



Log and board optimization with smart 3D/2D laser Profiling

Company Overview

Established in 1993 in Salmo, British Columbia, Porcupine Wood Products manufactures Western Red Cedar logs into decking, fencing, sidings and trim board products of the highest grade. Porcupine cuts slow-growing second growth logs with less than 20" butt diameter. These logs produce exceptional lumber with tight grain and small knots. This fiber is ideal for decking, dimension, fencing, and sidings.



The mill produces cedar products that are among the best, if not the very best available on the market. Porcupine is certified under Program for the Endorsement of Forest Certification (PEFC) in the spring of 2009.



The Challenge

The primary challenge Porcupine mill operators face is updating their lumber optimization systems to continuously improve the reliability and increase the grade and value of wood products produced.



The Solution

To optimize value recovery and maximize product quality, Porcupine turned to leading mill automation provider Raptor Integration to design and deploy a custom wood optimization solution.

Raptor implemented three secondary-breakdown machine vision solutions, including (1) a 360° cant scanner, (2) flitch scanner, and (3) board scanner. These systems leverage LMI's chroma+scan and Gocator scan technology to generate precision raw data that is communicated to Raptor's software and used to optimize cutlines and achieve the highest value recovery and quality for every piece of lumber:



Cant Optimization

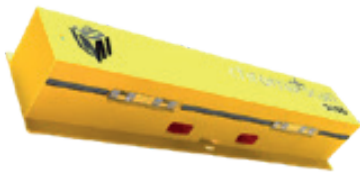
- (1) At the cant scanning station, a multi-sensor network of 4x Gocator 2180 laser profilers are mounted to a scan frame at the infeed of the gang saw to provide 360° scans of cants traveling from the upstream process. This Gocator sensor network is synchronized to within 1µs and generates a stitched 3D point cloud of the entire cant (top, bottom, sides) for optimal board-cutting decision logic and 100% defect detection. At the outfeed of the gang saw flitches are sorted to a transverse edger queue and boards are sent to the transverse trimmer queue.
- (2) Mounted above the edger queue, a bank of Gocator 250 multi-point scanners paired with Gocator 210 bolt-on light modules generate geometric, 3D color vision, and tracheid detection data of flitches. Gocator provides a complete 2D/3D image profile that is used to identify defects and produce the best cut decisions based on grade of the finished lumber.
- (3) Raptor's traverse board scanner leverages a bank of Chroma+Scan 3155 multi-point scanners to generate a full 3D geometric profile of each board, which is then used to calculate optimal trim decisions. Scan data is used to calculate wane, thickness and width thresholds.



Board Scanning



UI Interface



chroma+scan 3155



Gocator 2180



Gocator 250 + 205 (lightbar for color vision)

Furthermore, because LMI's sensors produce very high resolution data, mill operators are able to detect subtle anomalies in downstream processes (e.g., wedge) that can ultimately help diagnose and fix errors in upstream cutting machinery.

The Gocator Advantage for Wood

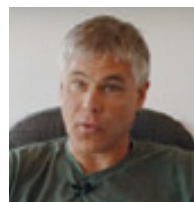
- Web Browser-Based User Interface - Easy Setup and Control
- 2D+3D Data Generation for Profile Geometry, Color Vision, and Tracheid Measurement
- Multi-Sensor Networking for 360° Scanning Capability
- Standard Communication with PLCs (EtherNetIP, Modbus, PROFINET)

Result

Porcupine has seen a 15% increase in value recovery since implementing the Gocator-driven Raptor Integration scanning system.

Next Steps

In the future, porcupine plans to install optimization in the planer mill to further take advantage of the technology available today. Currently they rely on lumber graders for this process.



With scanning automation we have increased our output of goodgrade material by more than 15%. The sky is the limit. And it's not just this type of scanning automation, it's robotics, it's everything. When it's viable economically to me, as a small producer, this is something I want to jump into.

Craig Upper, General Manager, Porcupine Wood Products