

No Moving Parts HMI

The MC33794 E-Field Imaging Device by Motorola is used to create an HMI for industrial environments. The MC33794 detects the effects of the human operator's hands on eight input devices. The input devices are built around electrodes designed to produce responses to human interaction in either digital or analog fashion. The HMI envisioned by this design would control an industrial system with two axis of motion. The HMI in this design consists of two analog speed control inputs and six digital switches. The digital switches, three for each of the two axis of motion control consist of Forward, Reverse and Maintain Speed. Because the input devices have no moving parts they should yield a longer service life in industrial environments where dust and dirt and repeated activation require high durability. One of the great features of the MC33794 is the repeatability of the signals produced by the electrodes. Once an input device is calibrated, the unactivated and activated signals are easily interpreted by simple software. The failure mode for a broken wire to an input device is that the device is 'off' or the analog signal is at its zero value. From a safety standpoint this is a good result.

This HMI is still in the prototype phase, so the interface from the HMI to the controlled hardware is simulated by a serially connected application running on a computer. This provides an easy way to experiment with the physical design of the HMI input devices in a pleasant working environment. The software is designed to talk to the EDK through the default serial interface. When the sensors are calibrated, the calibrations are saved in a file that is recalled when the program reopens so the previous work is not lost. Bar graphs display the readings from the analog inputs, and digital indicators change color for on/off switching of the digital inputs.

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