

HOLLAND MECHANICS IS SETTING NEW STANDARDS IN SPOKED WHEEL PRODUCTION

Robot Quattro The Flexible Four Hand



For two decades, the wheelbuilding supplier Holland Mechanics has optimized production flexibility in bike manufacturing. The world leading wheelbuilding philosophy whereby lacing & tightening is combined was introduced in the early seventies by Holland Mechanics. Now Holland Mechanics has developed another step in spoked wheel production with the introduction of the Flexible Tightening machine the Robot Quattro. The wheelbuilding department will be ready for the coming decades where flexible mass bicycle production is the new challenge.

Maximum flexibility in wheelbuilding, in combination with high quality output, has always been the benchmark for our wheelbuilding machinery. By combining lacing and tightening in one machine and truing in the second machine, wheelbuilders could get the largest variety of wheels. But, as flexible wheelbuilding has become very common in our industry, bicycle factories needed new ways to maintain quality and flexibility while increasing production line output.

In response, Holland Mechanics developed the Robot Quattro. It splits the production process into three steps, like the in-flexible 4 Head Tightening machines which were popular in the late 70's and 80's. Holland Mechanics has combined the biggest advantages of the old 4 Head concept, the speed of mass production, by using 4 Tightening Hands. We also solved the biggest disadvantage of

the 4 Head, the complexity of changing over, by integrating the 4 hands in a fully automatic Robot. This way we created a Flexible Mass production line whereby quality, flexibility and speed are combined.

The lacer in step one sets the spokes and nipples loosely. This reduces the time required and improves output. Importantly, lacing quality no longer depends upon the

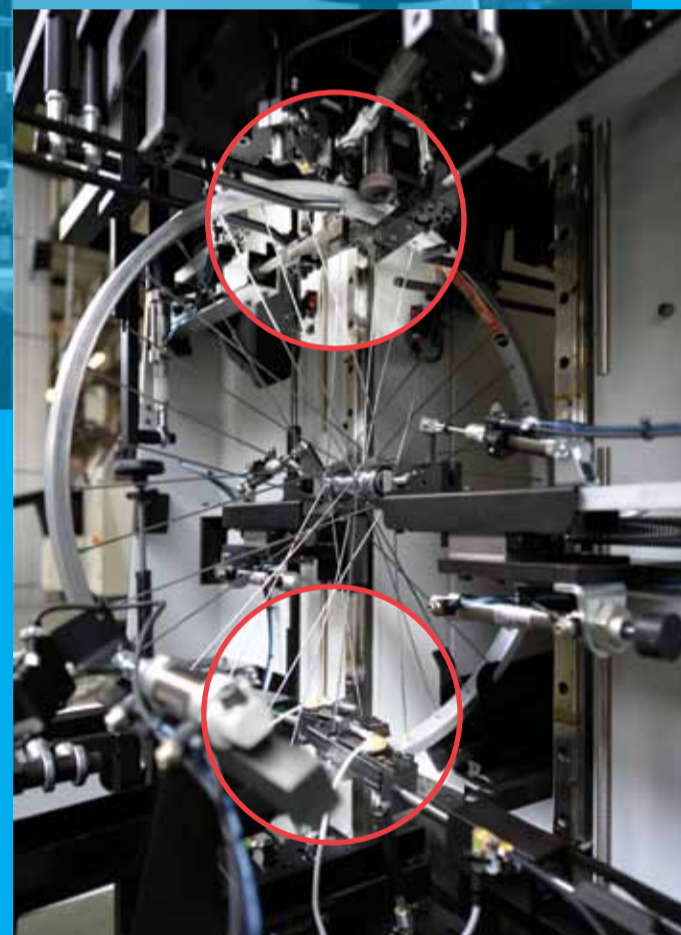
operator. In step two, the newly designed four hands tightener, the Quattro, gives the wheel set an equal tension spread. The four hands complete this process very rapidly. Flexibility is also guaranteed. The Quattro can change over to a different wheel fully automatic. Finally, in step three, the Truing Robot finalizes the wheel. By splitting the production process into three steps, the Holland Mechanics Quattro creates a continues flow with an optimal balance between the different production stages, allowing greater accuracy when predicting truing times.

The Robot Quattro has many advantages. This modular production line saves floor space and creates more output with less machines and operators. It can even work as a Tightening & Truing Robot whereby the Quattro is much faster with 4 hands than conventional robots.

