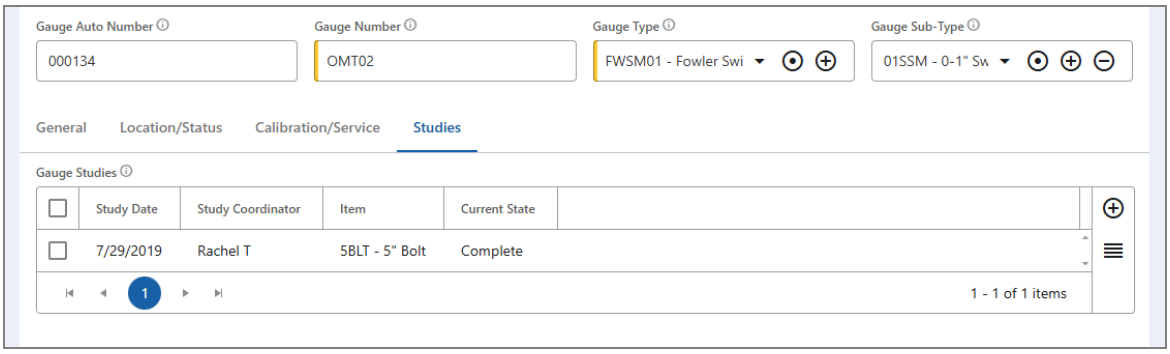


Use the Calibration/Service tab to set up calibrations and costs for the specific gauge. Here, you can determine whether to set up calibrations by usage or frequency, specify if a gauge is calibrated externally, and supply or create a list of calibrations and costs.

This tab is connected to several other processes. To learn more about completing this tab, see:

- "Gauge Calibrations" on page 35
- "Cost Logs" on page 13
- "Asset Usage Log" on page 40

Fig. 17: Gauges screen, Studies tab



The Studies tab contains a list of any gauge studies that involve the selected gauge. You can add gauge studies to this list.

This tab is linked to the Gauge Studies process. See "Gauge Studies" on the next page for information on completing this tab.

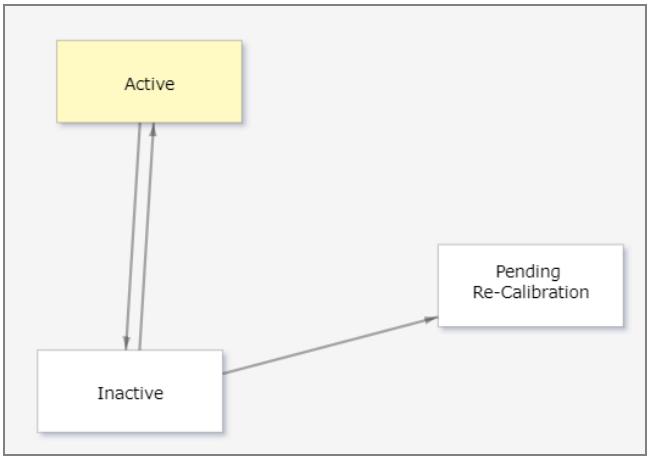
Gauges States

This section defines each state available in the workflow for the Gauges process. See "State Change Security" on page 55 to learn more about how these states transition.

Active (Default). The gauge is active and currently being used in service.

Inactive. The gauge is inactive; check the gauge status to see why.

Pending Re-Calibration. Select this state to create a Gauge Calibration record. If the calibration passes, the gauge state moves to Active; if the calibration fails, the gauge state returns to Inactive.



Gauges Tasks

Adding a New Gauge

1. Select Gauges from the left navigation panel. Then, click the Add New button in the toolbar.
2. In the General tab, enter values for the gauge number, type, sub-type, and description. If this is a master gauge, then set the "Master Gauge" toggle field to YES.

   Note: Master gauges are used to calibrate other gauges.

3. Select or enter additional details about the gauge, including the manufacturer, model and serial numbers, original cost, and more.
4. Navigate to the Location/Status tab. Use the Department, Work Center, and Specific Location fields to specify where the gauge is located.

   Note: The Specific Location field is especially useful if there are multiple gauges in a work bench. Here, you can specify the bin, shelf, row, etc.

5. Select a status and assigned user for the gauge. If the gauge needs to be calibrated at the time of entry into the system, then for auditing and best practice purposes, select the Inactive status.
6. If this gauge is dedicated to a specific item or customer, then set the "Dedicated Gauge" toggle field to YES and specify the details in the drop-down fields that follow.
7. Click Save to save the new record. When selecting the next state, click Active.

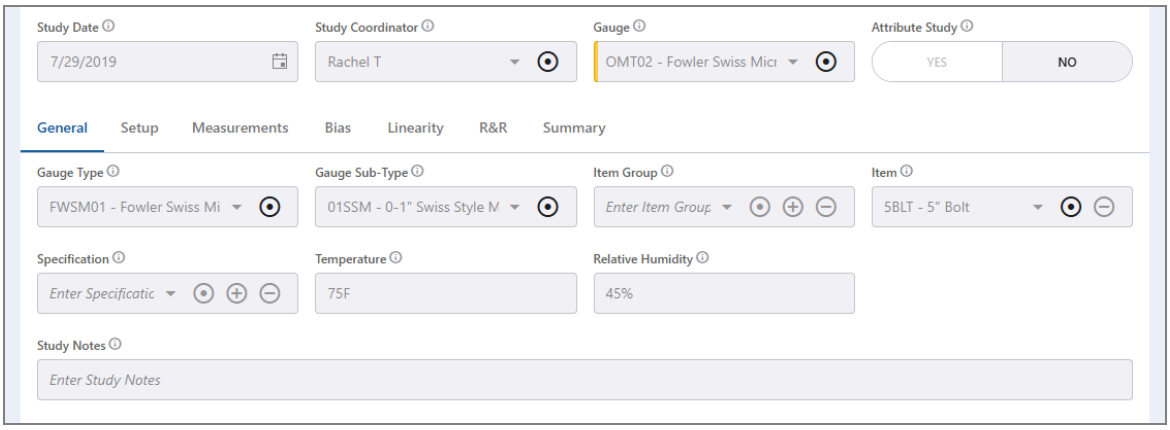
Gauge Studies

Gauge studies are used as a gauge analysis technique and help identify possible sources (equipment, people, processes, samples, environment, etc.) of variation in the measurement system. In the gauge studies process, there are three possible studies you can conduct:

- **Bias.** Determine how well your measurements compare to a master reference.
- **Linearity.** Show the accuracy of your gauge through a range of expected measurements.
- **R&R**. Stands for repeatability and reproducibility. Show the amount of variation in your measurement system between the gauges and people taking the measurements.

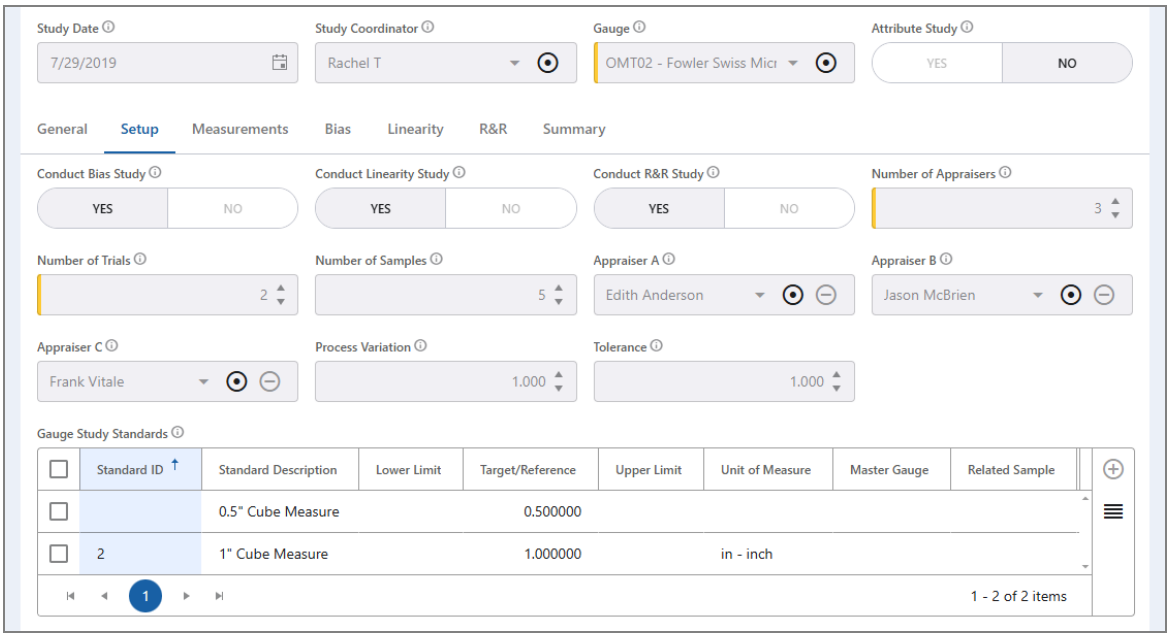
Gauge studies are linked to the Gauges process. See "Gauges" on page 25.

