Intelligent Control

Intelligent, fully automatic control of the multi-stage process of grain collection, cleaning, drying and storage.

We have completed investments with a total capacity exceeding 3 million m^3

We provide comprehensive drying and storage teams, consisting of silos, a wide range of dryers and reliable grain transport systems.

Reliability and ease of use

The automatic control system of the FEERUM complexes allows you to supervise the multi-stage process of grain collection, cleaning, drying and storage. It is very simple and intuitive to use. Available online, also on your smartphone.

Control cabinets

The standard FEERUM control cabinets are manufactured based on modern Eaton products. Each device powered from the control cabinet is properly secured. In addition, the start-up of devices depending on their power is carried out using Softstarts or frequency converters.

Automatic or manual control

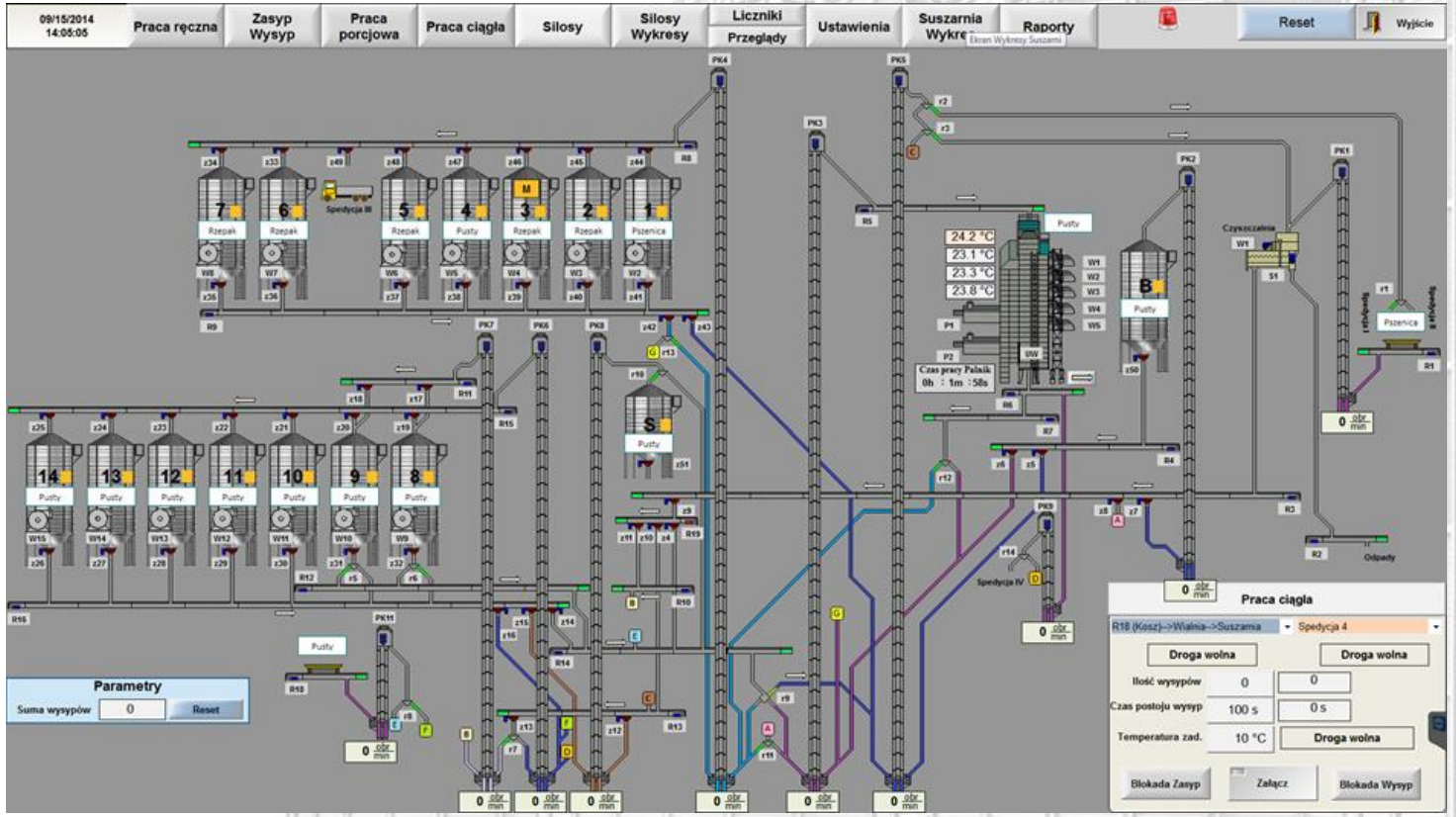
The control, depending on the size of the object, is carried out via a touch panel or a computer (SCADA system) with an LCD monitor. From the operator's point of view, the customer can control the entire technological process. This process is illustrated on the LCD monitor or panel, on which you can check, among others temperature, grain level in silos or dryer, operating states of individual sensors, switching on and off times, number of operating hours, etc.

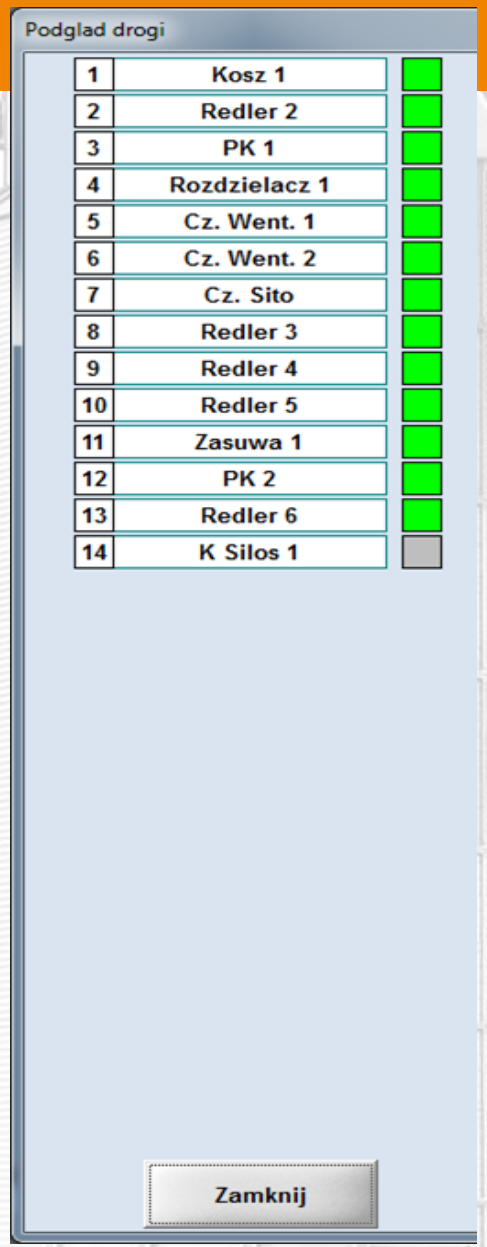
Confirmation of filling silos or dryers

The system receives information from high-class capacitive sensors.

