

HEINOLA news

HEINOLA SAWMILL MACHINERY INC. customer magazine | AUTOMATION special issue



A new direction for AUTOMATION

NEW ideas are easy to generate, but a new way of thinking requires a lot more work. We have completely redirected our thinking at HEINOLA Automation, to look at automation solutions from a fresh perspective. We have thus produced solutions that serve our customers' needs even better in an ever-changing world.

Our new programming philosophy has already taken firm hold at HEINOLA Automation. One of the indicators of this is that the software for the plants more often consists of tried-and-tested programme segments that talk to each other and to the customer's programmes. This modular execution has several benefits: the whole is more controlled overall, programmes are lighter and more straightforward and software updates are easier to carry out.

This new way of thinking is also visible to the user. Programmes are increasingly solving the most commonplace faults independently with solutions that have been considered beforehand. If the situation requires involvement from the operator, the programme

is able to give clear instructions on the display. This shortens potential downtimes and makes it faster to start up again afterwards.

Accurate measurement data and better adjustability go hand in hand. HEINOLA Automation ensures data reliability for solutions by taking measurements at several stages and by duplicating measuring instruments. When accurate measurement data is combined with well planned control algorithms, timber moves through the lines with as little disruption as possible.

Clear and informative reporting is one of the strengths of HEINOLA Automation. We are constantly developing our systems, and provide customers with essential information whether regarding production output, sawing batch expenses or process speed. A new data system level that reports from the production level directly to the user or through the user's ERP system allows for more flexible reporting.

HEINOLA Automation has taken a giant leap towards a new era in automation. Join us for the ride. ■



TIMO JUNTUNEN

CHALLENGES

offered
by HEINOLA
were tempting

"I AM originally from Leppävirta and act as the new manager for HEINOLA's electrical engineering and automation department. I have a Master of Science in Technology in Industrial Management and Bachelor of Machine Automation, and have previously done project management and business development for electrical engineering and automation technology, as well as design work in product development, mainly for the pulp and paper industry. I have worked for CLS-Engineering Oy, Honeywell Oy and Oy Hackman Process Ab.

I was very excited when I came across this challenging task at HEINOLA. Right from the start I noticed that I was surrounded by a skilled and motivated group of experts. I want us to have a positive attitude and be an interactive group, and to deliver large international projects as well as internal development projects. We want to create better solutions to improve electrical and programming services. First and foremost, we want to create new standardised automation products as part of turnkey deliveries.

HEINOLA's process control is carried out using programmable logic controllers and industrial computers, which are responsible for process control, optimisation and reporting. The links between the process and the equipment are carried out by fieldbuses. In turn, the link outside the process is carried out through local networks. This is definitely a challenge." ■

Coming from the world of packaging and pallet lines, **Ville Eronen** was unfamiliar with wood industry term

