



**Rockwell  
Automation**



**InnovationSuite**  
powered by PTC

# THINGWORX APPLICATIONS

**Connected Work Cell**

▶ **BEGIN**

# ThingWorx applications Introduction

ThingWorx Applications accelerate time to value and time to scale by focusing on use cases that have substantive impact on the P&L while building a foundation for digital transformation.

High impact applications replace custom, bespoke approaches with repeatable, configured-not-coded, applications that leverage the domain expertise from hundreds of successful implementations.

These applications vastly reduce the effort associated with designing, coding, and testing new applications.

# High impact applications



Built for multiple customers, industries, locales and sites



Built for performance at scale with dozens of assets at dozens of sites



Affordable, quick to deploy and easy to support



Managed applications with version control and pre-requisites

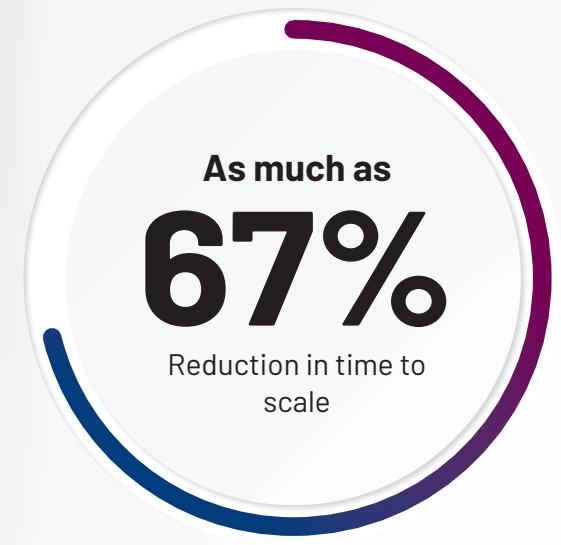
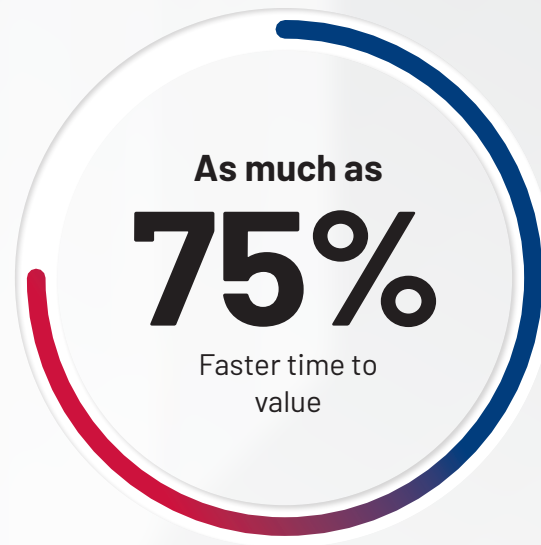


Extensible (horizontally and vertically)



Upgradable applications aligned with ThingWorx capabilities, features and releases

# Vastly reduced efforts



# ThingWorx Applications Universal Features

The high impact applications align to the most common requirements. This enables companies to rapidly create a foundation for digital transformation.

Using our scalable, extensible platform, they can iteratively extend into additional digital transformation use cases.



# Out of the Box Features



**Multi-Language Support**

**All features/displays configurable to security roles and settings**

**Process Troubleshooter**

**Waste, Downtime, and Production tracking models**

**Waste and Downtime reporting mashups**

**System Configuration Displays:**

Plant Model | Reason Trees | Control Characteristics | Smart Tools | Products

# ThingWorx application Connected Work Cell (CWC)

# ThingWorx Applications Framework

Leading with solutions, Pivoting strategy with applications for proven no regret use cases, that still have the power and flexibility of the platform.

**SOLUTIONS & APPLICATIONS**

**INDUSTRIAL IOT SOLUTIONS PLATFORM**



## Connected Work Cell

Digital, augmented work instructions  
Augmented remote assistance

Advisors • Connectors • Domain Model • Business Logic • UI Elements

### BUILDING BLOCKS



**Connect**



**Build**



**Analyze**



**Manage**



**Experience**



Security

### INFRASTRUCTURE & CLOUD

Strategic Partners • Global Systems Integrators • Management Consultants

**EXISTING LANDSCAPE**



# Connected Work Cell – Use Case Introduction

Connected Work Cell streamlines how information is delivered to frontline workers by aggregating critical data from multiple data siloes into a simplified visual application.

Since the work cell now pushes the process and steps to operators, it makes frontline workers more flexible with less need for upfront training and upskilling before being assigned to a new work cell.

Integration with connected tools provides bi-directional communication to both download tool settings and collect actual tool data for traceability.

## Challenges Facing the Industry

- Targeting assembly for complex discrete products
- Operators on the plant floor work with disparate systems of information to complete their work: ERP, MES, binders, paper, PDF-based work instructions, quality forms, disparate smart tools, and more.
- This disconnect increases the training burden and causes operators to waste time switching between systems seeking the right information

## Benefits from CWC

- Delivers up to date, digital, and in-context information to operators on the shop floor. By combining data from multiple production sources, the operator has seamless bi-directional interaction with all data required to perform daily work.

# Connected Work Cell

Provide workers a seamless experience while capturing operational execution data

with a modular application that provides:

