FreePoint™
Technologies Inc.

Tube Mill Manufacturers

Application Notes

by FreePoint Technologies Inc.

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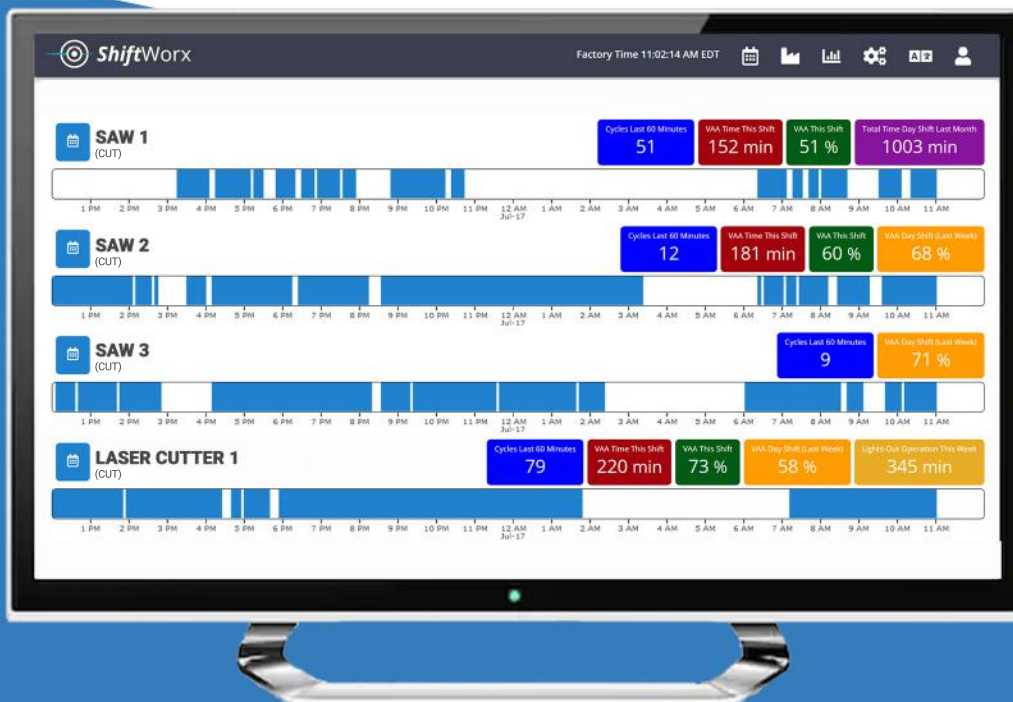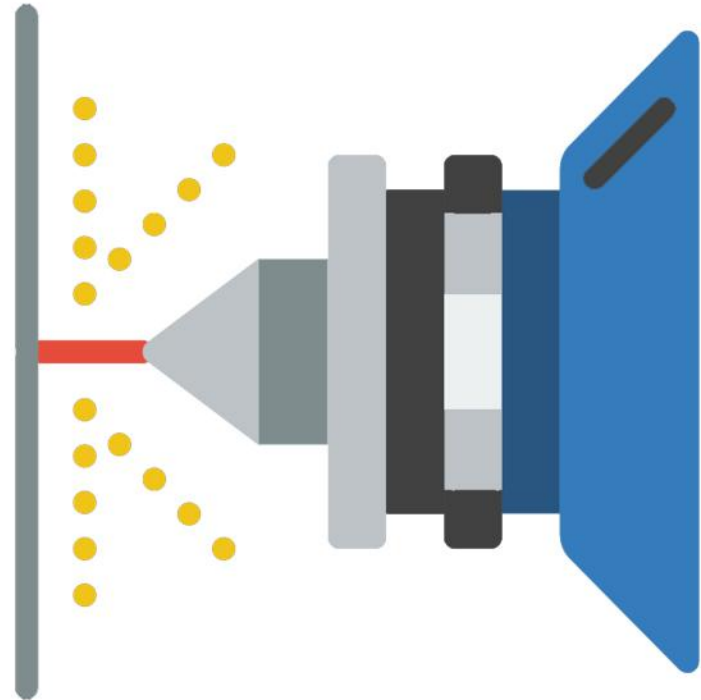info@getfreepoint.com
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About Tube Mills

INDUSTRY OVERVIEW

Manufacturers in this industry have a continuous production process that takes rolled sheets of flat steel or other metal and forms it into tubes. Machine rate and runtime are the best indications of overall process efficiency.

