Flour Inventory System for Storage Silos

Microl LLC

The flour inventory system automatically records flour intake and consumption and monitors the flour stock in storage silos. Its modular design makes it possible to extend the system's functionality in terms of the number of inputs/outputs and their software processing, thus "tailoring" the system to a specific facility.



Depending on the customer's needs, in addition to inventory accounting the system can be supplemented with manual and automatic control loops for delivering flour to production and with various digital signals for information, pre-alarm and alarm functions. The system includes all the software needed for the supervisory computer. Together with modern microcontrollers, it provides easy remote monitoring of the whole system and a variety of flour intake and consumption reports per shift, day, month, year and so on. The main application is the flour store of a bakery.

Functions

- automatic accounting of flour intake and consumption, monitoring of flour stock in the silos;
- zero correction of the flour weight in each silo;
- manual (remote from the computer and local) and automatic control of flour delivery loops to production;
- flour intake and consumption reports per shift, day, month, year, etc.;
- archiving of all system events;
- system diagnostics and self-diagnostics;
- a common database for the bakery's flour store;
- connection to the company's accounting software for centralized control of flour intake and consumption.

Design

The flour inventory system is built as an instrumentation cabinet and is a complete, ready-to-use product. The front panel of the cabinet carries a power indicator lamp and the front panels of the microcontrollers. Depending on the customer's needs, manual control equipment and additional alarm lamps can also be placed on the panel.

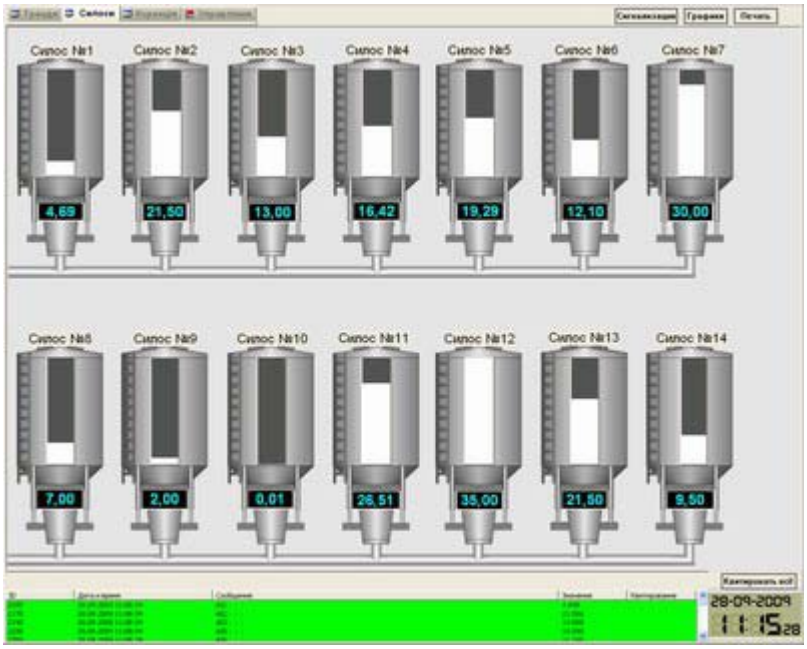


Flour inventory system cabinet



Inside the cabinet

The supervisory computer communicates with the cabinet through the Visual Intellect SCADA system. This SCADA system, developed by Microl, is a universal tool for building an operator workstation.



Flour silo mimic diagram in the Visual Intellect SCADA system

Brief specifications

- silo flour weight sensors — strain-gauge load cells with an equivalent resistance of 75...1000 Ω;
- sensor connection — 4-wire or 6-wire;
- number of monitoring points (flour silos) — up to 16;
- maximum conversion error of the load cell input signal, as a percentage of the rated output range — ±0.25 %;
- display accuracy on the microcontroller front panels — ±0.01 %;
- climatic version — group 4 per GOST 22261, for operation from −40 to +70 °C;
- vibration resistance — version 5 per GOST 22261;
- connection to the operator's computer — shielded twisted pair up to 1200 m long, RS-485 interface, Modbus RTU protocol;
- supervisory software — Visual Intellect SCADA system (included in the delivery set).

This inventory system was installed at the flour store of Ivano-Frankivsk Bakery Plant OJSC (2009).

Contacts

For more information about the products mentioned in this article, please contact **Microl LLC**:
+38 (0342) 502-701
+38 (067) 359-70-90
+38 (095) 092-07-28
sale@microl.ua, microl_zbut@microl.ua, zbutmicrol@gmail.com
www.microl.ua

Technical support:
+38 (0342) 502-702
+38 (067) 704-00-29
+38 (095) 302-37-57
support@microl.ua, supmicrol@gmail.com

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