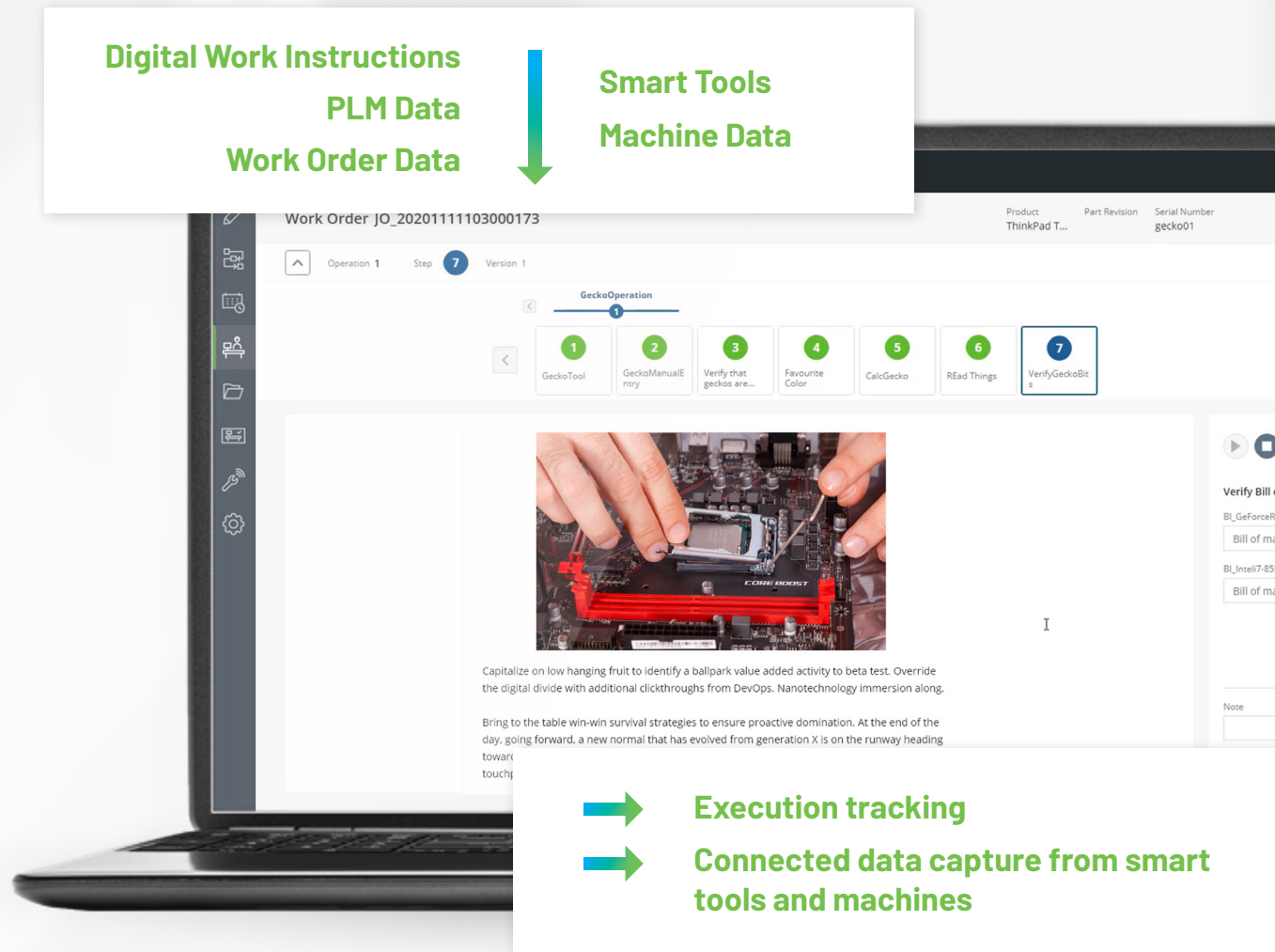
and empowers your teams to be more productive with less errors:

Powered by:



Digital Work Instructions  
PLM Data  
Work Order Data

Smart Tools  
Machine Data



Execution tracking  
Connected data capture from smart tools and machines

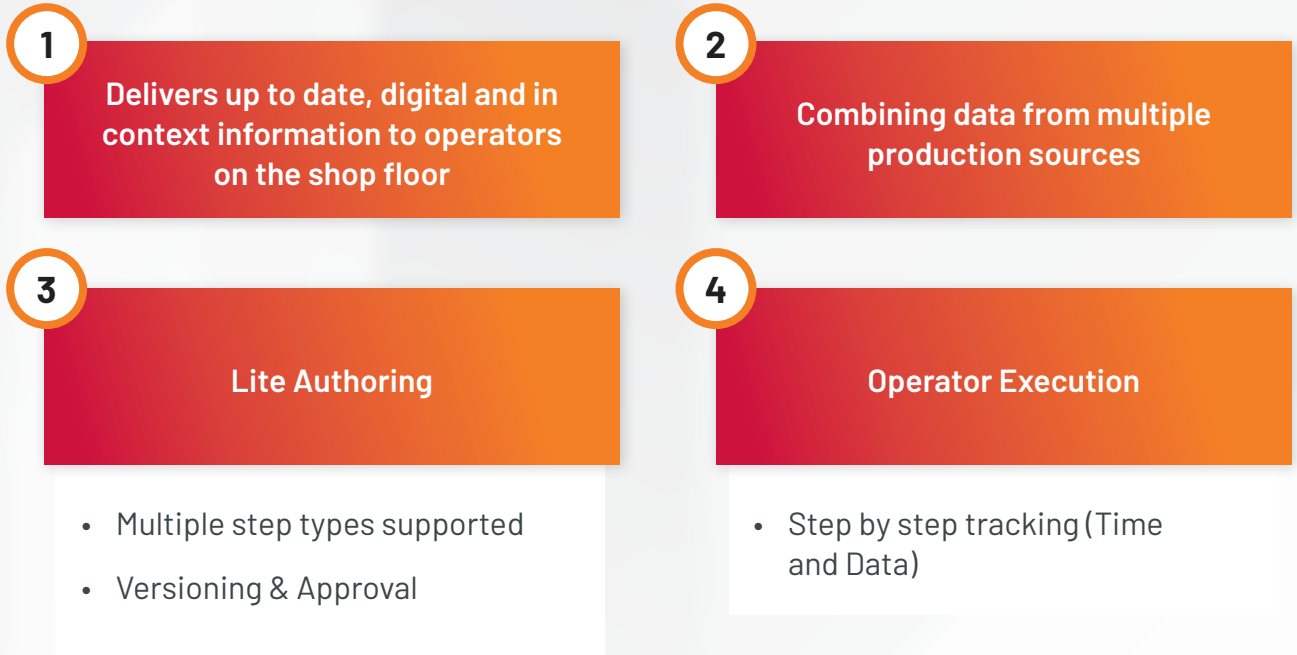
# Connected Work Cell

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Powered by:



# Connected Work Cell

Provide workers a seamless experience while capturing operational execution data

with a modular application that provides:

and empowers your teams to be more productive with less errors:

