A dark blue vertical bar is on the left. A blue arrow points right from the bar, containing the date.

7/10/2018

Maximo Calibration User Guide

ORA-TECH SYSTEMS

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Career and Objectives

10- Years diversified Experience of Work Project teams to deliver IT solutions or manage high availability & complex IT Operation Solutions in Airports and MOIs (Ministry of Interior) at KSA

Maximo Asset Management solution

C#.net, Ajax, JavaScript, XML, Web logics, Webserver 7.5, Administration of Webservers, WSDL

Search Engine Optimization Techniques Management Reporting, RFID based software development Microsoft .NET Technologies (C#.NET & VB.NET & ASP.NET), XML Web Services, C++ Plan, organize, direct, control and evaluate the operations of information systems. Extensive experience in CMMS, HRMS, Open Text implementation, support and system analysis

Skills in architecture design, installation, configuration and administration of Maximo Asset Management 7.5, Maximo Integration Framework (MIF), Maximo Develop and implement processes and procedures to ensure that all work and associated notifications are closed on time, with specific emphasis on Quality and Costs

Professional Projects Summary

- UCC Makkah- MOI Ministry of Interior Jail (KSA)
- HTC (KAIA) King Abdul Aziz International Airport, Jeddah
- OGDCL-UCH Project IBM Maximo Implementation (Pakistan, Baluchistan)
- ARAQA Palace - Riyadh Ministry of Interior (King's Salman ARAQA Palace)
- KSU King Saud Universities (All over the Kingdom) Ministry of Health
- MOI- Riyadh Phase-2 (Ministry of Interior Jail)
- KASCH King Abdul-Aziz Specialized Children Hospital (Ministry of Health)
- DSS (Decision Support System) Portal for BTAM (SBG) Saudi Bin Ladin Group for Operation and Maintenance
- SAP – Architecture and Implementation with Configuration
- Oracle-ERP (eAM) at KAIA Airport Implementation and Configuration of Flight Scheduling Management System
- Financial Reporting Management System for Business Intelligence Reporting (BI Tools) Like Cognos from IBM, Configuration and Implementation of Reports Designing Tools
- BIRT Tool for Reporting Management System, Hands on Experience for Developing as per Business Process of Organization

Volume

1

IBM MAXIMO

Calibration Module User Manual Guide

User Manual Guide

ORA-TECH


User Style Sheet Guide

DO NOT COPY

Calibration

Calibration is the process of configuring an instrument to provide a result for a sample within an acceptable range. Eliminating or minimizing factors that cause inaccurate measurements is a fundamental aspect of instrumentation design.

ICON KEY

 Valuable
information

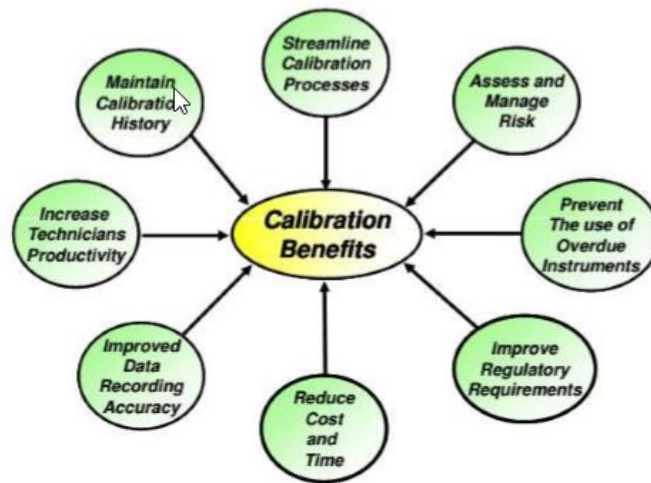
Instrument calibration is one of the primary processes used to maintain instrument accuracy

What calibration can do for you?

Calibration is the activity of checking, by comparison with a standard, the accuracy of a measuring instrument of any type. It may also include adjustment of the instrument to bring it into alignment with the standard.

Calibrations are performed using only a few calibrators to establish the correlation at specific points within the instrument's operating range. While it might be desirable to use a large number of calibrators to establish the calibration relationship, or "curve", the time and labor associated with preparing and testing a large number of calibrators might outweigh the resulting level of performance.

What calibration can do for you ?




3

IBM Focus & Commitment for a strong Calibration Solution:

- Calibrate Instrument, MT&E, Standards
- User-defined Calibration Data Sheets
- Fully 21 CFR Part 11 Compliant
- Calibration Job Plans & Job Plan Revision
- Calibration Intervals
- Calibration Work Orders
- Traceability & Reverse Traceability
- Loop Calibrations
- Calibration History



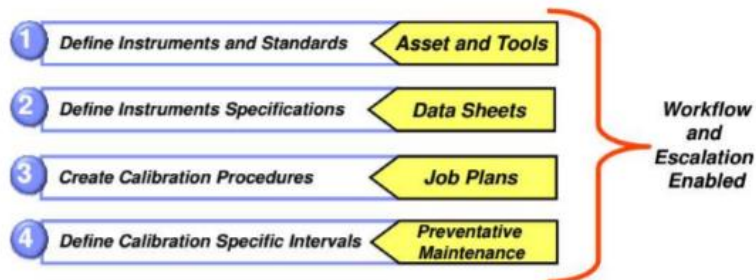
Calibration Functionality

Features						
	Assets	Assets defined as Calibration instruments	Tools defined as M&TE	Asset Templates	Locations as Tag Ids	Loop Calibration set-up
	Data Sheets	Customer defined resolution configurations	Linear and Non-Linear Instruments	Repeatable Test Points	EU, %SPAN, %URV, %READING	Function and Dynamic Checks
	Job Plans And Pkts	Revision Control	Calibration Tasks	Planned Labor, Materials and Tools	Associated Data Sheets	Calibration Specific Intervals
	Work Orders	Workflow enabled	Overdue Standard Validation	Out-of-Tolerance Notifications	Ability to enter Uncertainty Data	Maximo Mobile with Calibration
	History and Reports	Calibration History	Tool Usage	Calibration Drift	Calibration Errors	Overdue Calibrations

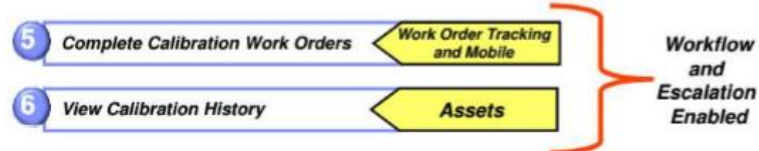
7

Calibration Functionality

Set-up



Technician Work



6

**Calibration Specific “Select Action
Menu” Options in Maximo Application**

Asset Actions

The following Calibration specific actions are available from the Asset (Cal) Select Action Menu:

Attach Data Sheet Template — Use to attach one or more data sheets to an asset record.

View Calibration History — Use to generate a list of calibration work orders associated with the asset. You can also generate a list for a specific date range.

View Tool Usage — Use to generate a list of all work orders that used a specific M&TE or standard to calibrate an asset (reverse traceability). You can also generate a list for a specific date range.

View Spot Check History — Use to view tool spot checks someone performed on the current asset using the Tool Spot Check action in the Work Order Tracking (Cal) Application. You can also generate a list for a specific date range.

☐ Select Records

View Crew Assignments

Calibration Details in Asset

Calibration Details

Create calibration asset records to define your instruments, measurement and test equipment (M&TE), and standards. [More Information](#)

Loop Location:

>>

Physical Location:

300-FIT-001A

Is M&TE?

☐

M&TE Classification:

Is Contaminated?

☐

Is Contaminated Description:

Buffer Solution?

☐

Internal Calibration?

☐

Calibration Vendor:

>>

Class:

CRITICAL

Operating Range From:

0

To:

100

Units:

In H2O

Next Calibration Due Date:

Due Date Extended?

Asset Department:

Model Number:

Loop Number:

Accuracy EU +/-:

%Span +/-:

100

%URV +/-:

100

%Reading:

Applied As:

+/-

Steps to Encode Data in Assets (Oil)

- 📖 Selection of Most Critical Assets, related to the Instrumentation Section which can cause the Failure of Specific Production Line.

