CAN Newsletter Online

MOBILE MACHINES

Ways of wiring technology

In a press release, Data Panel goes into detail of three ways of wiring technology in mobile machines. They chose the third way. Doing so, the company introduced its xtremeDB solution for this purpose which supports CAN, CANopen, and J1939.

The company explained: Unlike industrial installation technology, the installation of I/O technology in mobile machines has not yet reached a standardized modular, decentralized level. There are two methods that are more widely practiced, but they present a series of challenges that will not be sustainable in mobile machine systems in the future.

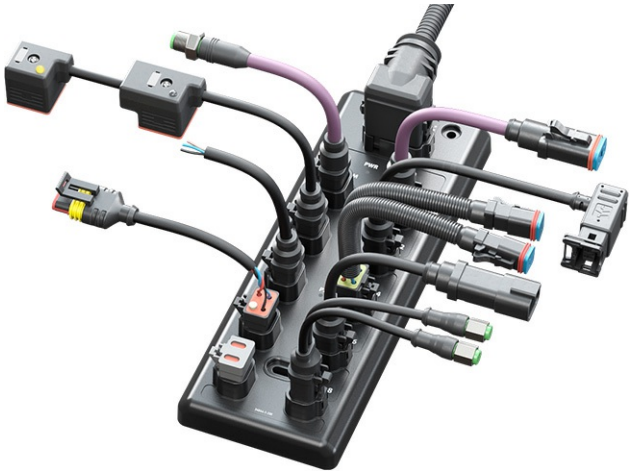
Bomag asphalt cold milling machine (Source: Data Panel)

The first way

The usual wiring system in series machines for the mobile segment is the single-wire harness adopted from the automotive world. What works well in the engine compartment of a truck often proves unsuitable for construction, municipal, or agricultural machinery. The materials are incompatible with the operating media, and the unprotected single-wire seals cannot withstand high-pressure cleaning. In order to achieve a certain protection for the sensitive wire insulation, cable harnesses must be elaborately bandaged, braided, or laid in protective hoses. This incurs costs and makes routing in the machine more difficult, the company concluded.

The second way

Other machine builders use industrial terminal box technology (maximal IPx5), or even domestic installation technology (IPx4) as an alternative to the cable harness, and mix these with automotive connectors and single wires by necessity. Unfortunately, such assemblies are often incompatible and must be helped with sealing compound, heat shrink tubing, or insulating tape and creativity. The installation of the boxes is time-consuming, and a large number of individual parts and tools are also required. An additional, and significant, drawback is the high-space requirement of terminal boxes; because mobile machines have limited space.



XtremeDB I/O module with connection cables (Source: Data Panel)

The third way

Data Panel addresses the issue of installation systems in mobile machines by providing full support to machine builders in the planning, installation, and commissioning of their machines, promised the company in their press release. This is achieved, among other things, by means of a standardized, pluggable modular system consisting of coordinated and, according to the company, robust components. This kind of system can also harmonize the industrial and automotive installation worlds instead of relying on one-size-fits-all solutions, the company continued.

XtremeDB modules

Active xtremeDB I/O modules (the CAN Newsletter reported) with D-sub connection technology form the center of the Data Panel solution. The modules are available for CAN, J1939, or CANopen. These modules offer eight ports for input or output signals and can be individually parameterized. Sensor signals can be read in digital, analog, or as frequency/counter/encoder signals. Outputs are available as digital, radiometric, pulse width modulated PWM (pulse duration modulation), or PVG-compatible signals. The company said: With these modules, series machines benefit on a modularly designed, pluggable extension level, opposed to the limitations of relying solely on wiring harnesses. Smaller machines, which only work with a display control, can be expanded with full-fledged I/O's using xtremeDB modules. The motor vehicle type approval (E-approval) for on road usage is available for the mixed I/O modules, as well as branch specific EMC standards are fulfilled.

Up to 52-A total current can be fused and centrally-wired in four power circuits. The outputs can drive up to 4 A, and two digital outputs per module can be loaded up to 10 A. All outputs are overload and short-circuit protected, and the momentary output current amperage values for each pin can be read out via the CAN connection. Integrated diagnostics via LED and CAN ensure troubleshooting.

The modules are addressed by means of jumpers in the 18-pin D-sub connector. This means: When the module is replaced, the address setting remains in the connection cable. A replacement module is immediately ready for use after plugging in, no prior setting or parameterization required. The modules are equipped with two combined CAN and sensor supply connections, which allow expansion. Data Panel also offers solutions for a star-shaped and shielded CAN distribution.

Various xtreme modules with sheated connection cables as I/O extension for display controllers and harness installations (Source: Data Panel)

Connection cables

Data Panel also provides the matching xtreme connection cables. The company said about the IP68 / IP69K approved cables: They are resistance to high-pressure cleaning and come with advantages when installation, e.g. on booms or other moving parts, is required. The system is supplemented with connector accessories, as well as matching dummy plugs, and terminating resistors.

Bomag cold milling machines are designed for the selective milling of road and floor pavements. Four xtremeDB modules are mounted near the milling drum to permanently withstand the mechanical and thermal loads, as well as the media used during high-pressure cleaning. The decentralized concept reduces the wiring harness complexity and the wiring effort of the machine electronics at this point, further explained Data Panel. Plug-in options are provided.

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