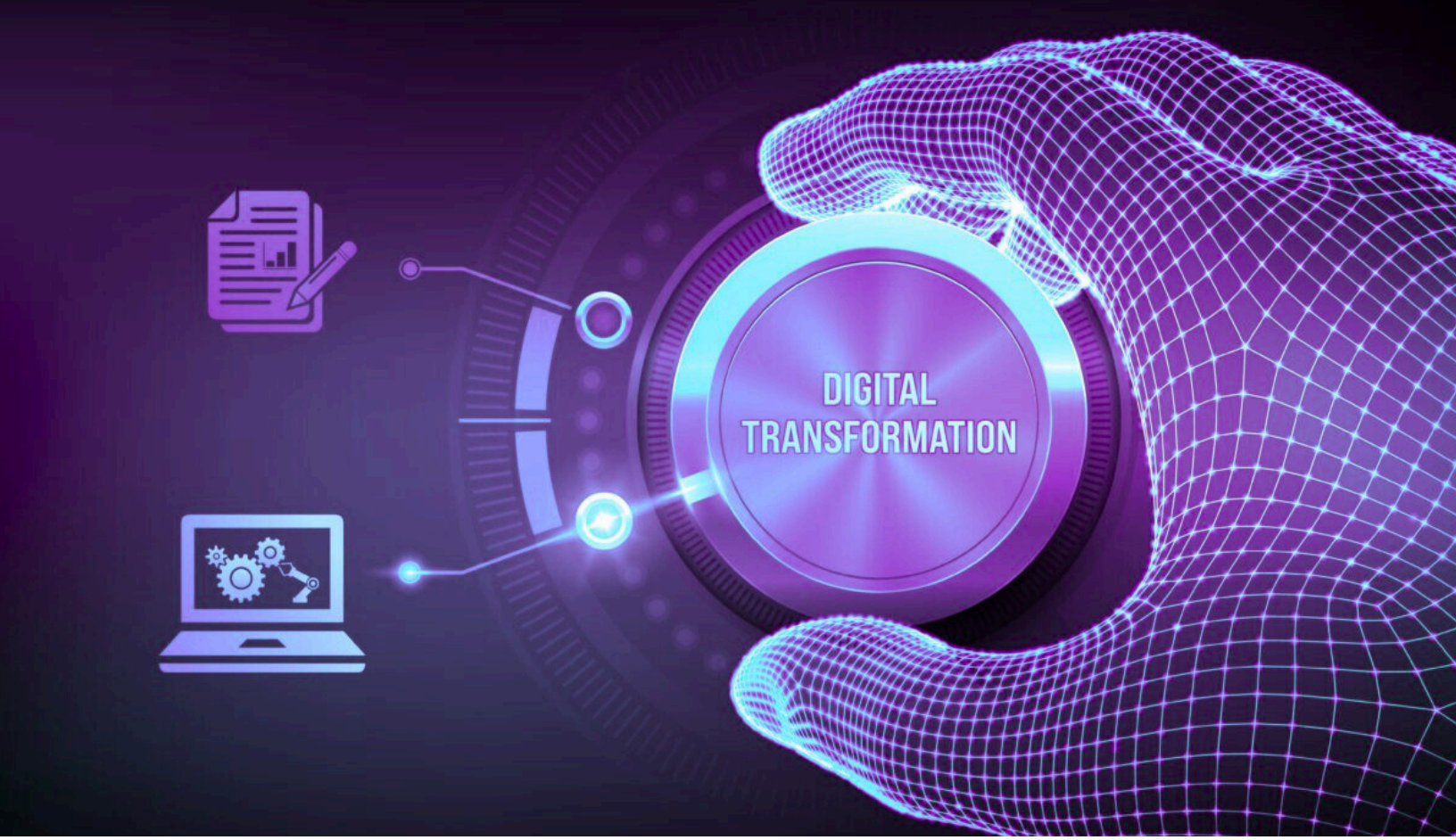


SSM CMMI level 3

An ISO 9001:2015 Certified Company

X- Force Digitalization

Calibration Management System - CMS

Overview

Calibration is essential to ensure that instruments and equipment operate within defined accuracy standards, minimizing errors and maintaining compliance with industry regulations. A Calibration Management System (CMS) streamlines the entire calibration lifecycle by enabling efficient tracking, scheduling, documentation, and reporting of calibration activities. It helps reduce downtime, improve traceability, and ensure audit readiness while enhancing the overall reliability of measurement systems across the plant or laboratory environment.