Example:

Consider an Example of FIT (Flow Indicator Transmitter) at UCH-II of DEHY-Train-1 (300-FIT-001A) could be the Critical Asset which can cause the Failure of this Train. Henceforth the Class of this Asset is set to be Critical.

Class:

CRITICAL

Operating Range From:

0

To:

100

Units:

In H2O

Calibration:

The comparison of an instrument's performance to a standard of known accuracy. The objective of calibration is to ensure that an instrument's output properly corresponds to its applied input.

Operating Range:

📖 **From:** Enter the minimum numeric value of the operating range of the tool/Equipment. This field is used in conjunction with the Operating Range to field.

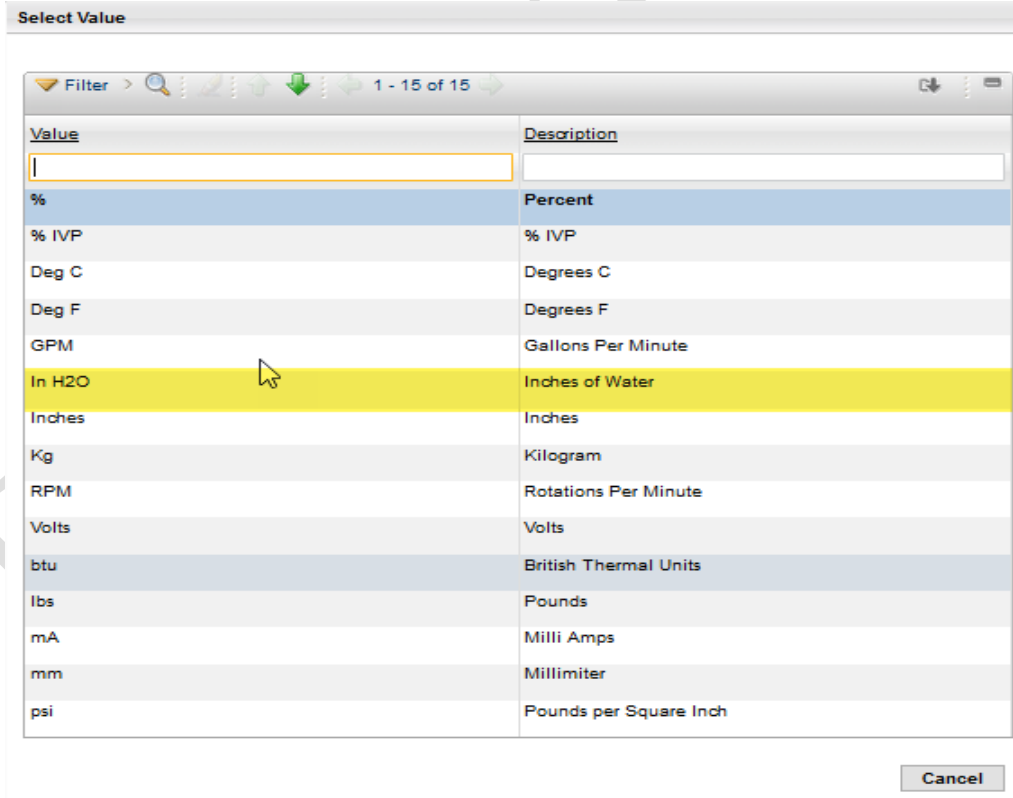
📖 **To:** Enter the maximum numeric value of the operating range of the tool. This field is used in conjunction with the Operating Range from field.

📖 **Selection of Units:**

Flow Indicator Transmitter:

Input Unit: inches of H2O

Please See the below Image in order to select the Right Input Unit for the FIT



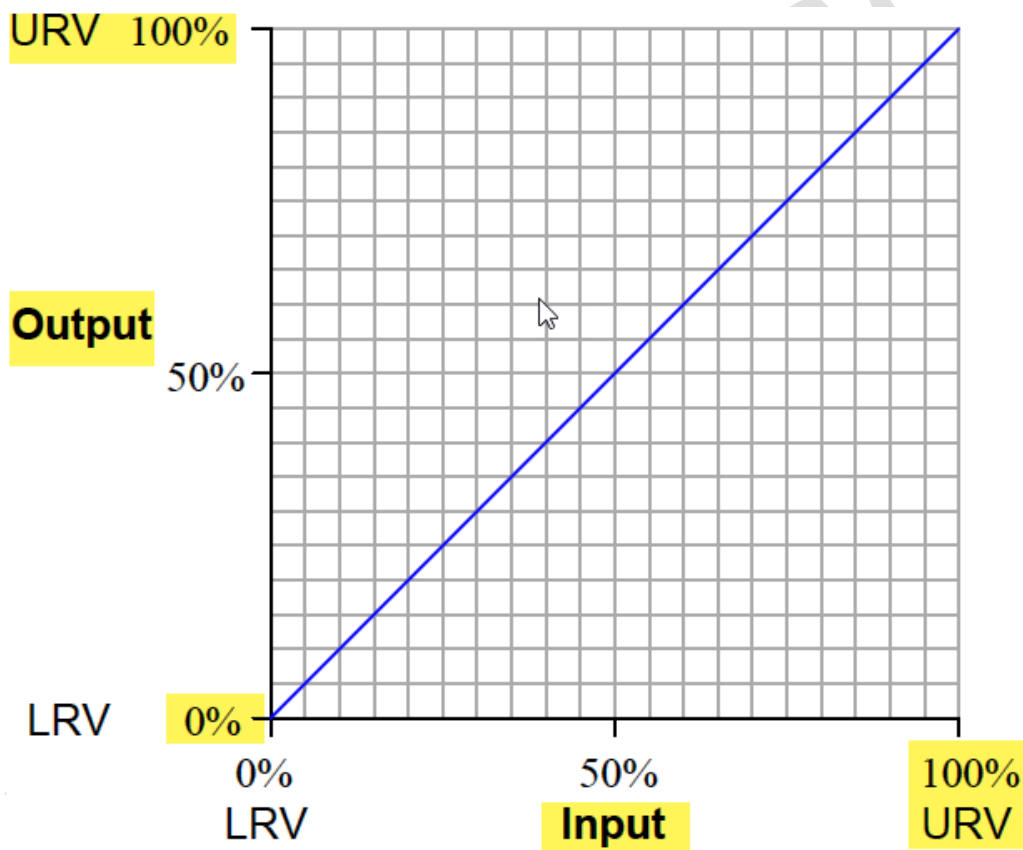
The screenshot shows a 'Select Value' dialog box with a search bar and a list of units. The 'In H2O' unit is highlighted in yellow. The list includes various units such as %, % IVP, Deg C, Deg F, GPM, Inches, Kg, RPM, Volts, btu, lbs, mA, mm, and psi.

Value	Description
%	Percent
% IVP	% IVP
Deg C	Degrees C
Deg F	Degrees F
GPM	Gallons Per Minute
In H2O	Inches of Water
Inches	Inches
Kg	Kilogram
RPM	Rotations Per Minute
Volts	Volts
btu	British Thermal Units
lbs	Pounds
mA	Milli Amps
mm	Millimeter
psi	Pounds per Square Inch

Cancel

📖 **% Span:**

- 📖 The Purpose of the Calibration is to ensure the input and output of an instrument reliably correspond to one another throughout the entire range of operation. We may express this expectation in the form of a graph, showing how the input and output of an instrument should relate. Graph is linear in nature in most of industries.
- 📖 **This graph shows how any given percentage of input should correspond to the same percentage of output, all the way from 0% to 100%.**
- 📖 Things become more complicated when the input and output axes are represented by units of measurement other than the Percentage.



