



CUGHER GLASS:

shattering integration barriers; helping customers win business

Rockwell Automation Integrated Architecture is used by Cugher Glass — a manufacturer of silk screen printing machines and equipment — to integrate, synchronise and optimise complex production solutions for its clients in the automotive glass sector. In this article, the Italian company explains how this is possible.



BACKGROUND

Based in an industrial area in the suburbs of Milan, northern Italy, Cugher Glass is a manufacturer of silk screen printing machines and equipment for both large industrial production and small-volume production.

The main application sector for the company's machines is printing on flat glass and rigid materials, where it is a primary supplier to the automotive, architectural and home appliance industry. Its customers range from the biggest players in the

flat glass industry to smaller manufacturers, in over 650 installations around the globe. Indeed, every year many new glass printing lines are installed around the world and last year 12 of them came from Cugher Glass. The company has lived

through the evolution of the industrial sector, adapting its machines and services in order to remain complementary with the ever-changing needs of the market and to provide its customers with the most efficient solutions. Its silk screen printing solu-



tions for flat glass integrate perfectly with production lines, offering the maximum level of integration possible for the automation and quality control of the silk screen printing process.

It is this complementary integration that resulted in Cugher Glass approaching Rockwell Automation for a complete control solution for its next-generation machines based on Rockwell Automation Integrated Architecture™.

THE CHALLENGE

According to Marino Bonetti, Sales Manager at Cugher Glass: “The global flat glass market was worth some USD 77.74 billion in

2013; so it is a highly profitable market for those who can provide the right solutions. Our customers come to our plant and say: ‘I want *this* equipment with *this* precision. If we cannot deliver this package, our customers – the car makers – might look for another supplier.’ We therefore make it our mission to supply our customers with machines that will meet this demand. Put simply, our customers win business because of our machines.”

“Our customers usually have a very complex manufacturing process,” he continues, “comprising different phases of glass processing,

cutting, washing, printing, drying, tempering, etc. Out of these, Cugher machines perform maybe the most significant in terms of the added value stage – printing. In this process we have to provide technology-based innovation and capabilities in terms of printing accuracy, flexibility, reliability for precision, speed, the possibility to print up to the edge of the glass, the centring of the glass (even with complex shapes), the printing of two glass panels simultaneously and the overall quality of the printed design.

- A Rockwell Automation solution was installed, which included:
- Integrated Architecture
 - Significant Global OEM Technical Consultants (GOTC) support
 - Allen-Bradley ControlLogix PACs
 - Allen-Bradley CompactLogix PACs
 - Allen-Bradley PowerFlex 525 & 750 drives
 - Allen-Bradley PanelView HMIs and drives
 - EtherNet/IP
 - Stratix switches

... AND THE SOLUTION

A glass printing line can be made up of multiple stations and it is the synchronisation and integration of these stations that really makes the dif-





ference and provides the primary customer benefits. These stations can include printing machines, stackers, infrared dryers, glass centering stations, vertical inspection stations, booking systems, supervisor systems and part tracking systems, all controlled and integrated using advanced line automation solutions, such as those supplied by Rockwell Automation. The Rockwell Automation solution that Cugher Glass has deployed automates every step of the process,

with the whole line being managed by an external PC connected to multiple Allen-Bradley® ControlLogix® Programmable Automation Controllers (PACs), which are used to send the recipes to all machines on the line. When the customer changes the production mode all recipe changes are sent to each and every automation element. The PACs also control the major axes of the machines, driven by either Allen-Bradley PowerFlex® drives or Allen-Bradley Kinetix® servo solutions.

“Sometimes we use Rockwell Automation gear for particular features,” Bonetti explains. “Our technicians select Logix PACs for specific tasks and then use them up to their limit. With the support of Rockwell Automation and especially its Global OEM Technical Consultants (GOTC), we have refined specific features and modified the PAC firmware to suit our processes. Rockwell Automation has shown us the flexibility to adapt to demands very quickly.”

