JÖRGEN HANSSON

A touch of the future

OWNERS OF EVEN THE MOST GENERAL PURPOSE MACHINES ARE NOW EXPECTING INCREASED EFFICIENCY THROUGH THE USE OF MODERN CONTROLS AND ONBOARD COMPUTING

RIGHT: **Advanced machine-management systems are used to improve the duty cycles of industrial vehicles**

The functionality of a machine is to a considerable extent realised in software, a trend that can be expected to continue. With even basic CAN-based controls, OEMs can create added value by introducing onboard diagnostics, video surveillance, user-support tools, and fleet-management functionality. In essence, we are on the path towards making the machines more intelligent. To some extent, jumping on the bandwagon is also a matter of branding. Modern controls and onboard computing is a factor that end users increasingly consider in their evaluation of machines.

There are complex, specialised machines where this development is already far advanced. In a forest harvester, for example, the duty cycle needs to be very high if the owner of the machine is to get a reasonable payback on the investment. In a container terminal, the different handling equipment needs to be seamlessly integrated, with the highest possible uptime, to meet the increasing expectations of timely goods delivery.

But now the operation of general purpose and less complex machines is becoming subject to similar expectations. Increasing competition requires a focus on operational efficiency. In response to this development, the Nordic control-system specialist CC Systems launched the new onboard display computer platform CC Pilot XA at Intermat 2009. This advanced but slim product platform makes it possible to create advanced, next-generation control and machine-management systems for vehicles that previously could not justify the cost of such systems.

What happens when a potential buyer of a new machine notices the in-cab display? He will hopefully think that the display is good as it gives him direct, easy-to-interpret feedback on various machine functions. Moreover, he will probably push the display surface with his finger, in an attempt to interact with the machine; an instinctive interactive behaviour learned through the use of PDAs, touch-screen mobile phones and so on.

CC Pilot XA uses a robust, yet affordable, touch screen and, with the 7in widescreen display size, it is possible to create a user interface with large icons that enables easy interaction even during bumpy rides. The platform also supports 8in and 10in screens.

Open software platform

The low-power ARM11 CPU kernel in CC Pilot XA has a solid track record in the automotive business where it is commonly used for advanced control and multimedia applications. With CC Systems packages, OEMs can programme both machine controls logic and GUI (Graphical User Interface) in an IEC 61131-3 compliant tool, such as CoDeSys. The platform also supports Windows CE and Linux and, with this operating system support, it is easy to integrate commercially available applications or application add-ons, such as machine telematics and fleet-management software. Such software solutions are also offered together with the product platform. The open-computing platform with optional software solutions means there is freedom of choice when adopting CC Pilot XA.

To support easy programming of stylish user interfaces, graphical objects designed by industrial design experts, such as meters and gauges, are offered as plug-ins to the standard graphical libraries. For OEMs who want to achieve greater differentiation, through the GUI there is the opportunity to implement proprietorial GUI components or use the GUI industrial design service offered together with the product platform.

The CC Pilot XA platform supports dual CANbuses, and provides a choice of CANopen, SAE J1939 or a proprietary protocol. By connecting to the engine CANgateway, the display replaces engine/transmission meters and gauges using the graphical component plug-ins described. This saves time in wiring and installation and also reduces the material cost for the electric system in total. The display can also act as a controller for working hydraulics and electric actuators, providing feedback from these systems and also enabling touch-screen control of their functions.

With up to four analogue video interfaces, CC Pilot XA is also a video surveillance monitor that is able to show two video images simultaneously. Waste trucks, for example, have standards today calling for onboard video surveillance of the vehicle rear, kerb side and so on. By using the same display for machine control and video surveillance, cabin space is saved as well as the cost of a separate video monitor. The video decoding is solved in a FPGA circuit, and no main CPU computing power is required for displaying the video images on the screen.

CC Pilot XA also has Ethernet, USB and RS232 interfaces, facilitating easy integration of Ethernet-based information systems and peripherals such as a memory stick, a wireless modem and a GPS receiver.

Prepared for functional safety

Industrial vehicle OEMs are challenged by new legislative requirements, such as the EU directive 2006/42/EC, requiring the onboard electronics to conform to safety standards. The CC Pilot XA platform has an optional safety co-processor that can be used for safety-critical functions and watchdog functionality, such as for control of internal power supply, start-up and shut-down logics, monitoring of internal temperatures and the overall integrity of the unit. With the safety co-processor, CC Pilot XA can be used to run safety-critical functions that require SIL2 classification according to IEC 61508 or performance level D according to ISO 13849. The co-processor solution has been SIL2 classified by TÜF, the leading European certification body on functional safety.

In summary, the CC Pilot XA display computer platform is developed to meet the emerging needs for advanced machine management systems, intuitive human-machine interaction and to satisfy legislative requirements on functional safety. It provides a touch of the future. **iVT**

Jörgen Hansson is product management director at CC Systems, which he joined in 1993

CONTACT
www.cc-systems.com
info@cc-systems.com

ABOVE: **The new CC Pilot XA display computer**