

“Recipe Management eliminated manual setpoint entry and gave us full traceability for every parameter.”
Process Engineering Manager, Global Seasoning Manufacturer



DATASHEET

Recipe Management

Fully ISA-88 Compliant Control for Process Precision

Manual recipe management exposes manufacturing operations to costly errors, inconsistent product quality, and compliance risks. Operators re-keying setpoints into PLCs, uncontrolled recipe versions circulating on paper or spreadsheets, and no real-time visibility into whether equipment is actually running at target — these are the realities that drive batch failures, product holds, and regulatory findings. The LOGICAL SYSTEMS Recipe Management (RM) application eliminates these risks by providing a single, controlled system for the entire recipe lifecycle: from product definition, trials and approval through execution with automated setpoint download and real-time deviation monitoring.

Seq	Code	Name	Description	Equipment	Duration	Trigger	Status	Actions
1	SEG-RECEI...	Green Bean Receiving	Incoming QC, moisture check, and silo intake	Conveyor	-	-	Active	
2	SEG-ROAST...	Roasting	Drum roasting with programmable roast curve	Roaster	-	M Auto ...	Active	
3	SEG-COOL...	Cooling & Degassing	Air-quench cooling and CO2 degassing rest	Conveyor	-	-	Active	
4	SEG-GRIND...	Grinding	Burr grinding to target particle size	Grinder/Mill	-	M Auto ...	Active	
5	SEG-BLEND...	Blending	Origin and roast profile blending	Mixer	-	-	Active	
6	SEG-PACKA...	Packaging	Weighing, bag filling, and valve-seal	Filler	-	M Auto ...	Active	

Production Line Flow

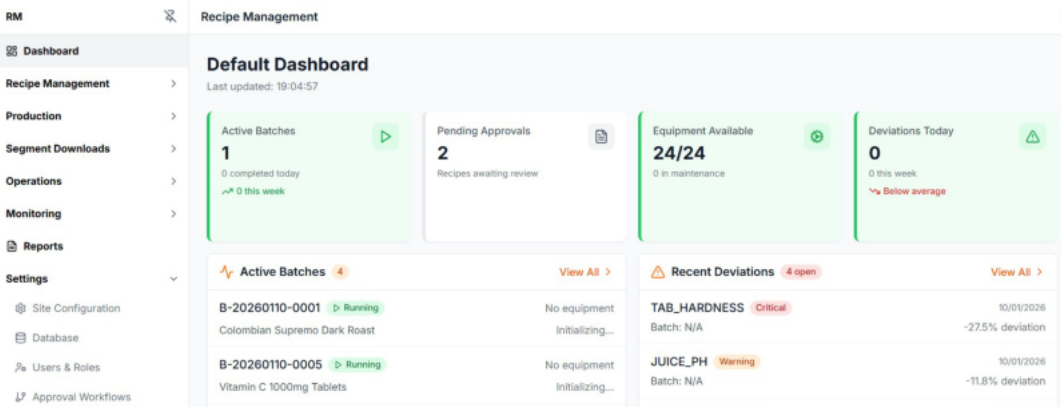
Green Bean Receiving → Roasting → Cooling & Degassing → Grinding → Blending → Packaging

Legend: Standard (orange), Auto-Trigger (purple), Critical (red), Optional (light blue)

Built on the Inductive Automation® Ignition platform, the RM module follows the ISA-88 (S88) procedural model to structure recipes as procedures, operations, and phases with parameters bound directly to OPC tags. Recipe setpoints are downloaded to automation systems automatically through configurable trigger modes: manual, auto-on-previous-complete, or equipment-request handshake with verification readback to confirm values are correctly received. Real-time setpoint monitoring continuously compares actual process values against targets, detecting deviations across configurable tolerance bands and generating alarms before quality is compromised.

From single production lines to multi-site global operations, RM scales with your manufacturing complexity. Golden Batch comparison enables batch-to-batch consistency, while NPD trial workflows support new product development with relaxed tolerances and enhanced data collection. Material substitution with automatic rebalancing, potency-based parameter scaling, and tail-end management ensure every batch is optimized for quality and yield. With 21 CFR Part 11 electronic signatures, full audit trails, and version-controlled approval workflows, the system meets the most stringent regulatory requirements.

