JENS KARLSSON

Fleet treat

A NEW FLEET MANAGEMENT PLATFORM THAT IS SEAMLESSLY INTEGRATED WITH THE MACHINE CONTROL SYSTEM CAN TURN MERE VEHICLE SUPPLIERS INTO LEADING MACHINE SERVICE PROVIDERS

RIGHT **CrossLink XA is a combined controller and host for an onboard fleet management client**

Over the past few years, machine control systems have improved in their fault-finding and maintenance abilities. A control system often contributes with vital information and calibration possibilities through service tools or through its user interface. The effectiveness of the service personnel working in the field has, over time, been greatly improved by control system functionality such as event logs, error logs, parameter viewing and setting and software updates.

The logical next step in service and maintenance effectiveness is to make parts of the control system functionality available to the back office. This will allow problems to be easily solved without having to be present at the machine, eliminating travel costs and greatly reducing the time needed for fault analysis.

The control system information can be used to diagnose the current machine state. It can also be used to make a prognosis about the occurrence of future fault states. If diagnoses and prognoses can be made available back office, a range of new opportunities open up to improve service and maintenance.

Besides fault-related information, machines also produce information describing the results of their usage, such as production data. By providing this information to machine owners and end users via the back office, machine utilisation can be monitored in near real time, making manual reporting and administration redundant and providing a means of improving utilisation.

At Bauma 2010, CC Systems will introduce CrossCheck, an integrated machine diagnostics and fleet management platform for the OEM market. It addresses both the typical end-user needs (such as machine position and fuel usage) and the more advanced machine diagnostics features that OEMs can use to create a more profitable aftermarket business. The solution is flexible enough to be used out of the box but can also be tailored for specific needs.

With the CrossCheck platform, a machine fleet of arbitrary size communicates vital information to a back-office side-server cluster. The information from each machine is stored and it can be automatically or manually analysed to assess machine status. This data is made available to the back-office users via web applications, or via a business system.

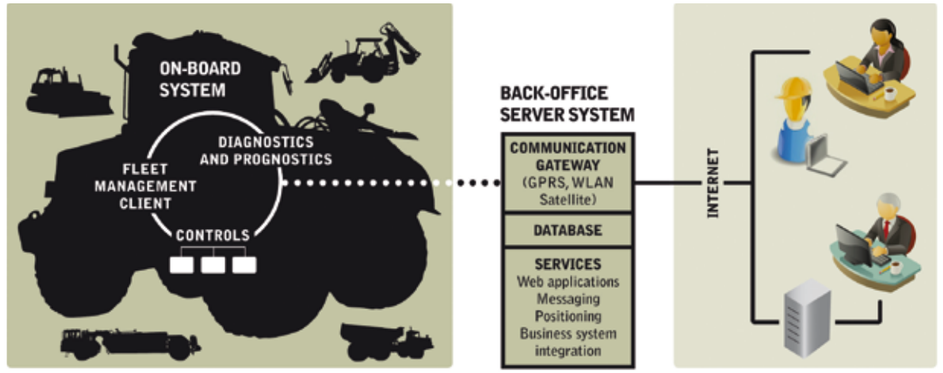
Improved intelligence

The CrossCheck platform integrates machine controls with diagnostics/prognostics and fleet management functionality. By using information available in the control system, the diagnostics part can draw more refined and specific conclusions on machine health. The prognosis part then uses the information to predict future behaviour and life expectancy.

The back-office part makes the in-depth information on machine health available in a comprehensive and easy-to-interpret format. It enables OEMs to analyse such factors as the health, most common problems, user behaviours – all on a fleet level. This information can be used for product enhancements and also supports the establishment of attractive and beneficial service agreements. Examples of end-user services that can be offered include the instant distribution of acute alarms and automatic service orders.

Using this approach, OEMs can apply a CBM (condition-based maintenance) strategy in aftermarket operations. The diagnostics and prognostics support makes it possible to change from time-planned machine maintenance to a schedule based on the machine's condition. For example, prognostics can use trends of timing, current or vibration, related to certain operations, to make predictions of remaining time of service.

With in-depth machine intelligence available back office, warranty conditions of machine usage can be monitored. The case of an operator failing to observe alarms when operating the machine, for example, constitutes a warranty breach that the system can detect. This information protects the vehicle manufacturer in the event of a potential warranty claim and also enables notification to the fleet owner of the inappropriate usage, thereby protecting the machine more efficiently.



LEFT: **System overview – the CrossCheck fleet management platform**

Industrial platform

The CrossCheck software platform is divided and deployed in two parts: one for the machine, in tight integration with the control system, and one for the back-office server system. The onboard fleet management functionality is provided to the system application developers using a comprehensive application programming interface (API). The functionality can be hosted on any control system module that has appropriate data carrier hardware and drivers. CC Systems offers a range of suitable modules, including displays, controllers and dedicated communication modules.

The solution provides possibilities for very close integration between the machine control system application and the fleet management client. Updates in the machine controls are easily incorporated in the fleet management client. Special requirements on diagnostics, prognostics or warranty control could lead to the need for the inclusion of additional control system sensors.

In general, any control system information or commands can be made available for back-office usage, including sensor values and fieldbus data.

The diagnostics and prognostics software framework provides an infrastructure for implementing diagnostics and prognostics functionality and has a predefined interface that integrates it with the fleet-management client. There is a clear separation between the control, diagnostics/prognostics and fleet management subsystems, which is important because real-time behaviour in the control part must not be affected by the other parts. Keeping the three software parts separated makes system testing, maintenance and updates easier.

The data-carrier interfaces are supported with worldwide roaming agreements with operators or satellite subscription agreements. This helps dramatically reduce the communication cost in comparison to standard SIM card subscriptions, while the OEM does not need to spend time on subscription handling.

The back-office solution is an established Fleet Management platform used by a number of large industrial corporations. It is securely hosted on a server cluster with 24/7 support, raid systems and backup. It is prepared for any fleet size as server clustering is employed for load balancing.

The back-office solution provides several services and functionalities, such as data analysis and administration tools, emailing/SMS and positioning services such as mapping, address retrieval and geofencing. The back-office users access the different information views and reports via internet preset views, offering possibilities to work either with specific machines or defined groups of machines. A fleet can be grouped to support an organisational structure and then user authorisation can be applied to restrict access.

Users can – via the web interface – also send information to machines. For service and aftermarket organisations, this typically includes parameter settings and firmware updates. In addition to the web-based access to information, the back-office solution supports data exchange with third-party business systems. This means that fleet management can be integrated with such features as financial reporting and planning.

Fleet offering

The CrossCheck platform gives OEMs the opportunity to offer their clients a fleet management system that, in addition to the service-related functions, provides fleet operators with a tool for other aspects of operational management. As an example, CrossCheck can be used to communicate work orders and work-shift planning from the back office to the machine operator, as can information on tasks performed and other production data. This offer enables OEMs to move from being a mere machine supplier to providing a reliable machine service. **iVT**

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