Fig. 18: Gauge Studies screen, General tab



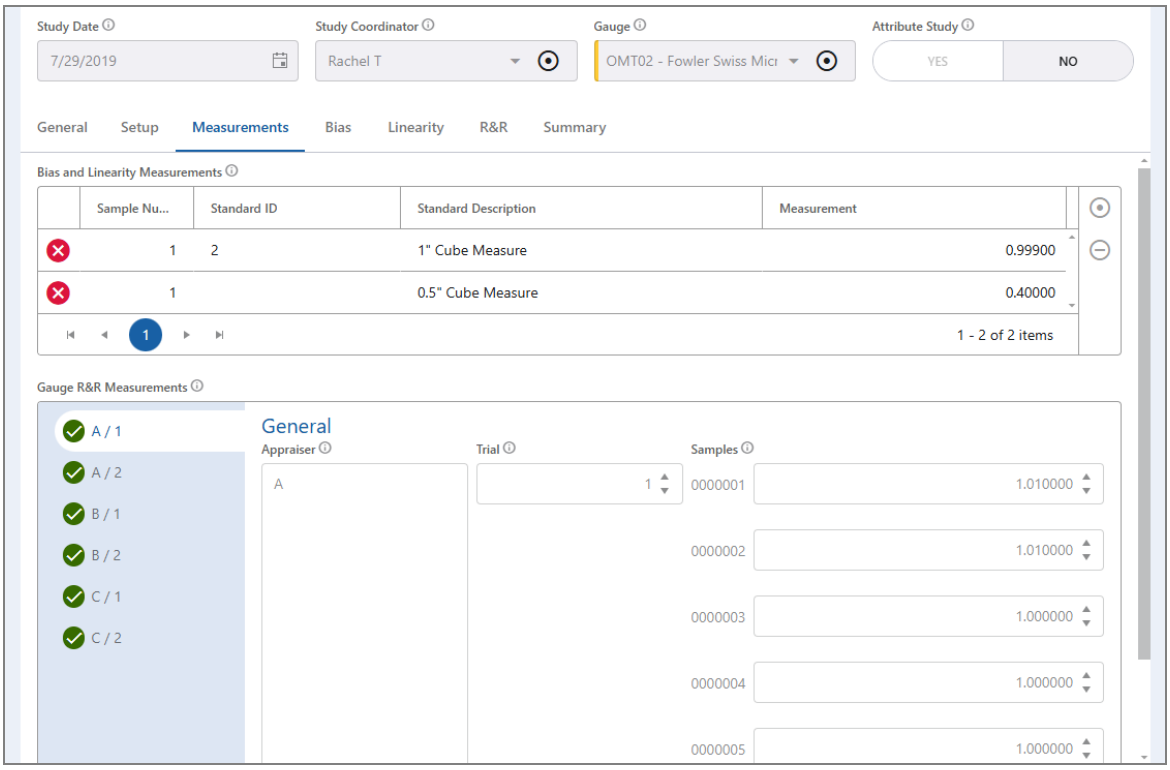
The General tab is used to define the basic details of a gauge study, including the name of the coordinator, the gauge that the study was conducted for, the item that was measured as part of the study, and some of the environment conditions.

Fig. 19: Gauge Studies screen, Setup tab



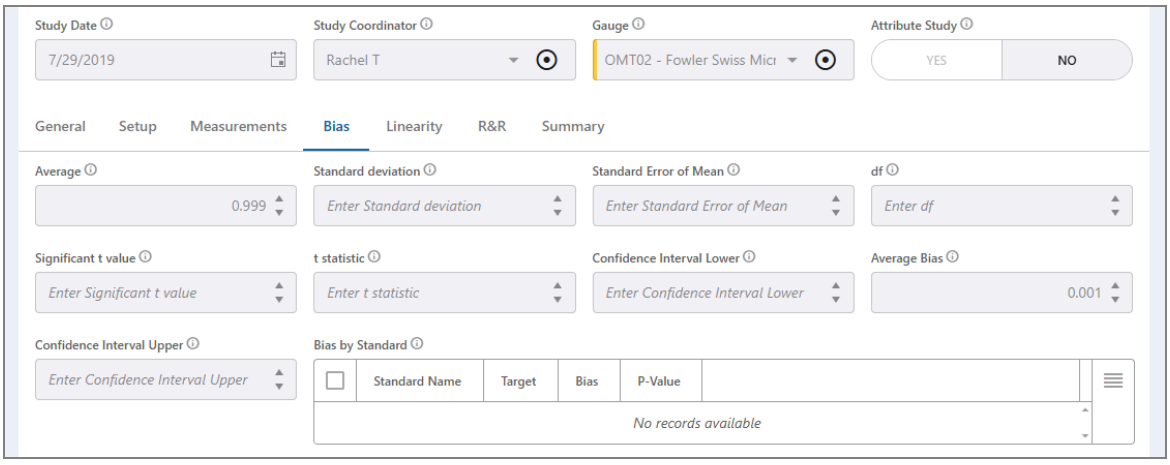
Use the Setup tab to define the type of study you are conducting and set up the parameters for variation, tolerance, number of trials and samples, and so on. You can select up to three appraisers for a study.

Fig. 20: Gauge Studies screen, Measurements tab



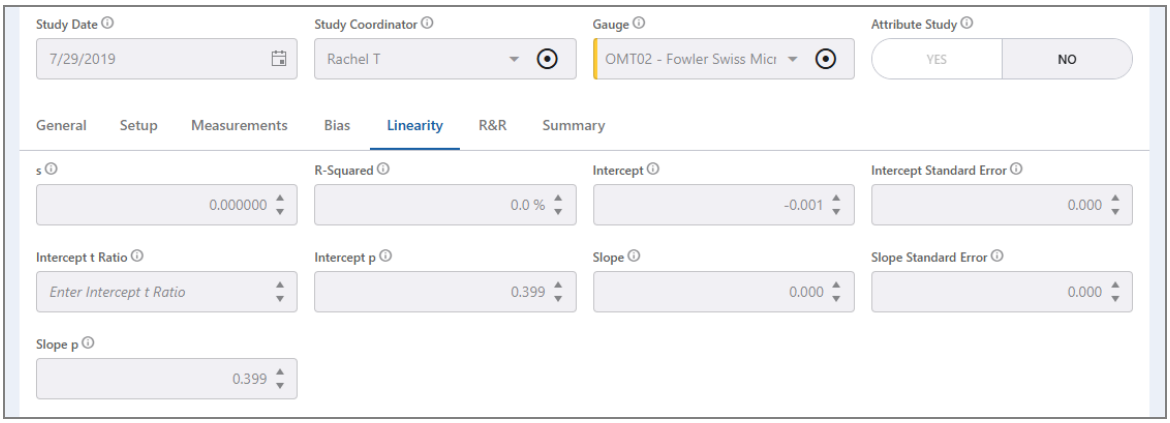
Use the Measurements tab to enter the data found from the conducted gauge study. The fields and field details that appear in this tab are determined by the parameters set in the Setup tab.

Fig. 21: Gauge Studies screen, Bias tab



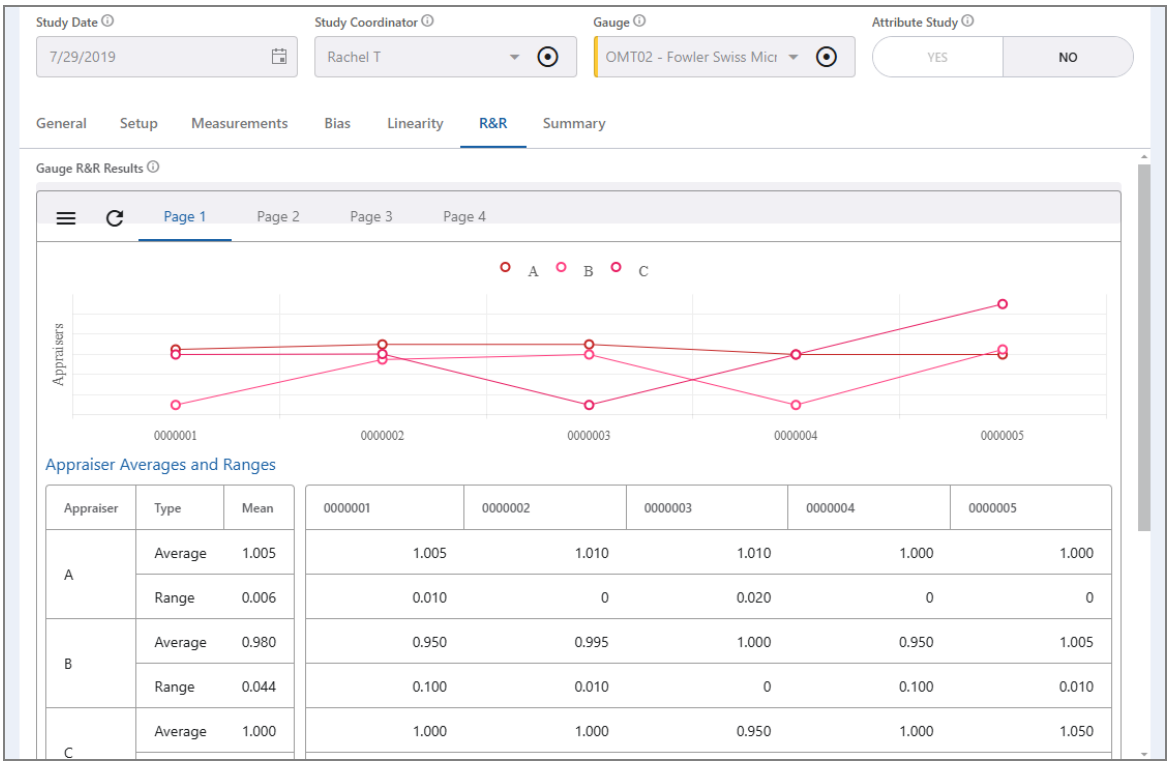
The Bias tab shows the results of the measurements from a bias study; these results are populated automatically. This tab is hidden if the "Conduct Bias Study" toggle field is **NOT** set to YES in the Setup tab.

Fig. 22: Gauge Studies screen, Linearity tab



The Linearity tab shows the results of the measurements from a linearity study; these results are populated automatically. This tab is hidden if the "Conduct Linearity Study" toggle field is **NOT** set to YES in the Setup tab.

