



LOCKTIME

PROCESS CONTROL



CLEAN/ETCH SYSTEMSⁱ

PROCESS MACHINERY

PROCESS CONTROLS

PROCESS TOOLS

PROCESS TREATMENT

PROCESS SUPPORT



REL, INC. AUTOMATED ANODIC ETCH
PROCESSING LINE SHOWN

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LOCKTIME



WHAT IS LOCKTIME COHO?

LOCKTIME Coho is an industry 4.0, modular, PC & PLC-based controls solution for chemical processing dip lines and FPI lines.

LOCKTIME Coho is an optimized, predictive motion control software that continuously optimizes the full system model, to establish a motion control plan that optimizes throughput.

LOCKTIME Coho is developed and supported in the USA.

ORIGIN

With the development team based on the shores of Lake Superior, the software name was inspired by the local favorite Coho salmon.

LOCKTIME COHO SPECIAL SAUCE

The sauce is the algorithm. Each and every time a carrier/part is added to the line, LOCKTIME Coho will consider millions of potential control plans, and downselect to execute the process based on constraints set up in the run recipe.

LOCKTIME Coho is built with a Data First approach, providing unprecedented run history. Every input to the line is logged.

UI can be run on traditional HMI, iPad, PC, allowing for wireless line control. This is useful for running or jogging the line.



LOCKTIME COHO RECIPE

The recipe is the set of process steps that each part has to follow through the system process. Each step has time, temperature and/or pressure constraints.

HMI/PC/IPAD

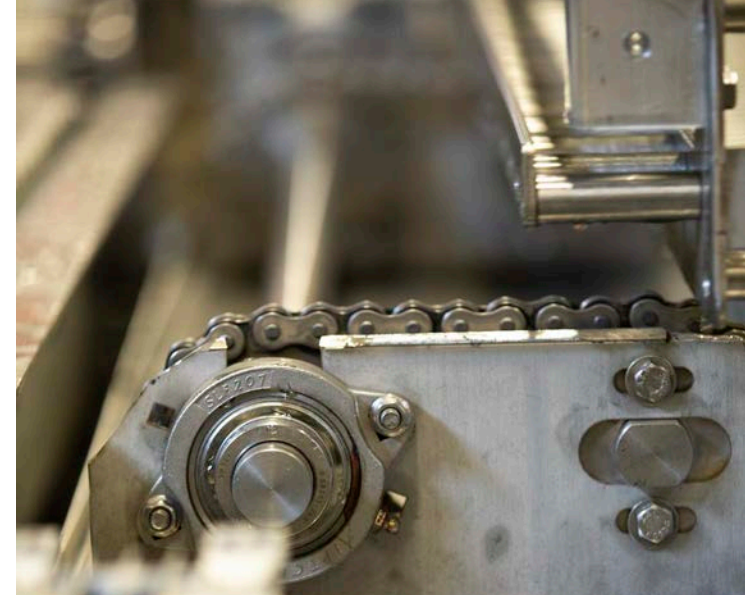
- ▲ Display real-time tank & line data
- ▲ Display historical tank & line data
- ▲ Update recipes
- ▲ Add carrier to enter line
- ▲ Alarms/alerts/diagnostics
- ▲ Auto quality management

LOCKTIME COHO SYSTEM BENEFITS

- ▲ Increased throughput utilizing optimization without hardware changes
- ▲ Process customization flexibility (add new recipes in minutes with login authority)
- ▲ Intuitive UI with optional cloud connectivity
- ▲ UI can be updated easily without special software
- ▲ Start-stop robustness due to line state memory (E-stop events, power loss recovery are seamless)
- ▲ Able to process multiple recipes at maximum capacity
- ▲ Auto quality management
- ▲ Unique user logins with customizable access restriction
- ▲ Tested core software with continual updates (common for all equipment)
- ▲ LOCKTIME Coho system can be migrated to updated hardware in the future

LOCKTIME COHO RELIABILITY

- ▲ All solid state computing with industrial grade server
- ▲ Easily upgraded as computer technology evolves
- ▲ LOCKTIME Coho has a system model, eliminating physical collisions or controls “locking up”
- ▲ Start-stop robustness: system state is continuously updated
- ▲ Redundant safety checks by both LOCKTIME Coho software and system PLC