The terminology became familiar for the **AUTOMATION TECHNOLOGY ENGINEER**

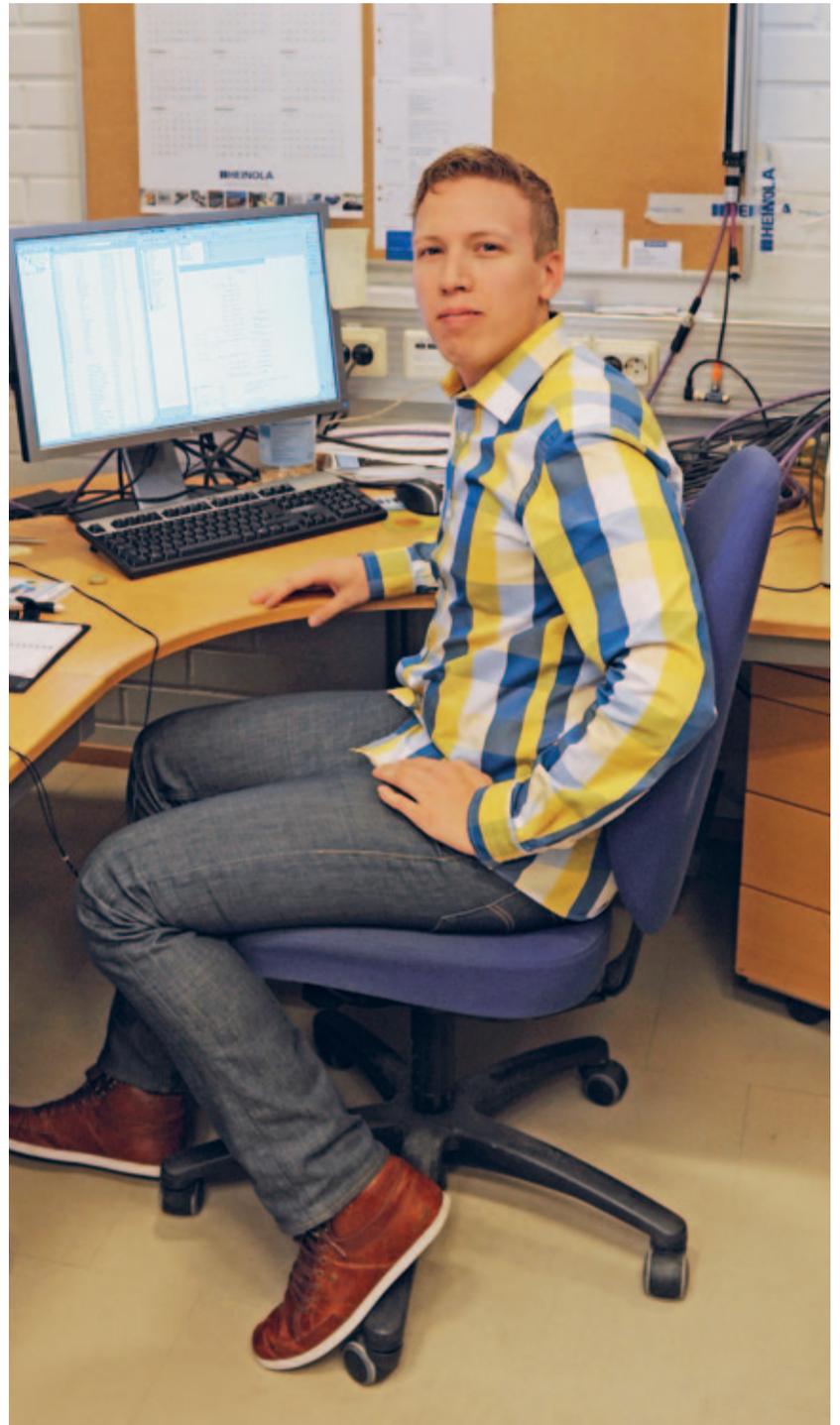
"I AM a 28-year-old automation technology engineer who escaped south from Savonlinna. After secondary school, I moved to Jyväskylä to study engineering. I prolonged my student life by going to Singapore on an exchange, and it was definitely worth it. Towards the end of my studies I worked as a project and laboratory engineer as part of the Automation Engineering programme at the JAMK University of Applied Sciences. After completing my military service, I found a job in my own sector at Orfer Oy in Orimattila, working in the world of robotic packaging and pallet lines. I spent over three years with logic controllers and robots all over Finland and across the world.

In April 2011, I started work as an automation designer at Heinola Sawmill Machinery. My tasks include electrical

wiring design and logic programming. My first large project was updating the edging line at the Borgstena sawmill in Sweden, where I worked as an electrical wiring designer.

I have been involved in several projects in various ways and have been able to visit sawmills all over Finland and the world, even as far away as Chile. My next big project is doing the programming for the stick-stacking plant in Lesosibirsk.

This field of business is a world unto itself and I'm starting to get the hang of the terminology and processes. Terms like 'milling cutter', 'cant', 'warped' and 'trimmer' were not completely clear in the beginning. I have noticed that both the sector and Heinola Sawmill Machinery have a long history and traditions." ■



A SAWMILL that adapts to orders



ORVIS CORPORATION, headquartered in Hiroshima, ordered a customised solution from HEINOLA with automation expertise playing a crucial role. The sawmill, made-to-measure for the customer's requirements, was executed as a merry-go-round sawing line with a chipper canter and band saws, in addition to which, the last cutting unit is a settable horizontal circular saw.