The Quattro comes with the complete 2010 HM wheelbuilding philosophy which is called "The Vertical Flow®". Read more about the "vertical flow production process" on the next page of this HM-Today.

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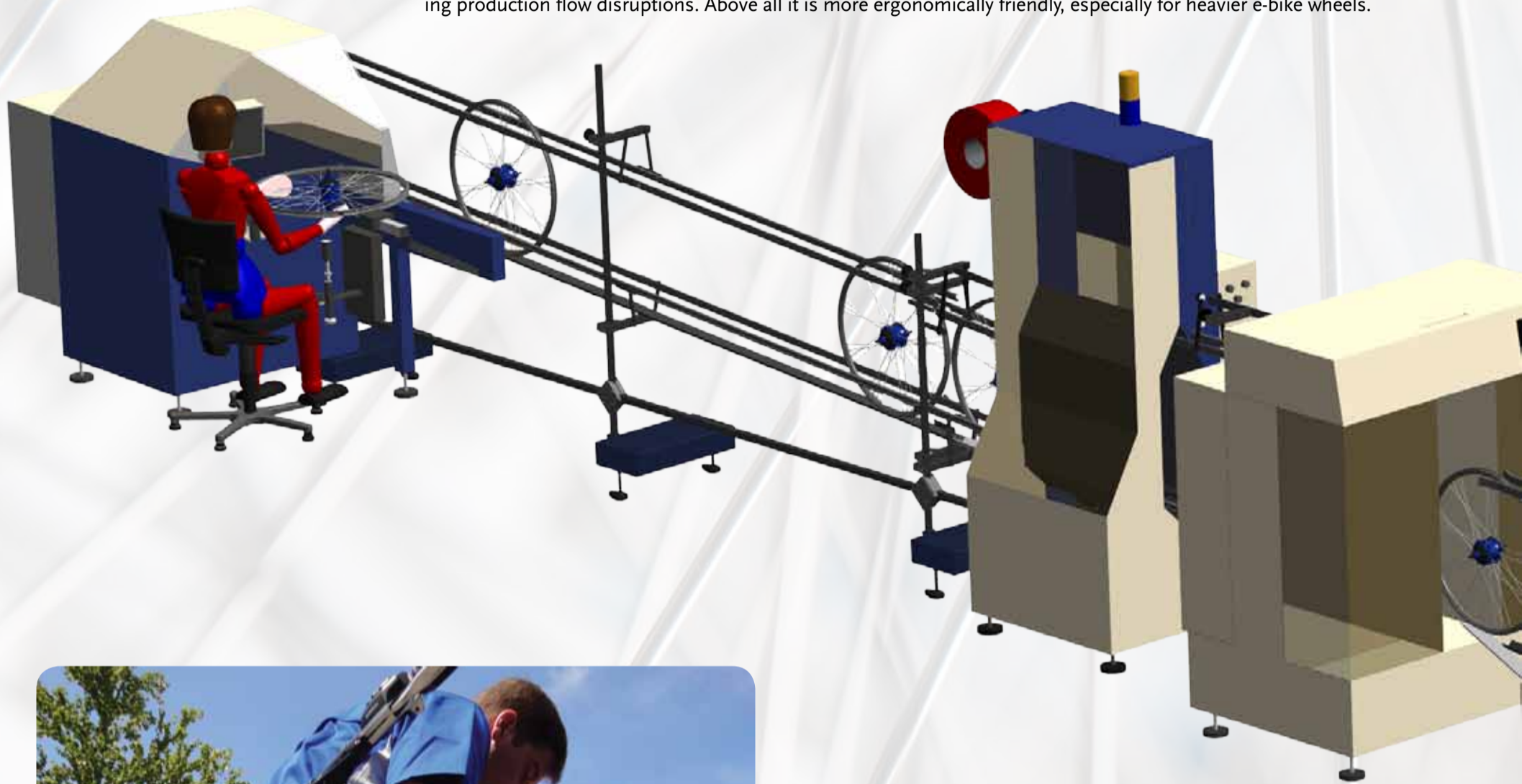
From the editor

After a turbulent and unpredictable 2009 we see a bright future again for the bicycle industry. A lot of companies have seriously picked up their business again and we see a growing demand for machines. More even we see that companies are looking for tailor made solutions and in this new Edition of the HM Today you can see where these requests lead to. We see the introduction of our new Robot Quattro for flexible mass production as one side of our working area until a very specific development in tubeless rim taping. Please read also about the "2010 Vertical Flow Philosophy" whereby we have optimized the Wheel Flow with the highest efficiency, wheel quality and ergonomics.