Visualization of the program

In order to increase the efficiency of the operator's work, the system is equipped with program visualization. The entire sequence of technological routes is visible on the computer screen. The operator can choose the starting point and the target grain and the system will start the individual devices by itself - with the appropriate time delay.

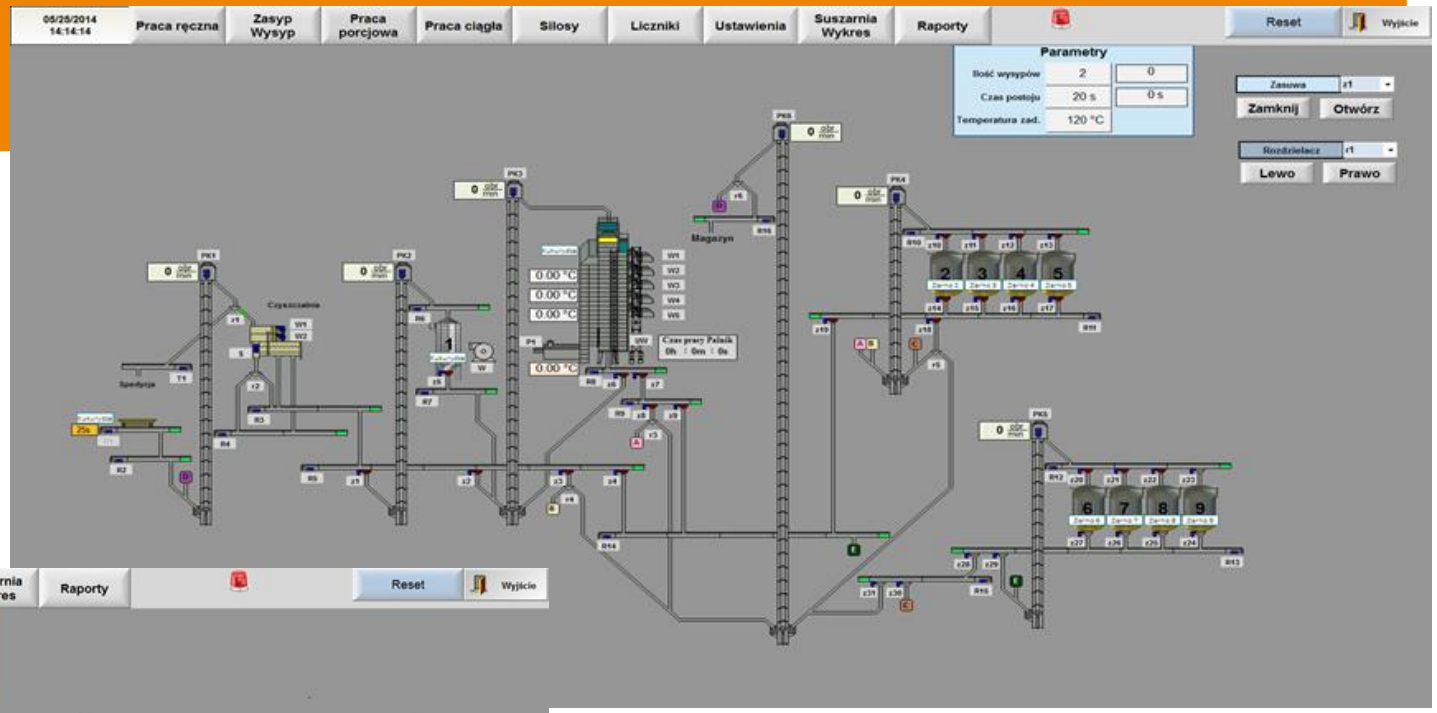


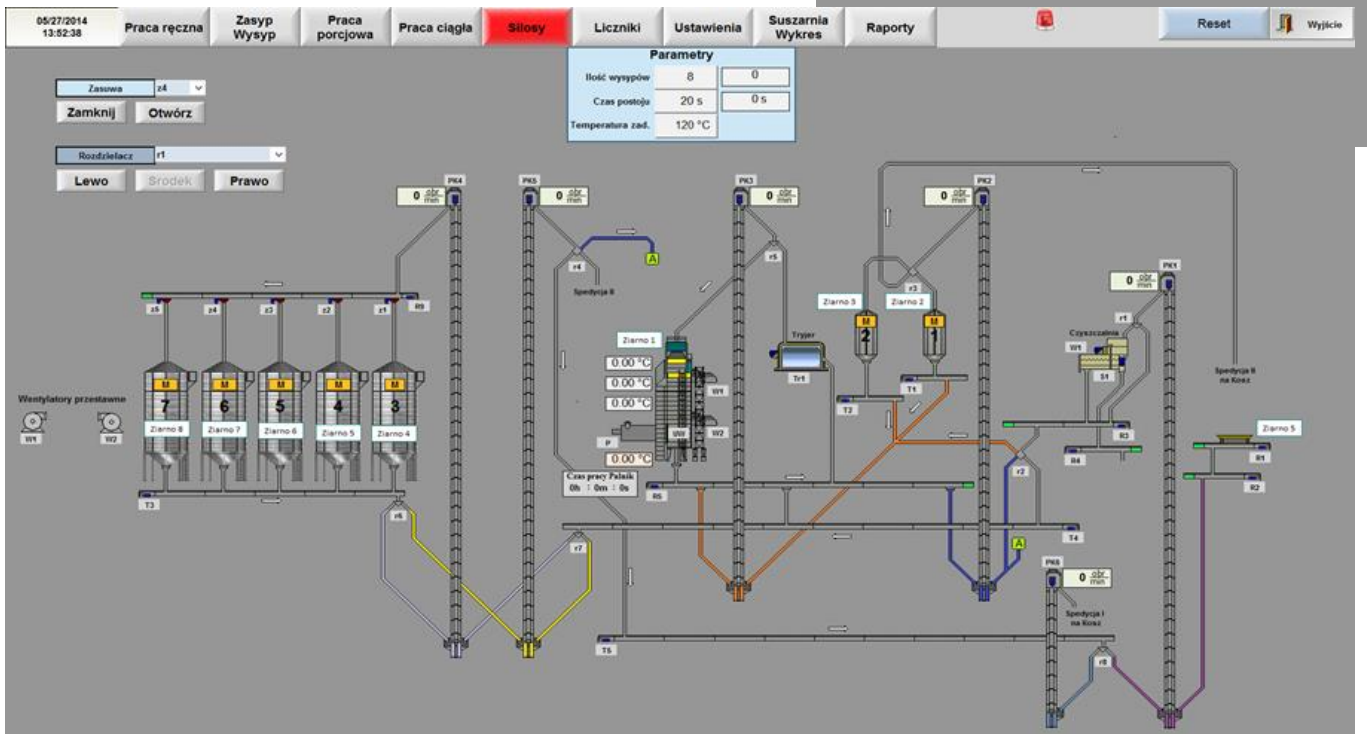


Manual control

In manual mode, the operator can service the individual device service, close or open the latch and switch the distributor.

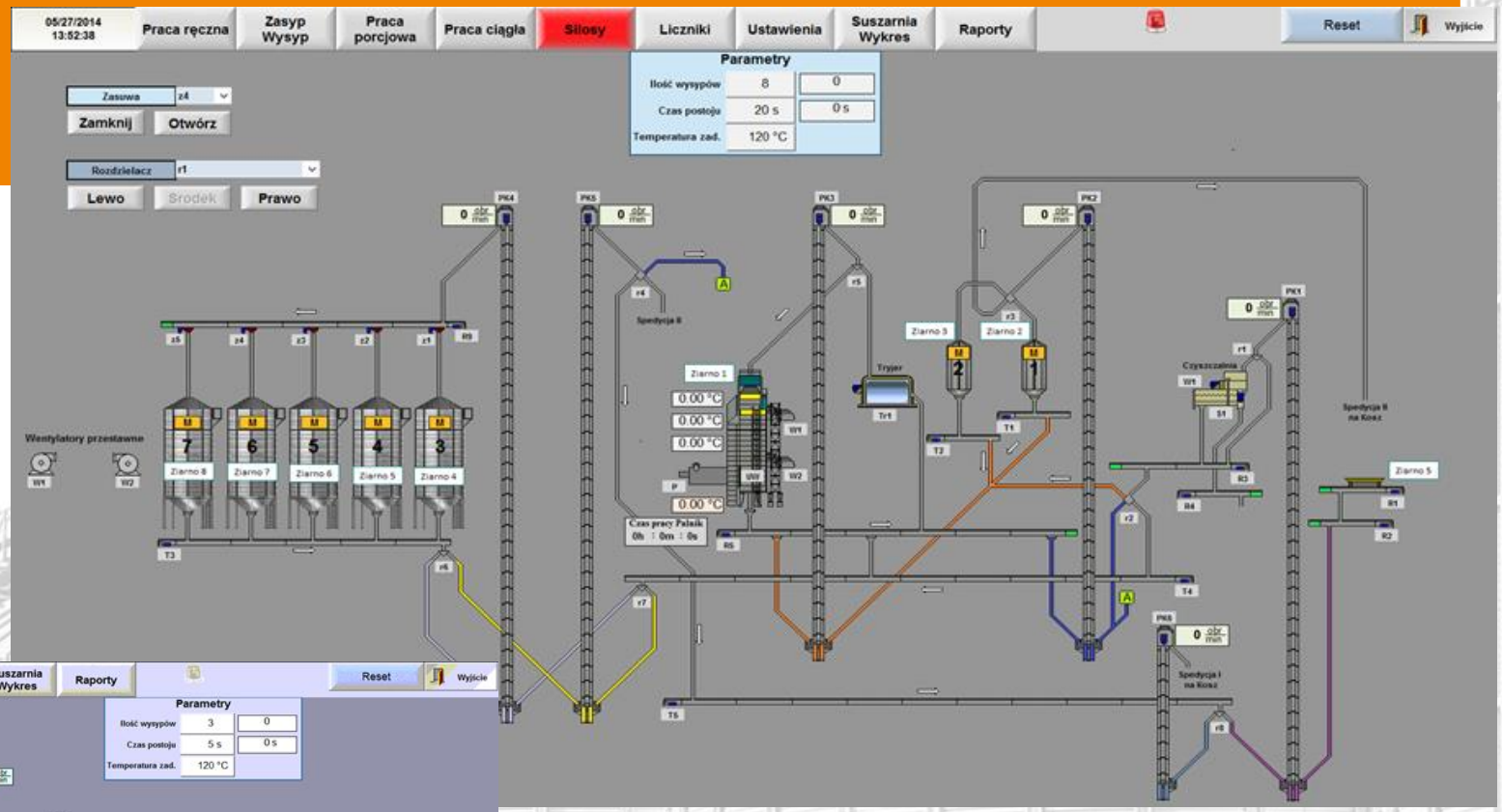
The devices start up without a time delay and in the order as the operator decides.

