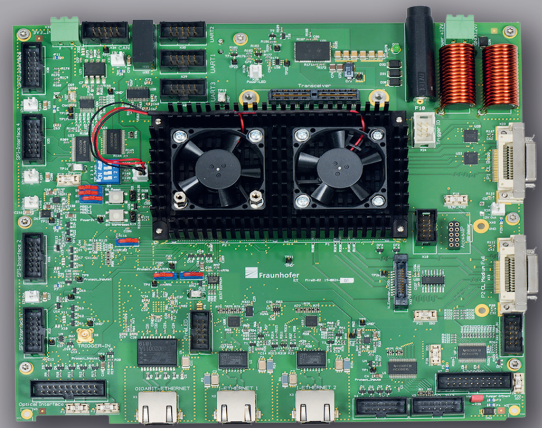




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FIRE – AN ELECTRONICS PLATFORM FOR PRECISE, REAL-TIME MEASUREMENT AND CONTROL TECHNOLOGY

Task

Fraunhofer ILT develops devices for production and laboratory measurement technology. The central element of these devices is a powerful electronic unit that can be connected to application specific dedicated sensors and actuators. The electronic unit is designed as an open platform which allows various application-specific functions to be implemented quickly. It also ensures continuous non interrupted data processing in real time and can provide high computing power if required. The institute has also implemented communication interfaces to systems important for laser technology applications; these include the connection to scanner systems and sensors.

Method

Fraunhofer ILT has developed a modular concept, consisting of a central base circuit board with versatile interfaces and a suitable portfolio of peripheral boards. Using this platform, application-specific electronic units can be assembled for new devices. For the interfaces provided, great importance has been placed on using international standards as well as real-time-processing capability.

The base unit features a high-end FPGA and an integrated dual core ARM processor with 1500 MHz clock frequency. Embedded Linux is used as operating system.

Results

The platform is based on an FPGA from Intel with a computing power of up to 500 GFLOPs. The following hardware interfaces were implemented on the base circuit board: Gigabit-LAN, Industrial Ethernet, camera interface, CAN bus, three serial interfaces and 11 additional peripheral interfaces. These are suitable for connecting laser beam sources, scanners, A/D and D/A converters, encoders, photomultipliers, photodiodes, programmable logic controllers (PLC) and precision scales etc.

Applications

The platform can be used in laser measurement and laser medical technology devices, such as distance sensors, opto-fluidic sorters and laboratory devices based on fluorescence measurement technology.

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3 Electronics platform FIRE.

4 The basic circuit board for FIRE.