

A vice for the fourth industrial revolution – New Product Information



A new vice with intelligent sensors that enable safe clamping of workpieces on machine tools and real-time production monitoring has been developed by Roemheld, which presented a prototype on its stand at the recent AMB show in Stuttgart.

The HPC machine vice can be operated intuitively via an associated app. It is the second Roemheld clamp with integrated sensors, following the introduction of a similarly equipped swing clamp in 2017 that measures, for example, clamping pressure, temperature and the cutting forces on the workpiece. The group's goal is to develop Industry 4.0-compatible workholding equipment that increases manufacturing quality.

The latest innovation, which extends the functions of the proven Hilma NC 125 machine vice, incorporates electronics that measure clamping forces in real-time and compares them with pre-set target and limit values. The results are transmitted wirelessly to stationary or mobile receivers on which the associated app Hilma Process Control is installed.

If the clamping force values approach one of the limits, a warning is transmitted. The data can also be communicated to the machine control for automated intervention in the production process. In addition to wireless transmission to the app, the Industry 4.0 standard OPC-UA software interface is used for data transmission. Measurements take half a second and detect changes in clamping force from 50N.

Current values are transmitted wirelessly to the app, where they may be read and are logged. They can also be controlled via an optical traffic light system in the app, whereby the operator conveniently enters the clamping force limits. Green indicates optimal production. As soon as a force value is measured at the edge of a set minimum or maximum, the light switches to yellow and the operator can intervene. If a limit value is exceeded the light turns red, in which case the machine can be set to switch off automatically.

With the current version of the app, the operator can differentiate between, and control on-screen, up to four HPC vices simultaneously. In addition, they can easily be calibrated via the app. For example, to protect the workholding system against premature wear, overloads are signalled to the operator with respect to nominal clamping force. The user can also check maintenance intervals via a load cycle counter.

The monitoring system, which can be battery or mains powered, essentially consists of a circuit board and a battery mounted within a housing on the clamp to protect them from swarf and coolant to IP67. It will be available as an option on the mechanical-hydraulic and fully hydraulic versions of the Hilma NC 125 machine vice. Further sensor projects will follow, so Hilma has designed the HPC sensor and app so that they may be used in a similar configuration on other clamps.

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