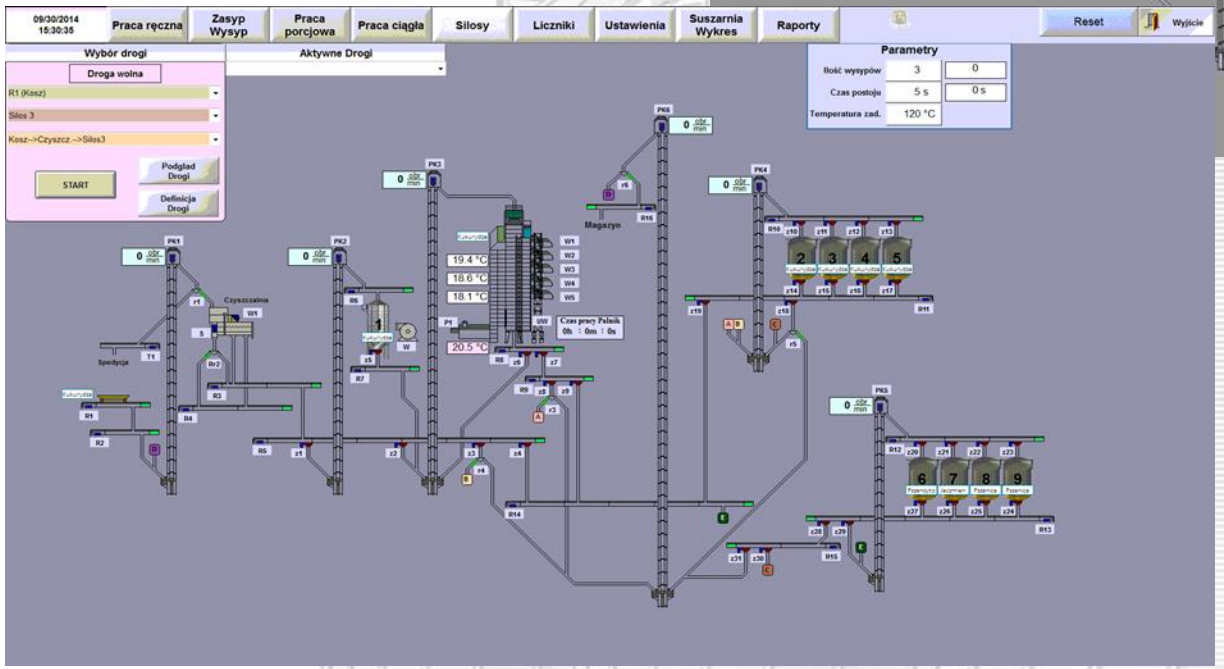




Loading/unloading

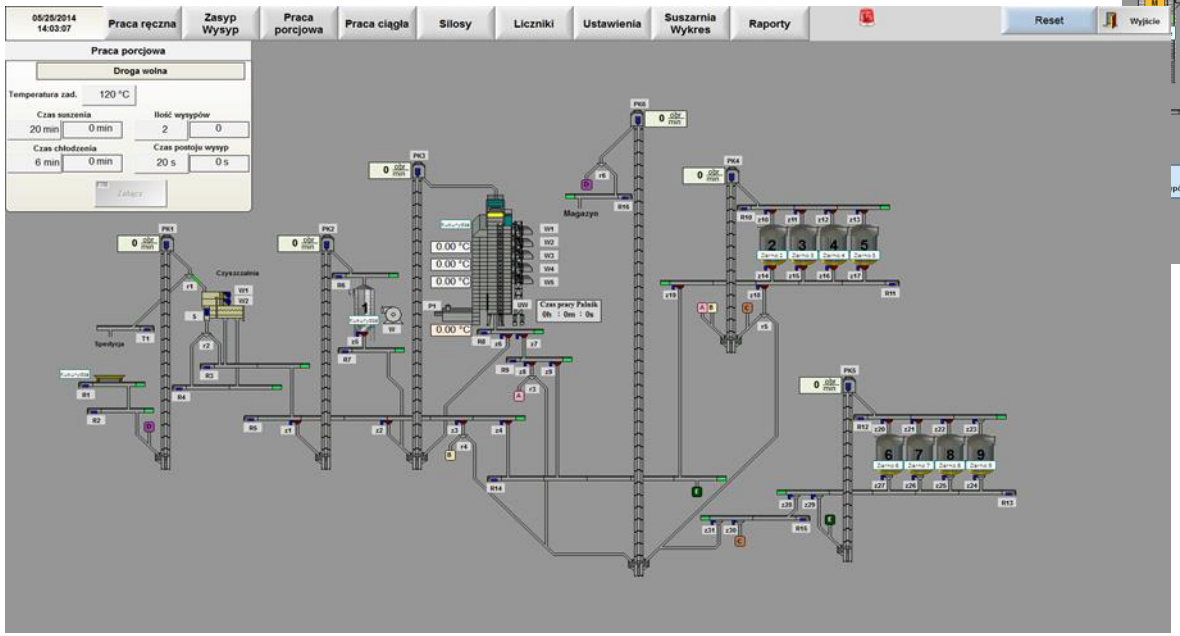
We can control loading and unloading by selecting the technological path from the starting point from which we want to start filling or pouring to the destination point, and then the program selects which and which device should it attach with the appropriate time delay.