Fig. 23: Gauge Studies screen, R&R tab

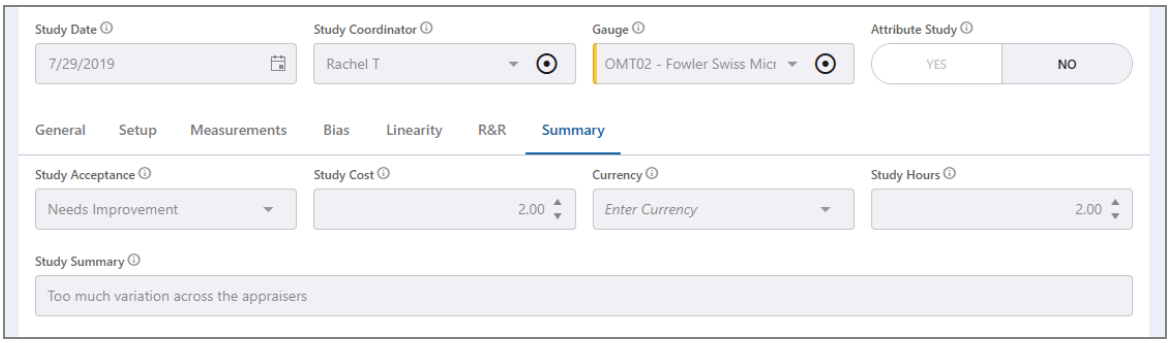


Appraiser	Type	Mean	0000001	0000002	0000003	0000004	0000005
A	Average	1.005	1.005	1.010	1.010	1.000	1.000
	Range	0.006	0.010	0	0.020	0	0
B	Average	0.980	0.950	0.995	1.000	0.950	1.005
	Range	0.044	0.100	0.010	0	0.100	0.010
C	Average	1.000	1.000	1.000	0.950	1.000	1.050

The R&R tab shows the results of the measurements from an R&R study; these results are populated automatically. This tab is hidden if the "Conduct R&R Study" toggle field is **NOT** set to YES in the Setup tab.

The results of an R&R study delve into much further depth than the other two studies.

Fig. 24: Gauge Studies screen, Summary tab



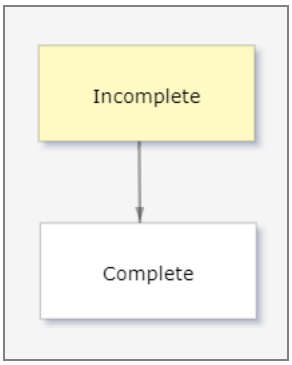
Use the Summary tab to determine whether the results of the gauge study are acceptable or need improvement. You can also record the study's cost and hours spent to completion.

Gauge Studies States

This section defines each state available in the workflow for the Gauge Studies process. See "State Change Security" on page 55 to learn more about how these states transition.

Incomplete (Default). The gauge study is incomplete.

Complete. The gauge study is complete.



Gauge Studies Tasks

Starting a New Gauge Study

1. Select Gauge Studies from the left navigation panel. Then, click the Add New button in the toolbar.
2. Select a gauge, study date, and study coordinator. The Gauge Type, Gauge Sub-Type, and Attribute Study fields default from the Gauge field.
3. Select the temperature and relative humidity of the study location at the beginning of the study. Then select the item that was measured as part of the study.

   Note: If the study is for a group of items, then select from the Item Group field.

4. Navigate to the Setup tab. Select the type of study being conducted, then choose the number of appraisers, trials, and samples. The maximum number of appraisers allowed is three.
5. Select the names of each appraiser involved in the study.
6. In the Process Variation field, enter the expected amount of variation in the process.
7. In the Tolerance field, enter the acceptable tolerance of the measurement.
8. Click Save to save the new record. When selecting the next state, click Incomplete.

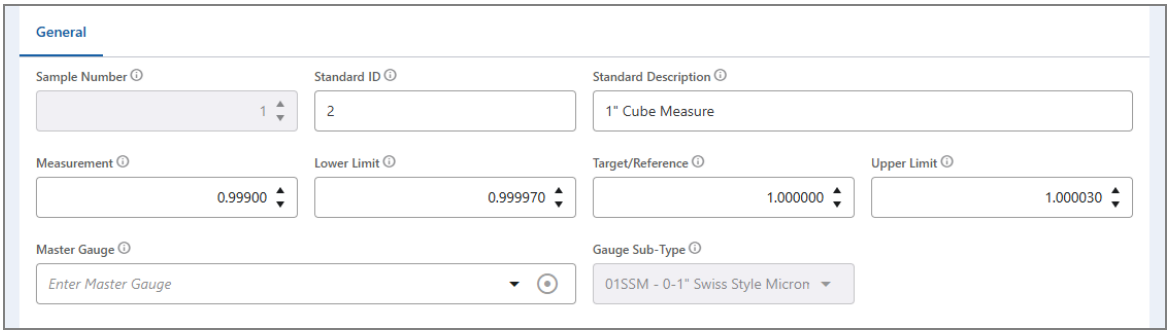
Conducting a Bias and Linearity Study

Once you have completed the task "Starting a New Gauge Study" and have selected both or either of the "Conduct Bias Study" or "Conduct Linearity Study" toggle fields, you may proceed with conducting a bias or linearity study. Note that the procedure is very similar for both studies.

1. In the Gauge Studies record that you want to edit, navigate to the Measurements tab.
2. Click within the Measurement column and enter the measurement for that gauge study standard and trial.

   Note: You can click the Details icon to open the measurement detail screen and observe the lower and upper limits. You can also enter the measurement in this screen.

Fig. 25: Gauge Sub-Type Calibration Standards Results screen



3. Click Save to save the new record. When selecting the next state, click Complete.
4. Navigate to the Bias and/or Linearity tabs. Note that the fields now contain numerical values. The fields are designed to automatically update with the information that you entered in the Measurements tab.

Conducting an R&R Study

Once you have completed the task "Starting a New Gauge Study" and have set the "Conduct R&R Study" toggle field to YES, you may proceed with conducting an R&R study.

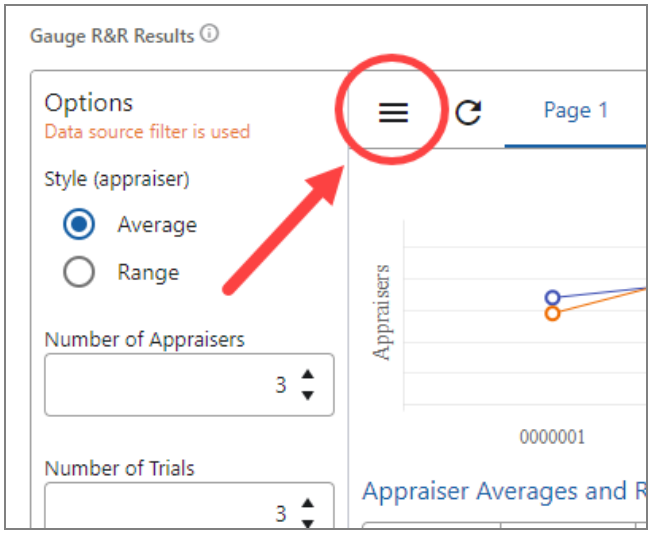
1. In the Gauge Studies record that you want to edit, navigate to the Measurements tab.
2. Notice that the items and samples lists reflect the numbers that you entered in the Setup tab. The example below reflects two appraisers (A), two trials per appraiser (B), and five samples (C).

Fig. 26: Gauge R&R Measurements sections

3. In the Samples field, record the actual measurements taken by the appraiser for the trial for each item. Then click Save to save the record.
4. Navigate to the R&R tab to see the results of the trial.
    a. **Page 1** contains a line chart, appraiser averages and ranges, part averages, and additional values.
    b. **Page 2** contains average and range results.
    c. **Page 3** contains Analysis of Variance (ANOVA) calculations.
    d. **Page 4** contains ANOVA results.

Note: If the chart does not appear, click the Options button and ensure the information matches what you entered in the Setup tab.

Fig. 27: Gauge Studies screen, R&R tab, Options button



5. Navigate to the Summary tab. Select a value for the overall acceptance result of the study.
6. Enter the cost and amount of hours spent on the study, as well as any overall comments.
7. Click Save to save the new record. When selecting the next state, click Complete.

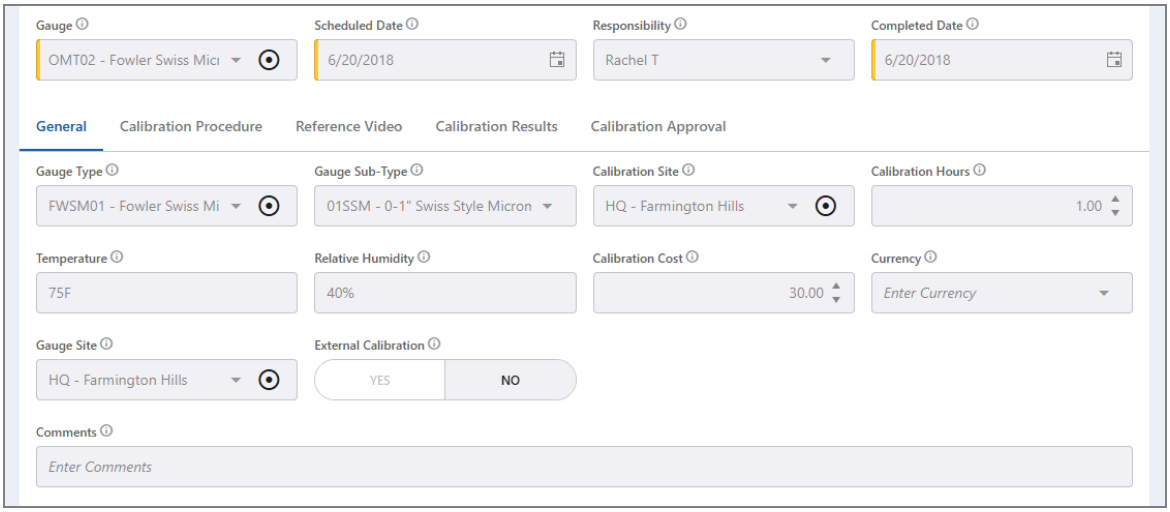
Gauge Calibrations

One of the necessary steps in minimizing measurement error is gauge calibration. Calibration is a comparison that assesses the relationship between the readings of a gauge and the values of a measurement standard under controlled and specified conditions. This process can be simple or complex, depending on the gauge and the accuracy required, so it is not unusual for calibrations to be conducted by a specialized external source.