Powered by:



thingworx® keeware®

**10 - 40%** ▲

Increase in worker productivity

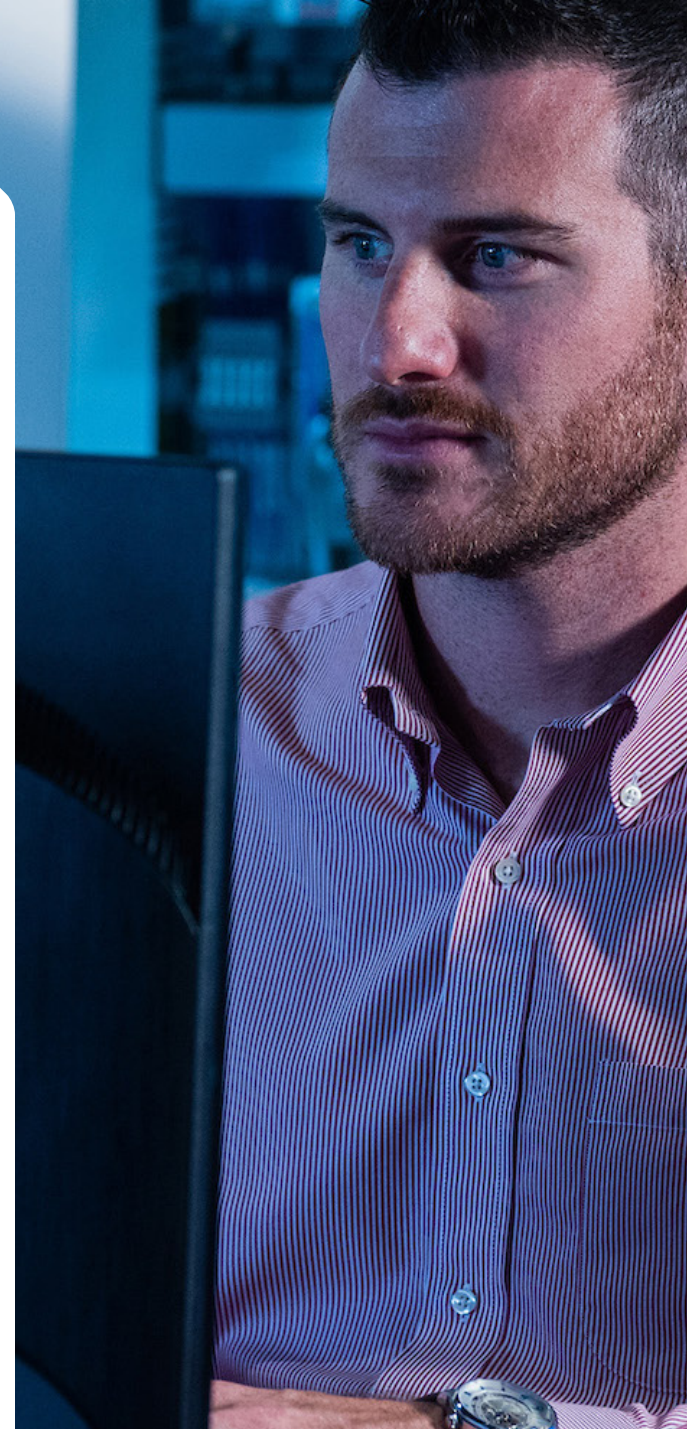
**30 - 65%** ▼

Reduction in training time

**3 - 25%** ▼

Reduction in scrap

Reduction in safety risks ▼



# CWC - Features And Key Users

## Out of the Box Features

- Authoring - Supports Multiple step types and versioning
- Work Order Scheduling
- Operator Executing and Step by Step Tracking
- Smart Tool Configuration
- Stations Dashboard Display
- File Storage and Document Management



## KEY USERS

**Operators benefit from step-by-step work instructions and work order updates**



**Authors are enabled with easy-to-use authoring tools and multiple step types to choose from**

# CWC - Authoring

Authoring

Scheduling

Execution

Pause Tracking

Smart Tools

Stations

File Storage

## Authoring

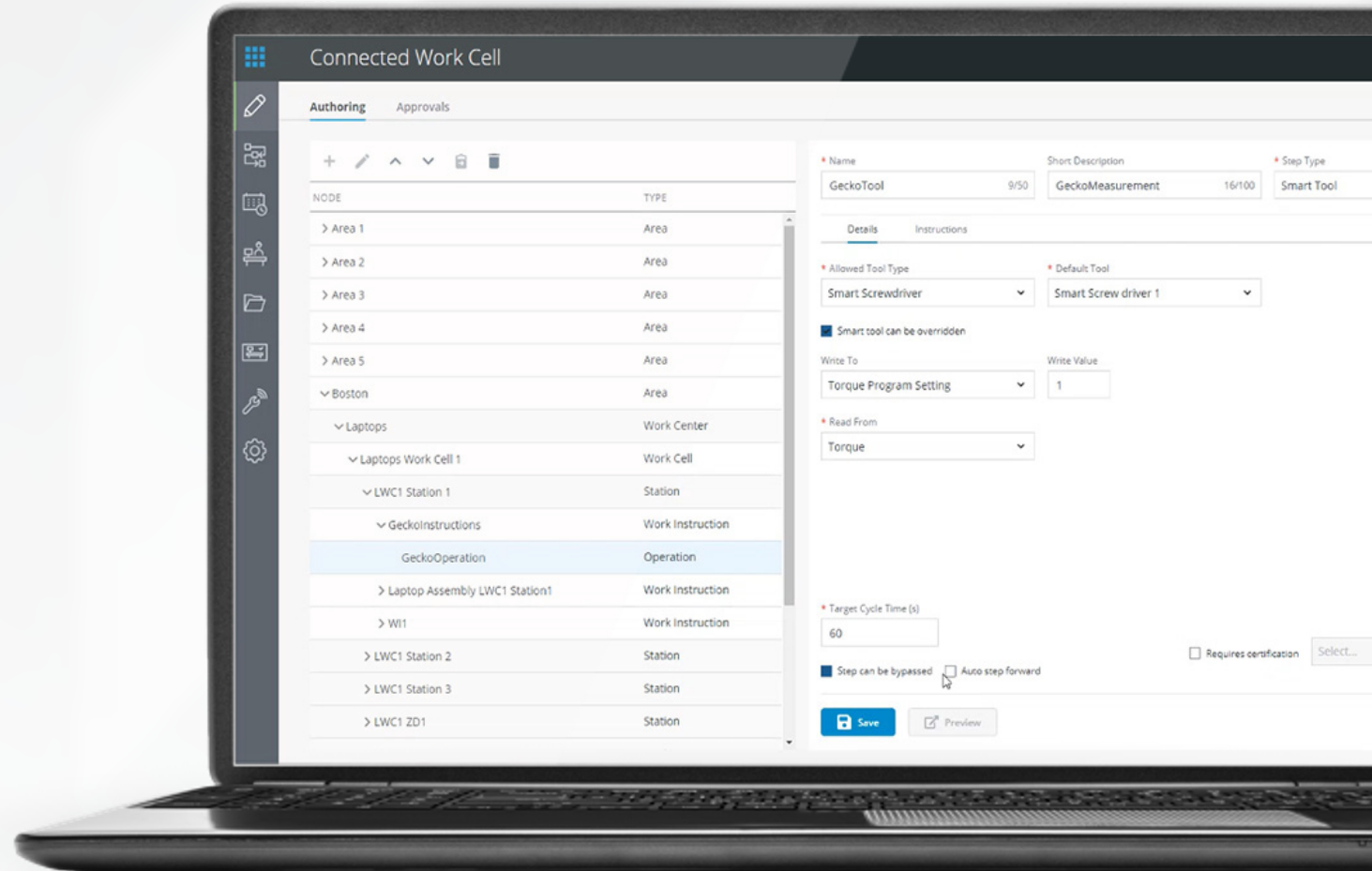
- Work Instructions
- Operation
- Steps
- Target cycle time

