

# Successful product lifetime extension of a medical device

By Patrick Hellmüller, Hamilton

*Thanks to a retrofit solution developed by the Swiss electronics manufacturer Syslogic, the product life cycle of the tried and tested Galileo ventilator from Hamilton Medical has been significantly extended.*



*Figure 1. The ventilator Galileo from Hamilton Medical is used in intensive care units worldwide and has versatile modes of ventilation.*

■ An American study conducted in the year 2000 revealed shocking conditions in the health system. Every year, deficiencies in health care in the USA lead to between 44,000 and 98,000 deaths – more than are caused by road accidents, breast cancer or AIDS. Hamilton Medical, one of the world leaders for ventilators, has made it its goal to combat this deplorable situation by making available innovative artificial respiration solutions.

Among other things, the company has developed the intelligent respiration mode ASV (adaptive support ventilation) for its ventilators. This system involves measuring different values such as the respiratory rate and minute volume (Vt) in patients and comparing them to target values. If necessary, ASV is capable of automatically adapting the ventilation pattern to the changing breathing mechanics and breathing activity of the patient. Apart from a clearly reduced risk of the patient developing permanent lung damage, the system improves the working conditions for doctors who are often under extreme pressure. ASV by no means makes physicians superfluous but it saves them time-consuming ventilator resetting procedures by executing continuous routine adjustments automatically. Clinical decisions still remain the responsibility of the doctor. However, with ASV such decisions are, thanks to easy access to all important respiration parameters, greatly simplified.

The first device ever to incorporate ASV was the Galileo ventilator which was launched in 1998. Since then, this intelligent artificial respiration mode has conquered intensive care units all over the world and is now seen by many physicians as an indispensable tool in treating patients. ASV not only reduces risk levels for patients while making ventilator operation easier for doctors, but it helps to lower health costs through quicker convalescence. The ventilator Galileo ideally meets the needs of intensive care medicine. This is shown by the mere fact that roughly fifteen years after its market launch, the product family continues to meet with keen interest and that it is still offered.

A product life cycle of fifteen years is almost an eternity for a device with complex electronic components. This immediately becomes clear when one recalls the typical life cycles of consumer electronics devices. Irrespective of whether it is a camera, computer or Hi-Fi component, products in this segment are totally obsolete after as little as two years. In contrast, such a long construction period is normal in the medical field. Accordingly, it can happen, of course, that individual components are no longer available. A considerable inventory was built up of the main computer installed in the Galileo series, yet Hamilton ran out of the devices in 2009. Since the Galileo series continued to be important, a strong market remained.

Hamilton Medical had to come up with a solution. From a business management point of view, taking a successful product off the market is always a bad idea. Eventually, the Grisons-based medical technology manufacturer found industrial computer specialist Syslogic, a competent partner with extensive experience and with the required product platform. This



*Figure 2. The first device ever to incorporate ASV was the Galileo ventilator launched in 1998.*



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partner was able to adjust a PC/104 board in such a way that compatibility was ensured.

Apart from the development and manufacture of industrial computers and touch panel solutions for industrial applications, Syslogic has made a name for itself in the European retrofit market. In addition, the company boasts numerous client references in the medical, engineering and railway industries. Retrofit means modernization or retrofitting of existing systems or devices which are no longer available. One key aspect in this connection is ensuring a reliable supply of spare parts – and it is precisely in this area that Syslogic offers unique know-how. Compared to the current situation, computer development was still in its infancy ten to twenty years ago. Given this rapid development, it is now rather difficult to procure compatible IT components for older systems, since they are usually no longer stocked or produced. But thanks to its 25 years of experience, Swiss industrial electronics specialist Syslogic, which maintains its own platform development, is in a position to offer standard products which precisely match retrofit requirements and are therefore compatible even with systems from the 1980s. This compatibility saves clients cost-intensive and time-consuming

software adjustments.

Syslogic has the necessary drivers as well as scalable platforms. Working closely with Hamilton's development department and with the processor manufacturer, Syslogic was able to adjust its PC/104 boards to the existing system quickly and smoothly. Beside software compatibility, graphics integration via a TTL interface, with which the IPC/NETIPC-4 boards used are equipped, was very important.

With the retro-compatible boards by Syslogic, which within the ventilator are responsible for the HMI (human machine interface), Hamilton is capable of extending the product life cycle of the Galileo series by at least five years. Due to the broad functional spectrum of Galileo which incorporates respiration modes for neonates as well as adults, the

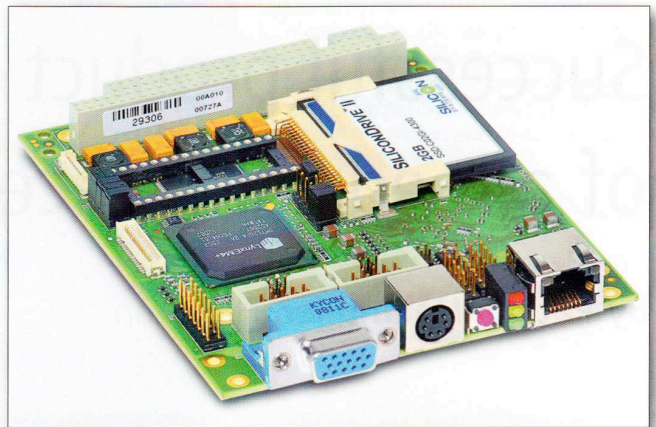
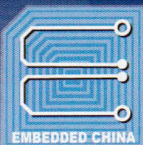


Figure 3. The Galileo ventilator comes with retrofit boards from Syslogic, which are based on a Vortex86DX-platform.

devices are still sought after in the market today. Meanwhile, the next innovative generations of the further-developed Hamilton ventilators are gaining in importance. As a result, the Galileo series will be discontinued in the foreseeable future, but only after more than fifteen years, during which time the series has not only contributed to but even co-determined the direction of technological developments in the field. ■



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