APPLICATION NOTE

VISUALIZATION SYSTEM

DUBNO Creamery

ASIX - a shared visualization platform for HMI operator panels and SCADA supervisory systems
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ASIX visualization system is not very demanding when it comes to PC hardware requirements and software resources. For this reason, when operator panels running on XP Embedded operating system has appeared, there is no reason why ASIX based applications could be run on them also. Low license prices, especially those for the smaller number of variables, are an additional incentive. In this Application Note, referring to the system implemented in Dubno Dairy in the Ukraine, we will show added advantage that Asix brings to the plant supervisory systems on such sites where operators use both local control using PC panels close to the process as well as the central SCADA system. In such applications it is possible and recommended to design visualizations based on the Asix platform as a single common application shared by both the HMI operator panels and the SCADA system. Advantages of this approach are fairly obvious: a much lower project cost, including lower costs of commissioing, training, servicing and visualization system maintenance. The Dubno Dairy project was managed by OBRAM, that general supplier of the plant.

Since HMI computer panels can be installed directly on factory floor, they are readily used for control and monitoring of production lines. Typically, they are connected with PLC controllers supplying process data, and on the other end with the SCADA servers, which collect and archive data from the entire production line. In the Dubno Dairy, ASKOM company has installed CP6203 series Beckhoff panels running Windows XP Embedded and version 5 of the ASIX visualization system. Panels of 8 facilities were linked by Ethernet with SIMATIC S7, two ASIX servers and an operation supervisory station.

ONE AND THE SAME APPLICATION RUNS ON PANEL COMPUTERS AND SCADA SERVERS.
Parametrization of ASIX network computers

1. Configuration

ASIX 5 application start-up parameters includes an XML file name and computer name. The latter determines the choice of HMI panel or SCADA server operation profile. Theoretically, each computer has access to all system resources, however the profile restricts this access to the fragments of technologies dedicated to the job through the structure of menus, passwords and statuses.

![Figure 1. Profiled panel and ASIX server menus](image1)

![Figure 2. Profiles for access to ASIX network computers process data](image2)
2. Process database and application scaling of operator panels

All the ASIX network computers are working based on the same database of process variables (it is redundant for panels). Variable communication channels from different parts of the technology have selective definitions. This limits the number of variables by which the panels gain direct access to the control layer data. This allows for **cost-effective choice of licenses** required for ASIX panels.

3. Communication

ASIX servers and operator panels (for their objects) receive data from the facility controllers using the SIMATIC TCPIP protocol (physical channels).
Thanks to the redundancy built into the Asix platform, in the event of channel damage, the operator panels will automatically switch to data acquisition through ASLINK network channels from the SCADA server. Also, the panels can acquire data from adjacent line facilities in this way.

4. Data archiving

Measurements and alarm events archives are stored on the ASIX servers, operating in redundancy and capable of recovering missing records from its partner. The servers provide archived data to panel computers and other ASIX networked workstations in the form of graphs, trends, lists of alarm events and reports.

5. Application Distribution

One of the ASIX servers distributes the application and its updates. It has a master file directory which is shared with ASIX computer network, where diagrams, scripts, and external actions of all computers are updated on the run. The only items which require an application restart are changes to variable databases, bitmap file, or system reconfiguration.
The same window control panels are used for controlling drives on the operator panel computers and the servers. Technology diagrams are also identical for panels and servers. In applications shared by HMI / SCADA, the screen resolution of the operator panel and the server should be the same in order to simplify the creation of graphical interface. In the Dubno Dairy application described here the panels have indeed the 1024 x 768 screen resolution, which is less than that of the the server screens (1280 x 1024), however by splitting the screen into segments, which display the selected application objects (diagrams, measurement and control panels, alarm dialogues), the laborious duplication of graphics was avoided.

Benefits of the solution applied

1. **SCADA servers** collect data from the entire plant and present plant status, but they can also be emergency data providers for the local operator panels.
2. SCADA servers are alternative control stations.
3. Diskless operator panels have access to the measurement and even data archives stored on the servers and are equipped in data presentation tools.
4. An uniform panel and server user interface simplifies operation.
5. Visualization system design effort is much smaller in comparison with the systems featuring heterogeneous visualization environments for operator panels and SCADA system.