## Step Types

- Informational
- Verification
- List
- Manual Entry
- Smart Tool
- Parts Verification
- Calculated

## Revisions & Versioning

- Approval process



# CWC - Scheduling

Scheduling

Execution

Pause Tracking

Smart Tools

Stations

File Storage

Route Mgmt

## Scheduling

- Work Order information coming from external system
  - Recommending ThingWorx Flow
- Filtering on WO Status (Not Scheduled, Scheduled, On-Hold, In-Progress, Complete)
- List of WO can be exported to Excel

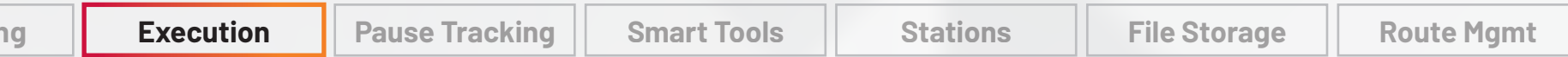
## Serial # Assignment

## Bill of Material Validation

The screenshot displays the 'Connected Work Cell' Scheduling interface. The main window shows a table of work orders with columns for Priority, Work Order Number, Route, Product Name, Start Time, End Time, Planned Qty, and Actual Qty. A modal window titled 'Edit Work Order JO\_2020111103000173' is open, showing fields for Priority, Status (Scheduled), Assigned Route (Geckos), and a Note. The modal also includes a 'Serial Number' section with a list of serial numbers (gecko01 to gecko05) and a 'Bill of Materials' section. The background shows a laptop displaying the same interface.

PRIORITY	WORK ORDER NUMBER	ROUTE	PRODUCT NAME	START TIME	END TIME	PLANNED QTY	ACTUAL QTY
100	DON'T TOUCH_202011200000...	PortlandKits	ThinkPad T495	2020-11-20 03:00:00	2020-11-20 06:00:00	1.00	0.00
	JO_20201113173000172		ThinkPad T495	2020-11-13 17:30:00	2020-11-13 20:30:00	25.00	0.00
	JO_20201113173000173		ThinkPad T495	2020-11-13 17:30:00	2020-11-13 20:30:00	25.00	0.00
				2020-11-13 17:30:00	2020-11-13 20:30:00	25.00	0.00
				2020-11-13 12:30:00	2020-11-13 15:30:00	25.00	0.00
				2020-11-13 12:30:00	2020-11-13 15:30:00	25.00	0.00
				2020-11-13 12:30:00	2020-11-13 15:30:00	25.00	0.00
				2020-11-13 19:01:00	2020-11-13 13:30:00	25.00	1.00
				2020-11-13 18:03:55	2020-11-13 13:30:00	25.00	1.00
				2020-11-13 17:54:49	2020-11-13 13:30:00	25.00	0.00
				2020-11-13 07:00:00	2020-11-13 10:00:00	25.00	0.00
				2020-11-13 07:00:00	2020-11-13 10:00:00	25.00	0.00
				2020-11-13 07:00:00	2020-11-13 10:00:00	25.00	0.00
				2020-11-13 18:25:32	2020-11-13 08:30:00	25.00	0.00