These machines can produce 1–125 central sections from one log. The side boards are handled by the edger optimizer by HEINOLA. It has a two-saw and a four-saw edger one after the other, so each side board can be turned into 1–5 end products.

The line automation here represents HEINOLA's latest expertise. The pattern support system creates the patterns automatically from the most popular and active products on the product list. The patterns are sent to the log scanner and the side board products to the edger

optimizer.

The log scanner optimises a pattern for each log and sends it back to the pattern support system. Then, the pattern support system calculates and sends the servo values to the logic controller of the line. The logic controller guides the wood through the process and changes the machine group pattern according to the progress of the timber. Finally, the logic controller tells the pattern support system the location and sawing stage of the timber on the line. These are then visible to the sawyer on the pattern support system interface. The production designer monitors production in the office through the pattern support system interface and puts products into production as the previous ones are finished. The batch change, common to Nordic sawmills, is missing from this line because production is constantly adapting to the products on the order list. ■

Intelligent GREEN SORTING

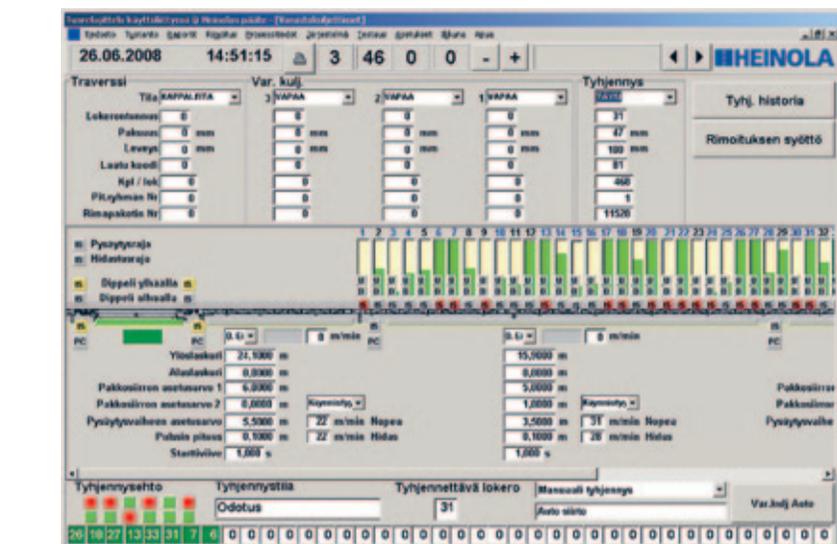
KUHMO is now sawing under the guidance of HEINOLA automation. The automation of the green sorting plant at Kuhmo Oy's sawmill was modernised in summer 2010. A new lumber handling plant and green packaging for central sections were also delivered early in 2011.

The control computers at both sorting plants belong to the same automation generation by HEINOLA. The starting point was that the user interfaces and production parameters for the plants were similar and automation for both used the same file and database server. One of the benefits of this arrangement was the shared production batch library, which enabled

sawing and sorting instructions to be defined just once. At the same time, the parameters for sorting and stick-stacking are only defined for the automation of one plant and then copied to the other via a file transfer.

Production and fault data from both plants are saved to a shared database, so reports can be printed plant-specifically or as a combination from both. The reports are passed on to the plant computer system using the same database.

Central section sorting groups the pieces into a 12-level "timber mat", each of which has three storing chain conveyors one after the other. One timber load can reserve 1-6 chain



conveyors depending on the size of the load or hard package to be formed. The chain conveyors used to make up the load can be freely located on different levels.