TYPICAL CAR WINDSCREEN LINES

In a typical car windscreen production line, glass that has already been cut and shaped enters the line and is centered and positioned using ‘electronic marks’ applied by the PACs. These marks are then used at every single stage of the process. The first print machine, fed by a PAC-controlled accumulator/buffer, receives the correct recipe. The glass enters and is printed typically with silver print for anten-





nas, etc. The panels are then checked for breakages or over print (which can cause major issues such as contamination on the rollers) before being transported into infrared driers to cure the ink. These driers are managed by software developed to run on Logix PACs and Allen-Bradley PanelView™ HMIs.

After the drier, the panels go to another stacker, prior to the subsequent print runs (and their associated stackers) for the addition of other feature and decals, all of which are managed by Allen-Bradley products. The stackers are important as they act as buffers, which give the machines

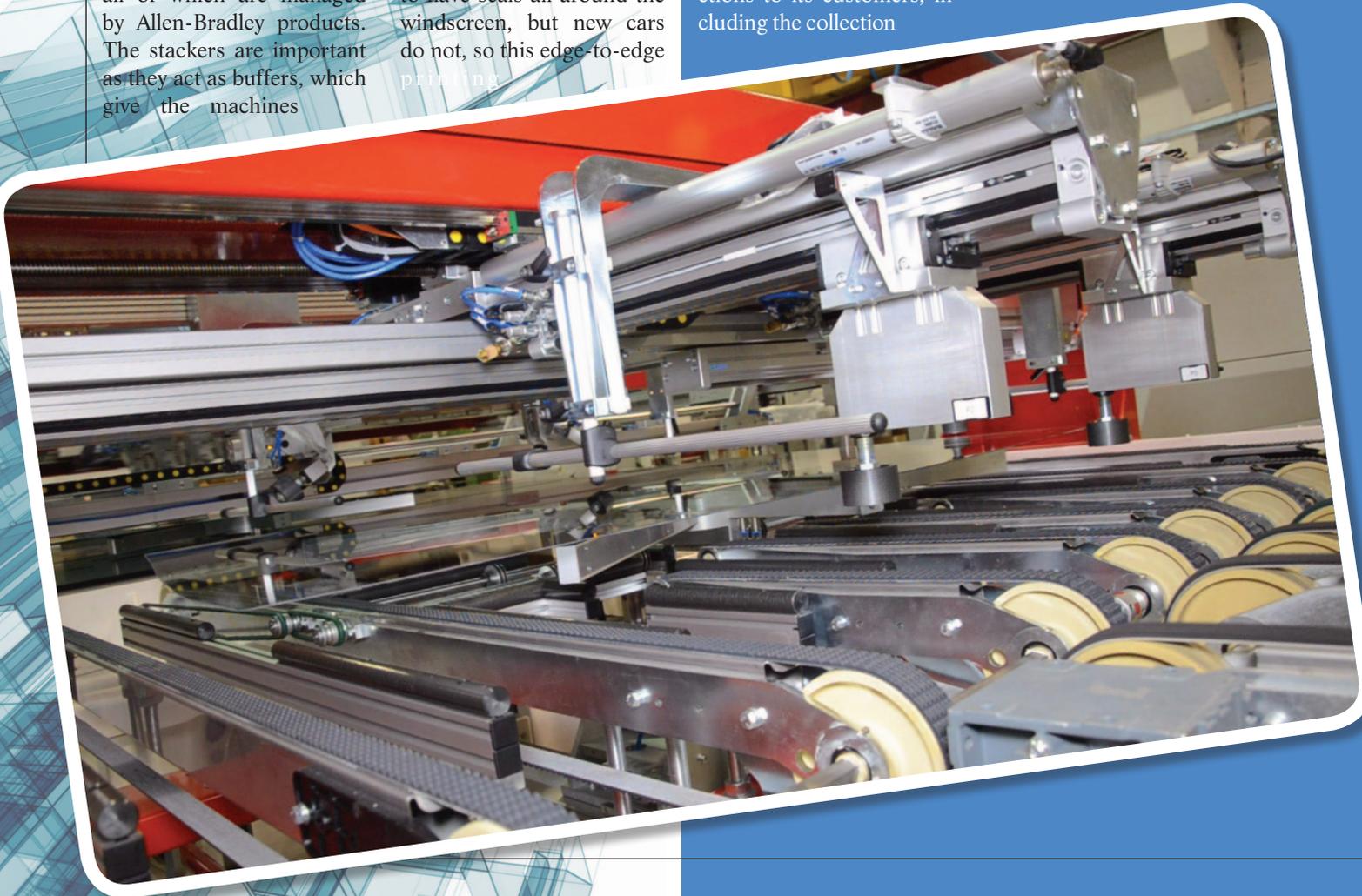
the opportunity to remove and replace any panels that have failed QA.