# CWC - Execution

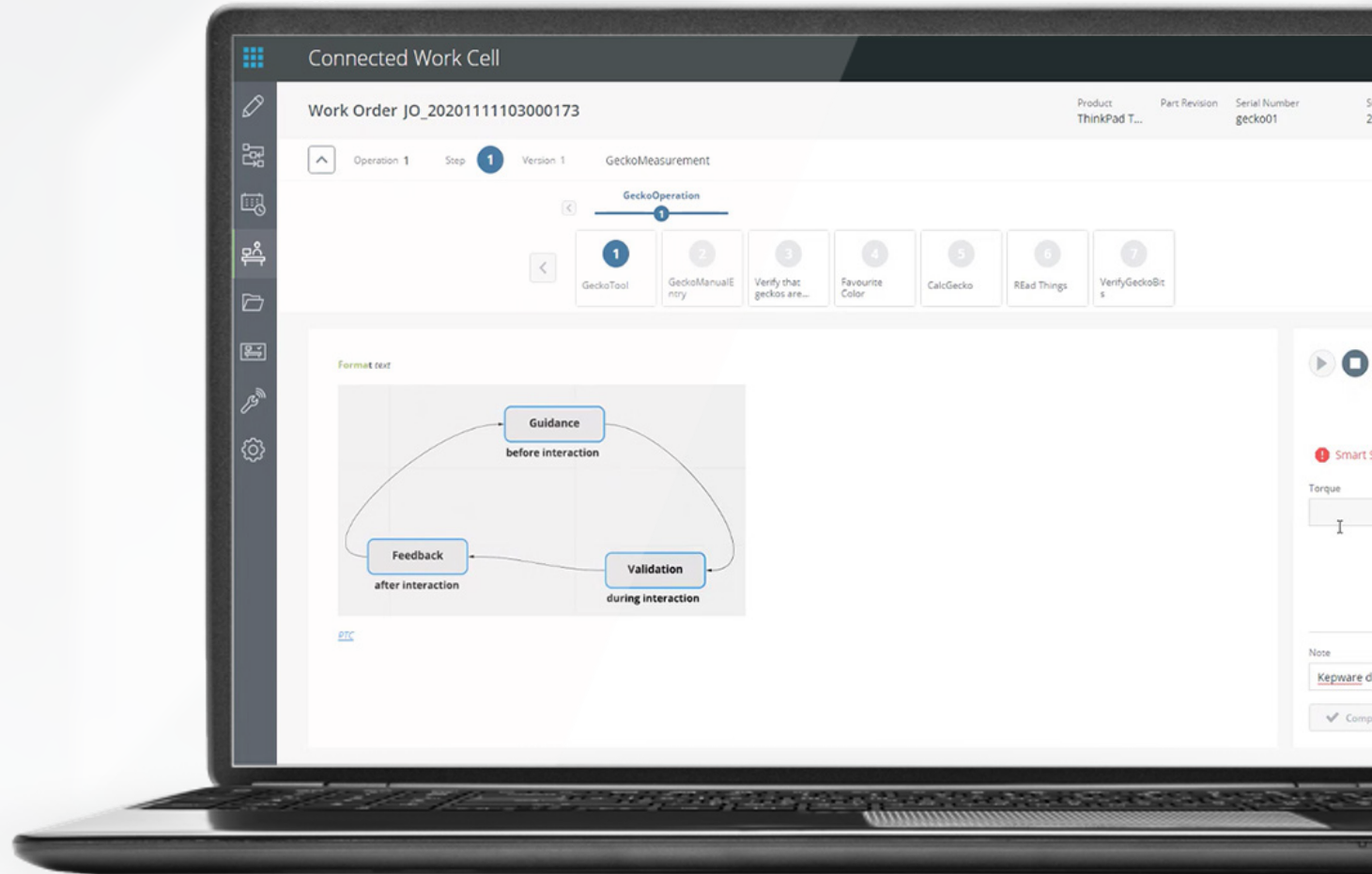


## Operator Information

- Current Work Order
- Operations and steps
- Instructions
  - Text
  - Image
  - Video
  - Attachment(s)

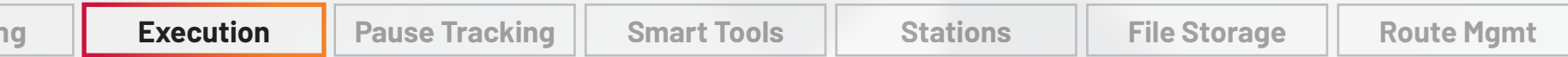
## Data Entry section

- Pause/Stop/Resume
- Bypass Step (Req. Approval)
- Smart Tool integration
- Auto-Advance Serial #