The load can be directed to an old stick-stacking plant or to green packaging, where it can be turned into a stick load or a hard package. The sorting instructions for a production

batch define the stick-stacking plant as the destination for a timber load. However, the destination can easily be changed via the display by dragging the load icon from one unloading queue to another with the mouse. Stick-stacking and packaging instructions follow the load automatically regardless of which stick-stacking plant is the destination. ■

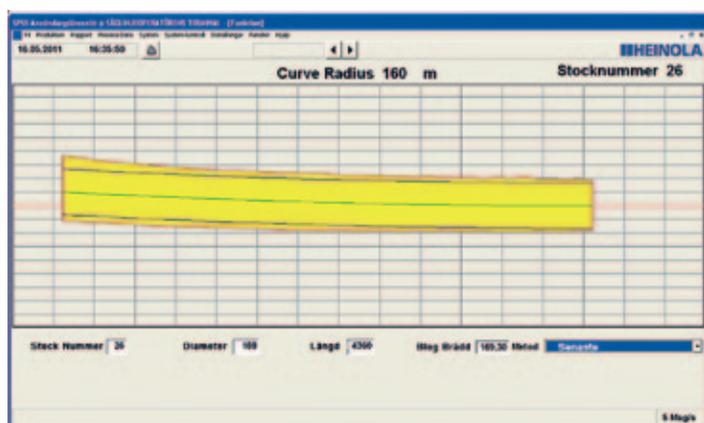
Active CURVESAWING

HEINOLA delivered a fully profiling circular saw line with active curvesawing to Norra Skogsägarna's sawmill in Kåge. The first phase includes a chipper canter, double profiling and a double-arbour circular saw; the second phase includes a chipper canter and profiling and a separate double-arbour rotary gang. With these machines, the smallest turning radius of the line in curvesawing is 100 metres.

HEINOLA's pattern support system sends approved patterns to the log scanner and the scanner optimises the best option for each log taking into account the log's warpedness. The pattern support system receives the pattern core

curve back together with the optimised cutting pattern in the log. It then calculates the log's servo values for the machines as well as the feeding and receiving rolls for the chipper canter and resaw guiding the curvesawing. The rolls guide the cant into the chipper resulting in a curved beam according to the optimisation.

Similarly, the feeding and receiving rolls of the resaw guide the beam through the resaw so that by deviating the rolls, located at the front and back of the saw, the core curve of the beam is parallel with the line when it meets the saws. This ensures that a curved beam does not twist the saws. ■



Accurate edging in CHILE

SOUTH AMERICAN giant Arauco ordered a new edging line from HEINOLA for their El Colorado sawmill in Chile. The edging line, delivered in summer 2011, consisted of high speed mechanics that enable a rate of over 50 pieces per minute and automated guiding for the line. Boards are measured with a double-sided scanner on the line with the benefit of measuring thickness more accurately and no need to rotate the board. Measurement lower down was added because the boards reach the edging line almost always wane downwards. 1-2 pieces can be produced at one time with the three-bladed saw. A specialty is products that exist every 3 mm across.

The double-sided scanner is

executed with factory-calibrated industrial cameras and the results are transferred to the edger optimizer via a fast data connection. One of the cameras is located above the board. Below the board there are cameras to the left and right, positioned at an angle of 45 degrees, which reduces soiling. It has been possible to lower the measuring gate thanks to the lower cameras set on the sides.

The line is also equipped with a marking device, which sprays an invisible UV identifier on the boards after edging that can be used to guide green sorting. The line is monitored by a separate security logic controller, which ensures safe working conditions in all circumstances. ■

LOVE FOR SAWING MACHINERY

taken all the way to Australia

"THIS JUNE it will be 20 years since I joined Heinola Sawmill Machinery Inc. Those 20 years have included many interesting tasks and events. I have seen things from the viewpoint of a designer, department manager, estimator and sales and various projects have taken me as far as Japan and Australia. It has been a joy to work with such skilled and dedicated colleagues and customers. "Out of love for sawmill machinery" might just be half true.