LOCKTIME COHO SERVER

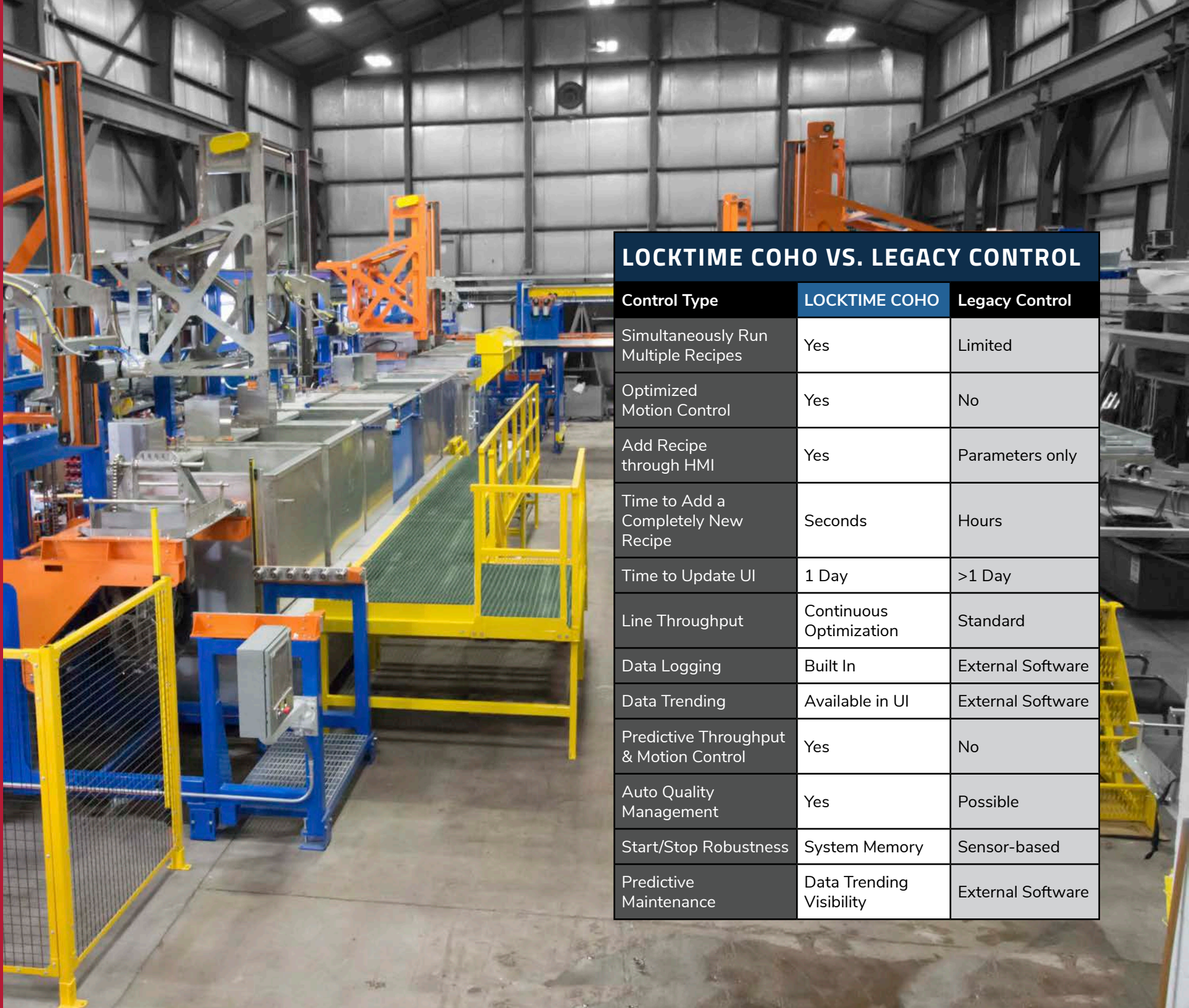
- ▲ Linux PC - datacenter
- ▲ Execution of algorithm
- ▲ Motion control & safety controls

PLC

- ▲ Interfaces with drives & sensors
- ▲ Interfaces with safety devices
- ▲ Redundant safety controls

LINE SENSORS/ACTUATORS

- ▲ Transporter sensors & drives
- ▲ Safety devices
- ▲ Temperature, flow rates, etc.



LOCKTIME COHO VS. LEGACY CONTROL

| Control Type | LOCKTIME COHO | Legacy Control |
|--|--------------------------|-------------------|
| Simultaneously Run Multiple Recipes | Yes | Limited |
| Optimized Motion Control | Yes | No |
| Add Recipe through HMI | Yes | Parameters only |
| Time to Add a Completely New Recipe | Seconds | Hours |
| Time to Update UI | 1 Day | >1 Day |
| Line Throughput | Continuous Optimization | Standard |
| Data Logging | Built In | External Software |
| Data Trending | Available in UI | External Software |
| Predictive Throughput & Motion Control | Yes | No |
| Auto Quality Management | Yes | Possible |
| Start/Stop Robustness | System Memory | Sensor-based |
| Predictive Maintenance | Data Trending Visibility | External Software |

LOCKTIME COHO FLEXIBILITY

- ▲ Recipes for parts can be updated 'on the fly'
- ▲ Algorithm is executed for each carrier placed into the line
- ▲ UI is very flexible
- ▲ Physical line changes (due to chemical changeouts, etc.) can be adapted into LOCKTIME Coho by changing the run recipe for a carrier/part

LOCKTIME COHO DATA TRACEABILITY

- ▲ The PC has excellent data tracking features for each part that goes through the dip line
- ▲ Barcode scan in parts, track operator inputs during the process, and process trace the carrier/part through the entire process
- ▲ Operating parameters can be tracked, stored, trended, and reported in customizable statistical displays on the UI
- ▲ Carrier throughput and tank information is stored for predictive maintenance purposes

LOCKTIME COHO INSTALLATION

- ▲ LOCKTIME Coho software is installed on a Linux datacenter in the control panel
- ▲ All motion control instructions are communicated through the PLC in the control panel to ensure all designed safety interfaces are clear before processing
- ▲ A UI will be installed on the control panel and a webserver is included for qualified and approved personnel to update recipes/add carriers in seconds
- ▲ Down time can be very minimal, if current line has modern controls hardware

LOCKTIME COHO EQUALS PC COMPUTING POWER

- ▲ Databased technology
- ▲ Algorithm predictive process modeling and control
- ▲ Enable flexible UI, connectivity
- ▲ Computing power is limitless





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