# CWC - Execution - BOM Validation

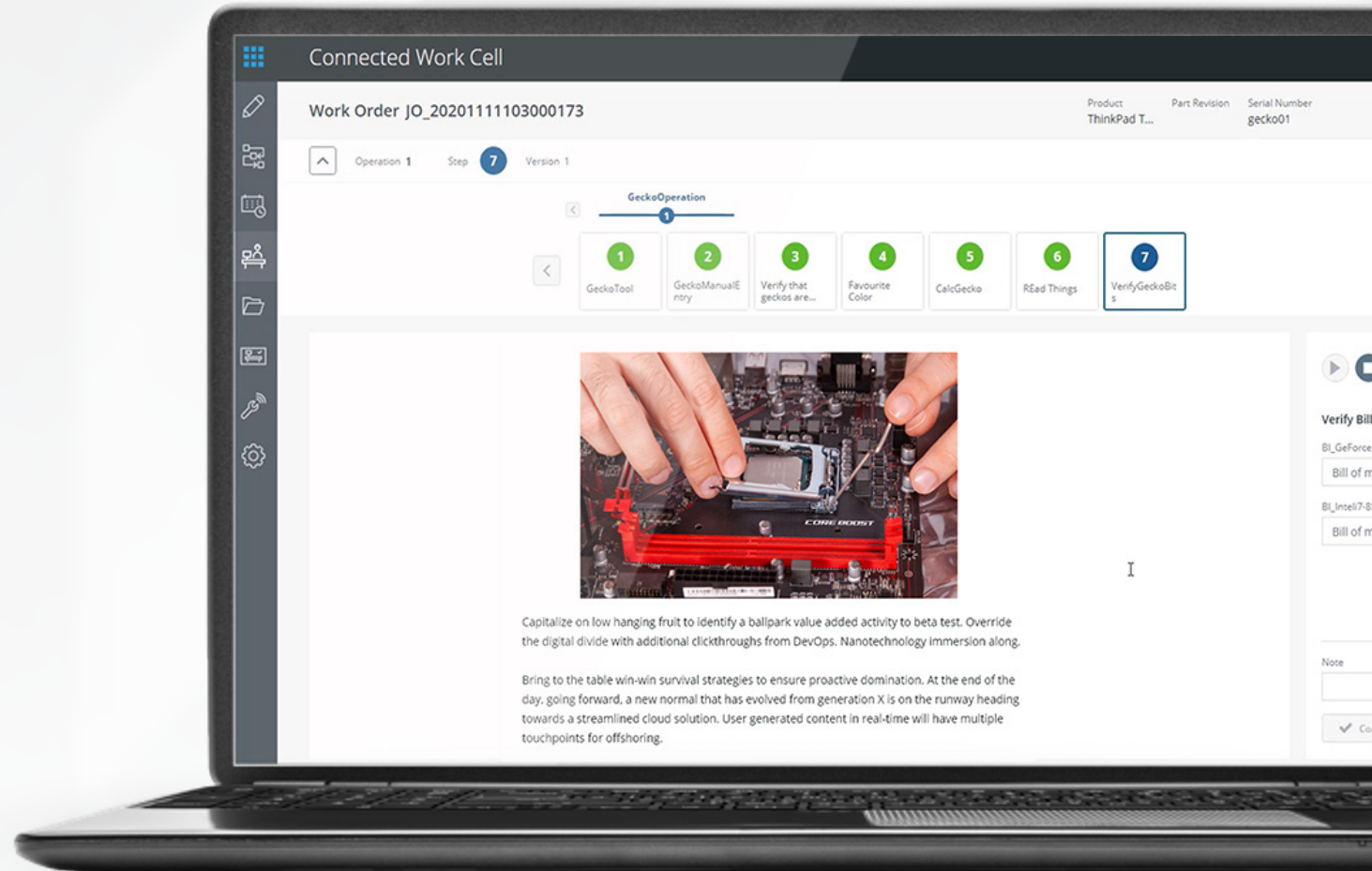


## Verify Parts

- Provide Bill of Materials before proceeding

## Reduce Rework

- Cut down on rework by requiring operators to key in full BOM
- Ensure correct parts are used



# CWC - Pause/Stop Tracking

Pause Tracking

Smart Tools

Stations

File Storage

Route Mgmt

## Pause/Stop

- User can pause the execution of a Work Instruction
- Pause time is tracked

## Reason Tracking

- Reason is required from the user when pausing or stopping

## Operator Visual Clues

- Notifying the operator when time is exceeding Target Cycle Time

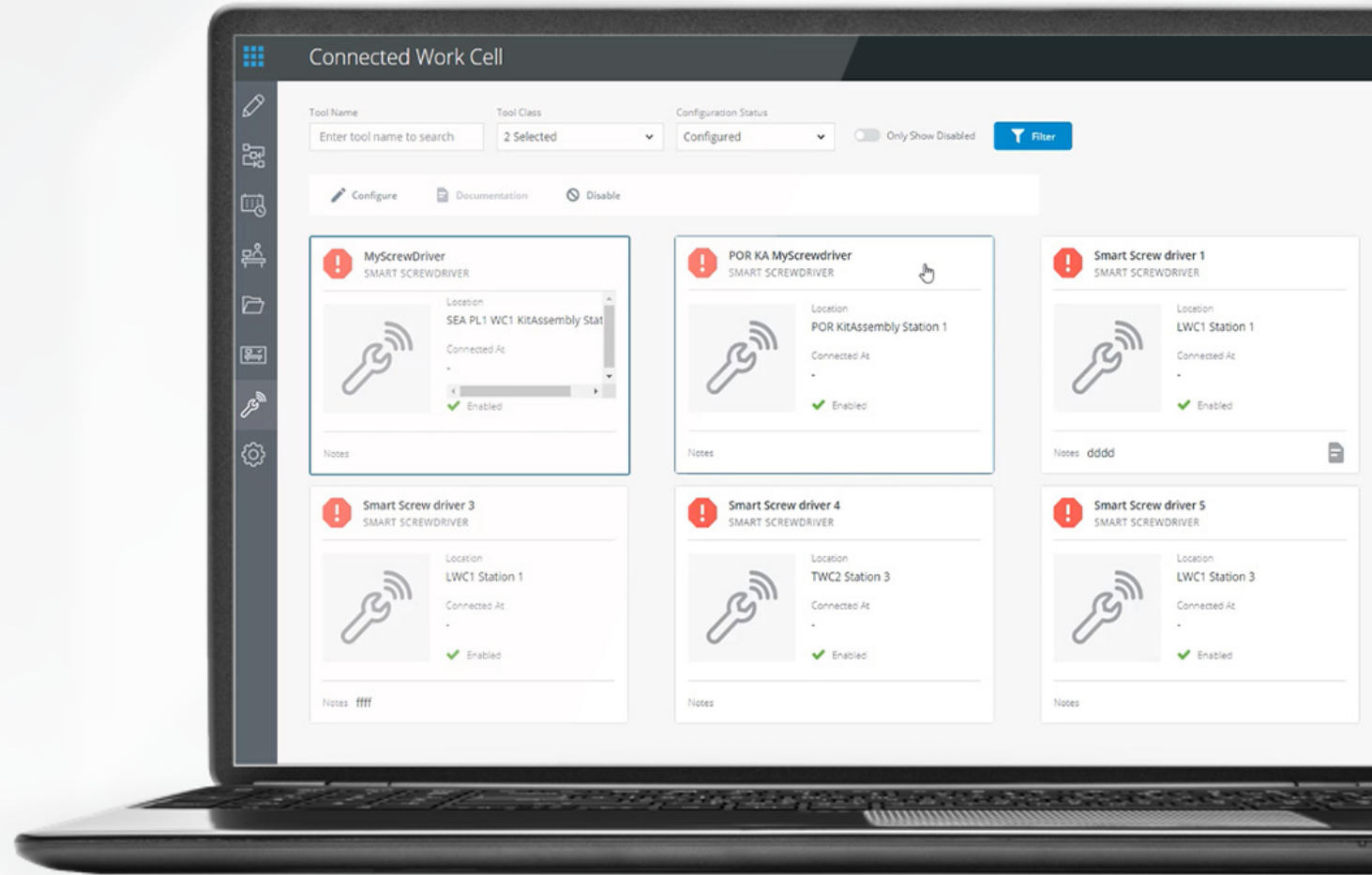
The screenshot shows a dialog box titled "Select a reason for stopping" with a close button (X) in the top right corner. Below the title, there is a message: "This work order will be stopped. If rejecting this item, select a waste reason." Below this message is a radio button group with three options: "On Hold", "QA Hold" (which is selected), and "Reject". Below the radio buttons, there is a section labeled "Selected Reasons" with a "Clear All" link. The main area of the dialog is titled "Select Reason:" and contains five blue buttons: "Break Time", "Miscellaneous", "Missing Parts", "Vendor Managed Inve...", and "Wrong Parts". At the bottom left of the dialog, there is a link "Up One Level" with an upward arrow icon. At the bottom right, there are two buttons: "Stop" and "Cancel".

