

Project Med-Con: Building Mask Machines to Fight Covid-19

In a race against the clock, Australian businesses create solutions for frontline workers in their efforts to combat Covid-19

Challenge

To re-design and build seven surgical mask-making machines within 14 weeks to meet urgent supply demands from frontline workers fighting Covid-19.

Solutions

Integrated Control and Automation

- The Allen-Bradley® Compact GuardLogix® PLC provides integrated control and safety for the mask-making machines
- Kinetix® 5500 Servo Drives integrate seamlessly into the Logix platform and deliver accurate start and stop functions for the mask machine
- PowerFlex® 525 drives with safe torque-off control the lamination process
- PanelView® graphic terminals provide access to real-time machine information

Results

Increased manufacturing capability

- The new mask machines will provide the capability for Med-Con to produce more than 3 million masks per week to help frontline workers fight Covid-19
- This represents an approximate 60-fold increase in manufacturing capability



Med-Con will increase its production capacity to 160 million masks per year.

Background

Coronavirus (COVID-19) is an infectious disease caused by a newly discovered coronavirus. As a global health pandemic, many countries around the world are struggling with surging coronavirus cases.

Healthcare workers rely on personal protective equipment to protect themselves and their patients from being infected and infecting others.

The World Health Organization (WHO) has warned that severe and mounting disruption to the global supply of personal protective equipment (PPE) – caused by rising demand, panic buying, hoarding and misuse – is putting lives at risk.

To address this, the WHO called on industry and governments to increase manufacturing by 40 percent to meet rising global demand.

The Australian Government recently tasked Australia's only surgical mask manufacturer, Med-Con, to increase production to help meet this demand. With only two of their three original 40-year-old machines operational, they realised that they would urgently need more mask-making machines.

Foodmach, an advanced engineering-to-order business based in Echuca, Victoria, was selected to assist with this project. Aided by the Australian Government, Foodmach was given a 60-day deadline to engineer and build the first of seven life-saving machines in order to meet urgent supply demands, targeting production of 60 million face masks by November 2020, with an ongoing annual capacity of 160 million masks.

Modelling the machines

The original machines were designed by Joe Carmody, whose business was a founding partner of Med-Con in 1989. In an industry-first for the time, the machine eliminated the need to hand sew surgical masks from rolls of material, as the machine does the complete job and heat seals the masks, without leaving holes caused by hand sewing.

Over the years, the original machine blueprints had been lost, making it impossible to build new machines. Engineers from the Australian Defence Force were called upon to model the parts and these 3D Models were shared with Foodmach, who then carried out further engineering and re-produced new drawings to facilitate and expedite the manufacturing process.

“While we are replicating an old machine, we are also having to modernise it to current control and safety standards in an incredibly short time frame. The timeline is so compressed that we only have eight weeks to do what would normally take six months,” explained Earle Roberts, ceo, Foodmach.

Driving mask production

Foodmach were able to take the original machine mechanics and modernise them to include the latest control and automation technology from Rockwell Automation. The Allen-Bradley® Compact GuardLogix® controller is at the heart of the machine, controlling the mask production process.

The Kinetix® 5500 Servo Drives integrate seamlessly into the Logix platform for easy configurability, system integration and safety. Together, the PLC and servo drives are key to controlling movement within the machine and keeping the accuracy of the machine’s start and stop functions.

These smart machines provide the capacity to increase mask production significantly, helping protect frontline workers in the fight to stem Covid-19.

These machines are designed to build the highest quality surgical masks with four layers laminated together for superior protection. The Allen-Bradley PowerFlex® 525 drives with safe torque-off controls the lamination process while operators can monitor production through the machine’s PanelView™ graphic terminals.



Earle Roberts, CEO Foodmach, onsite in Echuca, Victoria.

“Rockwell Automation’s Integrated Architecture® enabled plug and play integration of motion, drives and safety devices, providing the confidence that we could meet the tight timeframe of this project,” said Daniel Quartel, territory manager, Rockwell Automation.

The commissioning process of the first mask machine was seamless and certainly quicker than it would have been 40 years ago when the original machines were built. “The speed of the machine could be increased or decreased for testing and to see where any potential issues are happening, by simply pressing a button on the HMI screen. The machines have infinite speed control thanks to the Rockwell Automation PLC and integrated servo controllers and motors,” said Peter Marks, director of Capability and Exports, Foodmach.

Smart machines join the fight against COVID-19

“The progress with Foodmach has been tremendous, and equally importantly, they are well-woven into supply chains both locally and internationally. Med-Con was originally producing about 50,000 masks per week but now with the new machines, that number will exceed 3 million face masks per week. This is nothing short of extraordinary in terms of the compressed timeframe,” said Bruno Bello, business advisor, AMTIL – an industry partner to the Australian Government’s Entrepreneurs program.

Building seven mask machines within 14 weeks was a challenging task but the success of this project is testament to the power of collaboration and



Allen-Bradley PanelView graphic terminals provide access to real-time machine information.

determination to help win the fight against Covid-19. The project involved more than 2000 mechanical design hours for Foodmach, plus another 12000 manufacturing hours to build the machines.

“We were seeking to build the first machine in eight weeks, but we were able to deliver it ahead of schedule in seven weeks. A key part of that was having suppliers such as Rockwell Automation that hold available stocks of parts in Australia and can also expedite getting components in from overseas if required,” said Earle Roberts.



The Australian Government tasked Med-Con to increase mask production to meet rising demand resulting from Covid-19.

There is a very strong fit between the capabilities of Rockwell Automation both in terms of the physical products they provide and also the service and assistance their technical support provide us, making them our choice of supplier for this project,” added Roberts.

The first carton of 50, Level 3 surgical masks was recently made on the new machine and it was cause for celebration by all involved. In the coming months, Med-Con will continue to work around the clock to make sure masks are available to frontline workers to help flatten the curve.

“Prior to the new machines, we were making approximately two million masks per year. All of a sudden now, we are looking at increasing our annual ongoing production to 160 million masks,” said Steve Csiszar, CEO, Med-Con.

Australia’s mask manufacturing capacity is secured thanks to the innovative work of an exceptional team of engineers, designers and technicians. These smart machines provide the capacity to increase mask production significantly, helping protect frontline workers and their patients in the fight to stem Covid-19.



Foodmach took the original machine mechanics and modernised them with the latest control and automation technology from Rockwell Automation.

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