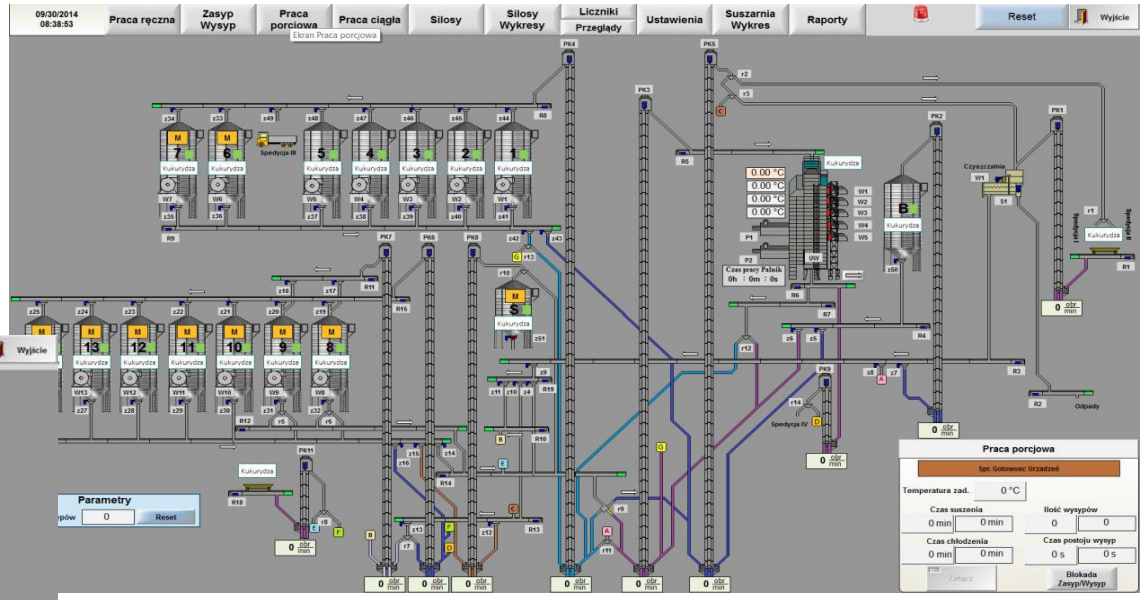




Batch work

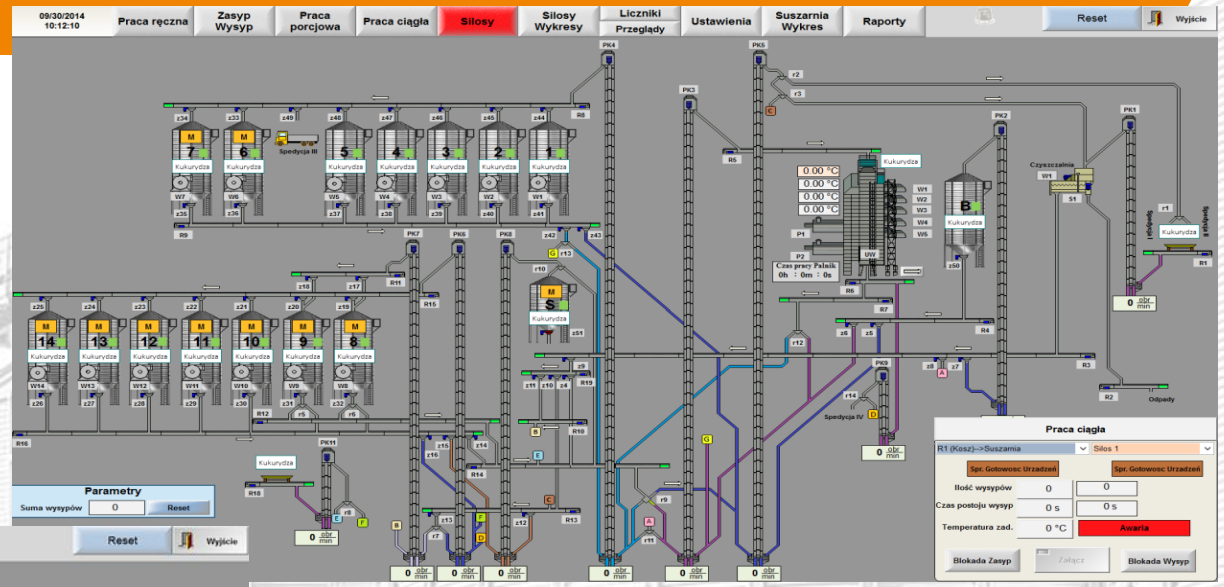
In the case of a small amount of grain to be dried, we can control the dryer's operation in batch mode. Then we dry the given portion of grain, which after cooling it is sent to the silos once.