The Gauge Calibrations process provides a calibration and approval workflow for managing gauges, whether internally or externally calibrated. You can add and access gauge calibrations directly through the process in the navigation panel; however, calibrations are typically created through a Gauge record. See "Gauges" on page 25.

This process contains commands. See "Commands" on page 66 for more information.

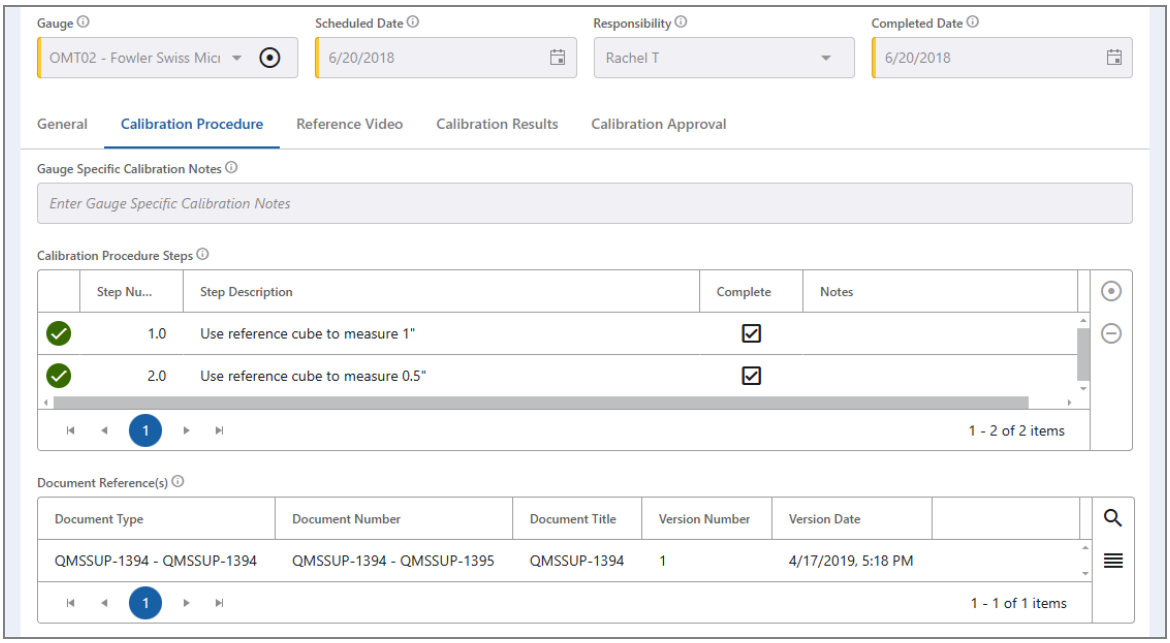
Fig. 28: Gauge Calibrations screen, General tab



The General tab is used to define the basic details of a gauge calibration. Many of these fields are automatically populated when the calibration is created from a gauge record.

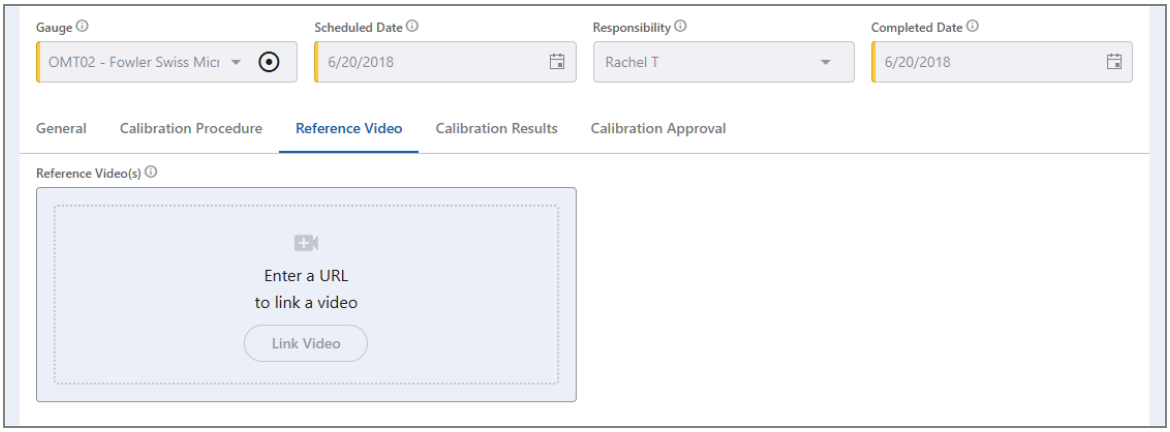
When the gauge calibration is marked as external, this tab contains significantly fewer fields. See "Transactions" on page 57 for a list of which fields are excluded.

Fig. 29: Gauge Calibrations screen, Calibration Procedure tab



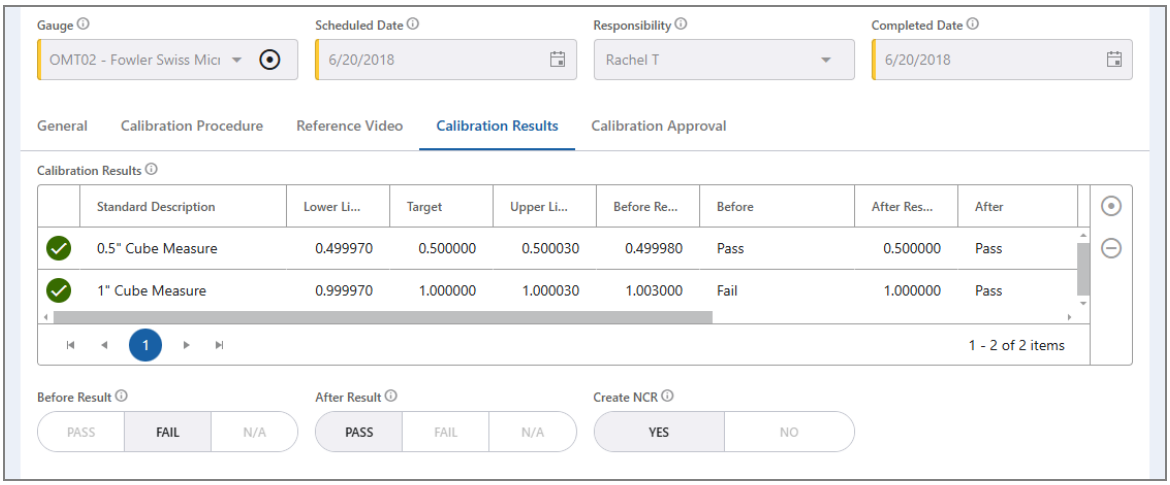
Use the Calibration Procedure tab as a checklist of steps to complete as you work through the calibration. The Document References field is populated by any documents linked in the relevant gauge type.

Fig. 30: Gauge Calibrations screen, Reference Video tab



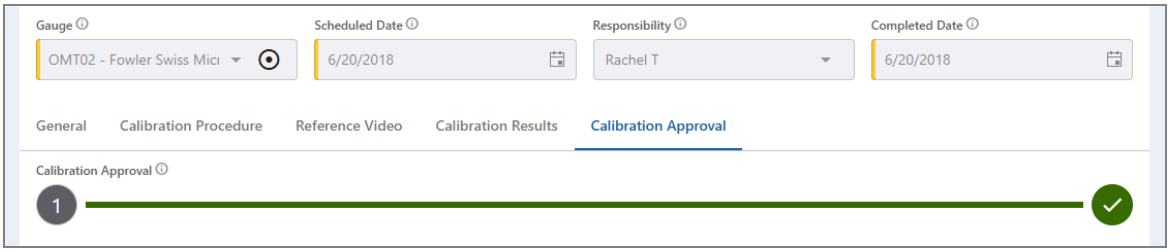
The Reference Video tab allows you to upload a video that supports the calibration. Videos must be in .mp4 format or a YouTube link.

Fig. 31: Gauge Calibrations screen, Calibration Results tab



The Calibration Results tab contains the parameters for each gauge being calibrated and allows you to analyze the results to confirm whether they pass or fail inspection.

Fig. 32: Gauge Calibrations screen, Calibration Approval tab



The Calibration Approval tab contains the approval process for the gauge calibration. If any nonconformances were created as a result of the calibration outcome, then they are accessible from this tab. For Life Science users, an investigation may be created instead of a nonconformance; this depends on the setup of the associated site.

Gauge Calibrations States

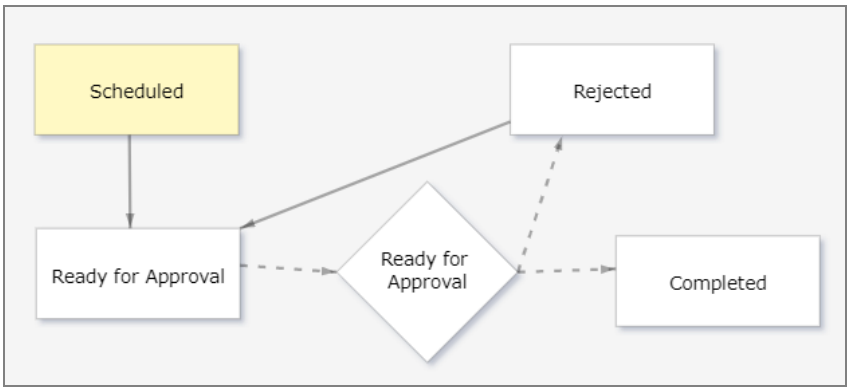
This section defines each state available in the workflow for the Gauge Calibrations process. See "State Change Security" on page 55 to learn more about how these states transition.

