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ThinkIO in action:

Power Engineering

One of the projects of Don-RTSoft, a branch of RTSoft, is development of Technological Information Exchange System (TIES) for Irganuysk hydroelectric station (HES) including automated system of System Operator - Central Dispatch Administration (SO-CDA). Irganuysk HES TIES system is designed for automated acquisition of technological information about normal and abnormal conditions of station operations and for transmitting collected data to system operator's affiliates, and for realization of automated control of main equipment of Irganuysk HES.

Irganuysk HES TIES system is a two-level system:

- lower level (sensor and controller level) – information acquisition and transmitting subsystem (IATS SHC - software and hardware complex);
- upper level (visualization and on-line control level) – operational and information subsystem (OIS software and hardware complex).

Level interaction is realized by a communication subsystem and is supported by software and hardware means of all hierarchical levels. Accordingly, main communication functions of Irganuysk HES TIES system are distributed between lower and upper levels components and include data exchange using Ethernet, TCP/IP, IEC 870-5-104, OPC protocols.

The communication subsystem also provides data exchange through communication channels with automated systems of SO-CDA's branches using IEC 870-5-101/104 protocol.

In order to provide distributed technological data acquisition from intellectual transmitters of upstream and downstream and from digital temperature sensors, IATS SHC includes two units based on ThinkIO-Classic controllers:

- CCS communication gateway
- Head Node communication gateway
- CCS communication gateway is located on the territory of CCS ABR (Central Control Station's Auxiliary Boards Room) of Irganuysk HES and provides:

- downstream parameter values acquisition from level sensors via PROFIBUS-DP network, initial data processing and data transfer to the SMART-server level using IEC 870-5-101/104 protocols;
- digital temperature sensors readings input, initi al processing and retranslation to the SMART-server level.

Head Node communication gateway is located on the territory of Irganuysk HES Head Node communication facilities and provides:

- upstream parameter values acquisition from level sensors via PROFIBUS-DP network, initial data processing and data transfer to the SMART-server level using multiplexing equipment and IEC 870-5-101/104 protocols.

Linux operating system with RTAI real-time extensions is used as a ThinkIO controller's system software. RTAI addition to Linux system provides guaranteed event reply time, **which** allows of classifying Linux+RTAI as a "hard real-time system".

Use of ThinkIO-Classic controllers in this project showed competitive advantages of such controllers: high performance, Linux OS with RTAI real-time extensions (Linux+RTAI), compact size, industrial design, advanced communication facilities, support for modern IEC 870-5-101/104 telemetry protocols and PROFIBUS, CANopen, DeviceNet industrial busses.

About Kontron

Kontron is a worldwide leading manufacturer of Embedded Computer Technology and robust mobile solutions. They supply leading OEMs, system integrators and application providers in the most varied market segments such as data and telecommunication, automation technology, metrology and control engineering, transportation, gaming and entertainment, medical and military technology, as well as aeronautical engineering and energy. Our objective is to enable customers to significantly reduce their time-to-market and to provide them with clear competitive advantages with products such as high-performance open computer platforms and systems, single board computers, HMIs and mobile, rugged computers. Kontron employs over 2,300 employees worldwide, with production plants in Europe, North America and the Asia-Pacific region. The company is listed in the German TecDAX 30 under stock exchange code "KBC". Kontron is a member of the Intel® Communications Alliance and therefore receives early access to leading Intel technologies and preferential engineering support. For more detailed information on Kontron, please visit the company website: www.kontron.com

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