Challenges in Manual Calibration

Manual calibration processes pose several challenges that can impact operational efficiency and compliance. These include:

- **Missed Calibration Schedules**: Without automated reminders, important calibration activities are often overlooked, leading to uncalibrated equipment in use.
- **Incomplete or Inaccurate Records**: Manual data entry increases the risk of missing or erroneous calibration logs.
- **Human Errors**: Inconsistencies and mistakes during calibration or documentation can compromise data integrity.
- **Regulatory Non-Compliance**: Poor documentation and lack of traceability may result in failing audits or regulatory inspections.
- **Limited Asset Visibility**: Without real-time data, maintenance teams lack insights into asset status and upcoming calibration needs.
- **Time-Consuming Processes**: Paper-based or spreadsheet-driven tracking requires excessive manual effort and coordination.

Values Delivered with CMS

Cost Savings

Annual savings of **₹50,000 – 1,00,000** from reduced downtime, paper usage, and incident-related expenses.

Resource Savings

15–20% reduction in manpower efforts for documentation

20–30% reduction in unnecessary calibrations.

Elimination of paper permit helps in saving of **0.5 - 1 Tonne Paper** per year.

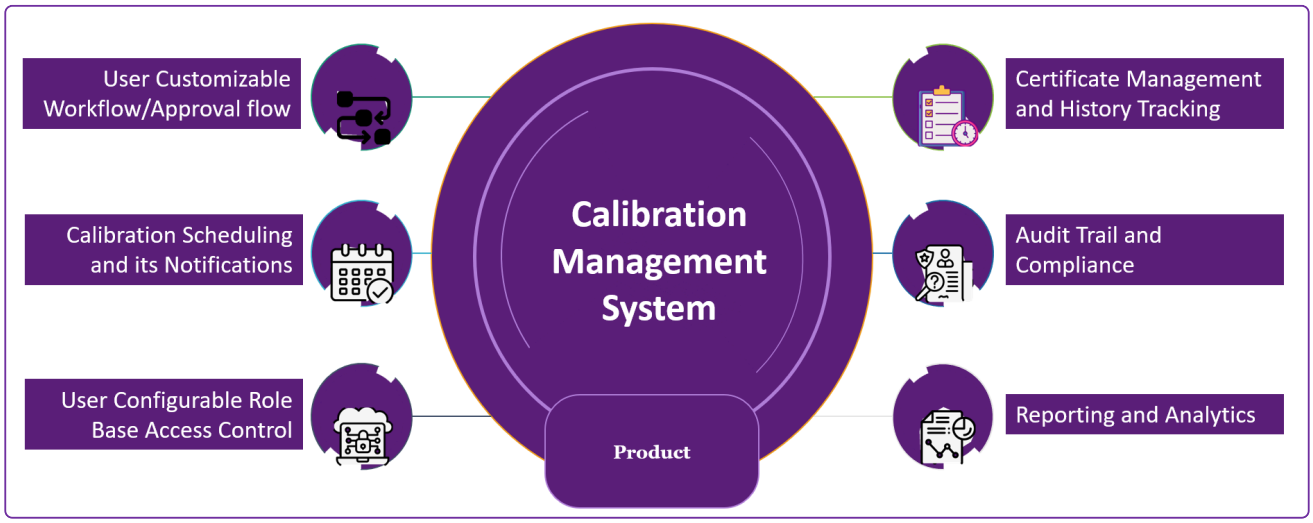
Compliance

90–100% compliance, avoiding audit penalties.

