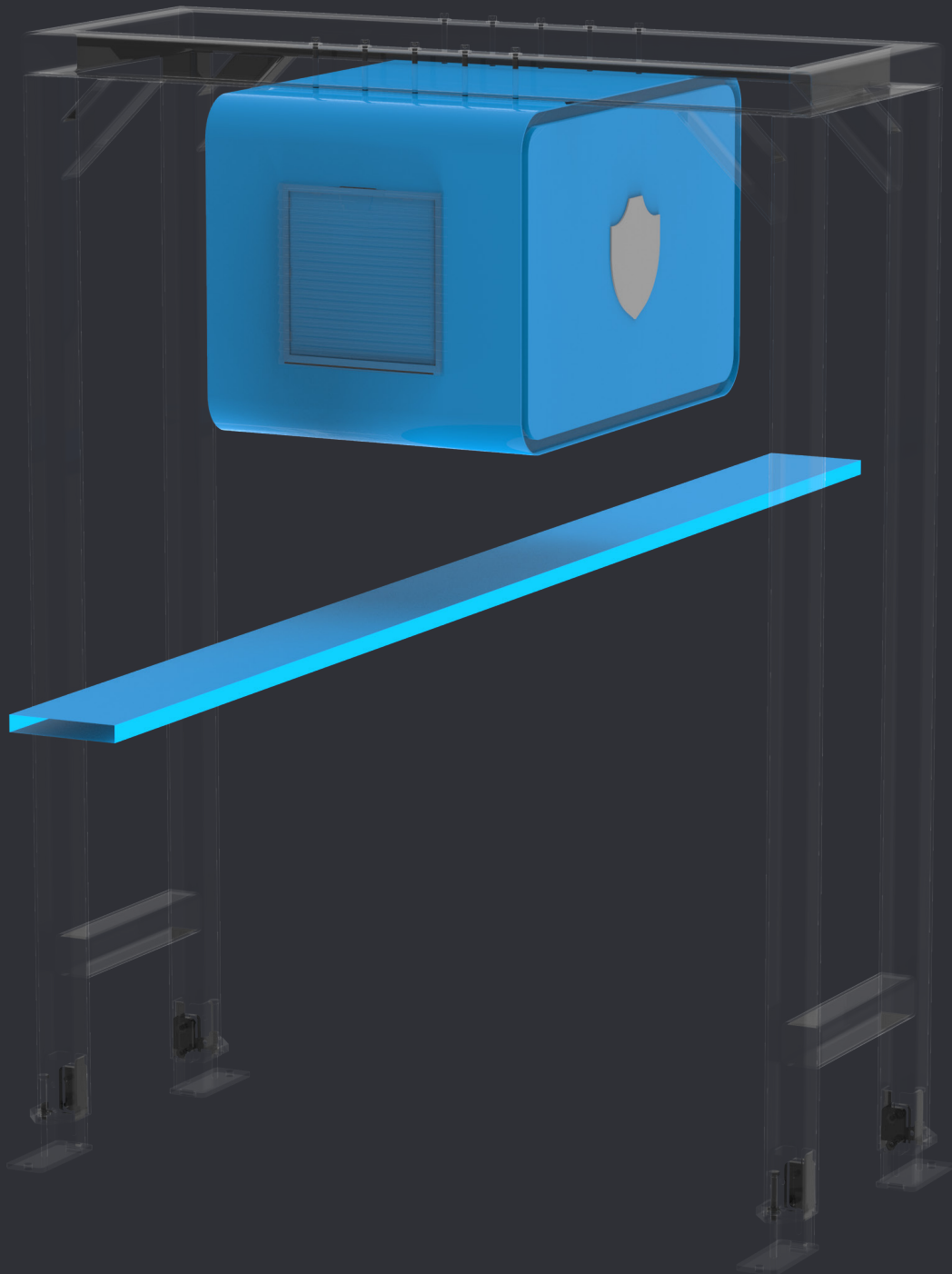# WS SMARTi

WS 100
Lumber Compact
Scanner

Company Presentation

About

SMARTI Wood Scanning as part of **TAB SYSTEMS Inc.** is a producer and developer of advanced AI machine vision systems for wood industry. We manufacture lumber and log scanners for cutting, sorting, grading and other multipurpose applications. Our lumber scanners support one-side or multi-side scanning with utilization of in-house developed AI algorithms for accurate defect/feature detection and classification. Optional x-ray scanning combined with advanced AI, furthermore offers insights into lumber structure, strength and hidden defects/features. Log scanners provide 3D scanning with optional x-ray feature for optimized sorting, cutting and grading.
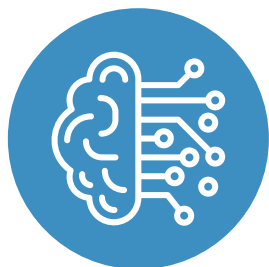
Cutting-edge
Class leading AI algorithms and machine vision technology in a quality solution.
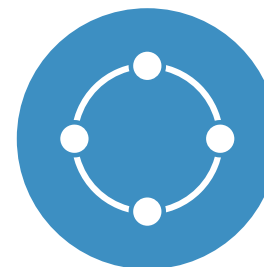
Competitive
Market leading pricing with quality customer service for entire product/solution portfolio.