Scheduled (Default). The gauge calibration is scheduled.

Ready for Approval. Calibration has been finished and is ready for approval.

Rejected. Calibration approval was rejected. Please review the rejection comments, make the appropriate modifications, and re-submit for approval.

Completed. The gauge calibration is complete.



Gauge Calibration Tasks

Adding a New Gauge Calibration

Calibrations are typically added directly from the relevant gauge's process screen.

1. In the Gauge process screen of the gauge to be calibrated, navigate to the Calibration/Service tab.
2. Select an employee to be the default person responsible for gauge calibrations created for this gauge.
3. Add notes specific to this gauge when completing the calibration. These notes will show on the calibration screen.
4. Click the Add New Item button from the Gauge Calibrations field. A new screen appears.
5. Enter values in the Temperature and Relative Humidity fields. These are free-type fields, so you can use whichever temperature scale you prefer.
6. Click the calendar icon on the Scheduled Date field; a calendar window opens.
    a. If this is an ad hoc calibration, then select "This occurrence only" in the calendar. Otherwise, select "The whole series".
    b. Select the scheduled date for the calibration, then click OK.
    c. Note that the Scheduled Date field is automatically controlled by the system after the first calibration is created.
7. In the toolbar, select the Commands button.
    a. If you want to change the frequency of the calibration schedule:
        i. Select "Change Frequency".
        ii. Choose one of the frequency options, such as Monthly or Quarterly. The default frequency is Yearly.
        iii. Click OK.
    b. If you want to specify an end date:
        i. Select "Adjust Schedule Dates".
        ii. Choose one of the end options, such as ending after a set number of occurrences or after a specific date. The default is "No end date".
8. Click Save to save the new record. When selecting the next state, click Scheduled.

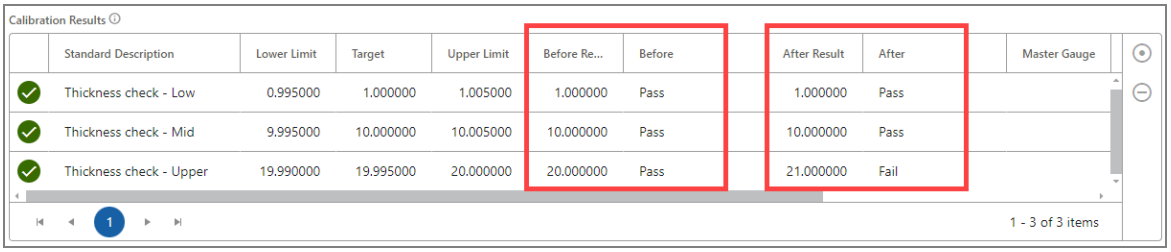
Note: If you want calibrations scheduled by usage instead of calendar frequency, then see "Asset Usage Log" on page 40 for additional instructions.

Completing a New Gauge Calibration

1. Within the relevant Gauge Calibration record, navigate to the Calibration Procedure tab. Notice that the Calibration Procedure steps have been pulled from the Gauge Type.
    a. Use these steps as a checklist when completing the calibration.
    b. As you complete each step, be sure to select the "Complete" check boxes and add any relevant notes.
    c. Click Save to save the record when finished.
2. Navigate to the Calibration Results tab. Use the Before Result and After Result columns to record what the measurements were before and after the calibration. The Before Result is used to check the gauge in the "as found" condition; the After Result would only need to be populated if the gauge was modified in any way (re-calibrated, cleaned, etc.).

   Take note of the Before and After columns. A measurement out of spec will say Fail, while a measurement that matches the Target column (or falls within the Lower/Upper Limit parameters) will say Pass.

Fig. 33: Calibration Results field, Before and After results



Note: If the Before Result is a Fail, you should enter a comment stating what you did to fix the issue.

3. Depending on the values, a new toggle field titled "Create NCR" may appear. You can set this field to YES and save the record if you want to create a nonconformance with relevant data pulled from this calibration record. A link to this NCR is then available within the Calibration Approval tab.
4. Navigate back to the General tab and select the completed date.
5. Click Save to save the new record. When selecting the next state, click Ready for Approval.

Adding an External Gauge Calibration

An external calibration is a calibration conducted by an outside source. Calibrations are typically added directly from the relevant gauge's process screen.

1. In the relevant Gauge process screen, navigate to the Calibration/Service tab.
2. Click the Add New Item button in the Gauge Calibrations field. A new screen opens.

3. Set the "External Calibration" toggle field to YES. Note that multiple fields and tabs are now hidden.
    a. See "Transactions" on page 57 for a full list of which fields and tabs are hidden.
    b. If the linked gauge's "External Calibration" toggle field is set to YES, then the calibration-level screen is already converted for an external calibration.
4. Enter the scheduled date for this calibration.
5. When the outside source has completed the calibration, they will supply you with a certificate. Upload a copy of this document to the External Calibration Certificate field.
6. Click Save to save the new record. When selecting the next state, click Ready for Approval.

Approving a Gauge Calibration

1. The person responsible for approving a gauge calibration is automatically notified when it is time for approval through the Inbox or optionally from an e-mail notification (clicking the link in that message takes you to the calibration for approval).
2. Open the Inbox, either through the Home Page dashboard or by clicking the Inbox icon in the toolbar.
3. Upon opening the Inbox, click the approval item under the Gauge Management group to show the inbox action icons. Then click the Open icon. The screen navigates to the calibration's detail screen.
4. In the detail screen, click the Approve/Reject button in the Calibration Approval field. A small window appears.
5. In the Sign Off window, enter your password and either approve or reject the change. Use the comments field to document any information about your decision. Comments are required for rejection.

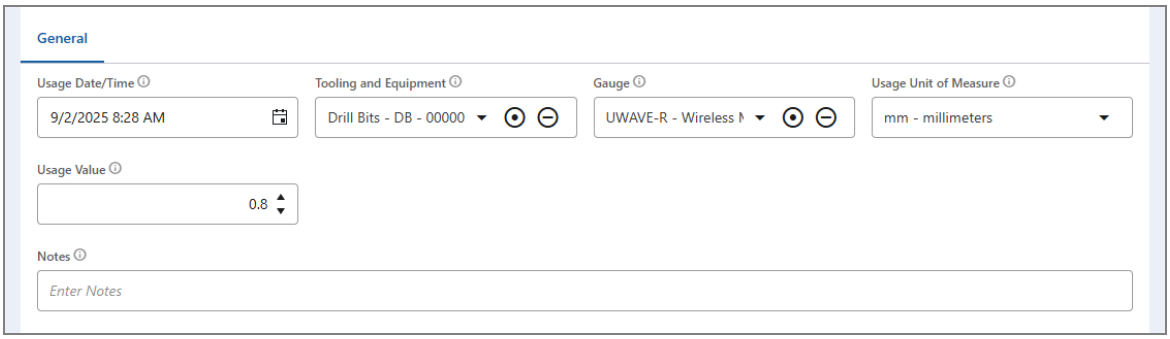
    Note: Once all members of the approval process have finished, the Calibration record moves to the Complete state.

Asset Usage Log

The asset usage log documents usage for assets such as gauges. The information entered into the log can then be used with gauges to create calibrations.

If you selected "Usage Based Scheduling" in the Calibration/Service tab of the Gauges process, then you will use asset usage logs to record equipment usage. When configured properly, logging enough asset usage triggers a calibration. See "Gauges" on page 25.

Fig. 34: Asset Usage Log



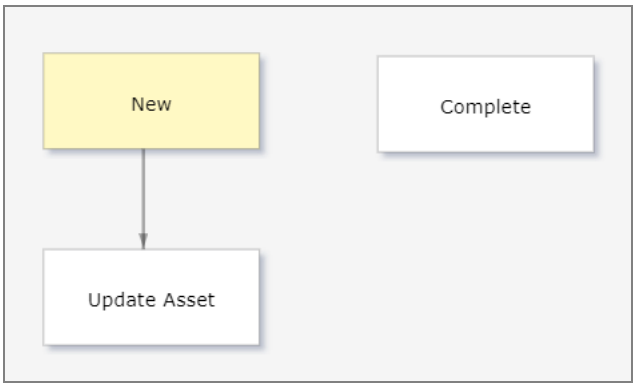
Asset Usage Log States

This section defines each state available in the workflow for the Asset Usage Log process. See "State Change Security" on page 55 to learn more about how these states transition.

New (Default). The asset's usage has been updated; this log record can no longer be changed.

Update Asset. Select this state to update the asset's usage.

Complete. The asset's usage has been updated; this log record can no longer be changed.



Asset Usage Logs Tasks

Setting Up Usage-Based Scheduling

Before asset usage logs can be effectively entered into the system, the relevant gauges must be prepared to receive the log data.

1. Select Gauges from the left navigation panel. Then, double-click the record that you want to edit.
2. Navigate to the Calibration/Service tab.
3. Set the "Usage Based Scheduling" toggle field to YES. Three new fields appear: Usage Frequency Hours, Percent of Use Before Notification, and Hours in Use Since Calibration.

Note: The Hours in Use Since Calibration field is read-only. It represents the number of "active" hours since the last calibration.

4. Select a number in the Percentage of Use Before Notification field. This field determines when an advance notice gauge calibration notification will be sent to the responsible user.
5. In the Usage Frequency Hours field, enter the number of hours of use that will trigger a calibration. These hours will be logged later during the Asset Usage Log process.
6. Click Save to save the record. When selecting the next state, click Active.

Adding a New Asset Usage Log

1. Select Asset Usage Log from the left navigation panel. Then, click the Add New button in the toolbar.
2. Select the gauge that was used.
3. Select the appropriate usage unit of measure.
4. Enter a usage value for the selected unit of measure.
5. Enter any notes relevant to the usage log, such as why the gauge was used.
6. Click Save to save the new record. When selecting the next state, click Update Asset.