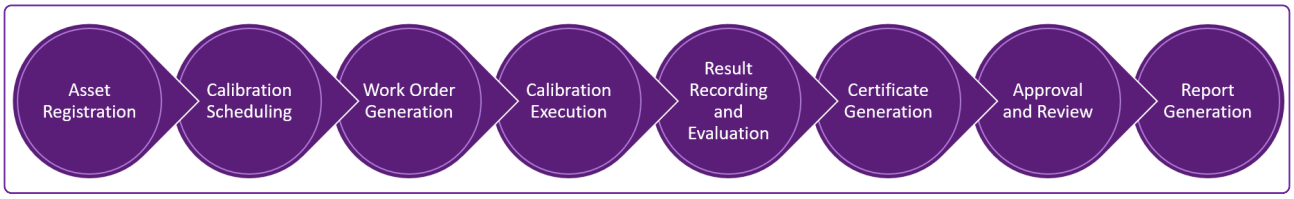
Production

Reduced Production Loss from Downtime

Values Delivered with CMS



CMS Workflow



Types of Instruments Calibrated

A Calibration Management System supports a wide range of field and laboratory instruments commonly used in industrial operations. These include:

- **Pressure Gauges** – Ensuring accurate pressure measurement critical to process control.
- **Flow Meters** – Verifying correct flow readings for liquids and gases.
- **Weighing Machines** – Maintaining precision in load measurements for batching and quality assurance.
- **Level Transmitters** – Monitoring material levels in tanks and silos with accuracy.

Advantages of a Calibration Management System

- **Improved Accuracy & Reliability:** Ensures instruments are calibrated on time and within tolerance, reducing measurement errors and enhancing product quality.
- **Regulatory Compliance:** Maintains detailed calibration records and certificates, supporting compliance with ISO, FDA, NABL, and other industry standards.
- **Time & Cost Efficiency:** Automates scheduling and reporting, significantly reducing manual effort and administrative costs.
- **Audit-Ready Documentation:** Provides traceable, centralized, and easily retrievable calibration data for internal and external audits.
- **Real-Time Visibility:** Offers dashboards and alerts for real-time monitoring of calibration status, due dates, and asset health.

X- Force CMS Report

Calibration by Technician and Report will read by Engineer and approve it

MR's OFFICE

TATA CHEMICALS

TEST AND CALIBRATION REPORT

Date of Calibration:	09-05-2025	Calibration Due on:	15-04-2025		
Tag No:	5-61900	Description:	TEST PRESSURE GUAGE		
Plant & Service:	SUB MASTER				
Type of Instrument:	Pressure Gauge				
Make:	Scandura				
Model & Serial No:					
Range of Instrument:	0-2500	UNIT:	kg/cm2	LC:	0.1
Calibrating Range:	0-250	UNIT:	kg/cm2	Room Temp:	28
Sensor/Input Signal:	0-250	UNIT:	VDC	Humidity:	32
Indication/Output Signal:	0-250	UNIT:	mA		
Linear/Sq.Root:	Linear				
Measurement Uncertainty:	2				

Calibration is done by using the following master instruments:-

Description	Model No	Sr.no	Certificate No	Due Date	Accuracy	LC	Traceability:
RTD		137/97		25-03-2025	0.1%FS	0.01	

Linear Instrument

Range	Input Signal	Expected Indication/Output	ACTUAL OUTPUT							
			Before Calibration				After Calibration			
			UP		DOWN		UP		DOWN	
			Value	Error	Value	Error	Value	Error	Value	Error
0	0	0	0.1	0.04	0	0.00	0	0.00	0	0.00
25	62.5	62.5	62.8	0.12	62.2	-0.12	62.55	0.02	62.48	-0.01
50	125	125	125.9	0.36	124.6	-0.16	125.1	0.04	125	0.00
75	187.5	187.5	187.9	0.16	187.2	-0.12	187.55	0.02	187.5	0.00
100	250	250	250.1	0.04	250	0.00	250	0.00	250	0.00

Remarks: ok

RAM

Area Engineer — Technician

Form No. : QSF-MR-03-03 Form Rev. No. : 02 Form Rev. Date : 13.07.2016