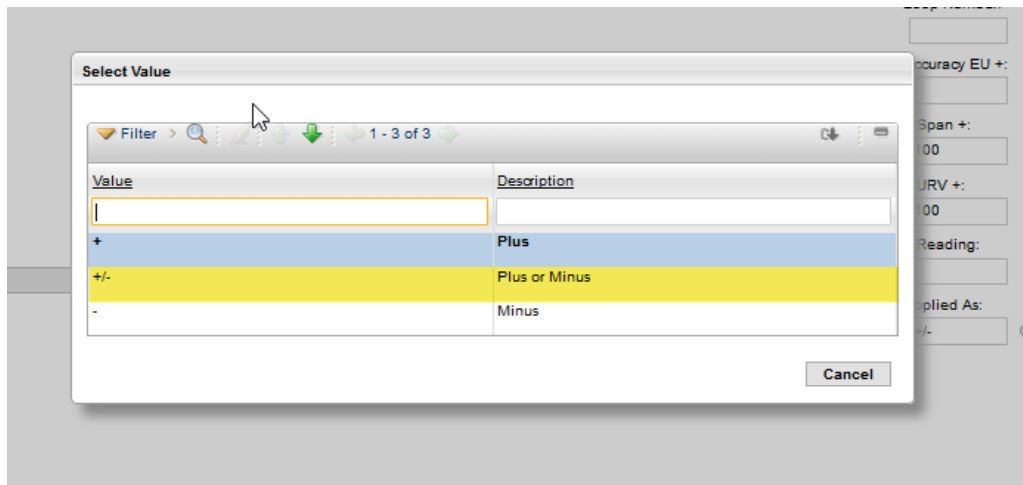
%Span +:

%URV +:

%Reading:

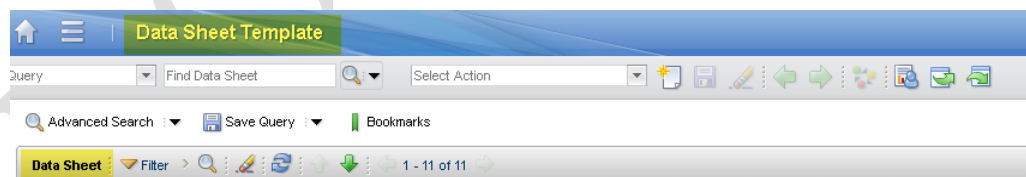
Applied As:

% Applied AS: Enter the direction of the accuracy fields (%Span, %URV, and %Reading). Valid entries are +, -, and +/-



Preparation / Considerations – Assets

- Identify and build the Asset List of assets that will go into Maximo those require Calibration.
- Depends on the amount of instruments, Category, functions and points. This document can serve as the input for creating the data in Maximo
- If Maximo is already in use for NON-Calibrated Assets. Then you need to transform your calibration assets to conform with Maximo best practices (Guidelines, procedures)



How to Prepare the Data Sheets?

Attached the Data Sheet to the Respective Asset/Locations

Attach Data Sheets

❓ To specify the data sheet you want to attach, type the necessary data for each sheet. To refine your list, enter filter criteria for the column(s) and press Enter or click search.

Data Sheet	Description
<input type="text"/>	<input type="text"/>
H2S_FIT_IN\$	Data Sheet of FIT at H2S Trains UCH-II (300/310)

OK

New Row

Attach Data Sheets

❓ To specify the data sheet you want to attach, type the necessary data for each sheet. To refine your list, enter filter criteria for the column(s) and press Enter or click search.

Data Sheet	Description
<input type="text"/>	<input type="text"/>
H2S_FIT_IN\$	Data Sheet of FIT at H2S Trains UCH-II (300/310)

Select Value

Go To Data Sheet Template

OK

New Row

Assets (Oil)

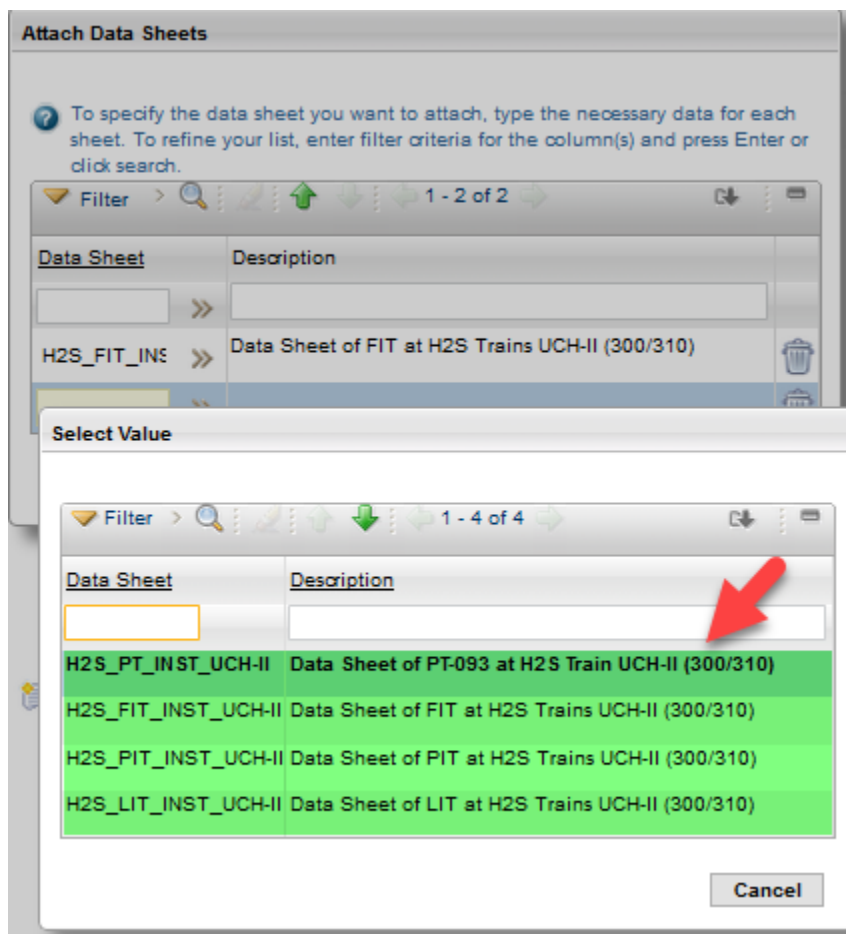
Data Sheet Template

Query: Find Data Sheet Select Action

List Data Sheet Work Assets Configuration

Data Sheet:
H2S_FIT_IN\$ Data Sheet of FIT at H2S Trains UCH-II (300/310)

Revision:
0



ICON KEY

- * Valuable information

Preparation / Considerations - Data Sheet

You can configure a data sheet for the following types of asset functions:

- Analog asset functions
- Discrete asset functions
- Assets with multiple analog and discrete asset functions
- Use the Data Sheet Template application to perform the following functions:
- Create data sheets
- Associate work assets to a data sheet
- Configure how values are formatted and saved
- Find data sheet records

- * Valuable information

Preparation / Considerations - Data Sheet

Define creating ranges of the Instruments (On Asset Master list)

- Define the General category of the instruments.
- Gauge
- Temperature Transmitters
- Scales

This grouping represents your instruments Assets. Data Sheet will be created per grouping to allow datasheets to be shared among common categories.

- Numbering for Data Sheet Templates
- Auto number vs Smart Number
- **Description**

Identify what the DS is performing Device, input Range, output range.
SCALE, 0 To 10, KG, 0 To 10, KG

- Create Data Sheet ID as FIT (Flow Indicator Transmitter)
- H2S_FIT_INST_UCH-II
- Data Sheet of FIT at H2S Trains UCH-II (300/310)
- OGDCL
- UCH

What is Data Sheet?

Ora-Tech Systems
<h3>Data Sheet</h3> <p>Data sheets provide technicians with the information that they need to perform a calibration. A data sheet is a template that defines the specifications of an asset for the calibration process.</p> <p>A data sheet defines the asset function specifications and the calibration point of an asset. The data sheet also defines the functional checks and dynamics checks of an asset, if required.</p> <p>Data sheets are associated with assets and are copied to calibration work orders for the asset. On the work order data sheet, the technician enters calibration As Found and As Left data. This data is used to analyze asset performance and calibration frequency.</p> <p>The data sheet also records uncertainty measurement data for instruments and measuring and test equipment (M&TE). This uncertainty data is calculated and imported from an external source into the Data Sheet Template application and the Work Order Tracking application.</p>

Steps to Create Data Sheet

- Data Sheet Name and Unique ID
- Proper Description Name of Data Sheet Clarify the Assets Data Sheet
- SITEID = "UCH" (In Case of UCH SITE)
- Encoding the Uncertainty Data
- K-Factor
- Confidence Level
- Asset Functions
- Type of Calibration
- Input Units/Output Units
- Input Information and Output Information
- Scaling Factor
- Tolerance
- Calibration Points

Data Sheet Name with Unique ID

List ViewData SheetWork AssetsConfiguration

Data Sheet:

H2S_FIT_INST.