Chapter 4

Inbox Messages

Introduction to Inbox Messages

Most processes in the system require multiple people, departments, or groups to coordinate on completing a process. The inbox automates notifications sent to the appropriate users at specific times in the process.

An individual inbox action item represents a single task, approval, or notification that has been sent to you. This task will remain in your inbox until the necessary steps have been taken for completion.

Inbox messages can be separated into three different action types:

- **Assignment.** You are required to take some action in the system to move it beyond your workflow.
- **Approval.** Your approval is requested. You must approve or reject the process item.
- **Acknowledgment.** This is only for your information. You can acknowledge the notification to remove it from your inbox.

See the User Interface user guide to learn how to access inbox messages.

Inbox Messages

The table below describes each inbox action item involved in the Gauge Management module. In addition to title and description, the table indicates which process each item comes from, who receives the message, and when it is sent. See the User Interface user guide to learn more about inbox messages.

Process	Title	Message	Action Type	Sent To / Sent When
Gauges	Default Responsibility – Usage Based Gauge Calibration Due Soon	A gauge calibration for the following information is due soon. Hours in Use: {HoursinUseSinceCalibration_f} Hours Threshold: {UsageFrequencyHours_f} Gauge: {Gauge_f} Gauge Type: {GaugeType_f}	Assignment	Sent to the Responsibility when the amount of time in the Hours in Use Since Calibration field is at a percentage of usage frequency hours greater than or equal to the percentage of use before notification.

Process	Title	Message	Action Type	Sent To / Sent When
Gauge Calibrations	Past Due for 7 Days	A gauge calibration for the following information is past due by 7 days. Scheduled Date: {ScheduledDate_f} Gauge: {Gauge_f} Gauge Type: {GaugeType_f} Site: {GaugeSite_f}	Assignment	Sent to the Responsibility when the calibration is past due by 7 days.
Gauge Calibrations	Past Due for 30 Days	A gauge calibration for the following information is past due by 30 days. Scheduled Date: {ScheduledDate_f} Gauge: {Gauge_f} Gauge Type: {GaugeType_f} Site: {GaugeSite_f}	Assignment	Sent to the Responsibility when the calibration is past due by 30 days.
Gauge Calibrations	Scheduled in 7 Days	A gauge calibration for the following information is due in 7 days. Scheduled Date: {ScheduledDate_f} Gauge: {Gauge_f} Gauge Type: {GaugeType_f} Site: {GaugeSite_f}	Assignment	Sent to the Responsibility when the calibration's scheduled date is 7 days away from the current date.
Gauge Calibrations	Scheduled in 30 Days	A gauge calibration for the following information is due in 30 days. Scheduled Date: {ScheduledDate_f} Gauge: {Gauge_f} Gauge Type: {GaugeType_f} Site: {GaugeSite_f}	Assignment	Sent to the Responsibility when the calibration's scheduled date is 30 days away from the current date.

Process	Title	Message	Action Type	Sent To / Sent When
Gauge Calibrations	Scheduled In Today	A gauge calibration for the following information is due today. Scheduled Date: {ScheduledDate_f} Gauge: {Gauge_f} Gauge Type: {GaugeType_f} Site: {GaugeSite_f}	Assignment	Sent to the Responsibility when the calibration's scheduled date is equal to the current date.
Gauge Calibrations	Approval Has Been Rejected	The following gauge calibration has been rejected. Please review the comments from the approvers. Gauge: {Gauge_f} Scheduled Date: {ScheduledDate_f} Completed Date: {CompletedDate_f} Comments: {Comments_f}	Assignment	Sent to the Responsibility when the current state changes to Rejected.
Gauge Calibrations	Ready for Approval	The following gauge calibration is ready for approval. Please either approve or reject. Gauge: {Gauge_f} Scheduled Date: {ScheduledDate_f} Completed Date: {CompletedDate_f} Comments: {Comments_f}	Approval	Sent to the approvers when the current state changes to Ready for Approval.

Chapter 5

Metrics and Reports

Introduction to Metrics and Reports

The QMS system includes reporting and metric features that let you analyze the data in each process, measuring efficiency and effectiveness. The metrics and reports available differ between each process.

Report are generated within each process, either from the search screen or the detail screen. Metrics and key process indicators (KPIs) are gadgets that can be placed on one of your dashboards.

See the User Interface user guide to learn how to generate reports, metrics, and KPIs.

Reports

Pre-set reports have been set up to be pulled on a process by process basis, though not every process has a pre-set report. Certain reports require additional parameters in order to be previewed. The parameters are listed on the right side of the preview window. If a report requires parameters, then this pane will automatically appear. Once you have selected the desired parameters, click the Preview button to see the report preview.

Below is a table that describes each report available in the Gauge Management module. In addition to title and description, the table indicates which process each report comes from and whether it is pulled from the search screen or detail screen. Lastly, if the report requires specific parameters in order to be generated properly, a description of those parameters is included below that report. See the User Interface user guide to learn how to access reports.

Process	Pulls From	Title	Description
Cost Accounts	Detail Screen	Audit Trail – Cost Accounts	Provides a path of how the record has progressed over time with changes (who, what, and when).
Cost Logs	Detail Screen	Audit Trail – Cost Logs	Provides a path of how the record has progressed over time with changes (who, what, and when).
Gauge Status	Detail Screen	Audit Trail – Gauge Status	Provides a path of how the record has progressed over time with changes (who, what, and when).
Gauge Types	Detail Screen	Audit Trail – Gauge Types	Provides a path of how the record has progressed over time with changes (who, what, and when).
Gauge Sub-Types	Detail Screen	Audit Trail – Gauge Sub-Types	Provides a path of how the record has progressed over time with changes (who, what, and when).
Gauges	Detail Screen	Audit Trail – Gauges	Provides a path of how the record has progressed over time with changes (who, what, and when).
Gauges	Search Screen	Gauge Cost Summary Report	Shows the total cost of calibrations for the global organization for a defined date range. The report is subdivided by department and current location.
Gauge Studies	Detail Screen	Audit Trail – Gauge Studies	Provides a path of how the record has progressed over time with changes (who, what, and when).

Process	Pulls From	Title	Description
Gauge Studies	Detail Screen	Gauge Bias Study	Shows the results of a Bias Study performed in this gauge study.
Gauge Studies	Detail Screen	Gauge Blank Measurement Form	Prints a blank measurement form for this gauge study.
Gauge Studies	Detail Screen	Gauge Linearity Study	Shows the results of a Linearity Study performed in this gauge study.
Gauge Studies	Detail Screen	Gauge R&R Study (Attribute Data)	Shows the results of a Repeatability and Reliability Study performed in this gauge study for Attribute gauges.
Gauge Studies	Detail Screen	Gauge R&R Study (Variable Data)	Shows the results of a Repeatability and Reliability Study performed in this gauge study for variable data gauges.
Gauge Calibrations	Detail Screen	Audit Trail – Gauge Calibrations	Provides a path of how the record has progressed over time with changes (who, what, and when).
Gauge Calibrations	Detail Screen	Calibration Sticker Report	Prints a calibration sticker to attach to the gauge that indicates who did the calibration, the date of the last calibration, and when the next calibration is due.
Gauge Calibrations	Detail Screen	Certificate of Calibration	Prints a certificate indicating the calibration information, calibration procedure, calibration results, any comments entered to the calibration, and a statement of conformity.
Asset Usage Log	Detail Screen	Audit Trail – Asset Usage Log	Provides a path of how the record has progressed over time with changes (who, what, and when).

Metrics

Below is a table that describes each metric available in the Gauge Management module. In addition to title and description, the table indicates which process each metric comes from. Lastly, if the metric requires specific parameters in order to be generated properly, a description of those parameters is included below that metric. See the User Interface user guide to learn how to access reports.

Process	Pulls From	Title	Description
Gauge Calibrations	Gadgets	Number of Calibrations Completed for a Site by Month for a Date Range	A metric showing the number of gauge calibrations completed by a user-specified site and within user-specified start to end date parameters, grouped by month.
Gauge Calibrations	Gadgets	Past Due Calibrations by Site	A metric showing the number of incomplete and past due gauge calibrations, grouped by site.

KPIs

See the User Interface user guide to learn more about KPIs.

There are no KPIs available for this module.

Chapter 6

Security Settings

Security Roles

Security roles define how various users access and control different types of processes and data. These roles are then assigned to each user. Some roles are used by many users, while others may only be applied to one or two individuals.

The following security roles apply in the Gauge Management module.

All Roles

System-controlled All Roles value. Any security applied to this special system role grants that security access to all users of the system.

Asset Usage Log Add/Edit

This security role allows you to add new and edit Asset Usage Log items.

Cost Log Add/Edit

This security role allows you to add new and edit Cost Log items. Upon adding a Cost Log record, you will become the person who logged the record by default. Only the person who logged the record or the Cost Log Administrator security role will be able to edit the Cost Log record.

Cost Log Administrator

This security role allows you to add new cost log accounts and cost logs. The Cost Log Administrator also has the ability to edit any cost log as if they were the employee who entered the cost log record.

Equipment Administrator

This security role allows you to add, edit, and remove records in any process in the Equipment module.

Equipment Champion

This security role allows you to add records in any process in the Equipment module.

Gauge Add/Edit

This security role allows you to add new and edit gauges.

Gauge Administrator

This security role allows you to add new, edit, and remove gauges, gauge calibrations, and gauge R&R studies.

Gauge Calibration Add/Edit

This security role allows you to add new and edit Gauge Calibrations.

Gauge Champion

This security role allows you to add records in any process in the Gauge module.

Gauge Maintenance

This security role allows you to add, edit, and remove gauge types, gauge sub-types, gauge subtype calibration standards, and gauge statuses. Typically this maintenance account is only given to one or two individuals who are responsible for setting up this data for others to use.