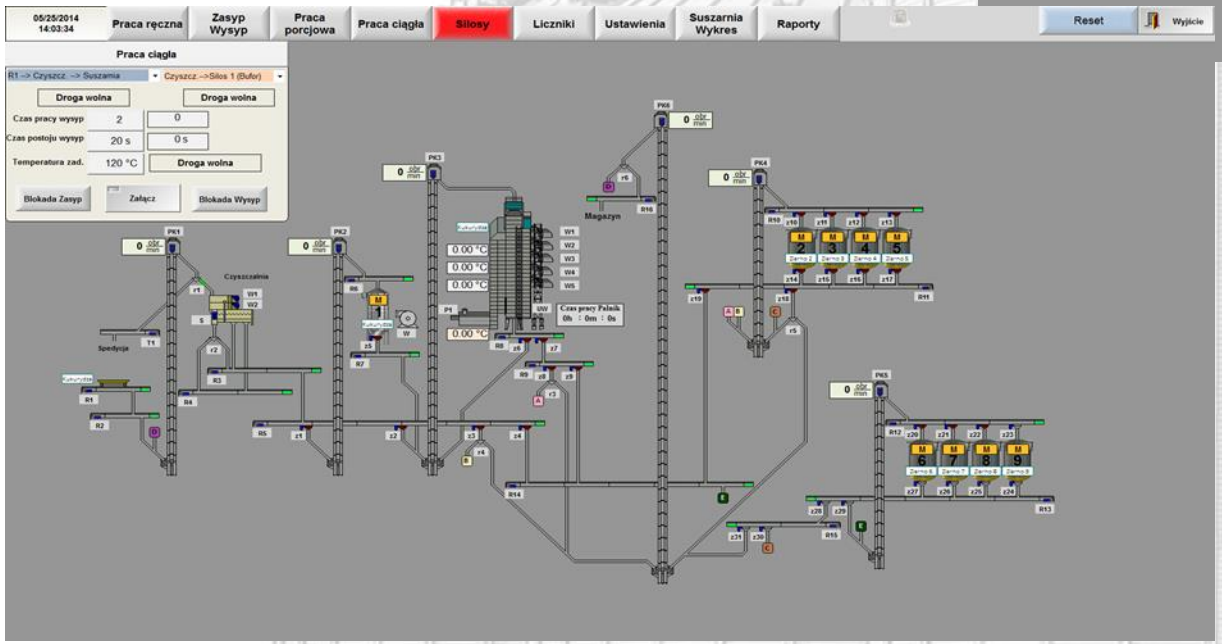




Continuous work

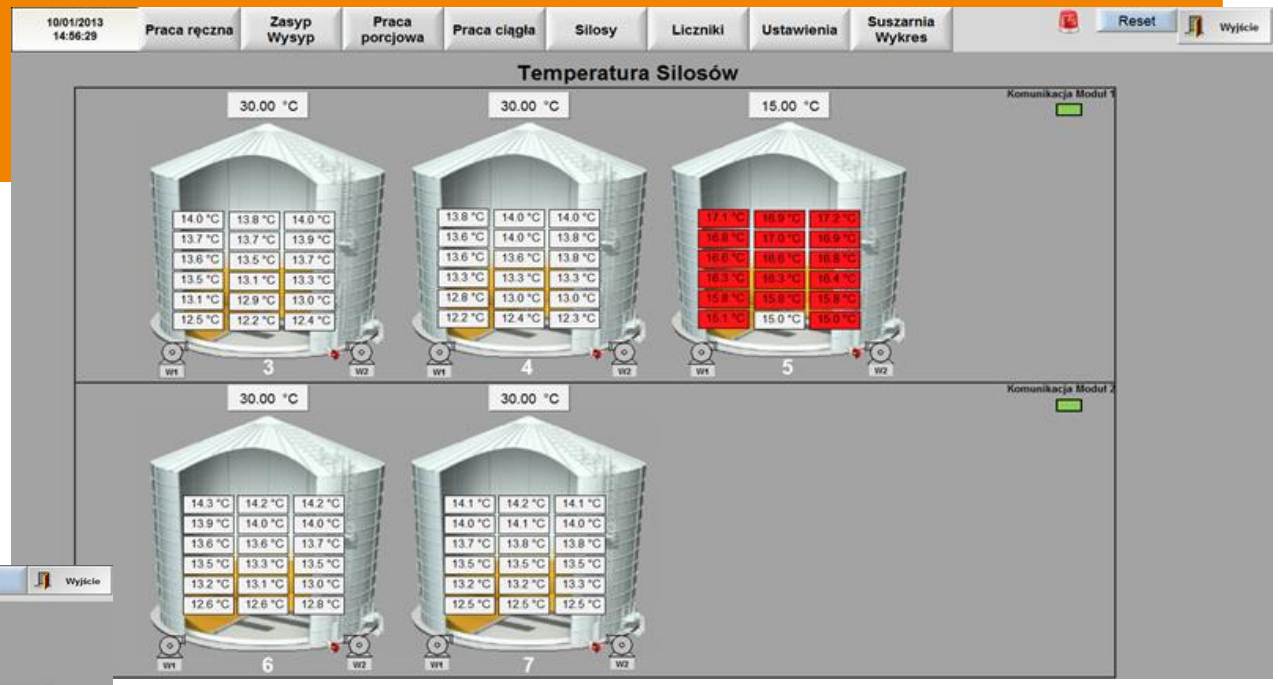
The continuous operation mode is activated in case of a large amount of grain where the dryer is topped up with grain at each discharge. The program algorithm based on sensor signals mounted in the dryer buffer (equipped with maximum and minimum grain level sensors) controls the grain addition.





Temperature monitoring

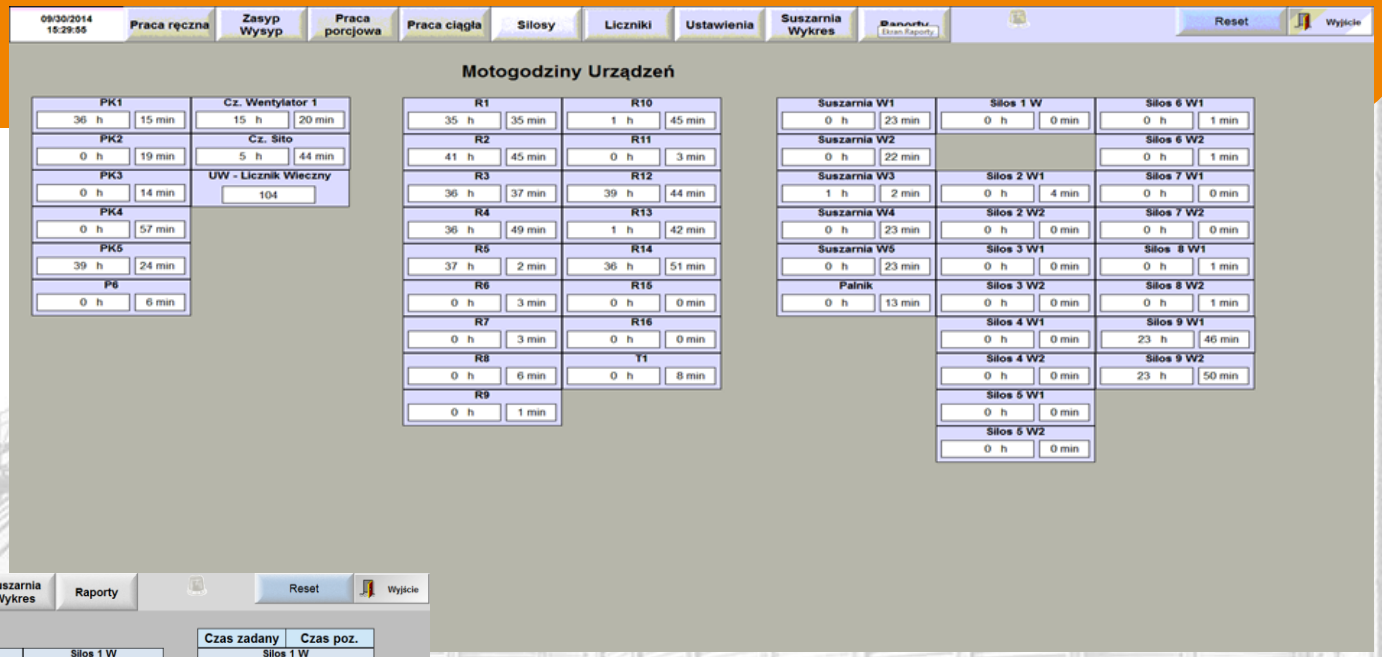
Temperature monitoring based on Dallas sensors. The probes are suspended from the silo roof structure on special holders. The probe has an ATEX certificate which allows us to use it inside a silo, in which there is an explosion danger zone 20.