From Intuitive Configuration to Dashboards with Real-Time Insight



Full-Loop Quality Execution

The diagram illustrates the 'Full-Loop Quality Execution' process. It shows a central 'Quality Execution' cycle with three main components:
1. **LSA SPC** (Statistical Process Control): Includes OOC (Out of Control) Events, Measurements, and Cpk (Process Capability Index).
2. **LSA RM** (Recipe Management): Includes Recipes, Batches, and Setpoints.
3. **LSA QMS** (Quality Management System): Includes Quality, LIMS (Laboratory Information Management System), and Compliance.
The flow is as follows:
- LSA SPC feeds into LSA RM via 'Capability' and 'Batch Data'.
- LSA RM feeds into LSA QMS via 'Batch Records' and 'Specifications'.
- LSA QMS feeds back into LSA SPC via 'Approvals' and 'Spec Limits'.
- LSA SPC also feeds back into LSA RM via 'Recipe Limits' and 'OOE Events'.

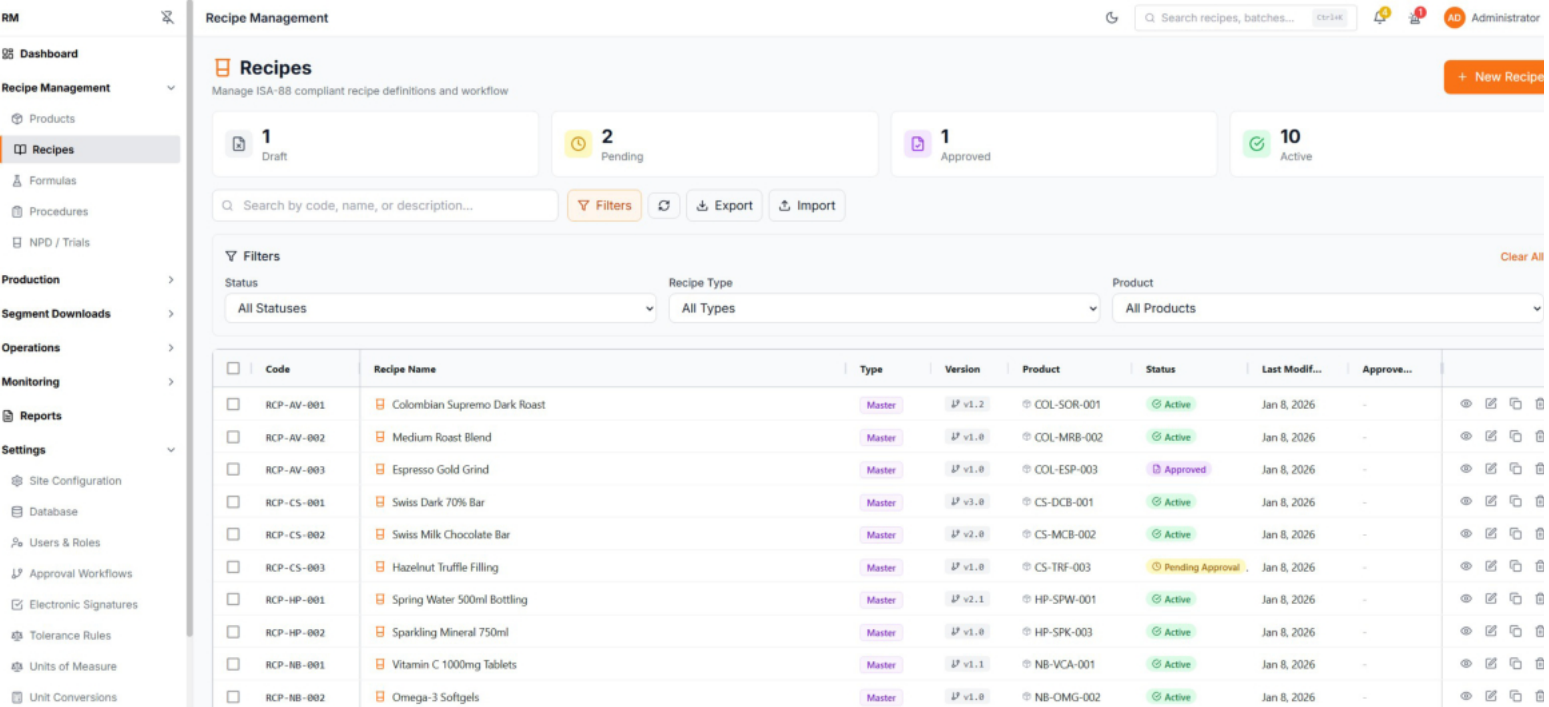
- **Cross-Module** Batch records flow to LSA QMS for release and CoA generation; recipe parameters feed LSA SPC control charts; recipe approval workflows generate LSA TMS tasks.
- **Active Batch Tracking** Real-time batch status with product, recipe, and equipment assignment visibility across all running operations.
- **Deviation Monitoring** Live deviation alerts showing parameter, severity (Critical/Warning), actual vs target values, and percentage deviation.
- **Equipment Availability** At-a-glance equipment status with maintenance tracking and capacity utilization.
- **Approval Pipeline** Pending recipe approvals queue ensuring controlled recipe promotion through Draft, Pending, Approved, and Active states.

