

Customized joystick for tractor

Curtiss-Wright Controls Industrial supplies its Penny + Giles JC8000 joystick controllers to Grammer EIA Electronics (formerly EIA Electronics) to be used in Massey Ferguson MF7600 series of tractors. The joystick can withstand a 380-Nm overload on the x- and y-axes and 2000 Nm on the vertical. It has also been tested in more than 60 million operations (15 million cycles) under laboratory conditions.

GRAMMER EIA ELECTRONICS (BELGIUM) is a system integrator, who manufactures its own CAN-based controllers. The company has developed control systems for tractors, excavators, wheeled-loaders and forklift trucks. For Massey Ferguson they required a new joystick, explained Marko Boving: "Our customers wanted a joystick controller with differentiated outputs on all the axes and an overpress function that would provide the positive feedback."

The company's multimedia operator interfaces, similar to BMW's i-Drive on-road cars, are typically operated from the armrest range using customized joystick and handle solutions. And this, as Marko Boving explained, is why he works closely with Penny + Giles: "They already have an excellent range of joysticks, handles and interfaces so we don't need to develop our own such products. Consequently, we rely on their expertise from initial development right through to production.

For this project we were asked to supply an alternative to a current Massey Ferguson joystick, with the specific requirement that it should provide the same feel and functionality. We passed a very detailed product and systems brief to our partners and they developed a joystick to our specification."

An important element of the brief was the need for overpress functionality in every axis with improved feel on the shorter stroke, in order to achieve more direct and positive feedback. The JC8000 joystick controller already had the independent axis functionality built into its design and features a spring on each axis, which helped to achieve the desired forward and right directional operation as well as the operator feel that the customer wanted. The joystick always returns to center, but when it is pushed forward or right it provides a 'click' to let the operator know that his instruction has been achieved. The vehicle electronics system from Grammer EIA Electronics recognizes the overpress decision and translates it into a machine action e.g. return-to-dig or return-to-load.

Within the JC8000 design the outputs are configurable to meet the customer's requirements, which can be programmed beyond the usual 'square' outputs. The overpress facility is programmable to allow the JC8000 to deliver more travel in each direction. The joystick provides an analogue output that feeds into a CAN node on the vehicle's control arm.

The JC8000 is offered exclusively on MF7600 series vehicles fitted with a front bucket. Normal operation employs switches but most of the buyers taking the bucket also choose the optional joystick, which is proving so popular with machine operators that it is almost a standard-fit item. Summing up, Marko Boving said: "Penny + Giles created a very effective solution, developed and delivered a very reliable product, and we were absolutely satisfied with the service they provided throughout."



The joystick for Massey Ferguson's truck requires a customized overpress function (Photo: Massey Ferguson)



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