Drymill RealTime
Lumber Size Control
2005

Presentation Outline
- Introduction
- System Components
- Applications, Objectives & Benefits
- Case Studies

www.sicamsystems.com
SiCam Systems Corporation

- Offices Vancouver (Surrey).
- 150 Customers in Four Countries.
- Regional Reps:
  - Quebec;
  - New Zealand & Australia.
- Wood Industry Size Control & Predictive Maintenance Technology:
  - SiCam RealTime Lumber Size Control;
  - SiCam Caliper Lumber Size Control;
  - SiCam Veneer & Panels Size Control.

Canada Customer Base

- Apollo Forest Products
- Abitibi Consolidated
- Ainsworth
- Babine Forest Prod.
- Bowater
- Canfor
- Domtar
- Interfor
- International Paper
- JD Irving
- Norbord
- Tolko Industries
- Slocan
- Tembec
- Timber West
- Weldwood Canada
- West Fraser
- Weyerhaeuser
**International Customer Base**

- Carter Holt Harvey
- Cascade Hardwood
- Crown Pacific
- Hood Industries
- International Paper
- Irving Forest Products
- MC Dixon Lumber
- MeadWestvaco
- Potlatch
- Riley Creek
- Rough & Ready
- Simpson Timber
- Stimson Lumber
- Tenon
- Vaagen Bros
- Weyerhaeuser

**Drymill Size Control Applications**

<table>
<thead>
<tr>
<th>Project</th>
<th>Research Partner</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planer/Moulder Infeed</td>
<td>International Paper</td>
<td>2002</td>
</tr>
<tr>
<td>Planer Outfeed</td>
<td>International Paper</td>
<td>2000</td>
</tr>
<tr>
<td>Fence Gauge</td>
<td>International Paper</td>
<td>2001</td>
</tr>
<tr>
<td>Length Gauge</td>
<td>Apollo Forest Products</td>
<td>2003</td>
</tr>
<tr>
<td>Splitting Planer Outfeed</td>
<td>Weyerhaeuser</td>
<td>2005</td>
</tr>
<tr>
<td>Moulder Outfeed</td>
<td>Gorman Bros. Lumber</td>
<td>2005</td>
</tr>
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</table>
Introduction

System Components

Applications Objectives & Benefits

Case Studies

**Hardware Components**

Data is read from the laser heads and analyzed by software.

Filters eliminate debris, natural defects and any anomalies in the data.

Critical sizes and angles are calculated for each profile.

Any sizes that are out of tolerance will generate immediate feedback and configurable alarms.

Data will be stored for long term trending and reporting in a MS-SQL SERVER database.

**Software Components**
Planer Infeed Application

- **Objectives:**
  - Scan all rough feed stock at infeed of drymill;
  - Track thickness and width of feed stock;
  - Track variation of feed stock.

- **Benefits:**
  - Provide feed back on thickness and width to greenmill for shrinkage calculation;
  - Provides alarms if feed stock is off size to facilitate adjustment of planer.

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**Planer Infeed Scan Model**
Planer Infeed Case Study

- **Mill Statistics:**
  - 15,000 boards per shift, 2 shift basis;
  - Lumber average value $200/m3;
  - Species: Southern Yellow Pine.

- **Study Objectives:**
  - Track greenmill variation, shrinkage and the relationship to drymill feed stock variation;
  - Identify opportunities to increase recovery.

- **Approach:**
  - Measure every piece with real-time lumber size control at greenmill & pre-planer.
**Planer Infeed Results**

<table>
<thead>
<tr>
<th></th>
<th>Greenmill</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb St Avg</td>
<td>Mar St Avg</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>1.168</td>
<td>0.889</td>
<td>-0.279</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Drymill</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb St Avg</td>
<td>Mar St Avg</td>
<td>Change</td>
<td></td>
</tr>
<tr>
<td>2.032</td>
<td>1.346</td>
<td>-0.686</td>
<td></td>
</tr>
</tbody>
</table>

In Millimeters

**Planer Infeed Impacts**

- Reduced greenmill variation (standard deviation-$S_1$) by $\frac{1}{4}$mm on thickness and $\frac{1}{4}$mm on width.
- Reduced planer allowances by $\frac{1}{4}$mm on each face – top, bottom & both sides.
- Reduced edge slivers & related downtime by 12 minutes per shift – 3% improved uptime.
- Greenmill thickness aim sizes reduced by $\frac{1}{2}$mm.
- Greenmill width aim sizes reduced by $\frac{1}{2}$mm.

Improved Planer Safety!
### Planer Infeed Financial Benefits

#### THICKNESS COST-BENEFIT SUMMARY

<table>
<thead>
<tr>
<th>Additional Profits - Lumber =</th>
<th>$202,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Profits - Chips =</td>
<td>$18,021</td>
</tr>
<tr>
<td>Additional Profits - Shavings =</td>
<td>$0</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$220,521</strong></td>
</tr>
<tr>
<td>Less Additional Processing Costs =</td>
<td>($35,438)</td>
</tr>
<tr>
<td><strong>NET Increase in Profits</strong></td>
<td><strong>$185,084 1st Year</strong></td>
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</tbody>
</table>

#### WIDTH COST-BENEFIT SUMMARY

<table>
<thead>
<tr>
<th>Additional Profits - Lumber =</th>
<th>$40,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional Profits - Chips =</td>
<td>$3,604</td>
</tr>
<tr>
<td>Additional Profits - Shavings =</td>
<td>$0</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$44,104</strong></td>
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<tr>
<td>Less Additional Processing Costs =</td>
<td>($7,088)</td>
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<tr>
<td><strong>NET Increase in Profits</strong></td>
<td><strong>$37,017 1st Year</strong></td>
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</table>

US Dollars

### Case Study

#### Minutes Saved / Shift

<table>
<thead>
<tr>
<th>Minutes Saved / Shift</th>
<th>Net Value / Minute</th>
<th># Shifts / Year</th>
<th>Total Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>$25</td>
<td>450</td>
<td>$135,000</td>
</tr>
</tbody>
</table>

Production Increase Benefit
Planer Outfeed Application

♦ Objectives:
  ■ Scan the thickness and width of every piece produced at the drymill planer;
  ■ Alert personnel immediately when miss-manufacturing occurs.