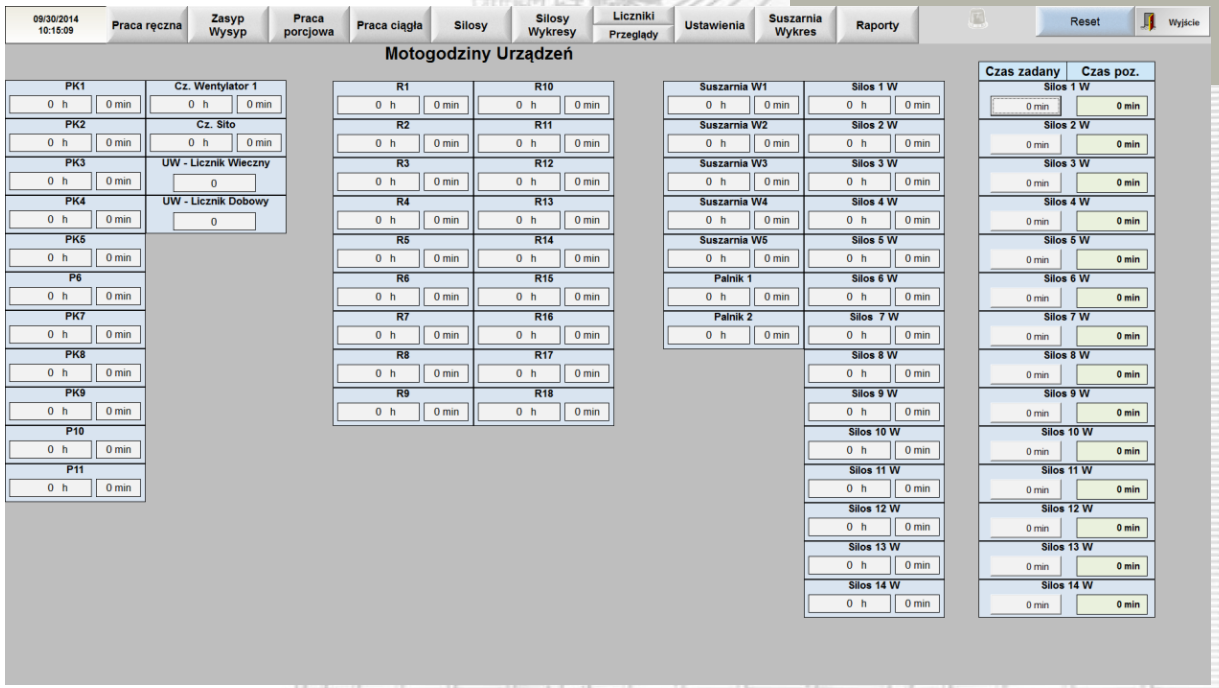


The readout is possible with the help of the object control application which allows automatic control of ventilation inside the silos and enables data archiving. In the case of a small number of probes, we can use a portable terminal, from which we can read up to two probes from one module.

Device counters

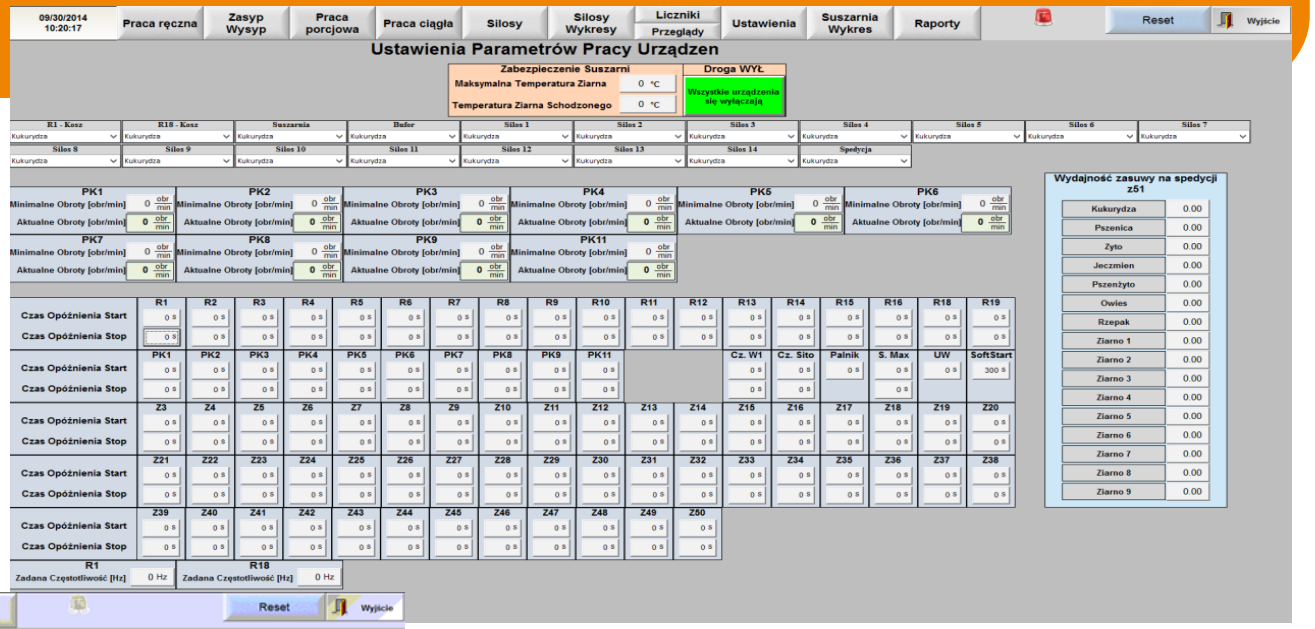
Hours counters of devices - after exceeding values given by the manufacturer displayed a message about necessity to execute periodic service. Thanks to the use of meters, we can monitor which devices work the most and properly care for them to serve as long as possible.