ISA-88 Recipe Model

The industry standard for recipe control, built into every batch.

RM implements the full ISA-88 procedural hierarchy: Master Recipes define how to make a product independent of equipment, Control Recipes are batch-specific instances with potency-adjusted values and scaled quantities, and Equipment Recipes bind to physical equipment with resolved OPC tag addresses for incremental download.

Each recipe is structured as Procedure → Operation → Phase → Parameters, where phases are configured with a phase type (Material Addition, Processing, Transfer, CIP), download trigger mode, materials consumed from the BOM, parameters with tolerances and tag mappings, and completion criteria. Recipes follow a controlled lifecycle (Draft → Pending Review → Approved → Active → Obsolete) with electronic signatures at each transition.



Comprehensive Governance

With Integrated Recipe Execution

RM manages the complete path from production order to automated setpoint download. Products are defined with comprehensive material properties, BOM structures, and barcode/SKU assignments. Each product links to one or more recipes, and each recipe supports multiple versioned procedures containing the process parameters that drive equipment behavior.

RM

Dashboard

Recipe Management

- Products
- Recipes
- Formulas
- Procedures
- NPD / Trials

Production

- Production Orders

Segment Downloads

- Monitoring Dashboard
- Active Orders

Recipe Management

Production Orders

Manage ERP production orders and scheduling

9 Total

0 Scheduled

0 Released

4 In Progress

0 Completed

0 On Hold

Search

Status

Production Date

Product

Group

SAP Order #	Status	Product	Recipe	Target Qty	Production D...	Scheduled	Linked Batch	Customer	Actions
COL-RO-250110-A	In Progress	COL-SOR-001	Colombian Supremo	500 kg	10/01/2026	--	Not linked		
FR-BTL-250110-A	In Progress	HP-SPW-001	Spring Water 500ml E	50,000 pcs	10/01/2026	--	Not linked		
CH-CHO-250110-A	Created	CS-DCB-001	Swiss Dark Chocolate	3,000 kg	10/01/2026	--	Not linked		
CN-SUP-250110-A	In Progress	NB-VCA-001	Vitamin C 1000mg Ta	100 kg	10/01/2026	--	Not linked		

Automated recipe download eliminates manual setpoint entry entirely. Process segments are configured with OPC tag paths for each parameter, and the system writes target values directly to PLCs with configurable verification readback. Trigger-based downloads monitor OPC tags and automatically initiate recipe transfers when production conditions are met, such as rising-edge signals from equipment handshakes. Changeover detection compares current and incoming product codes to flag product transitions, ensuring cleaning procedures and parameter revalidation occur when required.

Enterprise to Shop-Floor Connectivity

For Automated Data Collection & Control

Integration capabilities position the RM system as the recipe authority across the manufacturing enterprise. ERP systems provide production orders and scheduling data while receiving batch completion records in return. Direct PLC and SCADA integration through OPC UA and OPC DA enables bidirectional communication with process equipment, including verification readback to confirm values are correctly received.

Production

- Production Orders
- Order Groups
- Process Segments
- Import States

Segment Downloads

- Monitoring Dashboard
- Active Orders

Operations

- Equipment
- Batches
- Materials
- Golden Batch

Monitoring

- Real-time Status
- Deviations

Recipe Management

Active Orders by Segment

Stage production orders at process segments for recipe download

Production Flow

SEG-RECEIVING

SEG-ROASTING

SEG-COOLING

SEG-GRINDING

SEG-BLENDING

SEG-PACKAGING

Segment Details

1 SEG-RECEIVING

2 SEG-ROASTING

3 SEG-COOLING

Recipe Management

Golden Batches

Reference batch profiles for deviation monitoring and batch comparison

Search golden batches by name, recipe, or product...

Active

Inactive

Single Refer

NAME	RECIPE	REFERENCE BATCH	TYPE
Vitamin C Tablet Reference	-	bat_nb_h01	Single Reference
Spring Water 500ml Reference	-	bat_hp_h01	Single Reference
Supremo Reference Batch	-	bat_rv_h01	Single Reference

LOGICAL SYSTEMS RM eliminates manual transcription errors through automated setpoint downloads from recipe definition to equipment execution. Full version control with electronic signatures (21 CFR Part 11) ensures every recipe change is authorized, documented, and traceable. Golden batch profiles establish statistical baselines for ongoing production monitoring, enabling immediate detection of process drift before quality is compromised. The system supports unlimited product and recipe definitions with configurable batch sizing, scaling methods, and equipment requirements. Bill of materials (BOM) with potency and concentration adjustments ensures formulations account for ingredient variability, and configurable unit-of-measure (UOM) conversions maintain consistency across different engineering unit (EU) systems.

