Nanopositioning Systems in Automation Technology:  
Digital Piezo Controller with EtherCAT®

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There are more and more applications in the industrial environment for high-precision, piezo-based positioning systems; semiconductor manufacturing is a typical example of this. As a solution supplier for drive technology and positioning systems, PI (Physik Instrumente) therefore offers the E-727 piezo controller in a new variant.

Now, the digital controller can be operated by all industrial motion controllers from ACS Motion Control via EtherCAT and can therefore be integrated into the automation environment as "intelligent driver" for two- or three-axis piezo-based nanopositioning systems, irrespective of whether they work with capacitive, piezoresistive or strain gauge sensors.

A P-I controller with two notch filters optimized for piezo operation allows a high control bandwidth (20 kHz). Intelligent servo algorithms minimize the settling times, which allows repeatability into the subnanometer range. Further highlights of the digital controller include 4th-order polynomial linearization for the mechanics and electronics, an integrated data recorder, an ID chip for fast and quick exchange of the system components as well as subordinate, programmable drift compensation. In addition, there is the option of dynamic digital linearization. This DDL function lowers phase shift and trajectory errors to an indiscernible level in the case of dynamic-periodic applications. This is important for scanning applications that have to identify a particular position and reach it again accurately.

1.504 characters (incl. blanks)



Digital multi-channel piezo controller with EtherCAT® for piezo-based nanopositioning systems in industrial automation (Source: PI)

For more information, refer to our [>> product page](https://www.physikinstrumente.com/en/products/controllers-and-drivers/nanopositioning-piezo-controllers/e-727xf-digital-multi-channel-piezo-controller-with-ethercat-412418443/?utm_medium=foc&utm_source=PN&utm_campaign=LC-PIKA-PN-E-727)

About PI

Well known for the high quality of its products, PI (Physik Instrumente) has been one of the leading players in the global market for precision positioning technology for many years. PI has been developing and manufacturing standard and OEM products with piezo or motor drives for 40 years. By acquiring the majority shares in ACS Motion Control, a worldwide leading developer and manufacturer of modular motion controllers for multi-axis and high-precision drive systems, PI has made a major step forward in providing complete systems for industrial applications with the highest demand on precision and dynamics. In addition to four locations in Germany, the PI Group is represented internationally by fifteen sales and service subsidiaries.