Data Sheet of FIT at H2S Trains UCH-II (300/310)

Revision:

0

Organization:

OGDCL

Site:

UCH

Status:

APPR

Status Date:

06/07/18 4:18 PM

Attachments

Uncertainty Data

Uncertainty data is calculated by an external system. [More information](#)

System ID:

k-Factor:

1.960

Confidence Level:

95.00

Uncertainty Data

Uncertainty data is calc

System ID:

k-Factor:

1.960

Confidence Level:

95.00

Asset Functions

Asset Function

1

Functionality

ANALOG

Select Value

Filter

1 - 6 of 6

Value	Description
1.000	
1.645	
1.960	
2.000	
2.576	
3.000	

Cancel

Uncertainty Data

Expanded uncertainty and coverage factors are an important part of calculating uncertainty. Calculating them is not very difficult, but coverage factors can be a little confusing.

Select Value

Value	Description

1.000
1.645
1.960
2.000
2.576
3.000

Select Value

Value	Description
68.27	
90.00	
95.00	
95.45	
99.00	
99.73	

You find that you have 19 degrees of freedom and you want to find the coverage factor for 95% confidence. In Maximo for Calibration, These Options already Encoded and Managed in K-Factor



Confidence	90	95	95.45	99
alpha	0.1000	0.0500	0.0455	0.0100
df				
1	6.314	12.706	13.968	63.657
2	2.920	4.303	4.527	9.925
3	2.353	3.182	3.307	5.841

- New Row Adding by Asset Function
- Add the Function Test Unique ID
- Add the Description of Asset Function
- Add the Type Value of Asset Functions for Analog and Discrete

The screenshot shows the 'Asset Functions' interface. At the top, there's a header with 'Asset Functions', a 'Filter' button, and a status '1 - 1 of 1'. Below this is a table with columns 'Asset Function', 'Description', and 'Type'. A row is highlighted with '1' in the 'Asset Function' column, 'Functionality' in the 'Description' column, and 'ANALOG' in the 'Type' column. Red callouts are placed over the interface: 7 points to the 'Asset Function' column header, 8 points to the 'Functionality' text in the description field, 9 points to the 'Calibration Point?' checkbox, 10 points to the 'ANALOG' type value, and 1 points to the 'ANALOG' row in the 'Select Value' dialog box. The 'Select Value' dialog box is open, showing a table with 'Value' and 'Description' columns. It lists 'ANALOG' with description 'Analog asset function' and 'DISCRETE' with description 'Discrete asset function'. A 'Cancel' button is at the bottom right of the dialog.

What is Asset Function?

While a data sheet lets you enter calibration data for a specific asset, it also allows the user to enter calibration data for one or more functions that asset may perform. For example, a tablet tester measures both mass and length. The use of asset functions allows the user to specify the unique attributes of each function. You can create a single sheet that encompasses all of the asset's functions instead of creating separate data sheets.

- Add the Min Field Resolution (Decimal Places)
- Enter Input Range from and To along with Units
- Enter the Range Limit From and To along with As Reading %
- Enter the Values Tolerance on Output
- Out Put Range from and To along with Units. Which is mostly used for PSI, PIT, FIT, and LIT as mA (Mille Ampere) (4 -20) mA
- Enter the Processing Unit in %
- And Last Enter the Scaling Factor.

Input Information		Output Information	
Tolerance on Input? <input type="checkbox"/>	Input Limits Clipped? <input checked="" type="checkbox"/>	Tolerance on Output? <input checked="" type="checkbox"/>	Output Limits Clipped? <input type="checkbox"/>
Min Field Resolution: 0	Range Limit From: 0	Min Field Resolution: 0	Square Root of Input? <input type="checkbox"/>
Input Range From: 0	To: 100	Output Range From: 4	Reverse Flow? <input type="checkbox"/>
To: 100	As: %READING	To: 20	Process Units: %
Units: In H2O		Units: mA	Scaling Factor: 0.16

How to Calculate Scaling Factor?

Instrument Zero and Span Calibration

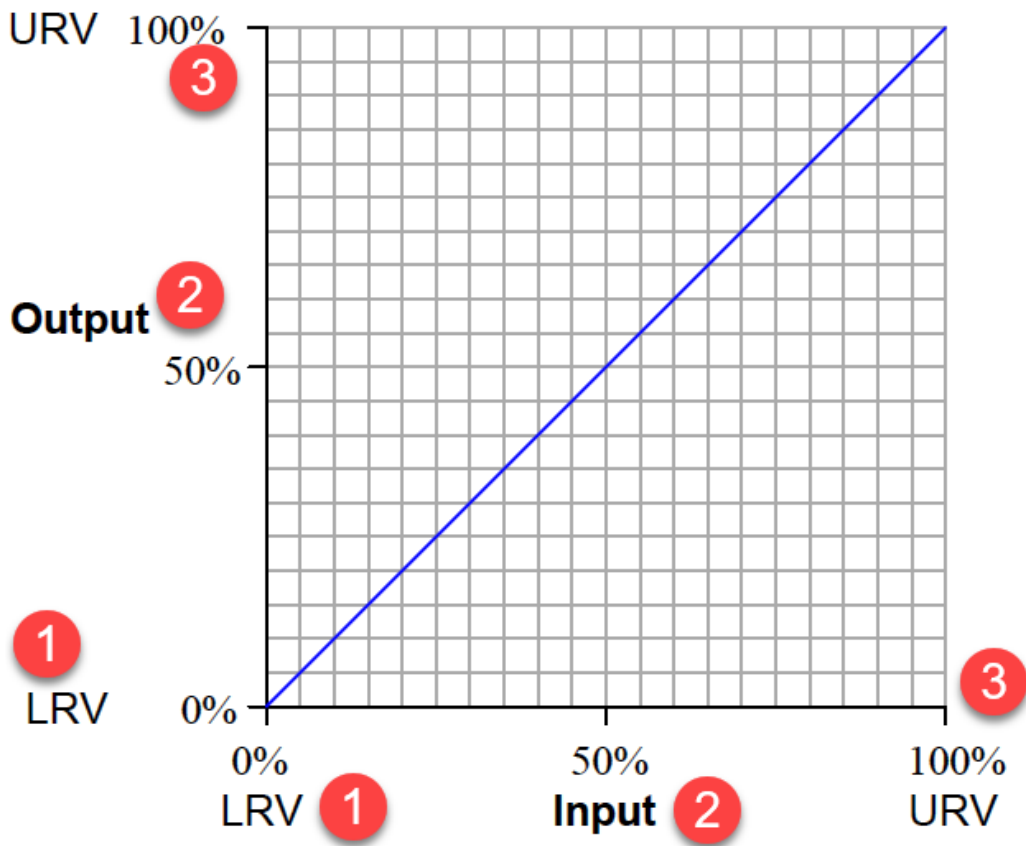
Every instrument has at least one input and one output. For a pressure sensor, the input would be some fluid pressure and the output would (most likely) be an electronic signal. For a loop indicator, the input would be a 4-20 mA current signal and the output would be a human-readable display. For a variable-speed motor drive, the input would be an electronic signal and the output would be electric power to the motor.

To calibrate an instrument means to check and adjust (if necessary) its response so the output accurately corresponds to its input throughout a specified range. In order to do this, one must expose the instrument to an actual input stimulus of precisely known quantity. For a pressure gauge, indicator, or transmitter, this would mean subjecting the pressure instrument to known fluid pressures and comparing the instrument response against those known pressure quantities. One cannot perform a true calibration without comparing an instrument's response to known, physical stimuli.

To range an instrument means to set the lower and upper range values so it responds with the desired sensitivity to changes in input. For example, a pressure transmitter set to a **range of 0 to 200 PSI (0 PSI = 4 mA output; 200 PSI = 20 mA output)** could be re-ranged to respond on a scale of 0 to 150 PSI (0 PSI = 4 mA; 150 PSI = 20 mA).