Kinetix servo solutions are used for the printers – for the print bridge and to drive the print squeegee. Servos must be used because the machine needs to know the precise position of the print head relative to the glass. Cugher has also developed a CNC system driven by Kinetix servos and drives that allows its machine to print to the glass edge – a major requirement for new automotive lines. Cars used to have seals all around the windscreen, but new cars do not, so this edge-to-edge printing

capability is vital as the black ink covers the metal supports for the glass – even internally.

The whole line, with all of the automation components, is linked using Ethernet/IP and Stratix™ 2000 or 8000 switches, depending on the machine size. By using Ethernet as the communication backbone, Cugher Glass has the option to expand the machine even further into the Connected Enterprise. This will allow it to offer a broad range of additional value-added functions to its customers, including the collection

of real-time performance data, historical data for performance assessments and maintenance schedules and connectivity beyond the shop floor into enterprise systems that can help manage the equipment even more precisely in line with other assets on site. The use of standard Ethernet within EtherNet/IP means that there is very little that needs to be done for these connections to be established; and full security solutions are also available for user control and to prevent unwarranted access.



RESULTS

"Cugher Glass is recognized the world over as an innovative company thanks to its historical tendency to study and realise innovative solutions for its customer's needs," Bonetti elaborates. "Developing these solutions is a very challenging task and right from the very beginning of the development of prototypes for new equipment, it is important to reduce unknown variables as much as possible. By basing the automation system on Rockwell Automation components, we are able start off on the right foot.

"Our initial relationship with Rockwell Automation was brought about by customer demand," Bonetti explains, "especially by customers in certain geographical locations. Our original automation supplier was not well accepted in these areas due to a lack of local technical and post-sales support. Once we implemented Allen-Bradley components in our equipment we found that they had a positive impact on the development of new automation and software; so much so that Rockwell Automation is now our first choice for automation solutions and has become part of our standards. We only use other automation components if expressly requested by the customer."

RESULTS

- Fully integrated automation and control infrastructure
- Synchronisation throughout the entire line
- Reduced programming efforts
- Increased flexibility for future changes
- Enhanced productivity
- Greater worldwide customer acceptance

CHANGING AUTOMATION

"Changing from our original automation supplier over to Rockwell Automation was a very challenging process because no tools exist to make this sort of transition, we had to completely revise all the software and hardware and then test every single function, but it was well worth doing because this is what the market is demanding."

"After the initial technological challenge everything became easier. The customers got technology they were comfortable with in terms of operating and training. Programming and troubleshooting is also easier as is the integration of third party devices. Long term the picture is also very promising as the programmers are far happier with the

Rockwell Automation software and the flexibility of the tools for programming means that future updates can be realised and implemented far more efficiently and in a timelier manner."

"During our experiences with Rockwell Automation," Bonetti concludes, "we have had several chances to test the responsiveness of the technical support from Rockwell Automation and we have always had a prompt reaction to our requests. Since we have a very proactive R&D department, the new equipment proposed by Rockwell Automation is often implemented and 'stressed' to use new features up to the maximum limit. Sometimes we have been the very first customer to make use of some of these special features and so far Rockwell Automation has demonstrated its ability to solve any issues that we have had. When mixing new automation solutions with brand new mechanical systems, unknown issues can arise. When we used Allen-Bradley products, we found that we had indeed got off on the right foot, we didn't need to worry about the

automation elements; we could simply focus on the mechanical and electrical issues. When you make as many prototypes as us this is vitally important."

"The results mentioned above are specific to Cugher Glass's use of Rockwell Automation products and services in conjunction with other products. Specific results may vary for other customers."

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