A fast turnaround

WHEN HUBTEX NEEDED TO DEVELOP A MULTIDIRECTION STEERING CONTROL SYSTEM FOR ITS NEW THREE-AXLE MODEL SIDELOADER. ITS SUPPLIER WAS ABLE TO DELIVER A CUSTOM-BUILT SOLUTION IN JUST TWO WEEKS

The German Hubtex Group may well offer the world's largest program of specialist forklift trucks – boasting heavy-duty compact models, glass transport systems and mobile order pickers, its vehicle line is impressive. With these machines, the OEM is one of the top 25 largest forklift manufacturers in the world - and is still growing rapidly.

Multidirectional sideloaders have been the company's core product line for many years, and are used in a wide range of applications, such as in woodprocessing factories, the steel trade and in light metal production, to name but three. The term 'sideloader' is rather misleading, however, as these vehicles can be used as Class II sideloaders, as Class I frontloading forklifts for commissioning goods and the un/loading of trucks, and as narrow-aisle trucks in warehouses.

Last year, the company introduced an update of its DS 27 model. The new three-wheel, multidirectional sideloader with stand-up cabin is designed for handling pallets and long and medium-weight loads up to 2,700kg. "This new development is part of our strategy of offering a wider, more customer-oriented and high-quality product range than any other competitor," Jürgen Keller, general manager, explains.

With the DS 27 three-wheeler, Hubtex positioned itself to succeed in the market segment where top guality and performance are expected to go hand-inhand with very attractive pricing. Achim Otterbein, head of construction, reflects on the nine-month development phase: "We gave ourselves the goal of setting new standards in this market segment, focused on the requirements of our customers."

At first it was planned to design a truck according to the 'keep it simple' principle, but this concept was soon abandoned in order to meet customers' price/ performance expectations. "In the course of the discussion with potential customers, we found out that they did not want to make do without, for example, a state-of-the-art display for indicating the steering mode," he explains. "And they wished the steering system to be as sophisticated, fast and flexible as possible."

Setting new standards

The Hubtex DS 27 therefore meets extraordinary performance and value standards. For example, thanks to the advanced steering system, the three-



The Hubtex DS 27 sideloader is a three-wheel, multidirectional sideloader with stand-up cabin. designed for handling pallets and long and mediumweight loads up to 2,700kg

wheel universal sideloader offers the fastest available direction switchover times between lengthwise drive, crossdrive, diagonal drive and circle drive. "This enables more precise maneuvering and faster positioning of the load when compared with standard vehicles that do not allow for diagonal drive," explains Keller.

The Hubtex DS 27 offers clear advantages over nominally multidirectional sideloaders and it can be used to achieve a more efficient workflow. It also offers the best all-around operator visibility in its class, while its sound-optimized assemblies reduce noise emissions to a minimum.

The Hubtex engineers were challenged to find a new control system solution that could meet the demanding performance and price expectations of their customers. "Our standard control system is designed for eight axles, but this seemed 'overengineered' in terms of function and price," Otterbein says. "On the other hand, our customers had clearly said they wanted a high level of functionality, comfort and safety. To meet these demands, we decided to develop a new multidirectional steering system."

The next question was: Build or buy? Should the Hubtex engineers rely on inhouse skill or external expertise? Otterbein continues, "On the one hand, we were skeptical because it really takes a lot of knowhow to develop a multidirectional steering system. On the other hand, Curtis Instruments had proposed designing such a system with all of its components and software. In the end, we agreed to give it a try and commissioned Curtis to design the complete control system for electrical and hydraulic drive, steering and working functions. At least there were ust three instead of four axles..."

This task was demanding and the schedule equally ambitious - this all took place just a few weeks before the Cemat exhibition, where Hubtex wanted to present the machine for the first time.

The impetus was on Curtis! Accordingly, it delivered a fully customized vehicle drive system in just two weeks, which was instantaneously installed and put into immediate operation. The truck performed perfectly smoothly and comfortably. By now, this system is in full production at the Hubtex factory in Fulda, and the customers praise its steering, driving and working performance.

For the DS 27, Curtis engineers selected off-theshelf components from the broad range of Curtis CANopen controllers and instruments. They guickly created the specific functionality required by this vehicle with Curtis's proprietary Vehicle Control Language (VCL) software. This powerful applications environment allows Curtis AC motor speed controllers to perform as virtual system controllers.

This enables a solution where all the drive, steer, load control and operator interface functions are handled perfectly by the Curtis system without the need for any additional electronics or software. 'You Feel It When You Drive It' - the Curtis advertising slogan - was again vigorously tested and the results proved its veracity once more.

The resulting solution features a Model 1234E AC controller to handle the vehicle traction and act as overall system master, issuing commands to the other system components. A larger Model 1236E AC controller drives the hydraulic pump, while two Model 1353 I/O expansion modules drive the many proportional valves needed by the load-handling hydraulics and the complex steer-by-wire electricover-hydraulic steering system. All available I/O are shared across the system and distributed logic makes most efficient use of the processing power in the pump and traction controller. As the man-machine interface, the large, full-color Curtis enGage VI display allows the driver to easily select between the different



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The Curtis Integrated Drive System for Hubtex MS27 Sideloader



driving and steering modes, and feeds back comprehensive vehicle status and diagnostic data. The graphical user interface is more or less selfexplanatory and supports the operator in any vehicle condition without resorting to cryptic error messages.

Fully functional

This comprehensive, compact and cost-effective systems solution is capable of handling four different drive directions and up to 10 different steering modes. The machine manages even tricky tasks such as handling long loads in confined spaces. The control system ensures smooth and precise conversions from one mode to another; it also optimizes driving, steering and working functions because all are

controlled by a single system. The power of the drives is distributed according to the driver's needs, and the workflow is always smooth and precise.

All control and drive components are fully integrated into the control system by the VCL application software that can be easily configured, modified and maintained. "In our first two projects, Curtis did the VCL programming, but as this is really easy, we are planning to train two or three of our electronic engineers," reveals Otterbein. "We will then be able to do the programming ourselves."

Why does Otterbein speak of two projects? Because there is a second one that has not yet been put into series production: "We asked ourselves: Does the Curtis system, which is very well accepted and praised by our customers, also work with four-wheel multidirectional drives, i.e. with an additional axle?"

The answer was easy. Hubtex took a used fourwheel truck, Curtis developed the appropriate control, and within one week, the system was put into operation. The prototype truck is now being used in an extended in-house test in Hubtex's manufacturing plant. Within the coming months, the OEM will present a new four-wheel multidirectional sideloader that will set new standards in its class for performance, flexibility, dynamics and operator comfort – equipped with the Curtis control system. **ALT**

Gerald Scheffels is a technical writer based in Wuppertal, Germany



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