# CWC - Smart Tool Manager

- king
- Smart Tools**
- Stations
- File Storage
- Route Mgmt

## Smart Tools Config.

- Configure name, location, picture, properties
- Smart Tool Status
- Linked documentation

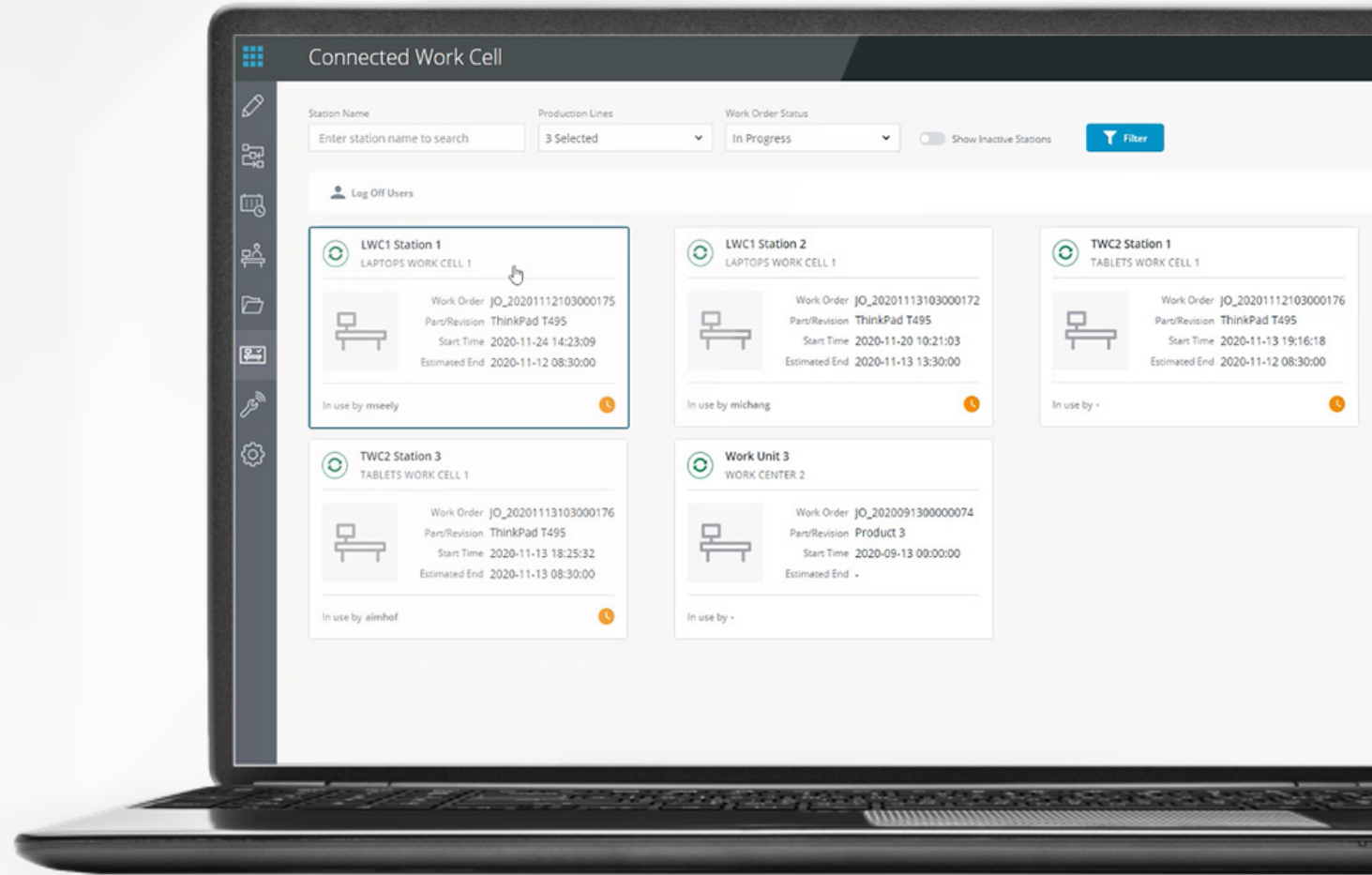


# CWC - Stations Dashboard



## Stations Dashboard

- Status of each station
- Station information
  - Work Order
  - Part
  - Start Time
  - End Time
- See current operator posted at the station