HOLLAND MECHANICS' VE

Vertical Flow® Turns Production Around

The introduction of the newest tightening machine Robot Quattro comes with a new production philosophy the "Vertical Wheel Flow®". After the lacing process the wheel is turned ninety degrees and placed in the wheelrails automatically. From this moment the laced wheel is transported in a vertical position for the complete wheel building process. All machines, from lacing till tyre fitting, are now designed for vertical wheel handling whereby the wheel-building machines are operating as wheel stations. This new process brings an optimal workflow whereby loading and unloading has become an integrated part of the production process. The Vertical Flow® has many advantages. It requires less handling by the operator, saving time, better logistics, higher wheel quality (less damages) and avoiding production flow disruptions. Above all it is more ergonomically friendly, especially for heavier e-bike wheels.



E-Bikes: From Niche Market to Mainstream

The e-bike wheel assembly machinery is a fine example of Holland Mechanics' innovative wheelbuilding solutions. Seven years ago we teamed up with Sparta, to develop a special lacing machine equipped for e-bike wheels and their big motor hubs.

At that time Sparta was our first and only e-bike customer operating in a niche market. Today the market for e-bikes has grown to a huge segment with an even bigger potential. Some experts say that e-bikes will replace most of the world's bicycles.

The "In-line Lacing Machine" can position the nipple screwdriver exactly in-line with the spoke, even if the spoke hole in the rim is under an angle. This special technology is necessary for lacing the big motor hubs but can also be used for all other wheels. The "In-line Lacing Machine" has already proven itself as a successful development for Holland Mechanics. Besides Sparta it has now also been installed at many other bicycle companies such as Cycleurope, KTM, Batavus, Union, Hartje, Idworks, Simplon, Roland Werke and Giant.

The completion of the e-bike wheel assembly line makes Holland Mechanics a turn key supplier for e-bike wheel building machinery. Holland Mechanics also has the expertise to provide made to measure solutions for each individual customer, and assist with design, manufacturing, and all other issues which manufacturers might come across when starting up wheel building. The last 2 years we see that the hub motor is becoming more popular because of its modularity. Standard bicycle models can easily be equipped with e-hubs. Our R&D is always following the trends, technology and design changes of e-hubs. Therefore we have close contact with the leading e-hub companies like Bionx and Shimano. For example we received already samples during the Shimano e-hub introduction in Düsseldorf, Germany. Our engineers did test these so-called STEPS e-hubs on our E-Bike Line. Interested in the results? Please visit our booth 104 in Hall A5 at Eurobike.