Know-how
Team of experts from machine vision, AI/neural networks, wood industry and other fields.

Adaptable
Customization options for detection requirements, wood species and machinery control.

Made in Slovenia
In-house development and production of systems including software along with hardware.

Philosophy

Mission Statement

We are on a mission to constantly develop and manufacture advanced wood scanning systems to satisfy the needs of growing wood industry. Cutting-edge machine vision technology, combined with state of the art machine learning and AI algorithms provide an added value for the investment. Our solutions offer unmatched performance with increased yield, productivity and accuracy for cost efficient production process optimization.

Vision Statement

To provide scanning solutions for optimized lumber and log processing industry with the use of cutting-edge technology. To offer advanced machine vision hardware and software solutions, supported with AI technology. To contribute to sustainability in business and natural environment by continuously developing next generation technological innovations for production processes in wood industry.

Applications

Cutting Optimization, Sorting and Grading

SMARTI WS 100 is an advanced wood scanning system for one sided inspection applications in wood processing industry. System is used for various applications requiring optimized cutting, sorting and grading of lumber or veneer in production lines. Material is scanned from one side, while supporting conveyor belt speeds of more than 500 m/min. In-house developed AI technology enables real time accurate defect and feature detection on lumber or veneer surfaces. Any desired softwood and hardwood species can be supported due to our proprietary AI detection and classification algorithms. Optimization of cutting, sorting and grading of veneer and lumber is executed in accordance with standards or rules that are custom defined by the scanner operators.

Manufacturing Optimization

Maximizing Product Quality and Capacity

Acquisition of SMARTI WS 100 enables higher production performance, while maximizing yield outputs. Our proprietary AI technology for defect/feature detection allows for faster production and ultimate end product quality. Errors are eliminated in cutting, sorting and grading production processes, therefore ensuring fully automatized and autonomous manufacturing lines. Increased production yield outputs and high performance capabilities deliver a value for initial scanner investment. One side scanning of lumber or veneer combined with in-house developed AI algorithms assure for uninterrupted production workflows. Machine can control any manufacturing line or process efficiently and completely autonomously. Customer support for all our products and solutions is guaranteed in order to support high capacity production.

Detection Options

Defects

- Knots
    - Sound knot round
    - Sound knot splay
    - Sound knot spike
    - Dead knot round
    - Dead knot splay
    - Dead knot spike
- Knot hole
- Pith
- Bark pocket
- Resin pocket
- Resin streak
- Rot
- Resin
- Wane
- Bark beetle
- Lineatus
- Cracks and splits
- Lack of material

- Discolorations
    - Blue stain
    - Brown stain
    - Red stain
    - Yellow stain
    - Mold
    - Machine burning
- Planning errors
- Machine marks
- Saw step
- Dirt
- Fibre fracture
- Compression wood
- Fibre deviation
- Custom defect options

