

Krystian K. A. Żymelka

Laboratorium Badawcze Urządzeń i Systemów
Sterowania Transportu Szynowego w Katowicach
[Research Laboratory of Digital Devices and
Systems for Rail Transport Control]

Minikomputer PRS-4. Wspomnienia konstruktora

The PRS-4 minicomputer. A constructor's reminiscences

SUMMARY

The current paper gives an account of work to design a modern, reliable and interference-resistant minicomputer and on that basis to develop applications that could be used for effectively monitoring the production process and safety status in mines. High reliability was achieved by simplifying structures and minimizing the number of elements used in constructing the minicomputer, while its high resistance to interference was achieved thanks to enclosing the circulation of addresses and data (registers and buses of the processor, and the arithmetic unit) within two modules, separately for the older and younger byte of a 16-bit machine word. High efficiency of monitoring the production process and safety status in mines was achieved through decomposing the mine's overall technological process into particular unit processes and using an independent module for each such process, the module consisting of the minicomputer and dedicated software, specialized sensors and transmission systems. The result was a modern minicomputer, PRS-4, and a dispatcher system, MSD-80, composed of the following modules: HADES (production process monitoring), SAK (assessment of bumps hazard) SYLOK (localization of seismic events) and CMC1/2 (methane explosion prevention). Around 80 modules of the MSD-80 system were installed in Polish mines, and almost 30 were exported, including 21 to China, which also bought a license to produce the hardware and software for the SAK and SYLOK modules. The work described in the current paper lasted from 1973 (prototype of the minicomputer) until the mid-1980s (when production was discontinued) and proved that creative passion and involvement makes it possible, even in very unpropitious circumstances, to achieve goals that would otherwise seem unattainable.

Analecta – Studia i Materiały z Dziejów Nauki
[**Analecta – Studies and Materials on the History of Science**]
XIX, 2010, 1, 111-178