VERTICAL FLOW PHILOSOPHY

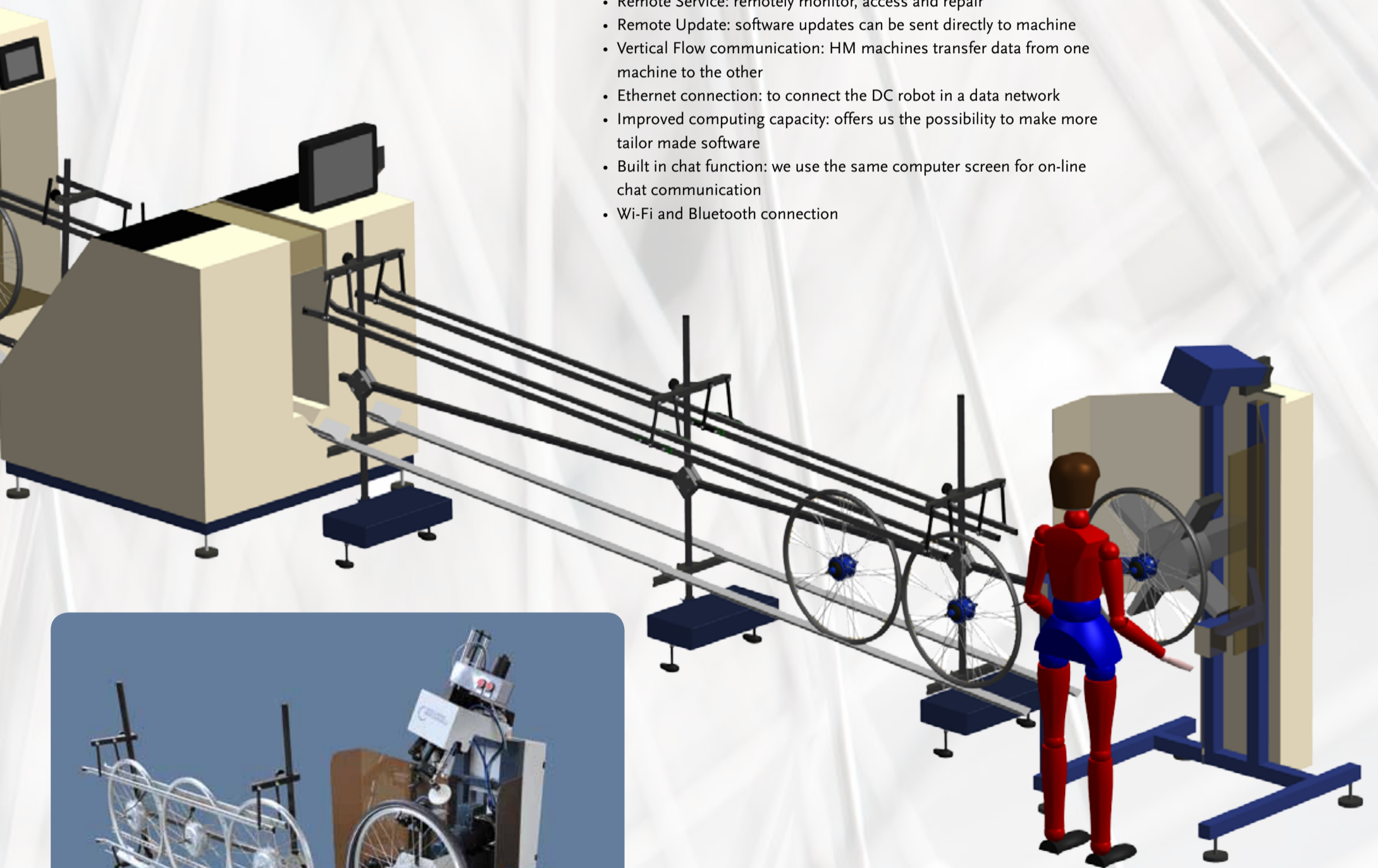
Connectivity & Multi Language

Since this year Holland Mechanics introduced two new models with the Touch Screen Panel PC: the Robot DC Touch and the Robot Quattro.

The full-color 8" touch screen operating panel offers a huge improvement on the simplicity of the daily machine operation. It is not only the operation of the machine that has been made simpler, but the new Windows embedded system that we are using offers unlimited possibilities for the interface and connectivity. The interface is now multi-language, this way you can train new operators faster and easier. Besides the interface we see also the connectivity as an unique feature. For example we can service your robot remotely from our facility in Holland. The Remote Service feature will save costs for your service and maintenance. Also the uptime of the wheelbuilding machines will be increased. The connectivity of the panel pc will be used for optimizing the Vertical Flow. The machines can "talk" with each other and transfer data. This way we can balance the complete line and send wheel data directly to the next wheel station.

Panel PC Benefits:

- Multi Language interface
- Remote Service: remotely monitor, access and repair
- Remote Update: software updates can be sent directly to machine
- Vertical Flow communication: HM machines transfer data from one machine to the other
- Ethernet connection: to connect the DC robot in a data network
- Improved computing capacity: offers us the possibility to make more tailor made software
- Built in chat function: we use the same computer screen for on-line chat communication
- Wi-Fi and Bluetooth connection



TMC AutoLoad

For 2010 Holland Mechanics has continued its investment and innovations in e-bike wheelbuilding. The latest smart solution is the TMC Auto-Load for efficient tire mounting. This new machine is developed according to our Vertical Flow philosophy. It automatically loads heavy e-bike wheels, increasing productivity and safety for the operators. The most important feature of the TMC Auto-Load is the ergonomic work position. The operator no longer has to lift each 5-7 kilogram e-bike wheel into the station, avoiding back strain, as well as the common accidents that can lead to work place injuries and lost time. As a result, manufacturing costs can be reduced and production volume is more consistent.