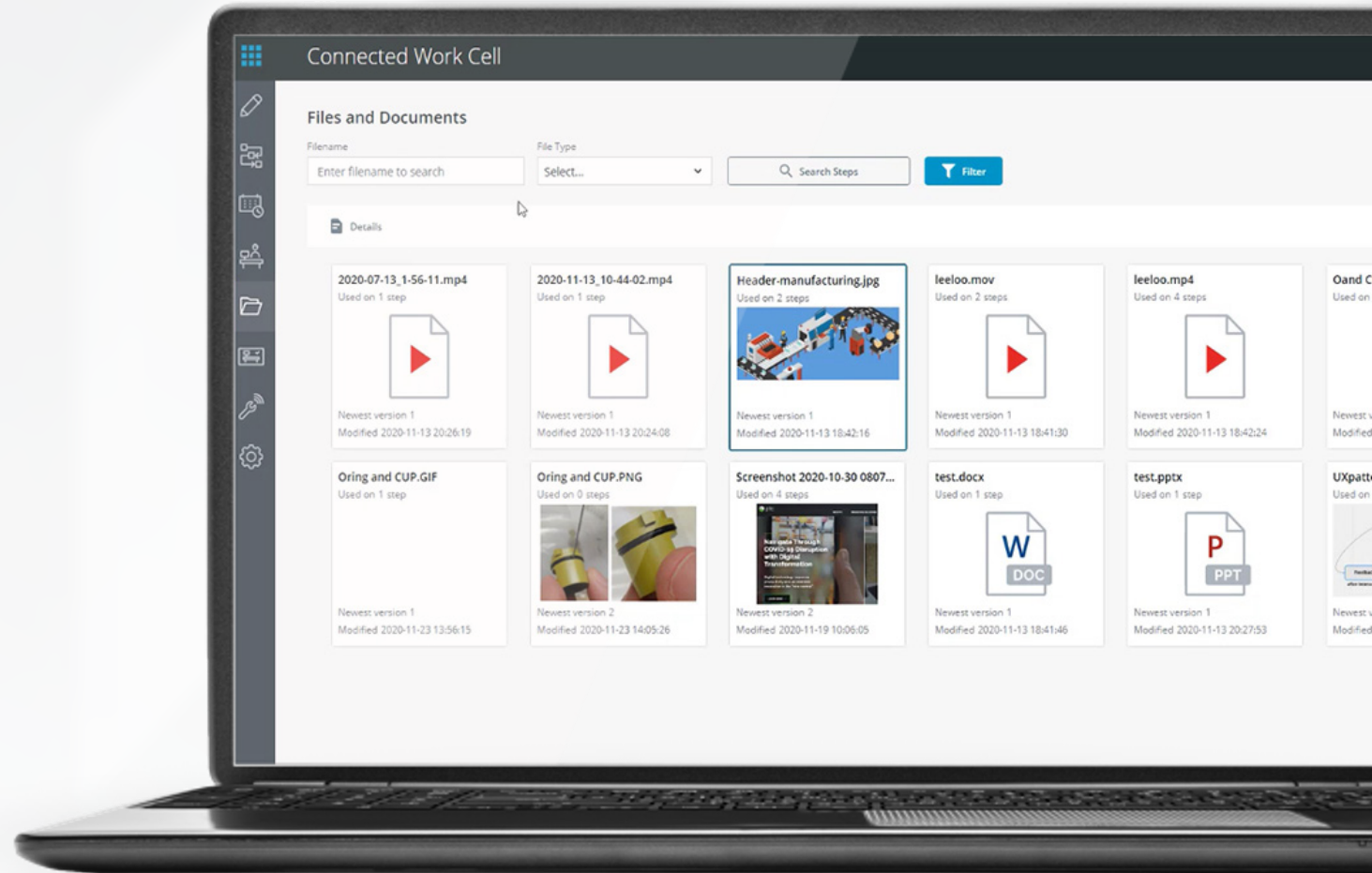
# CWC - File Storage & Documents

File Storage

Route Mgmt

## Document Management

- Complete history of documents
- Linked to Work Instruction version
- Using document metadata for performance

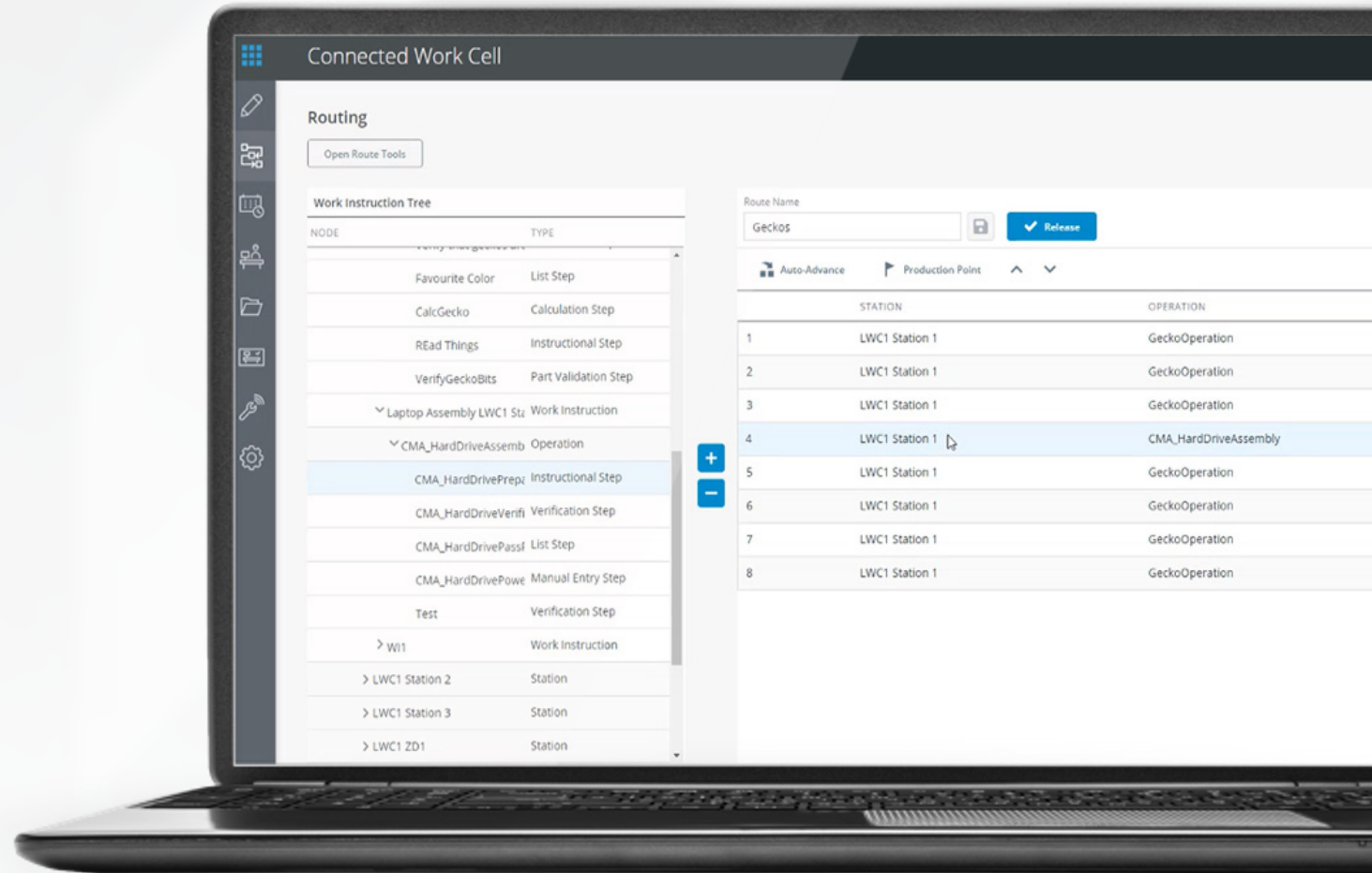


# CWC - Route management

## Route Mgmt

### Route Management

- Connect work instructions that straddle different stations
- Accommodate for variations in steps based on products
- Assign production points for routes
- Enable Auto-Advancing to bring serial numbers from one station to the next



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