

# New food industry HMI

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**Joint effort between Rockwell Automation and Metalquimia results in new standard for food industry HMI.**

**New food industry HMI undergoes extensive design and testing before gaining NSF certification .**

#### Background:

From a cleanliness perspective, the food industry is one of the most heavily legislated sectors on the planet – with consumer well-being acting as the primary driver.

Different sectors have different technical demands related to the potential for contamination, with a cola-bottling factory experiencing different pressures to one that handles raw meat. But in both cases, ingress protection, void removal and wash down all play primary roles in the cleanliness of the plant.

Ingress protection and void removal are relatively straightforward to address in a mechanical sense, being countered by special flush casing designs and the removal of horizontal surfaces – both of which also foster more effective cleaning. But the use of high pressure, high temperature washes, as defined by the IP69K rating, can deliver a unique set of challenges to electrical installations, electro-mechanical components and HMIs, which simply do not mix well with water and steam.

In many cases, these components are tucked away in sealed cabinets or they are surrounded by bespoke constructions designed to isolate them from the electricity/water equation. The problem is – especially for HMIs which have to be accessible – these design ‘extras’ cost money, demand extra design time and capabilities and often enlarge, deform or ‘upset’ the envelope of the machine, which in this day and age of sleek lines and clean-looking concepts, is simply not acceptable.

It was the need for a ruggedized HMI solution to bypass this over engineering and to improve machine design that prompted Metalquimia to approach Rockwell Automation with the idea of developing an HMI concept that could stand up to the rigours of the food industry’s operational and cleaning demands.

Founded in 1971 and located in Girona, Spain, Metalquimia is considered by many of its global customers to be a leader in technology and the manufacture of complete turn-key lines for the production of meat products. So, with this market depth and size in mind, it certainly had the need and the pull from its customers, it just needed the technology.

#### Challenge:

Any industry that handles raw meat offers an interesting set of challenges, with cross contamination and bacterial transfer being major issues that have to be countered. For this reason, regular cleaning at high pressure, high temperature and with chemicals is the norm.

The mechanical design of exterior components and machine chassis and casings is a mature and proven discipline, but any additions outside of this mechanical “comfort zone” can introduce trap points and voids. This is not a particularly straightforward exercise.

According to Josep Tarradas, Automation Manager at Metalquimia: “We had a wide choice of existing displays, but they all had issues relating to how we were going to deploy them. We needed to develop one with a larger and more effective bezel in order to prevent environmental ingress. We also needed something that offered us a nice look, as we did not want to upset the clean, modern lines of our machines.”

Any new HMI design has to resist a two-pronged attack: prevention of contamination and resistance from harsh cleaning regimens. These capabilities have to be addressed in a solution that would also be sympathetic to the design of the rest of the machine.

Ideally it needed to be certified too, to give end users to confidence that any new developments or design tweaks do not have a detrimental effect on the machine’s hygiene rating.

#### Solution:

After the initial contact two years ago, engineers from both companies supported a design exercise to help create a panel concept that not only delivered the operational capabilities of a machine-mounted HMI, but also catered for some of the world’s most stringent food industry legislation. Rockwell Automation used those ideas to build a new 12 inch stainless steel Allen-Bradley® PanelView™ Plus 7 HMI.

Following the development process, the new design was then subjected to four months of extensive testing in Metalquimia’s end-user-plant-simulation laboratory, which employs daily temperature cycles and fluctuating humidity coupled to regular aggressive wash down and cleaning.

According to Bart Nieuwborg at Rockwell Automation: “Other HMI vendors have stainless steel models, but to date, our IP69K compliant design is the only one to have achieved NSF certification – which captures the needs of most food industry customers across the globe. There’s a lot more to it than just the stainless steel. You have to be able to wash it with high pressure steam and you really do need to conformal coat/varnish the circuit boards inside the panel to counter condensation caused by temperature variations.”

From a design perspective, the new PanelView HMI has a flush, ‘grooveless’ bezel, which is backed with a specially designed blue silicone seal. Behind the panel metalwork a special mounting ring is provided, which, together with clips, helps to ensure that the panel, bezel and seal are firmly seated against the exterior of the machine. This mounting ring also prevents deflection when thinner gauge steel is used and makes the whole assembly more rigid.

#### Results:

Nieuwborg explains: “We have created an industry-hardened HMI that provides a more cost-effective approach versus a normal HMI encased in bespoke cabinet hardware. Existing PanelView users can exploit the potential of this new design too, as it is available in the existing nine and 12 inch sizes and uses the same development environment and software, so code can simply be transposed onto the new unit.”

Tarradas adds: “We subjected the new panel to testing the simulated some of the most demanding customer applications we have seen, with its performance in the face of cleaning playing a major role in the eventual success of the unit and its certification.”

Pere Canadell, Engineering Department Coordinator at Metalquimia backs this up: “The North American market is of particular importance to us, so we have to make sure that the NSF certification was in place. Our machines operate all over the world and this certification provides a lot of kudos other worldwide markets too, especially ones where the HMI solutions are covered by guidelines as opposed to the enforceable legislation.

“We have worked with Rockwell Automation from many years,” Canadell concludes, “and we have a good history of working together, which really showed in this product-development exercise. Both teams had great communication channels and appreciated each other’s mutual inputs. The teamwork was perfect. Both parties are delighted with the end result and we are already getting a positive reaction from our customers and the wider industry. This has been reinforced by the success of our MOVIPUS and TWINVAC EVOLUTION machines, which both deploy the new PanelView display.”

#### Challenge:

Metalquimia needed a new HMI design that would stand up to the rigours of the food industry in terms of contamination, cleaning and modern machine design.

### Solutions:

The Rockwell Automation Stainless steel PanelView Plus 7 display (9 and 12 in) exhibits:

- Grooveless bezel
- Specially designed blue silicone seal
- Special mounting ring and clips for sealing effectiveness and rigidity
- Conformal coated electronics
- Existing software environment for simpler transposition of code from one display to another

### Results:

- NSF certification
- Tested in aggressive operating conditions, including temperature and humidity cycling coupled to regular wash down and cleaning, compliant with IP69K
- No requirement for additional cabinet hardware for mounting
- Little impact on aesthetics of machine design

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