Gauge Navigation

This security role allows you to navigate to the Gauge module.

Gauge Study Add/Edit

This security role allows you to add new and edit gauge R&R studies.

System Administrator

This maintenance security role allows you to add and remove security roles, domains, entities, sites, locations, generalized code types and codes, product lines, item groups, item types, review frequencies, company types, cost accounts, and units of measure. Besides being able to add and remove items, you can also view and edit all of the fields for the processes noted. Typically, this maintenance security role is only given to one or two individuals who are responsible for setting up the data for others to use.

System View

System view is a generic role that most users and modules use. This role allows you to view (but in most cases not edit) much of the non-sensitive data in the system. Being able to view the data is still subject to you having the ability to navigate to, and open, a process.

Every user should have this security role because it allows users to view non-secure data for most processes. For users who typically only have to approve data, but do not have to add or edit data, this system view role is what they need.

Process Security Roles

Each list below displays the security roles that provide you with permissions to add items for the indicated individual process.

Cost Accounts

- Cost Log Administrator
- Gauge Administrator
- Gauge Maintenance
- System Administrator
- Tooling & Equipment Administrator
- Tooling & Equipment Champion

Cost Logs

- APQP Administrator
- APQP Champion
- APQP Projects Add/Edit
- APQP Projects Maintenance
- Cost Log Add/Edit
- Cost Log Administrator
- Gauge Administrator
- Maintenance Champion
- Tooling & Equipment Administrator
- Tooling & Equipment Champion

Gauge Status

- Gauge Administrator
- Gauge Champion
- Gauge Maintenance

Gauge Types

- Gauge Administrator
- Gauge Champion
- Gauge Maintenance

Gauge Sub-Types

- Gauge Administrator
- Gauge Champion
- Gauge Maintenance

Gauges

- Gauge Add/Edit
- Gauge Administrator
- Gauge Champion
- Tooling & Equipment Administrator

Gauge Studies

- Gauge Administrator
- Gauge Champion
- Gauge Study Add/Edit

Gauge Calibrations

- Gauge Add/Edit
- Gauge Administrator

- Gauge Calibration Add/Edit
- Gauge Champion

Asset Usage Log

- Asset Usage Log Add/Edit
- Gauge Add/Edit
- Gauge Administrator
- Gauge Calibration Add/Edit
- Gauge Champion
- Tooling & Equipment Administrator
- Tooling & Equipment Champion

State Change Security

As you complete tasks in the system, changes occur based on your activities (such as changing a record's state) and when other events occur (such as a specific amount of time passing). The changes based on your activities are called **actions**, while the event-based changes are called **transactions**. The main difference between the two is the initiator: actions are performed by users, and transactions are managed by the system.

Each system change may depend on a number of factors, including where you are in the system, who is involved, which fields are populated, and more. It is important to know the actions and transactions for each process because these affect your ability to complete a task.

The state change security for each process is separated into two sections:

1. **Security.** Which users (by security role or field role) can change the state of a record. Field roles are indicated with an asterisk *.
2. **Transactions.** The conditions that must be met to initiate a transactions.

Security

Cost Accounts

Transitions	Cost Log Administrator	System Administrator
Active >> Inactive	✓	✓
Inactive >> Active	✓	✓

Gauge Status

Transitions	Gauge Administrator	Gauge Maintenance
Active >> Inactive	✓	✓
Inactive >> Active	✓	✓

Gauge Types

Transitions	Gauge Administrator
Active >> Inactive	✓
Inactive >> Active	✓

Gauge Sub-Types

Transitions	Gauge Administrator
Active >> Inactive	✓
Inactive >> Active	✓

Gauges

Transitions	Gauge Add/Edit	Gauge Administrator	Gauge Champion	Worksheet Administrator
Active >> Inactive	X	X	X	X
Inactive >> Active	X	X	X	✓
Inactive >> Pending Re-Calibration	✓	✓	✓	X

Gauge Studies

Transitions	Gauge Administrator	Gauge Study Add/Edit
Incomplete >> Complete	✓	✓

Gauge Calibrations

Transitions	Gauge Administrator	Gauge Calibration Add/Edit
Rejected >> Ready for Approval	✓	✓
Scheduled >> Ready for Approval	✓	✓

Asset Usage Log

Transitions	Asset Usage Log Add/Edit	Gauge Add/Edit	Gauge Administrator	Gauge Calibration Add/Edit	Gauge Champion	Tooling & Equipment Administrator	Tooling & Equipment Champion
New >> Update Asset	✓	✓	✓	✓	✓	✓	✓

Transactions

Cost Accounts

Hide "Quantity Unit of Measure" if "Allow Quantities" is not True

When the "Allow Quantities" toggle field is set to NO, the Default Unit Cost and Quantity Unit of Measure fields are hidden.

Cost Logs

Containment Action Field is Null

When the Containment Action field is not populated, it is hidden.

Cost Account Allow Quantity is False

From the Cost Account field – when the selected cost account's "Allow Quantities" toggle field is **NOT** set to YES, then the Quantity and Unit of Measure fields in the Cost Log process are hidden.

This transition rule affects any cost logs made from this cost account.

Gauge Field is Null

When the Gauge field is not populated, it is hidden.

Hide CPR Task if it is Empty

When the CPR Task field is not populated, it is hidden.

Issue is Null

When the Issue field is not populated, it is hidden.

Nonconformance Field is Null

When the Nonconformance field is not populated, it is empty.

Preventive Work Order Field is Null

When the Work Order Preventive field is not populated, it is empty.

Project Field is Null

When the Project field is not populated, it is empty.

Project Task Field is Null

When the Project Task field is not populated, it is hidden.

Reactive Work Order Field is Null

When the Work Order Reactive field is not populated, it is hidden.

Training Event Field is Null

When the Training Event field is not populated, it is hidden.

Gauge Types

Attribute Gauge is True

When the Attribute Gauge toggle field is set to YES, the Conduct Bias Study and Conduct Linearity Study fields are de-selected and hidden.

Treat as Attribute for Calib./Studies is Checked

When the Treat as Attribute for Calib./Studies field is set to YES, the Bias/Linearity No. of Stds field is hidden.

Warning Label

The Warning label is hidden when one of the following items is true:

- The R&R Study field is not selected
- The R&R Study field is selected and the sample size is 5 or 10

Gauge Sub-Types

Attribute Gauge

When the gauge type is an attribute type, the Calibration / Study Standards field is hidden.

Not an Attribute Gauge

When the gauge type is NOT an attribute type, the Calibration / Study Standards field is hidden.

Gauges

Changes of External Field

When the "External Calibration" toggle field is changed, the system updates all linked gauge calibrations with data from the Gauge and External fields.

Check Usage for Calibration

The system creates a gauge calibration every day if the following conditions are met:

- The Hours in Use Since Calibration are greater than or equal to the Usage Frequency Hours.
- The Usage-Based Scheduling check box is selected.
- There are no scheduled gauge calibrations with a Gauge field that equals the current Gauge ID.

Once this criteria is met, a new gauge calibration is created based on the current date and the following fields from the gauge:

- ID
- Default Responsibility (if this is empty, then the currently logged employee)
- Gauge Type
- Gauge Sub-Type
- Site

Current Date minus Hours in Use Last Updated Date is Greater Than or Equal to 1

The Hours in Use Since Calibration field is updated when the following is true:

- The gauge is active
- The current date (minus the hours in use since last update) is greater than or equal to 1

Dedicated Gauge Equals False

When the "Dedicated Gauge" toggle field is set to NO, the Dedicated Customer and Dedicated Item fields are hidden.

Gauge is Pending Calibration

When the current state changes from Inactive to Pending Re-Calibration, a Gauge Calibration record is created based on the current date and the following fields from the Gauge record:

- ID
- Default Responsibility (if null, then the current login employee)
- Site

Gauge State Changed and Not Scheduled Calibrations

When the gauge's status is changed from Active, all incomplete gauge calibrations are removed from the gauge.

Gauge Type or Sub-Type Updated

When the gauge type or sub-type is changed, the type and sub-type are updated on incomplete calibrations.

Hide Gauge Calibration Standards

When the Gauge Sub-Type field is populated, the Gauge Calibration Standards field is hidden.

Master Gauge = False

When the "Master Gauge" toggle field is set to NO, the N.I.S.T # field is hidden.

Need to Create Calibration

A gauge calibration is created when the following is true:

- The hours in use on the gauge is greater than the usage frequency hours
- There is no gauge calibration for this gauge in the Scheduled state

OR

- The gauge is saved for the first time

Owner Type = Customer

When the selected Owner Type is Customer, the following fields are hidden:

- Department
- Employee Owner
- Supplier Owner

Owner Type = Employee

When the selected Owner Type is Employee, the Customer Owner and Supplier Owner fields are hidden.

Owner Type = Internal

When the selected Owner Type is Internal, the following fields are hidden:

- Customer Owner
- Employee Owner
- Supplier Owner

Owner Type = Supplier

When the selected Owner Type is Supplier, the Customer Owner and Employee Owner fields are hidden.

Send Usage Based Calibration Expiration Message

When the amount of time in the Hours in Use Since Calibration field is at a percentage of Usage Frequency Hours greater than or equal to the Percentage of Use Before Notification and Usage Based Scheduling is selected, a notification is sent to the default Responsibility to inform them that a gauge calibration is due soon.

Status Changed

When the previous gauge status does not match the current gauge status, the state is set based on the selected gauge status.

Additionally, the Status Date / Time field is updated to the current date.

Status Changed and Gauge is Inactive

When the gauge status is changed to inactive, the Status Date / Time is updated to the current date.

Additionally, the Hours at Last Inactive is updated with the current number plus the difference in hours between the Current Date and the Status Date / Time.