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03

RM

Recipe Management

Products

Recipes

Formulas

Procedures

NPD / Trials

Production

Production Orders

Order Groups

Process Segments

Import States

Segment Downloads

Monitoring Dashboard

Active Orders

Recipe Parameters

Operations

Equipment

Batches

Materials

Golden Batch

Monitoring

Reports

Recipe Management

Equipment

Manage equipment classes and instances for recipe execution

Total

24

Available

24

In Use

0

Maintenance

0

Offline

0

Equipment Instances

24

Equipment Classes

15

Search equipment...

Filters

Code	Name	Class	Location	Status	Tag Path	Updated	Actions
VITAL-MIX-01	Batch Mixer 1	Mixer	Modesto	Available	[VitalHarvest]Plant/RL	08/01/2026	
AROMA-MIX-01	Blender 1	Mixer	Medellin	Available	[AromaVista]Plant/Bl-	08/01/2026	
CACAO-GRD-01	Cacao Mill	Grinder/Mill	Zürich	Available	[CacaoSpring]Plant/Re-	08/01/2026	
CACAO-RST-01	Cacao Roaster	Roaster	Zürich	Available	[CacaoSpring]Plant/Re-	08/01/2026	
NUTRI-CAP-01	Capsule Filler 1	Capsule Filler	Suzhou	Available	[NutriBloom]Plant/Enc-	08/01/2026	
HYDRA-RCT-01	Carbonation Unit	Reactor	Évian-les-Bains	Available	[Hydrapure]Plant/Carb-	08/01/2026	
NUTRI-COT-01	Coating Pan 1	Coating Pan	Suzhou	Available	[NutriBloom]Plant/Coa-	08/01/2026	
CACAO-CNC-01	Conche 1	Conche	Zürich	Available	[CacaoSpring]Plant/Co-	08/01/2026	
HYDRA-FIL-01	Filler Line 1	Filler	Évian-les-Bains	Available	[Hydrapure]Plant/Fill-	08/01/2026	
VITAL-FIL-01	Filler Line 1	Filler	Modesto	Available	[VitalHarvest]Plant/F-	08/01/2026	
AROMA-GRD-01	Grinder 1	Grinder/Mill	Medellin	Available	[AromaVista]Plant/GrL-	08/01/2026	

Key Features and Benefits

Features

- ISA-88 compliant recipe hierarchy (Master, Control, Equipment)
- Automated setpoint download with OPC tag binding and verification readback
- Phase-based recipe staging with configurable download triggers (Manual, Auto, Equipment-Request)
- Golden Batch comparison (Single Reference, Statistical, Envelope)
- NPD trial workflow with stage-gated progression (Concept through Validation)
- Material substitution with automatic potency/concentration rebalancing
- Process Segment configuration with production line flow visualization
- 21 CFR Part 11 electronic signatures with configurable signature requirements
- Equipment class and instance management with OPC tag path templates

Benefits

- Standardized recipe structure ensures consistency across products, lines, and sites
- Eliminates manual data entry errors and confirms PLC values match recipe targets
- Flexible execution models from fully manual to fully automated equipment handshake
- Immediate deviation detection and alarming before quality is compromised
- Structured new product development with trial-to-production promotion path
- Regulatory compliance for pharmaceutical, food, and regulated manufacturing
- Adaptable to any industry, process type, and regulatory requirement

Technical Requirements

System Requirements

Ignition® (8.1.+) Core Modules, Quad-core processor, 16 GB RAM, 10 GB free disk space

Supported Operating Systems

Windows Server 2019/2022/2025, Windows 10/11, macOS (X, 10.16+), Linux (Ubuntu, CentOS, RHEL)

Supported Protocols

MQTT, OPC UA / OPC DA, REST API (JSON Payloads) Kafka (via connector), Snowflake (via pipeline, data bridge)

Supported Databases

Microsoft SQL Server, Oracle, MySQL, MariaDB, PostgreSQL, any database with JDBC driver

Supported Browsers

Chrome, Firefox, Safari, Microsoft Edge

LOGICAL SYSTEMS

RM

Every Recipe. Every Setpoint. Every Batch.

Controlled.

LOGICAL SYSTEMS Recipe Management transforms manual recipe handling into automated, traceable, ISA-88 compliant recipe execution — delivering consistent product quality with full regulatory compliance.

LOGICAL SYSTEMS

AUTOMATION & INTEGRATION SERVICES

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