

Development of medical equipment design

Accuracy while monitoring a patient during childbirth is absolutely critical – and can mean life or death for both the mum-to-be and her baby. Research has shown that 75 per cent of deaths during birth are due to human error and that misinterpretation of the fetal trace (the baby's heart rate) was the commonest failing. That is why K2 Medical Systems have been working with SCHURTER Electronics for the last four years, as the provider of touchscreens for its medical grade portal. Fiona Leslie talks about how SCHURTER Electronics and K2 Medical Systems have teamed up to provide important medical equipment

K2 Medical Systems was born out of the Plymouth Perinatal Research Group in 1999, converting research into innovative technologies to improve maternity care. The company develops state-of-the-art products that can be transferred into clinical practice with an exciting portfolio of products covering training, monitoring and data collection. K2 Medical Systems has products installed in over 90 per cent of UK hospitals including 964 K2 Medical Systems P2 Medical Grade Portals in 61 hospital maternity and labour wards around the UK and abroad.

SCHURTER Electronics, part of SCHURTER Holding AG, is pre-eminent in Europe for Human Machine Interface (HMI)

front panel integration and Projected Capacitive (PCAP) touchscreen solutions, with more than 75 years' experience. SCHURTER Electronics and K2 began working together in 2012 when the K2 team commissioned SCHURTER Electronics to develop a touchscreen for its portal's 19 inch monitor to overcome issues with the existing screen which used a different capacitance touch technology. The touchscreen performance was restricting the user interface design due to poor accuracy, repeatability and susceptibility to noise interference. The touchscreen to display gap also needed to be relatively large introducing optical parallax errors to the interface.

SCHURTER Electronics offered a solution that overcame all these issues by providing a PCAP touchscreen, a film-based product, without wires embedded within the sensor area. The PCAP technology enables a finger touch to be sensed through a protective layer in front of the display. This system provides high levels of reliability, with superior sensitivity, accuracy and user experience. Some of the key benefits of PCAP are multi-touch, high optical transparency and visibility, durability, low maintenance, no recalibration, easy to clean, a range of customisable cover lens options including glass, polyester and polycarbonate, and touch accuracy with stability and repeatability. SCHURTER Electronics has supplied 450 PCAP screens each year for the P2 Medical Monitor that is used in maternity units in the UK, Republic of Ireland and Australia, monitoring a patient's vital signs and comparing it with a baseline reading so medical decisions can be made as a result.

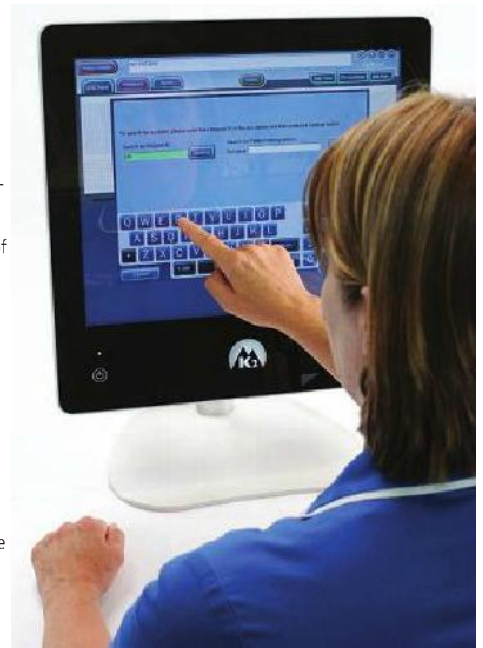
Infection control is a key factor in designing medical equipment and great

care was taken to deliver a superior design that addresses the wipe-clean needs for today's HCAI (Healthcare Associated Infection) control measures. The front of the device is effectively a sheet of flat, toughened glass. The touchscreen sensor and on/off control are integrated behind this glass. All areas of the device touched and handled by users during normal use are completely free from difficult to clean joints or crevices. The solid glass front also ensures optimal image quality from the display that will not degrade from continual use. The integrated projected capacitance touchscreen sensing surface is on the inside of the toughened glass front, which means the touchscreen will not suffer from wear and cannot be damaged. The sensing technology used is also free from drift; recalibration through service life will not be required. The touchscreen also provides class leading light transmission from the display ensuring bright and clear display of information.

The relationship between SCHURTER Electronics and K2 developed further as they worked together to improve the P2 Medical Monitor, overcoming issues with Electromagnetic Compatibility (EMC) to develop a monitor which can be used in critical care units, not just labour and maternity wards. The result is the forthcoming P3 Monitor for which SCHURTER Electronics is supplying the complete front panel – both the display unit and PCAP touchscreen. The size of the monitor has also been reduced whilst retaining the same size screen. Providing this integrated solution has multiple benefits including lower power consumption, reliability, quality and price.

Prototypes have been developed and the units go into production this year with the initial contract for 400 units. The key developments and improvements in the P3 Medical Grade PC are:

- The EMC (Electro Magnetic Compatibility) regulatory performance has been improved by K2 using SCHURTER Electronics' technology. RF (Radio Frequency) interference noise has been



reduced by installing SCHURTER Electronics' upgraded touchscreens

- The touchscreen accuracy and stability is much improved inaccuracies are more stable. P3 has new casting for housing allowing it to be lighter and slimmer
- A redesign improves waterproofing for increased suitability for use in wet areas, such as birthing pools
- The P3 boasts quicker booting and performance.

Angela Delbridge, senior engineer at K2 Medical, says choosing SCHURTER Electronics to supply was an easy decision to make: "We continued to use SCHURTER Electronics as the supplier for touch screen technology in our P3 product based on their performance in the preceding P2 design. They have proven to be a very reliable supplier; the delivered product has consistently satisfied the required specification in every way. Additionally, we have seen the performance of their technology improve within the challenging EMC regulatory test environment, bringing welcome benefits into our application. We have always found them to be a very personable and professional company to work with."

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