In analog instruments, re-ranging could (usually) only be accomplished by re-calibration, since the same adjustments were used to achieve both purposes. In digital instruments, calibration and ranging are typically separate adjustments (i.e. it is possible to re-range a digital transmitter without having to perform a complete recalibration), so it is important to understand the difference.

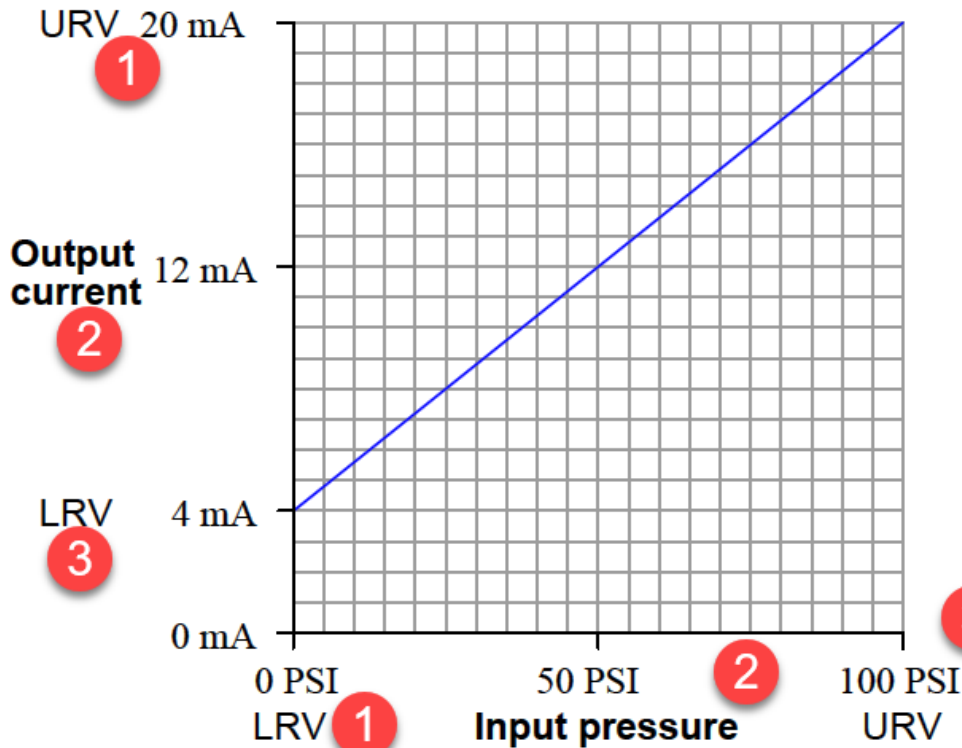
ZERO AND SPAN ADJUSTMENTS



This graph shows how any given percentage of input should correspond to the same percentage of output, all the way from 0% to 100%.

Things become more complicated when the input and output axes are represented by units of measurement other than "percent." Take for instance a pressure transmitter, a device designed to sense a fluid pressure

and output an electronic signal corresponding to that pressure. Here is a graph for a pressure transmitter with an input range of 0 to 100 pounds per square inch (PSI) and an electronic output signal range of 4 to 20 milliamps (mA) electric current:



Although the graph is still linear, zero pressure does not equate to zero current. This is called a live zero, because the 0% point of measurement (0 PSI fluid pressure) corresponds to a non-zero ("live") electronic signal. 0 PSI pressure may be the LRV (Lower Range Value) of the transmitter's input, but the LRV of the

transmitter's output is 4 mA, not 0 mA. Any linear, mathematical function may be expressed in "slope-intercept" equation form:

$$y = mx + b$$

y = Vertical position on graph

x = Horizontal position on graph

m = Slope of line

b = Point of intersection between the line and the vertical (y) axis

This instrument's calibration is no different. If we let x represent the input pressure in units of PSI and y represent the output current in units of milliamps, we may write an equation for this instrument as follows:

$$y = 0.16x + 4$$

One adjustment is called the zero while the other is called the span. These two adjustments correspond exactly to the b and m terms of the linear function, respectively: the "zero" adjustment shifts the instrument's function vertically on the graph (b), while the "span" adjustment changes the slope of the function on the

graph (m). By adjusting both zero and span, we may set the instrument for any range of measurement within the manufacturer's limits.

UCH-II INSTRUMENT

SCALING FACTOR :: (HOW TO CALCULATE SCALING FACTOR)

Consider An Example of FIT:- Flow Indicating Transmitter. (FIT-001A-D/Train1)

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

$y = mx + C$

Constant C will be calculated By MAXIMO TO BALANCE/ MATCH mA. (Constant = 4) mA

Slope Eq: $y = mx + C$

mA — y-axis $\Rightarrow y_2 = 20$

mA — y-axis $\Rightarrow y_1 = 4$

In H₂O — x-axis $\Rightarrow x_2 = 100$

In H₂O — x-axis $\Rightarrow x_1 = 0$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{20 - 4}{100 - 0} = \frac{16}{100} = 0.16$$

S.F

when $x = 75$, then

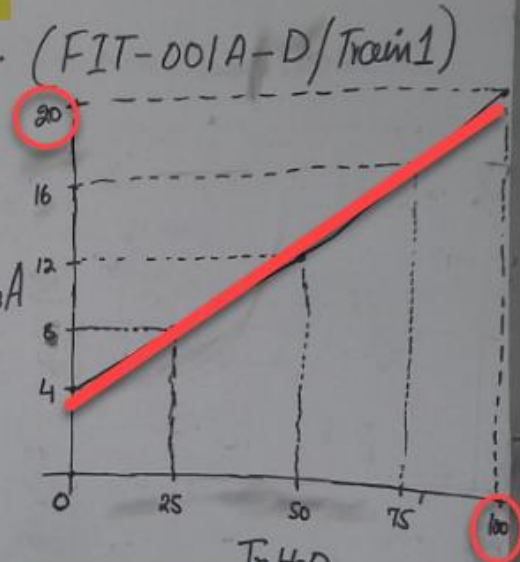
$$y = mx + C$$

$$y = 0.16 \times 75 + C$$

$$y = 12 + 4$$

$$y = 16$$

So when $x = 75$
 $y = 16$
 (75, 16).



In H ₂ O	mA
0	4 mA
25	8 mA
50	12 mA
75	16 mA
100	20 mA

Constant is 4

Tolerance:

- Add the Tolerance Range from and to
- AS Reading %
- Status When Exceeded (Very Important)

Tolerance 1

Description:

Single From:

To:

As:

Status when Exceeded:

1

Calibration Points:

- Enter All Calibration Points
- Just Encode the Nominal Input, Maximo CAL will calculate automatically the Desired Output in mA w.r.t Scaling Factor

Calibration Points	Function Checks	Dynamic Checks
Calibration Points Filter > 1 - 5 of 5		
Asset Function	Calibration Point	Description
1	0	First Calibration Point
1	25	Second Calibration Point
1	50	Third Calibration Point
1	75	Fourth Calibration Point
1	100	Fifth Calibration Point

Nominal Input	Desired Output
0	4
852.5	8
1705	12
2557.5	16
3410	20

Attach the Assets/Locations Associated with Data Sheet:

List ViewData SheetWork AssetsConfiguration

Data Sheet:

H2S_LIT_INST

Data Sheet of LIT at H2S Trains UCH-II (300/310)

Revision:

1

Value Interchange

Organization:

OGDCL

Site:

UCH

Work Assets

Filter

1 - 2 of 2

Location	Asset	Item	Description
300-LIT-013			Level Indication Transmitter
310-LIT-013			Level Indication Transmitter

New Row

List ViewData SheetWork AssetsConfiguration

Data Sheet:

H2S_FIT_INST

Data Sheet of FIT at H2S Trains UCH-II (300/310)

Revision:

0

Work Assets

Filter

1 - 6 of 8

Location	Asset	Item
	32547	
	32548	
	32549	
	32550	
	33135	
	33136	

	Description
1	Flow Indicator Transmitter
2	Flow Indicator Transmitter
3	Flow Indicator Transmitter
4	Flow Indicator Transmitter
5	Flow Indicator Transmitter
6	Flow Indicator Transmitter

New Row

Calibration Terminologies & Data Dictionary

Ora-Tech Systems

Terminologies

Asset Function	While a data sheet lets you enter calibration data for a specific asset, it also allows the user to enter calibration data for one or more functions that asset may perform. For example, a tablet tester measures both mass and length. The use of asset functions allows the user to specify the unique attributes of each function. You can create a single data sheet that encompasses all of the asset's functions instead of creating separate data sheets.
Calibration	The comparison of an instrument's performance to a standard of known accuracy. The objective of calibration is to ensure that an instrument's output properly corresponds to its applied input.
Calibration Point	The specific calibration requirement for each asset function. For example, a three-point check at 20%, 50%, and 75% calibrations points of an input range.
Clipped Range on Nominal Limit Values	You can specify that Maximo clips or limits the Range on Nominal lower and upper limit values for analog functions to the lower and upper input calibrated range of the asset function. Selecting the Limits Clipped check box lets you calibrate an asset within its input range.