Usage Based Scheduling is Not True

When the "Usage Based Scheduling" toggle field is set to NO, the following fields are hidden:

- Percentage of Use Before Notification
- Hours in Use Since Calibration
- Usage Frequency Hours

Gauge Studies

Attribute Study Checked

When the "Attribute Study" toggle field is set to YES, the following fields are hidden:

- Conduct Bias Study
- Conduct Linearity Study
- Gauge R&R Results

In addition, if the gauge is an Attribute study, the system sets Bias and Linearity records to false upon saving the record.

Bias or Linearity is not Checked

When the "Conduct Bias Study" and "Conduct Linearity Study" toggle fields are set to NO, the Bias and Linearity Measurements field is hidden.

Bias or Linearity Study Checked

When either the "Conduct Bias Study" or "Conduct Linearity Study" toggle fields are set to YES, the system runs the Bias/Linearity calculations for the samples entered.

Bias Study Not Checked

When the "Bias Study" toggle field is set to NO, the following fields are hidden:

- Average
- Average Bias
- Bias by Standard
- Confidence Interval Lower
- Confidence Interval Upper
- df
- Significant t Value
- Standard Deviation
- Standard Error of Mean
- t statistic

Gauge R&R Not Checked

When the "Gauge R&R" toggle field is set to NO, the Gauge R&R Measurements field is hidden.

Gauge Sub-Type Changed and Study Not Complete

When the Gauge Study state is Incomplete and the Gauge Sub-Type has changed, the system removes the old calibration standards and inserts new ones based on the selected sub-type.

Linearity Study Not Checked

When the "Linearity Study" toggle field is set to NO, the following fields are hidden:

- Intercept
- Intercept p
- Intercept Standard Error
- Intercept t Ratio
- R-Squared
- s
- Slope
- Slope p
- Slope Standard Error

Warning Label

The Warning label is hidden when one of the following items is true:

- The R&R Study field is not selected
- The R&R Study field is selected and the sample size is 5 or 10

Gauge Calibrations

Completed and No Longer Past Due

When the current state is Complete and the Past Due field is True, the field is set to False and the record is no longer past due.

Gauge is Changed

The following changes occur when the gauge linked to the calibration is changed:

- Calibration procedures are removed
- Calibration results are removed
- The type and sub-type are updated from the gauge

Gauge Sub-Type is Changed, Gauge and Type are not

When the gauge sub-type is changed but the gauge and gauge type remain the same, calibration results are removed and the record is re-saved.

Gauge Type is Changed, Gauge is not

When the gauge type is changed but the gauge remains the same, the following occurs:

- Calibration Results are removed
- Calibration Procedures are removed
- The record is re-saved

Hide When Attribute Gauge

When the "Attribute Gauge" toggle field is set to YES, the Calibration Results field is hidden.

Hide When Before Result and After Result is Not Fail

When the Before Result and After Result fields are NOT populated with Fail, the Create Investigation and Create NCR fields are hidden.

Hide When Create NCR is True or No Results Entered

When the Create NCR field is True, or when the Before and After Results fields are null, the Justification Not to Create NCR field is hidden.

Hide When External Calibration

When the "External Calibration" toggle field is set to YES, the following fields are hidden:

- After Result
- Attribute Calibration Results
- Before Result
- Calibration Cost
- Calibration Hours
- Calibration ID
- Calibration Procedure Steps
- Calibration Results
- Calibration Site
- Comments
- Create NCR
- Due in Next X Days
- Gauge Site
- Gauge Specific Calibration Notes
- NonConformance
- Past Due
- Relative Humidity
- Temperature

Hide When Incident Investigation is Not Null

When the Incident Investigation field contains a value, the following fields are hidden:

- Create Investigation
- Create NCR

Hide When Incident Investigation is Null

The Incident Investigation field is hidden when empty.

Hide When Nonconformances is Not Null

When the Nonconformances field contains a value, the following fields are hidden:

- Create Investigation
- Create NCR

Hide When Nonconformances is Null

The Nonconformances field is hidden when empty.

Hide When Not External Calibration

When the "External Calibration" toggle field is set to NO, the following fields are hidden:

- External Calibration Certificate
- Before Result
- After Result

Hide When Variable Gauge

When the Attribute check box is not activated, the "Attribute Calibration" Results field is hidden.

Newly Completed

When the Gauge Calibration record is complete for the first time, the following occurs:

- Procedure steps are locked
- Results are locked
- The linked gauge is updated

Not Completed, Past Due, or Scheduled Date Changed

When the record is Past Due **or** when the scheduled date is changed and the state is not Complete, the Past Due check box is selected.

Not External, Results Do Not Match Calculation

When the record is not an external calibration and the After/Before Result fields do not match the After/Before Result calculated fields, the system updates the result fields from the calculated fields of the same name. This transaction is used with internal calibrations to keep the primary result field synced with the newer calculated field.

Past Due for 30 Days

When the calibration is past due for 30 days, a notification is sent to the Responsibility to inform them that the gauge calibration is past due.

Past Due for 7 Days

When the calibration is past due for 7 days and less than 30 days, a notification is sent to the Responsibility to inform them that the gauge calibration is past due.

Ready for Approval

When the current state transitions to Ready for Approval, the system updates the current state to Locked for all linked gauge calibration results and procedure results.

Ready for Approval and Completed Date is Null

The Completed Date field is populated when the current state is Ready for Approval and the field is empty.

Rejected

When the current state transitions to Rejected, the system updates the current state to Unlocked for all linked gauge calibration results and procedure results. Pending gauges are set to Inactive.

Additionally, a notification is sent to the Responsibility to inform them that the gauge calibration has been rejected.

Scheduled in 30 Days

When the scheduled date is equal to the current date plus 30 days, a notification is sent to the Responsibility to inform them that the gauge calibration is due in 30 days.

Scheduled in 7 Days

When the scheduled date is equal to the current date plus seven days, a notification is sent to the Responsibility to inform them that the gauge calibration is due in seven days.

Scheduled Today

When the scheduled date is equal to the current date, a notification is sent to the Responsibility to inform them that the gauge calibration is due today.

Site is Create Investigation, Create Investigation is True, Before or After is False

When the "Create Investigation" toggle field is set to YES, an investigation is created with the following specifications:

- **Description of Incident/Problem/Situation:** "Gauge calibration for [gauge number - gauge description] failed calibration on [date of calibration]."
- **Reported By:** [current user]

Site is Create NCR, Create NCR is True, Before or After is False

When the "Create NCR" toggle field is set to YES, a nonconformance is created with the following specifications:

- **Problem Description:** "Gauge calibration for [gauge number - gauge description] failed calibration on [date of calibration]."
- **Initiated By:** [calibration responsibility]

Update to "Scheduled Date" and State not "Completed"

When the Scheduled Date field is updated and the record is **not** in the Completed state, the Due in Next X Days field is updated.

Usage Based Gauge

When the Usage Based Scheduling box is selected in the Gauges process, the record is updated to have a scheduling frequency of "None".

Asset Usage Log

Gauge Field is Null

When the Gauge field is not populated, it is hidden.

Tooling and Equipment is Null

When the Tooling and Equipment field is not populated, it is hidden.

Update Asset

When the current state transitions to Update Asset, the Current Usage Value is updated for the selected equipment and the state is updated to Complete.

In addition, the selected gauge's Current Usage Value is updated to add the value entered in the Usage Value field. For example, if the Current Usage Value is 5 and then 10 is entered into the Usage Value field, then the Current Usage Value is then updated to 15.

Commands

Some processes utilize command buttons to perform pre-defined actions. Commands can be found under the Actions icon in the top toolbar of the appropriate process.

Below is a table that describes each command available in the Gauge Management module. In addition to title and description, the table indicates which process each command comes from, the roles that can execute the command, and the states when the command can be executed.

Process	Title	Description	Used By	State When Used
Gauge Sub-Types	Set Lower and Upper Limits Based on Accuracy	Updates the lower and upper limits on the Gauge Calibration Standards to equal the standard's target +/- the Sub-Type's accuracy.	All Roles	All States
Gauges	Update Hours In Use Since Calibration	The field Hours in Use Since Calibration is updated on a daily basis. This command allows a user to update the value to the latest hour.	Gauge Add/Edit; Gauge Administrator; Gauge Champion	Active

Process	Title	Description	Used By	State When Used
Gauge Calibrations	Change Frequency	Opens the Frequency Options dialog, allowing you to change the frequency of the calibration.	Gauge Administrator; Gauge Calibration Add/Edit; Gauge Champion	All States* * Gauge Champion can only use in the Scheduled state
Gauge Calibrations	Adjust Schedule Dates	Opens the Scheduling Options dialog window, allowing you to modify the scheduling frequency for the current and future calibrations.	Gauge Administrator; Gauge Calibration Add/Edit; Gauge Champion	All States* * Gauge Champion can only use in the Scheduled state

Chapter 7

Module Frequently Asked Questions

Frequently Asked Questions

Why shouldn't I delete items?

Records should only be deleted when you are sure that they are no longer needed. Even though records use a soft delete mechanism, there is still work that must be done to restore an item once it has been deleted.

The best thing to do with an item that is no longer needed is to set it to Inactive, Retired, or Obsolete, whichever state is applicable. This way, the item historically remains in the system but cannot be used.

If you do need to delete an item for good, then use the Trash button in the toolbar. Typically, only the system administrator can delete items.

I just changed the state of a process. What happens now?

When a process' state makes a transition, the system typically takes some automated steps. Details about these steps are listed in the State Transitions section of each process in this user guide.

Typically, state transition steps perform one of three functions:

1. **Notifications.** Notifications are sent to the users that are responsible for the next state of a process.
2. **Field Update.** Fields that depend on a state, date, or action are updated.
3. **Another State Transition**. A process' state may be transitioned automatically by the system, depending on a state, date, or action update.

Some processes may not have any automatic state transitions. In that case, it is useful to check the States section to view the process' state map and read the definitions of each state.

You can also review the Task list for that process. Each list typically describes which state to select when saving a process record.