Examples of Machines Monitored:

• Roll Forming Tube Mill

• Die Punches

• Cut Off Saws

• Laser Cutters

ShiftWorx

Factory Time 11:02:14 AM EDT

SAW 1 (CUT)	Cycles Last 60 Minutes	VAA Time This Shift	VAA This Shift	Total Time Day Shift Last Month
	51	152 min	51 %	1003 min

1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM 12 AM Jul-17 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM

SAW 2 (CUT)	Cycles Last 60 Minutes	VAA Time This Shift	VAA This Shift	VAA Day Shift (Last Week)
	12	181 min	60 %	68 %

1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM 12 AM Jul-17 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM

SAW 3 (CUT)	Cycles Last 60 Minutes	VAA Day Shift (Last Week)
	9	71 %

1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM 12 AM Jul-17 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM

LASER CUTTER 1 (CUT)	Cycles Last 60 Minutes	VAA Time This Shift	VAA This Shift	VAA Day Shift (Last Week)	Lights-Out Operation This Week
	79	220 min	73 %	58 %	345 min

1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM 12 AM Jul-17 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM

The Challenge

Roll form mills are generally older, having been put in place many years ago. They are designed to run at a certain rate, but there is no guarantee that the mill would be run at the target rate. Lost production time, or production time run at a slower rate, is lost [revenue] productive time and less product produced.

The PLCs controlling the line are of various types and brands with little or no effective connectivity to other devices or monitoring software. The uptime of the roll forming mill is critical to the operation since it is the first stage of the manufacturing process and every other process is dependent upon it. As such, it cannot be offline for extended periods, making retrofits and upgrades difficult to do.
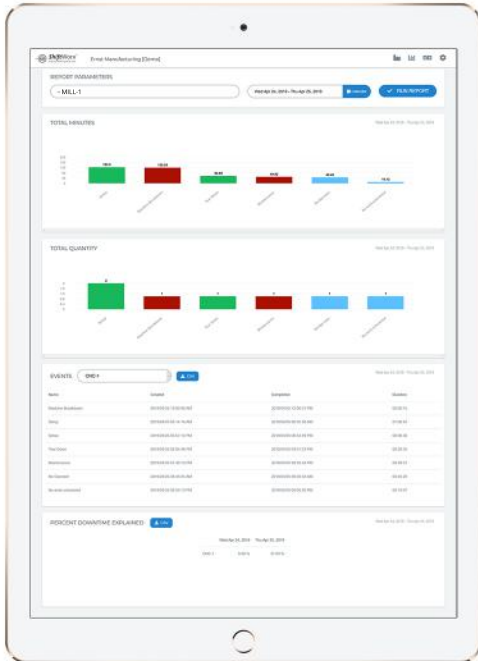
Secondary to the roll forming mills, are the other machines involved, such as:

- **Punches**   **• Cut-Off Saws**   **• Laser Cutters**
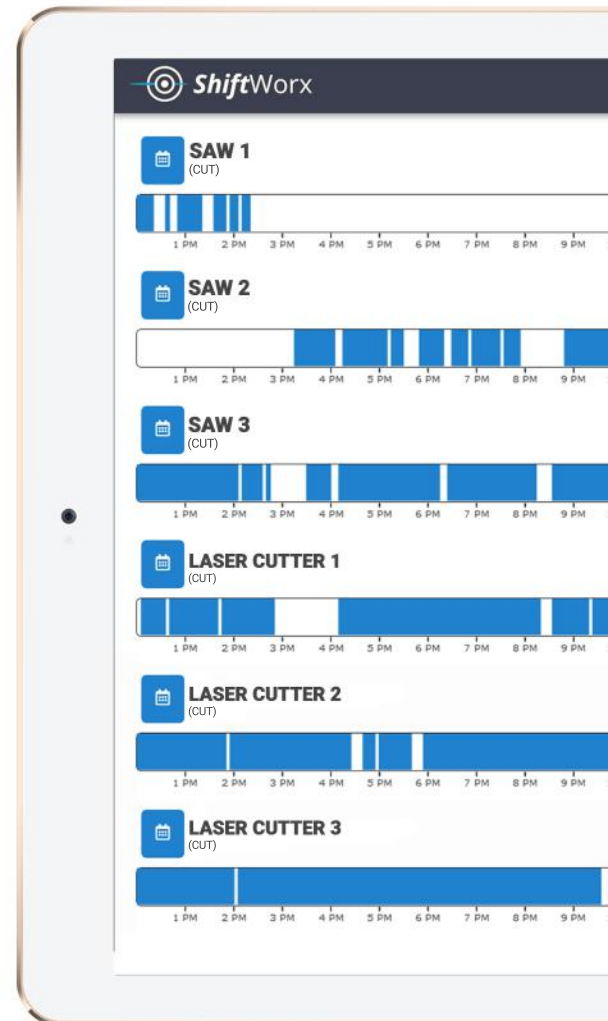
> FreePoint connects non-invasively to roll forming mill and the other machines involved.