Ora-Tech Systems

Terminologies

Clipped Tolerance Limit Values	You can specify that Maximo clips or limits the Tolerance lower and upper limit values for analog functions to the lower and upper output calibrated range of the asset function. Selecting the Limits Clipped check box lets you calibrate an asset within its output range.
Data Sheet	A data sheet provides a template to specify the input and output values and to enter As Found and As Left values.
Dead band	The difference between a switch's set and reset points.
Desired Output	The output you want to attain for a given input (for example, 0 psi input = 4 mA output).
Direction	The referential direction (that is, increasing or decreasing) of the specified calibration point in the calibration process.
Discrete Data Sheet	A discrete data sheet defines the necessary information to calibrate a discrete instrument or M&TE (for example, a switch). You define the data sheet in the Data Sheet Template application.
DUT	Device under test. The asset being calibrated.
UTT	Unit under test

Terminologies

Field Resolution	The minimum number of decimal places required for a numeric field value. Maximo validates that the field contains the specified number of decimal places. Maximo calculates input and output functions to the specified resolution.
Input	The process variable applied to the DUT.
Input Range	The upper and lower input values between which you calibrate an asset. Input Lower Range value is the minimum specified input value. Input Upper Range value is the maximum specified input value.
Instruments	Devices used to monitor and control plant processes (for example, gauges, transmitters, and switches).
Measuring and Test Equipment (M&TE)	M&TE are the tools used to calibrate instruments.
No Adjustment Made Option	The No Adjustment Made option lets the user specify a "no adjustment made" tolerance. If all As Found values are within the acceptable user specified tolerance, the technician can select the No Adjustment Made check box on the work order data sheet. When the technician selects the No Adjustment Made check box, Maximo copies the As Found values to the As Left fields on the work order data sheet , and both fields become read only.

Terminologies

Nominal Input	The user specified input value for each analog calibration point.
Output	The DUT's representation of the input.
Output Range	The upper and lower output values between which you calibrate an asset. Output Lower Range value is the minimum specified output value. Output Upper Range value is the maximum output value.
Process Units	Define the engineering units used for reporting calibration error.
Range on Nominal	The user-specified acceptable limits for input values for each calibration point. The range on nominal value might be limited to the input lower range value and input upper range value in certain cases.
Scaling Factor	The conversion factor from output engineering units to user specified units. For example, an I/P convertor might represent a temperature signal (current and pneumatic pressure). The user might want to show error in temperature engineering units (°C or °F).
Set Point	The input value at which a discrete device should actuate.
Set Point Action	The desired behavior of the discrete device (for example, a switch) at the specified set point (for example, open and close).

Terminologies

Standard	A standard is a tool used to calibrate assets. A standard has a higher degree of accuracy than the asset being calibrated.
Tolerance	<p>Tolerance defines an acceptable value or value range for a specified output value.</p> <p>Generally the asset's manufacturer establishes tolerance limits. For each asset function, Maximo allows up to four tolerance levels:</p> <ul style="list-style-type: none">• Tolerance 1 is the tightest tolerance.• Tolerance 4 is the widest tolerance.• You define the status for each tolerance level.• By default, Maximo assigns a status of PASS if the output value does not exceed Tolerance 1.

Calibration Job Plans

Job Plans:

- Create the Job Plan
- Enter with Unique ID Representing the Job Plan ID
- Enter Description along with SITE ID
- Encode the Job Plan Tasks specifically related to the Calibration
- Enter the Labor/Craft
- Encode the Tool which is used to Calibrate the Equipment
- Enter the Job Plan Tasks Description
- Enter the Calibrated Assets in Work Assets Tab
- Attach the Data Sheet which is already associated with Specific Job Plan's Work Assets

Job Plan	Description	Performing Section	Revision	Status	Duration	Template Type	Supervisor	Organization	Site
AM-LIT-CAL	Annual Calibration Plan for Level Indicator Transmitter for Instrument Section UCH-4	INST	0	ACTIVE	6:00	MAINTENANCE		OGDCL	UCH
AM-PIT-CAL	Annual Calibration Plan for Pressure Indicating Transmitter for Instrument Section UCH-4	INST	0	DRAFT	6:25	MAINTENANCE		OGDCL	UCH

Job Plan: AM-PIT-CAL

Description: Annual Calibration Plan for Pressure Indicating Transmitter for Instrument Section UCH-4

Revision: 0

Organization: OGDCL

Site: UCH

Performing Section: INST

Sequence	Task	Description	Nested Job Plan	Duration	Meter	Appointment Required?	Include in Schedule?
10	Obtain Work Permit and perform assignment(s) in the present			0.25			
20	Ensure all testing tools are available and in working condition			0.15			
30	Put the control loop on manual mode			0.15			
40	Check and note voltage on the power/signal terminals			0.15			

Task	Crew Type	Craft	Skill Level	Lab
		A.E (INST.)	EXPERIENCED	
		Detail Menu	EXPERIENCED	
		HELPER (INST.)	EXPERIENCED	

Task	Tool	Description	Tool Quantity
	I - HART COMM 475	Hart Communicator Fisher Rosemount 475 Multy Ranges	1.00

Job Plan:

AM-PIT-CAL

Annual Calibration Plan for Pressure Indicating Transmitter for

Work Assets and Safety Plans Filter 8 1 - 4 of 4

Location	Asset	Item
	32900	
	32904	
	33463	
	33467	

Data Sheets Filter 1 - 1 of 1

You can associate data sheets with a work asset on a calibration job plan. [More information](#)

Sequence	Data Sheet	Description
1	H2S_PIT_INST	Data Sheet of PIT at H2S Trains UCH-II (300/310)

9

Calibration Preventive Maintenance PMCAL

Preventive Maintenance Record:

- Create Preventive Maintenance Record from the PM Application
- PM Unique ID and Description
- SITE ID
- WORK PERMIT TYPE
- ASSET TAG #
- Attach Job Plan which is associated with CALIBRATION IN this case

Work Order Information

Job Plan:

AM-LIT-CAL



Description:

Annual Calibration Plan for Level Indicator Transmitter for Inst



- Define PM Work Type which should be PMCAL
- Work Order Status = WAPPR
- Owner Group

Owner Group:

UCH_PLAN_PLANT



Owner Group (PLAN_PLANT/PLAN_WELL):

UCH_PLAN_PL



- In Frequency Tab

List View	PM	Frequency	Seasonal Dates	Job Plan Sequence
-----------	----	-----------	----------------	-------------------

PM:

PMCAL-T-1-LIT

Frequency

Preventive Maintenance for CAL of LIT 013 at UCH-II Dehydrati

Work Order Generation Information

Use Last Work Order's Start Date to Calculate Next Due Date?



- Enter the General Information about the Frequency of PMs
- Time Based Frequency

* Frequency:

* Frequency Units:

Alert Lead (Days):

Estimated Next Due Date:

- Job Plan Sequence Tab
- Enter the Sequence which you want to Set for Generating the WO based on Frequency Combination Like M,Q,H,Y
- Generate Forecast Based on the Maximum Date till Forecasting your Master Plan

PM:

Query: Find PM

PM:

Forecast Details:

Site: Status:

Forecast Dates Locked? ☒

Reforecast Subsequent Dates? ☐

There are no rows to display.