I'm currently working as a project manager, mainly for automation

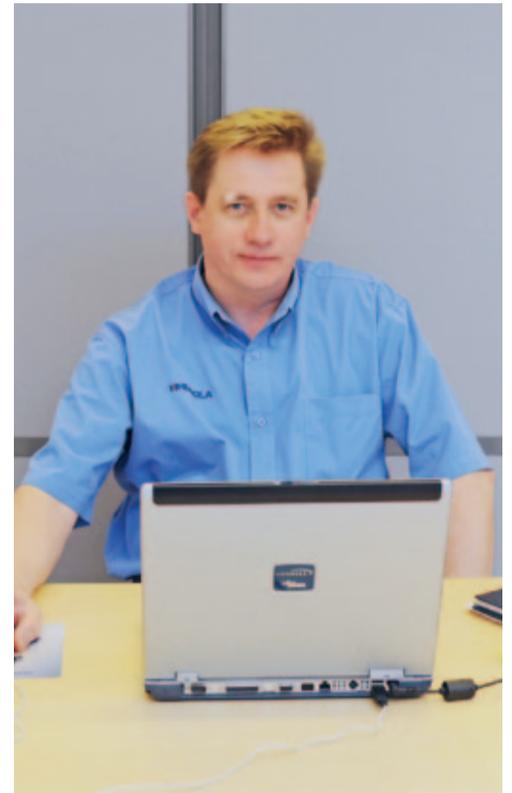
projects. My main project at the moment is an automation overhaul for the Satoh sawmill in Hokkaido, including new automation for the saw line and a similar overhaul of the edging line with scanners. The equipment and programmes will be brought into use during a week-long stoppage in August. This is the same saw line for which I implemented Omron logic controllers in 1997. We have come a full circle in a way.

I am known as the servo expert for sawmill machinery. I have basically scaled all our servo uses

and implemented a few hundred of them, and I have trained about half a dozen younger designers for servo tasks. I have also come up with a couple sawmill machinery patents.

I have a Master of Science in Technology in Electrical Engineering and am originally from Ylämaa, now a part of Lappeenranta.

My blended family includes my partner, three kids in their early teens and a wonderful poodle. My spare time is spent with the family, renovating an old wooden house in Lahti." ■



Erkki Toivari is known as the servo expert at HEINOLA.



Safe DRYING

HEINOLA'S first drying kiln equipped with HDC automation was set up at the Otava unit of Versowood Group. The automation for the two chamber kilns can also be used for progressive and hybrid kilns.

Each chamber, progressive or hybrid kiln with HDC automation is equipped with its own Siemens S7 logic controller and shared control room automation. There can be more than one control room, and if necessary, each logic controller can be equipped with a chamber-specific local control monitor. In Versowood's case, the logic controller for the first chamber also handles the path operation and functions as the security logic controller for the plant. The control rooms and logic controllers will be equipped with a remote control option. This enables HEINOLA's automation experts to assist with the customer's maintenance tasks in potential error and fault situations.

New adjustment principles are used for monitoring the start-up temperature difference and the wet-bulb temperature difference of the chamber kilns. These have already proven to be better solutions than the previous adjustment principles. ■

HEINOLA AFTER SALES – from spare parts to service agreements

SPARE PART and maintenance service are an important part of HEINOLA's operations. They help our customers ensure that production remains as efficient as possible throughout the year and from one year to the next.

We know the machines and equipment we produce, the life cycles of the parts and components used in them inside and out, and we can predict future maintenance and spare part requirements. An increasingly large number of our customers benefit from inspection and maintenance agreements with us. These help guarantee usability, speed and quality for their production equipment.

Our maintenance service agreements cover inspections, adjustments and maintenance for mechanics and automation more and more. For example, we can prevent bearing damage through regular and systematic inspections.

We have modern SPM condition monitoring

equipment, and all the measurement results from inspection visits are saved. By monitoring and comparing vibration values, we can follow the evolution of equipment conditions and carry out required actions quickly, without unexpected stoppages.

Maintaining the correct alignment of the sawing machinery ensures the high quality of the timber. Our experts inspect the alignments of machines and conveyors on every visit, carry out the required adjustments and of course give the customer a report of the measurement results and adjustments made.

Our automation maintenance staff inspects and calibrates the cameras and measurement equipment and checks the functions of the control systems. This way, the optimisation is carried out based on correct measurement results, and a high yield level can be maintained reliably. ■