The Solution

Some mills are controlled by PLCs where there is an output that toggles to indicate 1 foot/meter of tube has been produced. In such cases, this output provides the ideal **primary signal** to be monitored.

If the PLC does not have such an output available, a **proximity sensor could be mounted** to detect the keyway (or flag) on a feed wheel. This would serve as a good alternative as a primary signal. Other signals that can useful to connect would be to the cutoff saw (home switch), in line punches (solenoid), "out of material sensor", and auto/manual indication.

The primary signal would indicate that value adding work is being done, and would be used to calculate linear feet (or meters) or tube produced, plus feed rate of the material. The cutoff saw would indicate how many lengths of tube were made, and in conjunction with the primary signal, how long each piece was.

FreePoint's ShiftWorx software would track the mill's uptime, running time, linear feet (meters) produced, and feed rate. FreePoint's 'Narrative' software would allow the tracking all of the non-productive time – through the creation and use of reason codes.

Narrative

Using our "Narrative" module, Operators are engaged in the data collection process by empirically identifying all the non-value adding periods (down time causes), giving management the information they need to make better decisions.

Notifications

Using our "Notifications" module, supervisors, managers and maintenance staff can be alerted via text or email whenever a critical machine has stopped for a defined period of time, minimizing or eliminating unnecessary down time.

The Outcome

The increased transparency often results in an increase in productivity right away. Engaging operators through a very simple, intuitive Narration tool does two things: it collects empirical downtime information that facilitates data driven decisions on future investments, and engages the operators - making them part of the solution, not the problem.

Positive operator engagement has proven to pay short term dividends (increased daily productivity) and long term dividends (higher satisfaction means less absenteeism, higher retention, reduced onboarding and training cost.)

With the empirical data collected, management can provide more accurate job estimates on both time and cost, improving its competitive advantage, while increasing overall production capacity with real time machine utilization and production information at their fingertips.

- Increase Mill Capacity & Productivity
- Reduce Downtime
- More Accurate Production Reporting
- Remote Production Monitoring

KPI's & Measurements

Feed Rate
In feet/meters per minute

Length of Tube Produced
(by hour/shift/day/period)

# of Tubes Prouced
(by hour/shift/day/period)

Cutting Time
what % of time the mill/saw/cutter
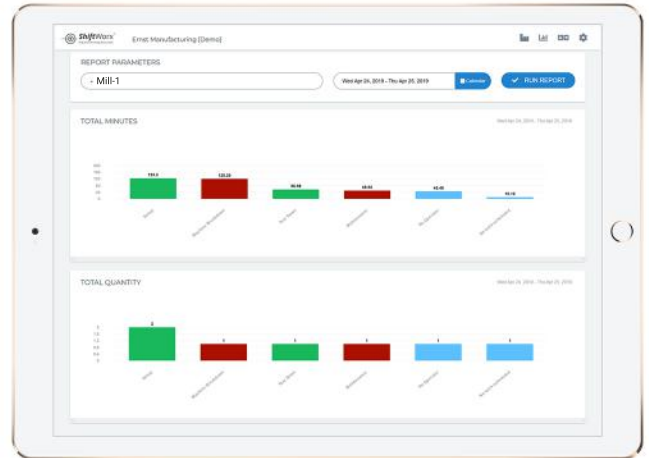has been running (uptime) by
hour/day/shift

Set Up Time
what is the average set up time by
machine, or job type

Downtime
what are the reasons for
non-productive time (equipment
causes, scheduling or management
related, material related)

Machine Utilization
which machines have capacity and
which machines are constraints

> **"** Using our *Notifications* module,
> supervisors, managers and
> maintenance staff can be
> alerted whenever a critical
> machine has stopped running.

Interested in an IIoT Solution?

Reach out to us today to speak with
an Account Manager.

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