AUTOMATIC PROCESS CONTROL SYSTEM ON THE BASIS OF MICRO-PC CONTROLLERS

Description
An automatic process control system (APCS) on the basis of MICRO-PC controllers is designed for collecting data from basic equipment units distributed in space and for controlling them. The APCS software and hardware system consists of the following main components:
- Hardware for monitoring and controlling local basic equipment.
- Hardware and software for local and central master stations.
- Radio-monitoring system for remote small unmanned basic equipment.
- Remote control system for monitoring and controlling distant small and medium basic equipment rarely visited by people.
- Hardware and software of corporate networks, providing unification of local master stations, central master stations, and remote stations into a single open distributed extendable system for real-time transmission, processing, and presentation of data.

Software and hardware elements mentioned above can be integrated into one another in different combinations and, thus, allow constructing multistage distributed systems for data acquisition, transmission, and presentation.

Technical specifications
- Number of signals processed by APCS: up to 23000
- Data communication protocol: TCP/IP
- Data-transmission speed in all channels: higher than 19200 bit/sec
- Real-time operation system: OC QNX

System implementation at the Uraisk administration of long-distance oil pipelines, joint-stock company "Sibnefteprovod"

Technical appraisal and economic benefits
The main advantage of APCS is its advanced architecture, which allows the use of the system both for small objects, such as boiler-rooms, and for objects covering a territory of hundreds
and thousands kilometers, such as oil pipelines, gas pipes, and electric networks. The possibility of upgrading the system, extending it, easy retargeting of its operation modes, high reliability and speed of APCS together with its moderate price make this system competitive. The mean cost of the basis APCS configuration with 12,000 information channels is 2.2 million USD, which is 2.5-4 times lower than the cost of many foreign and some domestic systems.

Application area
Pipeline transport, power industry, dispatcher systems for registration of energy resources (electrical and heat power, water, gas, etc.). Potential objects for automation can be industrial enterprises of oil and gas production and transportation, electric power stations, electric networks, plants, and mines.

Development stage
Uraisk and Tumen administrations of long-distance oil pipelines, Surgut state district power plant No. 1. Since 1997, the system for 15 oil-pumping stations has been operating on a territory of 550 km in length.

Patent situation
Not available.

Commercial offers
Complete set of services (APCS design, manufacturing, delivery, and maintenance).

Estimated cost
200 USD per signal in large systems (about 10,000 signals).

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