



CX5210 Embedded PC running TwinCAT 3 controls coating machine

## Innovative coating process revolutionizes the market for photochromic lenses

Eyeglass lenses that darken automatically in response to short-wave light were invented in the mid-1960s in the United States. The photochromic process uses molecules of silver halides that are embedded into the lens material and transform into neutral silver atoms that absorb a significant percentage of visible light, i.e. the lens darkens. Today, so-called organic photochromic lenses are also available. Both manufacturing processes are very complex and therefore expensive. That's why the coating process developed by young British company Shyre Ltd., which can produce photochromic lenses at one-tenth of the traditional cost, represents a major revolution in the field.



The machine is operated and controlled via a CP2912 multi-touch panel.



Thanks to One Cable Technology, the AM8100 servo motors take up very little space.

Ever since the first photochromic eyeglass lenses hit the market in the 1960s, the segment has been dominated by a few large companies. The coating technology developed by Shyre now makes it possible for large eyeglass retailers or labs to produce customized photochromic lenses made of all kinds of materials for their customers, making the need to keep large amounts of expensive pre-made photochromic lenses in stock a thing of the past. Lee Gough and Dan Hancu, the developers of this technology and directors of the Shyre Ltd., explain their business concept: "Developing a chemical process for coating the lenses was the first major challenge. The second involved designing the machine."

To start the process, the lenses are placed on a conveyor that transports them into the machine where they undergo a five-stage chemical cleaning process before being dried. They then move into the dipping station, which applies the coating. Finally, the optician cuts the coated lenses to the correct size for the frame the customer has picked out. The process developed by Shyre produces photochromic lenses at one-tenth the cost of typical big brand photochromic lenses. As another benefit, the coatings can be applied in all colors and even with gradients, while the classic process produces lenses that turn either grey or brown.

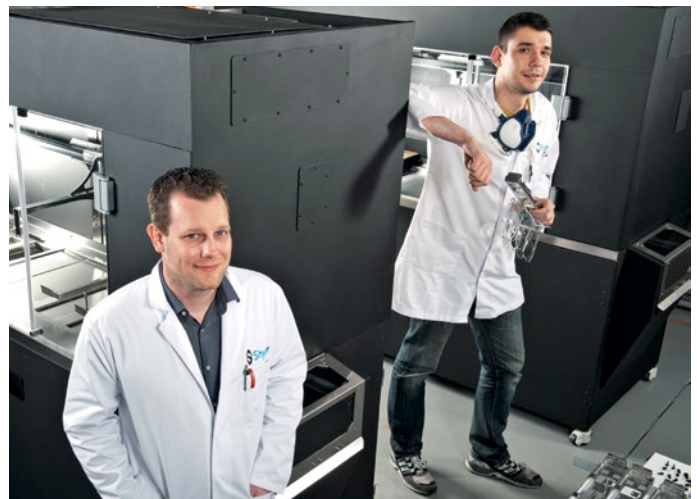
#### Coating solution needs compact controller

"We first saw Beckhoff's solutions at the Drives & Controls Show in Birmingham in 2014," recalls founder Lee Gough. "What impressed us initially was the One Cable Technology (OCT) for Beckhoff's servo motors. We had been looking for a compact solution since the drives had to be integrated into the machine. By implementing AM8100 servo motors with OCT we were able to save a lot of space, because the control cabinet needs to be only 20 centimeters deep. Since lab facilities are generally expensive and space is at a premium, this was a decisive criterion."

A CX5120 Embedded PC with an Intel® Atom™ processor running TwinCAT 3 automation software functions as the central controller. A CP2912 multitouch panel is used for operator interaction and "recipe" control. With IP 65 protection at the front and IP 20 at the rear, the panel is ideally suited for this application. Lee Gough is also thrilled with the control system's flexibility, which allowed the company to upgrade from TwinCAT 2 to TwinCAT 3 still during the design phase.

"The connectivity of the PC-based platform is another plus, because it allows us to integrate it directly into our VPN system," says Gough.

"Using a secure and dedicated Internet interface, we can support our customers directly from our headquarters in Shropshire. The coating machine includes components such as solid-state switches and sensors, LED lighting, brushless motors and lubrication-free bearings to keep maintenance and downtime to an absolute minimum. And by having access to the data stored on the system, our process experts can quickly identify the root of any issues or recommend improvements from afar; there is no need to wait for a site visit."



Lee Gough and Dan Hancu, the founders of Shyre Ltd., have revolutionized the eyewear market with their invention. Using the coating process they developed, photochromic lenses can now be produced at one-tenth the cost of conventionally produced photochromic lenses.

Further information:

[www.shyre.co.uk](http://www.shyre.co.uk)

[www.beckhoff.co.uk](http://www.beckhoff.co.uk)