♦ Benefits:
  ■ Always run on size specification;
  ■ Eliminate size claims;
  ■ Improve overall grade out turn.
Planer Outfeed Scanner

Planer Outfeed Scanner
Planer Outfeed Case Study

- S4S Planer with Finger Joining Application for Trim Ends.
- Finger Joining Requires +.125mm (.005”) Extra on Width.
- Planer Runs Heavy by .125mm on Thickness & .250mm on Width.
- Skip Dressing on Top & Bottom is a Major Cause of Downgrade.
Planer Outfeed Results

- Thickness now at .125mm - .250mm Under Planer Target Size - Always!
- Width now On Target for Finger Joining Requirement - Always!
## Planer Outfeed Impacts

- Grade Outturn Increased by 1.2% in Overall Value Due to Reduced Skip Causing Downgrade.
- Increased Finger Joined Product Production by .5% Due to Less Downtime Caused by Over Size (Width) Feed Stock.
- Reduced Greenmill Aim Size by .125mm (1/8mm) on Thickness & Width.

Financial Impact: $150,000 US Per Year

## Fence Gauge

- **Objectives:**
  - Detect end position of every piece after fencing;
  - Detect fence miss-manufacturing.

- **Benefits:**
  - Every piece properly fenced;
  - Improve on-length performance.
Wood Manufacturing 2005

Fence Gauge Scan Model

Fence Gauge - Scanner

Wood Manufacturing 2005
Wood Manufacturing 2005
Wood Manufacturing 2005
Fence Gauge Case Study

- Random Length S4S Planer.
- Lengths from 6’ – 20’ Domestic USA Products.
- Manual Study showed average of 1.3% Shorts mainly caused by Miss-Fencing.
- Manual Study did not account for off length due to Fence Miss-Manufacturing Special Variation Events.
- Lengths Variation at +/- 6.35mm.
- Length Claim Frequency – One Per Year.
Fence Gauge Results

- Shorts Reduced to .2% of Pieces Verified by Manual Studies.
- Length Variation Reduced by 1.78mm or 28% - Now at +/- 4.57mm.

<table>
<thead>
<tr>
<th># Boards</th>
<th>Average</th>
<th>Miss Trim / Savings per Board</th>
<th>Annual Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>135,000</td>
<td>$0.25</td>
<td></td>
<td>$33,750</td>
</tr>
</tbody>
</table>

Fence Gauge Impacts

- Fence Verification Installed for 2 Years – No Length Claims Since Install.
Length Gauge

**Objectives:**
- Scan the length of every piece produced at the drymill planer PET saws;
- Improve control to always run length variation less than +/- 1mm;
- Alert personnel immediately when trimming miss-manufacturing occurs.

**Benefits:**
- Always run on length specification.
Length Gauge Case Study

- Stud Mill Installation.
- Lengths from 6’ – 10’.
- 70% Domestic USA Products.
- 30% Japan High Grade Products.
- Length Claim Frequency:
  - None on Domestic Products;
  - Two Claims Per Year on Japanese Products.

Length Gauge Results

- Length Gauge Verified PET Trim Saws Performance at less than +/- 1mm Length Variation Consistently - Good Marketing Tool for Japanese Customers;
- Length Gauge Alarms Triggered:
  - PET Saws Miss-Set in PLC – Operator Error;
  - PET Saw Damaged;
  - Too Many Under Length Pieces in Feed Stock.
## Length Gauge Impacts

- Length Gauge System Installed 18 Months – No Length Claims Since Install.
- Very Happy Japanese Customers.
- Able to Increase Average Sales Value by .5% on Japanese Products for $150,000 per Year Benefit.

## Splitting Planer Outfeed

### Objectives:
- Scan the thickness and width of every piece produced at the drymill planer;
- Alert personnel immediately when miss-manufacturing occurs.

### Benefits:
- Always run on size specification;
- Improve overall grade out turn.

New Application in 2005
Moulder Outfeed

**Objectives:**
- Scan all the critical dimensions of every piece produced at the moulder;
- Alert personnel immediately when miss-manufacturing occurs.

**Benefits:**
- Always run on specification;
- Maintain competitive advantage due to unique product characteristics;
- Improve product quality & value.

New Application in 2005
Wood Manufacturing 2005

Moulder Outfeed Scan Model

Moulder Outfeed Scanner
Wood Manufacturing 2005
Wood Manufacturing 2005
Wood Manufacturing 2005
Conclusion

- Global Competition Continues to Increase in the Wood Products Industry.
- Every Forward Looking Wood Products Company is Seeking Competitive Advantages.
- Increased Manufacturing Reliability is Identified as a Significant Area of Opportunity to Gain a Competitive Advantage.
- Real-Time Size Control & Online Predictive Maintenance Technology is Available Now.
- The Fastest & Fittest Companies will Adopt these Technologies within the Next 5 Years.
- Innovators & Early Adopters will Gain 1-5 Years Competitive Advantage in the Market Place.

“SIZE MATTERS”

in lumber size control

Thank You…

Look for drymill planer and moulder size control scanning technology from SiCam Systems in 2005.

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