



Upper Columbia Mill Breaks Production Records with the Help of State-of-the-Art Technology

In 2007 GreenWood Tree Farm Fund and Collins embarked on a joint venture to build Upper Columbia Mill, with a vision of constructing a mill that sources timber exclusively from GreenWood Tree Farm's Pacific Albus plantation and utilizes state-of-the-art technology to process it. To do this, they situated Upper Columbia Mill amid GreenWood Tree Farm's 24,000-acre tree farm in Boardman, Oregon, USA.

The FSC-certified plantation, which surrounds Upper Columbia Mill, differentiates the operation from most sawmills and provides them with several unique advantages. Upper Columbia Mill does not buy trees on the open market, which allows them to remain competitive in a challenging economy. Unlike the timber sold on the open market, Pacific Albus timber is consistent, uniform and sustainable. Due to the tree farm's proximity, logs are harvested within three miles of the mill and do not have to be cut to highway

length for transport. Stems arrive at Upper Columbia Mill within one-and-a-half days of harvest. As the mill's production fluctuates, the logging levels can shift accordingly. Combined, these factors have a substantial impact on Upper Columbia Mill's bottom line.

When Upper Columbia Mill opened its doors in September 2008, they operated with a skeleton crew while they fine-tuned the equipment and operations. Now the mill employs approximately 85 full-time employees, and that number continues to grow.

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Upper Columbia Mill





JoeScan scan heads provide information on the sides of the board and identify wane.

Since opening, Upper Columbia Mill has consistently broken production records. During its first year, Upper Columbia Mill produced more than 5 million board feet of lumber. By 2012, it generated 48 million board feet. In 2013, Upper Columbia Mill exceeded its 2012 record by more than 20 percent, producing 59 million board feet. The random-width lumber the mill produces is used for several applications: furniture, decorative framing, pallet stock, pencil stock and even snowboards.



Upper Columbia Mill – Boardman, Oregon, USA

Customized Optimization System Meets Unique Needs and Reduces Learning Curve

As a new operation, Upper Columbia Mill had the opportunity to select and deploy state-of-the-art technology. It was vital to select equipment and optimization systems that fit its particular needs, rather than deploying a solution with a one-size-fits-all approach. "Every tree, every species is different," explains Scott Ezell, maintenance superintendent at

Upper Columbia Mill. "So is every mill. Upper Columbia Mill needs equipment that can meet our unique requirements."

When Upper Columbia Mill approached Nelson Bros. Engineering about optimization systems, the mill asked for a single customized solution throughout the merchandising, gang, board edger and trimmer operations. Upper Columbia Mill wanted one system that the crew could easily learn and maintain. Nelson Bros. Engineering delivered. "With Nelson Bros., we asked for a system that met certain criteria," Ezell says. "They deployed the same hardware across four machine centers and made it work. It just fits. It's the same JoeScan scan heads, same interface and same concept throughout all four machine centers. We only have to learn one system. The platform works, and it doesn't need a million layers to meet everyone's needs."

Simplicity of JoeScan Scan Heads Contributes to Productivity

Scanning is an integral component of the optimization, and Upper Columbia Mill uses 24 JoeScan scan heads in the four machine centers to optimize cutting decisions and maximize yield. Even before the mill was operational, Ezell was impressed with JoeScan scan

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JoeScan scan heads transversely profile boards in the trimmer.

heads because of the easy setup and calibration. “To power up a JoeScan scan head, all you need is two plugs – Ethernet and the connector – and it’s up and running. It doesn’t require a special computer,” he says. Calibration is just as straightforward. “Calibration of JoeScan scan heads is easy. We can just dial them in and go.”

The simplicity of JoeScan scan heads contributes to Upper Columbia Mill’s operational productivity. By using a simple scanning system, the crew at Upper Columbia Mill can focus on production rather than learning the intricacies of complex equipment. “The simplicity of JoeScan’s products makes them worth their weight in gold,” Ezell says.