Visitors at Holland Mechanics China

Indian Delegation visits Holland Mechanics China

Holland Mechanics China is playing a key role in the Asian bicycle industry. The last years many international delegations did visit HMC for training or just to learn about mechanized wheelbuilding. This year we also had an important Indian delegation with most of the key players of the Indian bicycle industry. The visitors showed great interest in the possibilities Holland Mechanics has to offer for high volume wheel production in the low-, mid-, and high-end segment. Today the demand for better wheels in the Asian bicycle industry has grown enormously and is very favorable for Holland Mechanics. Our expertise in mechanized wheelbuilding (almost 40 years!!) and strong geographic positions in Europe and Asia are the key to this success.



Ryde chooses for TCS spokes and coloured nipples



With the introduction of the new 2011 wheelsets, Ryde (previously Rigida) switched from standard spokes and nipples to Sapim TCS spokes and double square nipples. When using this combination of spokes and nipples Ryde is able to true wheels without any damages on the coloured nipples and without any wind up in the spokes. This is essential when a high spoke tension is required in combination with relatively thin (double butted 2.0 – 1.5 – 2.0) spokes. Such a thin spoke is very prone to twist which leads to spoke failure once high tensions are required.

With the Introduction of the TCS spoke this problem is eliminated. The TCS spokes have a small square just above the thread. When used in the Holland Mechanics Outside Truer, the nipple driver rotates the nipple from the tire side, and a special spoke gripper will hold the TCS spoke just above the nipple. When you hold the spoke at this point there will be no torsion transferred to the spoke, and you receive a direct tension increase.

Tubeless tires for every bike

One of our latest developments is the application of Tubeless rim tape with our in-line rim taping machine HT. Initially designed for woven tapes, we were challenged by Stan's NoTubes to have our HT rim taping machine made suitable to handle his tubeless tape.

In tubeless possibilities you can divide wheels in two segments one using a tubeless rim, where there are no nipple holes drilled, and the second using a standard drilled rim that was made air tight by means of an inner layer.

It is obvious that the first type of rim where there are no spoke holes offers good tubeless possibilities, but the wheel is very complicated to assemble, which leads to high assembly cost.

Using a normal drilled rim makes the assembly already a lot faster and easier, and mechanized wheel building is very well possible. Then only the assembly of the tubeless tape was labor intensive. Up to now where Holland Mechanics offers the possibility to do in-line rim taping making tubeless systems available for virtually for all types of bikes.

Imagine that riding Tubeless originally started very small in MTB only, now it suddenly will be available for every kind of bicycle including the city and commuting bikes. When the Tubeless rim tape is applied and the tire will be assembled there will be added 60cc of tire sealant, which makes the tire and rim not only air tight but also seals any leak in the outer tire. So no flat tires anymore, and a much more comfortable ride due to lower tire pressure in tubeless tires.

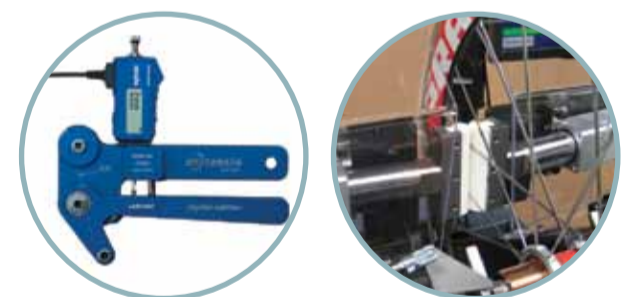


Pro Truer

This year Holland Mechanics updated the functionality of the Pro Truer even further. With requests from customers around the globe we keep on innovating this high end wheel truer step by step.

Please check the unique characteristics of the Pro Truer:

- The machine works from the centre of the hub. This is also always the middle position.
- You do not need a reference wheel to calibrate the machine.



- At start up you set the zero position, and then you can run the machine without further adjustments.
- Easy change over between wheel sizes.
- Programmable data base for 500 wheels
- Machine will tell operator what to do (tighten or loosen a spoke)
- Approval signal when the wheel is true.
- Digital spoke tension measuring (optional)
- Free floating stabilizing to equalize the position of the stabilizers and give same force at both sides of the wheel (optional)
- Database for spoke tension table (for the spokes)
- Automatic calculation to kilogram.
- Polar diagram for left side and right side of the wheel
- 100% spoke tension check possible.
- Print out data on a label printer (optional)