Texture/grain Orientation

- Radial
- Semiradial
- Tangential

3D Measurement

- Length
- Width
- Height
- Volume

Technology

AI and Machine Learning

SMARTI WS 100 runs with proprietary AI technology in order to facilitate accurate defect/feature detection on lumber or veneer. Machine learning is supported with controlled data inputs in a process called annotating or teaching the machine. For each wood species AI model is generated with respect to the defect/feature inputs. With such principle all softwood and hardwood species can be supported with planned or unplanned surfaces. Annotating process can be done in house or at the customer's location by our experts. The process is based on annotating or imputing individual defects/features by marking them on scanned boards. Large enough dataset is a basis for machine learning to produce accurate and efficient AI models for detection.
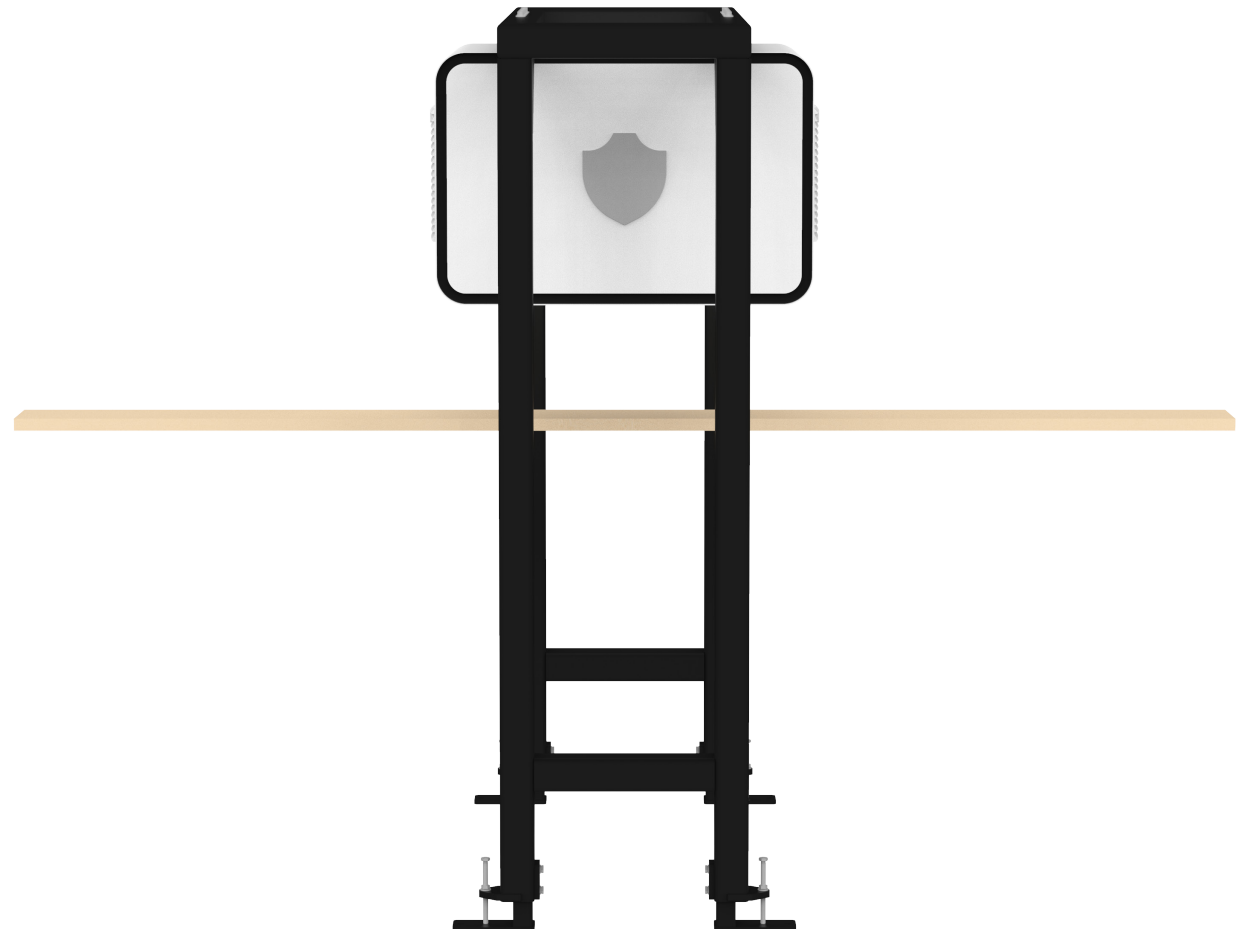
Software Interface

User Friendly and Powerful UI

Scanner user interface is accessible via touch screen terminal for viewing and machine controlling purposes. Each piece scanned is displayed in real time with all the defects/features detected and classified. Information about single board and about current production batch is presented on the home screen. In SMARTI user interface there are classifications to work sets and batches. Work set is a set of rules for cutting, sorting and grading for defects/ features detection that are set by the user or pre-set to support desired standards. Batch represents boards that are scanned with a set of rules for specific work set from the point of starting to stopping the production. Users can view individual boards scanned in a historical database and create various reports. Statistics and simulations are provided as standard. Simulations allow for adjusting batch settings and seeing would-be outputs on already scanned boards. The feature allows for experimentation without harming real production yields. Software also allows for different user rights in order to control and protect manufacturing process.

Connectivity

Interconnected Machines for Industry 4.0

SMARTI WS 100 is a smart wood scanning machine capable of controlling various manufacturing lines. Optimized cutting, sorting and grading of boards is completed fully automatically according to pre set work set parameters. Scanner can autonomously control manufacturing machinery, therefore utilizing productivity and minimizing labour requirements. Multiple machines can be controlled directly by the scanner or signals can be provided for their control. Architecture of SMARTI software allows for multiple scanners to be connected and managed from each individual machine or one central hub. Individual or multiple scanners can be installed in one or more physical locations for fully connected smart manufacturing. Production can therefore be monitored efficiently and easily by scanner operators and managers. Value is delivered with multiple data manipulation options and decentralized machine control. Connectivity options are eliminating the need for third party management software solutions and therefore saving costs. Scanners are enabled to be controlled from anywhere and at any time.

SMARTi

Advanced AI
Wood Scanning
Solutions