JoeScan Scan Heads Provide Profiling Data to Optimize Cutting Decisions

At Upper Columbia Mill, the scanning process begins in the merchandising area. The JoeScan scan heads capture detailed data on the geometry of the stem, and this data is analyzed to identify the key components and characteristics to optimize for the best recovery. The scanning data feeds directly into the optimizer program, which conveys information to the PLC (program logic controller) system that controls the six-saw merchandising line. Some scanning solutions use up to four scan heads to profile stems; JoeScan scan heads accomplish the profiling needed with just two.

In 2013, Upper Columbia Mill added a veneer plant. According to Ezell, the veneer plant adds “a whole new

level of complexity to the system.” The system has to differentiate between veneer blocks and sawmill blocks, and then position the saws correctly to cut a straight log and optimize the cut for maximum recovery. JoeScan scan heads are an essential part of the system. The high-resolution, accurate scan data enables the optimization program to identify the nodes, evaluate alternate cutting patterns and ultimately select the most valuable set of blocks to cut from a given stem.

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Upper Columbia Mill*

After the primary breakdown, two JoeScan scan heads profile cants before they pass through the gang saw. A scan head positioned on each side of the cant determines the optimal cutting solution, and several decision processes rely on the data from the scan head. Currently, the gang runs up to 500 board feet per minute. While the cants go through the gang saw, the flitches move to the edger. Two additional JoeScan scan heads profile the flitches from the side and create a profile of the entire length. The data from the scan head helps determine where to cut the flitch to make a board. The edger optimizer system runs 1,250 board feet per minute, so it’s imperative that the scan heads are fast and reliable.

During the last stage of the sawing process, the boards travel to the trimmer. Upper Columbia Mill's trimmer utilizes a bank of 18 JoeScan scan heads that profile entire boards transversely. The scan heads profile the boards from three different angles – two rows of six scan heads profile the bottom of the board, and a row of six scan heads on the top provides information on the sides of the board and identifies wane. According to Ezell, the scan heads identify "how much we can see, where it's at on the board, and what we're going to do to improve the final product." The system trades off between length and quality as identified by the scan head data and trims the wane to make the highest-value board. Once the boards go through the trimmer, the information from the scan heads is also used to control a dynamic floating-sort process that directs each of the boards to one of 15 bins.



Lumber is sorted, stacked and loaded for transport to Upper Columbia Mill's planing mill.

Ease of Use and Reliability of JoeScan Scan Heads Drives Uptime

Downtime is costly for Upper Columbia Mill, and every minute counts. Consequently, Ezell values the clean design of the optimization and scanning systems. If necessary, his crew can troubleshoot the system: "The optimization with JoeScan scan heads offers a process that's clean enough that end users and the crew can

operate it and troubleshoot if necessary," he says. "Ten years ago, you needed an electrical engineer involved with the troubleshooting. With this system, we don't need a magic decoder ring to operate it." This is critical – now that the mill operates 60 hours per week, Ezell relies on his team to troubleshoot issues when he is unavailable.

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Equipment reliability also drives uptime. The level of reliability provided by JoeScan scan heads gives Ezell peace of mind. "The JoeScan scan heads just work," he says. The combination of reliability and simplicity that JoeScan scan heads offer makes them an ideal fit for Upper Columbia Mill – as a new mill, and as it continues to grow and evolve.

Upper Columbia Mill Lays the Groundwork for Future Growth

Since opening in 2008, Upper Columbia Mill has continuously thrived. So what's next? Today, data is used to track and enhance the mill's operations. The next step is to tie the mill data with the tree farm data to optimize tree spacing, watering, pruning and other aspects of the growing process. The evolution of the tree farm will enable Upper Columbia Mill to have a steady, sustainable supply of high-quality Pacific Albus. Continued operational efficiency is vital as well – the mill wants to eliminate downtime and continue to break records without increasing its hours of operation. Although these are ambitious goals, Upper Columbia Mill is resolute. And there's no doubt about it: Upper Columbia Mill is equipped for success. ■

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