

Have beer, will bottle

MicroBrewTech is a start-up located in the picturesque Victorian-era town of Oamaru in New Zealand's South Island. With the world-wide rise in the number of boutique- and micro-breweries, the company's founder, Simon Ross saw a need for brewery equipment that would be affordable for small, high quality brewers.

The first product Simon set out to design is a filler and capper that can fill 3600 bottles of beer a day. The way it works is that it first injects a pulse of CO₂ into the bottle, vacuums it out again, injects a second shot of CO₂ and vacuums *that* out. This "double pre-evacuation" ensures that the bottle is free of air, which can ruin a good brew if sealed into the bottle. Then pressurises the bottle with CO₂. Finally comes the beer! The machine forces the exact amount of pre-carbonated beer at close to 0°C into the bottle under pressure. The pre-existing CO₂ pressure in the bottle prevents the CO₂ in the beer from bubbling out while the bottle is filling. Finally the pressure is carefully released, allowing the beer to foam up the neck. While the neck is full of CO₂ foam — and not air! — the capping station quickly puts on the crown cap. This occurs all in one compact machine.

When he started designing the machine, Simon, an experienced machine builder, had prior exposure to industrial PLC controls. It was therefore a natural choice for him to use a conventional micro PLC as the main control element. What he discovered, however, was that the lack of a rich operator interface was constraining his design, and adding a conventional HMI unit to the PLC would blow his budget out of the water. So he did some further research and discovered SPLat Controls, who pioneered embedded controllers with integral operator interfaces back in 1998. As luck would have it, SPLat were in the process of developing their first off the shelf controller with an integral colour touch screen, the HMI430, and they agreed to supply Simon a prototype unit for his development work.

The resulting REV500 bottling machine leverages the HMI430's easily programmed touch screen to provide the operator flexible control over the machine's various functions and settings. It also helped Simon include a level of automation and adaptability that's quite unusual in a low cost machine, so small operators can quickly reconfigure for various products, and easily integrate other equipment such as labellers. Because the HMI430 was still under development, with scant documentation for the display functions, SPLat provided Simon with sample code snippets to get him going. Simon however quickly amplified on those examples, created his own custom graphics and produced his own attractive screen designs.

While the objective is to get beer into bottles, which the machine does extremely well, there is no doubt in Simon's mind that having a colour touch screen will make his machine more attractive to his buyers. "At a purely rational level, the ability to have multiple screen layouts for different functions definitely improves the usability of the machine." said Simon. "But beyond that, even in a business investment the eye appeal will still be a factor. And having the colour screen makes the machine seem thoroughly up to date — which of course it is." he quips.



Using a SPLat HMI430, a sophisticated controller with colour touch screen for this beer bottling machine was developed by the machine's actual designer rather than by a programmer with no knowledge of beer bottling.

http://www.microbrewtech.co.nz/DSC_7786a.jpg