Work Order Generation after Triggering PM Records

Calibration Preventive Maintenance PMCAL Work Order

- Work Order is Generated through PMCAL
- Work Order Type is PMCAL
- Fill the Information Likewise Simple Work Orders

The screenshot displays the 'Work Order Tracking (Oil)' application interface. The top section shows a search bar with 'Find Work Order' and a 'Select Action' dropdown. Below this is an 'Advanced Search' section with 'Save Query' and 'Bookmarks' options. The main table lists work orders with columns for 'Work Order', 'Reported Date', and 'Description'. A specific work order is highlighted with a yellow background.

Below the table, there are several input fields for 'Location', 'Status', 'Worktype', 'Assignment', and 'Performing Section'. A 'Select Value' dialog box is open, showing a list of values for the 'Worktype' field.

The detailed view of the work order is shown at the bottom, with various fields for 'Area', 'Work Order', 'Asset', 'Work Permit Type', 'Location', 'Parent W/O', 'Classification', and 'Class Description'. The 'Status' field is set to 'WAPPR'. The 'Attachments' section shows 'Total Cost (Estimated)' and 'Total Cost (Actual)' both at 0.00. The 'Status' is 'WAPPR' and the 'Status Date' is '06/07/18 11:22 AM'.

Numbered callouts (1-6) highlight specific fields in the application:

- 1: Work Order ID (18-12465)
- 2: Reported Date (06/07/18 11:22 AM)
- 3: Location (300-LIT-013)
- 4: Worktype (PMCAL)
- 5: Status (WAPPR)
- 6: Status Date (06/07/18 11:22 AM)

- Job Plan Regarding CAL is already Attached along with Work Assets regarding Calibration Details
- PMCAL #
- Fill the Information Likewise Simple Work Orders

Job Details

Job Plan:

AM-LIT-CAL »

1

Job Plan Revision #:

0

PM:

PMCAL-T-1-LIT »

2

HSE Monitoring Plan?

☐

Measurement Point:

Safety Plan:

 »

Contract:

 »

Condition for Work:

 »

Calibration Details

Frequency:

8

Calibration Overdue Date:

06/07/18 12:00 AM



Loop Calibration?

☒

Frequency Units:

MONTHS



Next Calibration Due Date:

06/07/18 12:00 AM





Physical Location:


300-LIT-013





Scheduling Information


* Target Start: 10/07/18 10:00 AM  **1**


* Target Finish: 10/07/18 10:00 PM  **2**

Scheduled Start: 10/07/18 10:00 AM  **3**


Scheduled Finish: 10/07/18 10:00 AM  **4**


Start No Earlier Than: 

Actual Start: 

Actual Finish: 

* Duration: 6:00 **5**

Time Remaining: 

Predecessors: 


Tasks for Work Order 18-12465					Filter	1 - 6 of 6
Sequence	Task	Summary	Observation	Estimated Duration	Start	End
10	Discuss the CAL Criteria with Shift Engineer			0:15		
20	Visual Inspect the Transmitter			2:00		
30	Analyze the Measurement Points			2:00		
40	Isolate the LIT from Process			0:30		
50	De Pressurized the LIT			0:30		
60	Used Hard Communicator-475 in order to Calibrate the LIT			1:00		


Tools			Filter	1 - 1 of 1
Task	Tool	Description		
1 - HART COMM 475		Hart Communicator Fisher Rosemount 475 Multy Ranges		

- Data Sheet is already Attached due to the Work Assets which are associated with Job Plans

List View Work Order Plans Assignments Related Records Actuals Safety Plan Log **Data Sheet**

? You must enter the results of the as-found and as-left data before you can close a work order. [More information](#)

Work Order: 18-12465 * Preventive Maintene for CAL of LIT 013 at UCH-II Dehydrat 

Parent WO: 

Associated Data Sheets Filter 1 - 1 of 1

Data Sheet	Description
H2S_LIT_INST.	Data Sheet of LIT at H2S Trains UCH-II (300/310)

Asset	Location	Tag Location
32521		300-LIT-013

Location	Tag Location	As Found Status	As Left
	300-LIT-013		

Input Units	Output Units	No Adj Made?	A
	mA		

- Delete Location
- Add to Bookmarks
- View Calibration History
- Attach Data Sheets**
- Associate Work Zone
- Run Reports

Attach Data Sheets

? To specify the data sheet you want to attach, type the necessary data for each column.
 To refine your list, enter filter criteria for the column(s) and press Enter or click the Filter icon.

Filter 1 - 1 of 1

Data Sheet	Description
H2S_LIT_INST.	Data Sheet of LIT at H2S Trains UCH-II (300/310)

- All the Calibration Details is already associated no need to attach here the Data Sheet as this automated from the PMCAL

Asset Functions											
Filter > 1 - 1 of 1											
Asset Function	Description	Type	Calibration Points?	Function Checks?	Dynamic Checks?	Input Units	Output Units				
1	Functionality	ANALOG	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	mm	mA				

Calibration Points											
Filter > 1 - 5 of 5											
Asset Function	Calibration Point	Nominal Input	Desired Output	Pv As Left Input	Pv As Left Output	As Found Input	As Found Output	As Left Input	As Left Output	Set Point	Pv As Left
1	0	0	4								
1	25	852.5	8								
1	50	1705	12								
1	75	2557.5	16								
1	100	3410	20								

Manual Input

☒ Shift Incharge CCR-II

☐ Waiting for ATA

☐ Pending

Memo:

Please Issue PTW

OK

Cancel

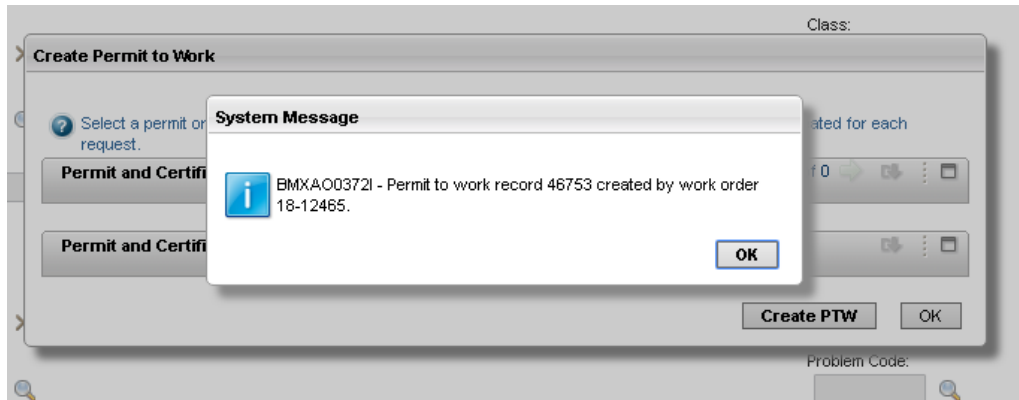
- Send WO to CCR-II In order to Take the PTW from Process Section
- Create the PTW and Fill the Details Accordingly

Inbox / Assignments			
Description	Start Date	Due Date	Last Memo
Next Assignment Due: 10/07/18 4:46 PM			
SR UCH-II 11532 - Rectification of hot oil pump # G due to high vibration - NEW - ELEC	10/07/18 4:34 PM	10/07/18 4:34 PM	The motor will be sent to m
WO UCH-II 18-12465 - Preventive Maintenane for CAL of LIT 013 at UCH-II Dehydration Train-1 - Waitin	10/07/18 4:46 PM	10/07/18 4:46 PM	Please Issue PTW
WO 18-9528 - Welding job for installation of sheds at RO plant . - Waiting for PTW	09/07/18 3:27 PM	09/07/18 3:27 PM	Close PTW
WO UCH-II 18-12920 - PM of Earthing Pits at Amine Train-1 and Cooling Tower Train-1 From EP-34 to EP	10/07/18 3:04 PM	10/07/18 3:04 PM	Job completed. Plz close th

Manual Input

☒ Create PTW
☐ Send Back to Planner Plant
☐ Send Back to Planner Well

Memo:



Related Permits to Work		Filter	1 - 1 of 1
Permit to Work	Description		
46753	Preventive Maintenane for CAL of LIT 013 at UCH-II Dehydrati		

Change Status

Permit:

46753

Preventive Maintenane for CAL of LIT 013 at UCH-II Dehydrati

Status:

REQUEST

Requested

* New Status:

Draft

OK

Cancel

Issuing Authority		Extension	Start	Finish	Issued?	Sign Off Date
302786	>>	0	10/07/18 5:16 PM	10/07/18 6:16 PM	<input checked="" type="checkbox"/>	10/07/18 5:17 PM

Dehydrati

Manual Input

☐ Mechanical

☒ Instrument

☐ Electrical

☐ Process

☐ Communication

☐ Telemetry

☐ Production

☐ Production Facility

☐ Telemetry

Memo:

Please Accept PTW

OK

Cancel

Site:

UCH

Status

Type

COLD

Workflow Assignments

Filter

11 - 20 of 21

Assigned Person Code	Name	Description	Process
301503	AZMAT ULLAH	PMCAL WO UCH-II 18-12465 on asset 300-LIT-013 - Preventive Maintenance for UCH-WO-CM CAL of LIT 013 at UCH-II	

Inbox / Assignments

Description

Start Date

Due Date

Last Memo

startcntr/M

Next Assignment Due: 10/07/18 5:19 PM

PM WO UCH-I 18-12877 on asset - Preventive Maintenance of PCV215 Dehydration Train - 10 at UCH-I - 10/07/18 1:54 PM 10/07/18 1:54 PM job completed please close PTW

PMCAL WO UCH-II 18-12465 on asset 300-LIT-013 - Preventive Maintenance for CAL of LIT 013 at UCH-II 10/07/18 5:19 PM 10/07/18 5:19 PM Please Accept PTW

Acceptance

Filter

1 - 1 of 1

Performing Authority	Extension	Person's Location	Person's Site	Accepted?	Sign Off Date
301503	0		UCH	<input checked="" type="checkbox"/>	10/07/18 5:24 PM

Select PeopleNew Row

Labor

Materials

Services

Tools

Labor

Filter

1 - 1 of 1

Task	Labor	Name	Approved?	Start Date	End Date	Start Time	End Time	Regular Hours(Each)	Rate
	301503	AZMAT ULLAH	<input checked="" type="checkbox"/>	10/07/18	10/07/18	5:25 PM	5:30 PM	0:05	0.00

Labor

Location	Tag Location	As Found Status	As Left Status	Required?
	300-LIT-013	INSPECT	PASS	<input checked="" type="checkbox"/>

New Row

Calibration Points

Function Checks

Dynamic Checks

Calibration Points

Filter

1 - 5 of 5

Asset Function	Calibration Point	Nominal Input	Desired Output	Pv As Left Input	Pv As Left Output	As Found Input	As Found Output	As Left Input	As Left Output
1	0	0	4			0	4	0	4
1	25	852.5	8			852.5	8	852.5	8
1	50	1705	12			1705	11.98	1705	12
1	75	2557.5	16			2557.5	16	2557.5	16
1	100	3410	20			3410	20	3410	20

List View | Work Order | Plans | Assignments | Related Records | Actuals | Safety Plan | Log | **Data Sheet** | Failure Reporting | Map

You must enter the results of the as-found and as-left data before you can close a work order. [More information](#)

Work Order: 18-12465 * Preventive Maintenance for CAL of LIT 013 at UCH-II Dehydrati

Site: UCH Status: APPR

Parent W/O: >>

Associated Data Sheets | Filter | 1 - 1 of 1

Data Sheet	Description
H2S_LIT_INST.	Data Sheet of LIT at H2S Trains UCH-II (300/310)

Asset Functions | Filter | 1 - 1 of 1

Asset Function	Description
1	Functionality

Manual Input

☐ Shift Incharge CCR-I
☒ Shift Incharge CCR-II

Memo:
Please Close PTW

OK Cancel

Calibration Points | Filter | 1 - 5 of 5

Asset Function	Calibration Point	Nominal Input	Desired Output	Pv As Left Input	Pv As Left Output	As Found Input	As Found Output	As Left Input	As Left Output	Set Point	Pv As Left Set Point	As Found Set Point	As Left Set Point	As Found E
1	0	0	4			0	4	0	4					
1	25	852.5	8			852.5	8	852.5	8					
1	50	1705	12			1705	11.98	1705	12					

Find Permit | Select Action

List View | Permit to Work | Permit Checklists | PPE | Review and Approval | Issue and Acceptance | **Handback and Cancellation** | Related Records

Permit: 18753 Preventive Maintenance for CAL of LIT 013 at UCH-II Dehydrati

Permit and Certificate Type: >>

Permit Level: >>

Status: CLOSED

Site: UCH

Handback Details

Work Completed?	Performing Authority: 301503 >> AZMAT ULLAH	Work Completed:
Returned to Safe Condition?	Closing Authority: 302786 >> Raza Khalid	Returned to Safe Condition: 10/07/18 6:28 PM
Isolation Removal Verified?	Isolating Authority: 302786 >> Raza Khalid	Isolation Removed: 10/07/18 6:28 PM
Returned to Production?	Area Authority: 302786 >> Raza Khalid	Returned to Production: 10/07/18 6:28 PM
Housekeeping & Inhibits Removed?	Inspection Authority: 302786 >> Raza Khalid	Housekeeping & Inhibits: 10/07/18 6:28 PM

Cancellation Details

Permit Reviewed By:

Manual Input

☒ Planner Plant (Satisfied)
☐ Mechanical (If Not Satisfied with Work)
☐ Electrical (If Not Satisfied with Work)
☐ Instrument (If Not Satisfied with Work)
☐ CAMP Maintenance (If Not Satisfied with Work)
☐ Process (If Not Satisfied with Work)
☐ Send to Planner Well

Memo:

OK Cancel

Site: UCH
 PM: PMCAL-T-1-L
 Class: WORKORDEI
 Work Type: PMCAL
 Performing Section: INST
 GL Account:
 Failure Class:
 Problem Code:
 Storeroom Material Status:
 Direct Issue Material Status:
 Work Package Material Status:

Inbox / Assignments

Description	Start Date	Due Date	Last Memo	startentr/inbxroute/bl
Next Assignment Due: 10/07/18 6:32 PM				
Refresh				
PM WO UCH-I 18-12877 on asset - Preventive Maintenance of PCV215 Dehydration Train - 10 at UCH-I -	10/07/18 1:54 PM	10/07/18 1:54 PM	job completed please close PTW	
WO 18-12465 - Preventive Maintenance for CAL of LIT 013 at UCH-II Dehydration Train-1 - For Workorder	10/07/18 6:32 PM	10/07/18 6:32 PM	Closed The WO	

1 - 2 of 2

Complete Workflow Assignment

Task:
WFO 18-12465 - Preventive Maintenance for CAL of LIT 013

Action:
☒ Close WorkOrder

Memo:

Earlier Memos [Filter](#) [1 - 4 of 4](#)

Memo	Person	Transaction Date
Closed The WFO	302786	10/07/18 6:32 PM
Please Close PTW	301503	10/07/18 5:41 PM
Please Accept PTW	302786	10/07/18 5:19 PM
Please Issue PTW	UCH-SITE-ADMIN	10/07/18 4:46 PM

OK Cancel

Work Order Tracking (Oil) BMXAA44121 - Process OGDCL-WO stopped. 1

Query Find Work Order Select Action

[List View](#) [Work Order](#) [Plans](#) [Assignments](#) [Related Records](#) [Actuals](#) [Safety Plan](#) [Log](#) [Data Sheet](#) [Failure Reporting](#) [Map](#)

Area: UCH-II 6

Work Order: 18-12465 Preventive Maintenance for CAL of LIT 013 at UCH-II Deh

Asset: 32521 Level Indicator Transmitter

Work Permit Type: COLD

Location: 300-LIT-013 Level Indication Transmitter

Parent WO:

Classification:

Class Description:

Launch Entry Name:

Site: UCH

PM: PMCAL-T-1-L 2

Class: WORKORDEI

Work Type: PMCAL 3

Performing Section: INST 4

GL Account:

Failure Class:

Problem Code:

Storeroom Material Status:

Attachments

Total Cost (Estimated): 0.00

Total Cost (Actual): 0.00

Status: CLOSE 5

Status Date: 10/07/18 6:35 PM

Inherit Status Changes? ☒

Accepts Charges? ☒

Is Task? ☐

Under Flow Control? ☐