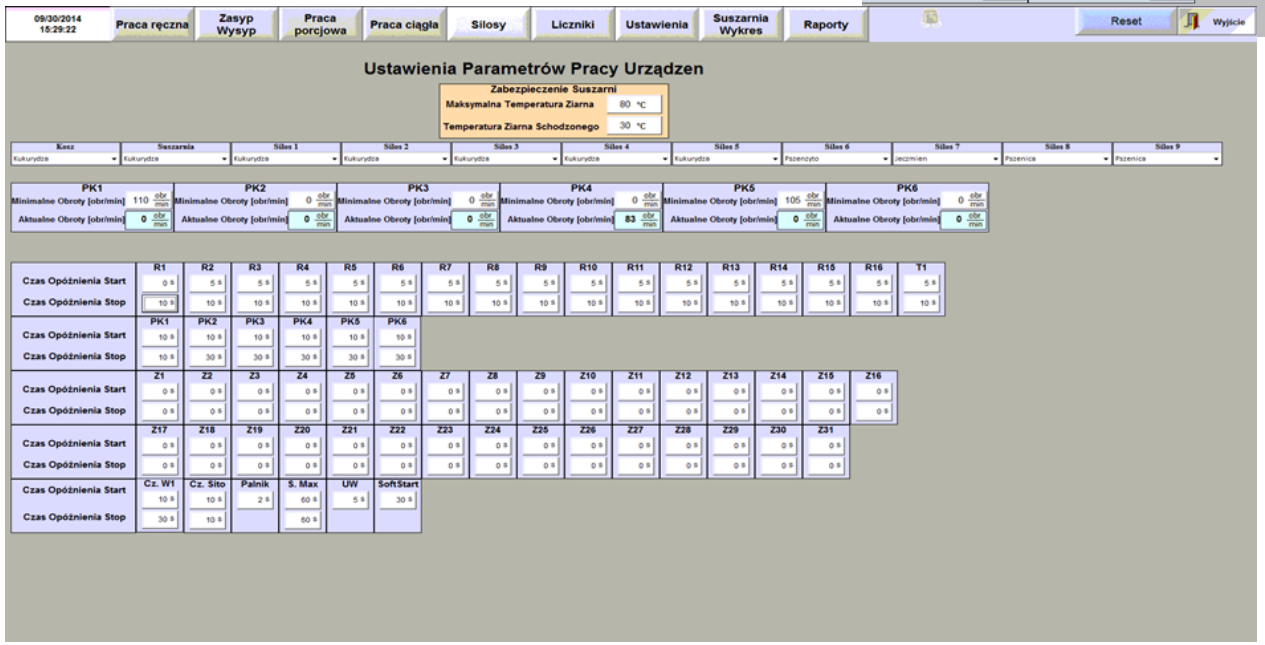




Settings

In the settings window, you can change the time between starting individual devices, the number of revolutions after which the lift will be turned off and the frequency of the drives. We also choose the type of grain that is in the given silo and on the hopper. The type of grain defined in this way activates the blockade: when there is maize on the basket and in rape No. 1 the rape, the program will not allow starting the road from the basket to silo No. 1.

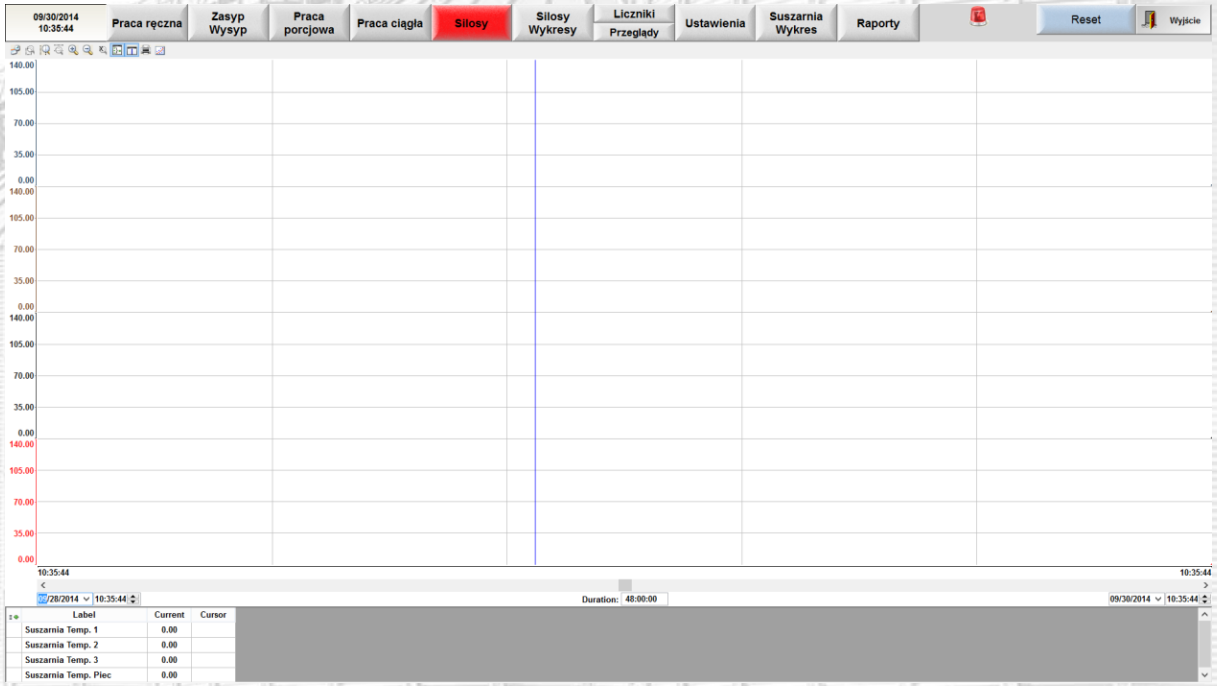




Dryer diagrams

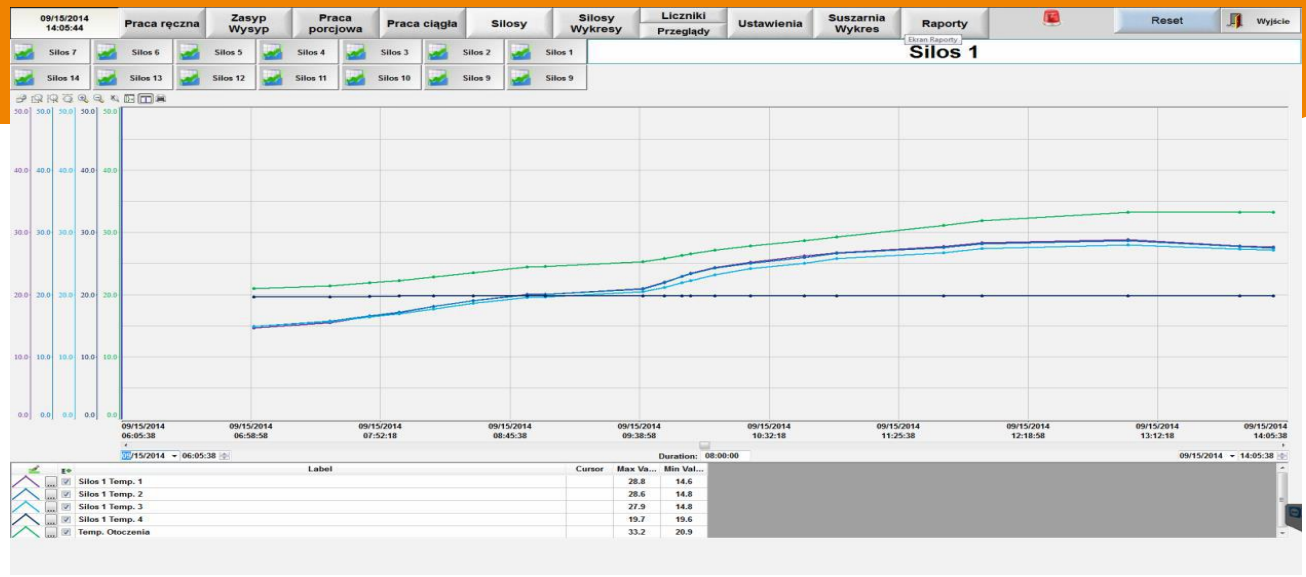
Temperature chart in the dryer.

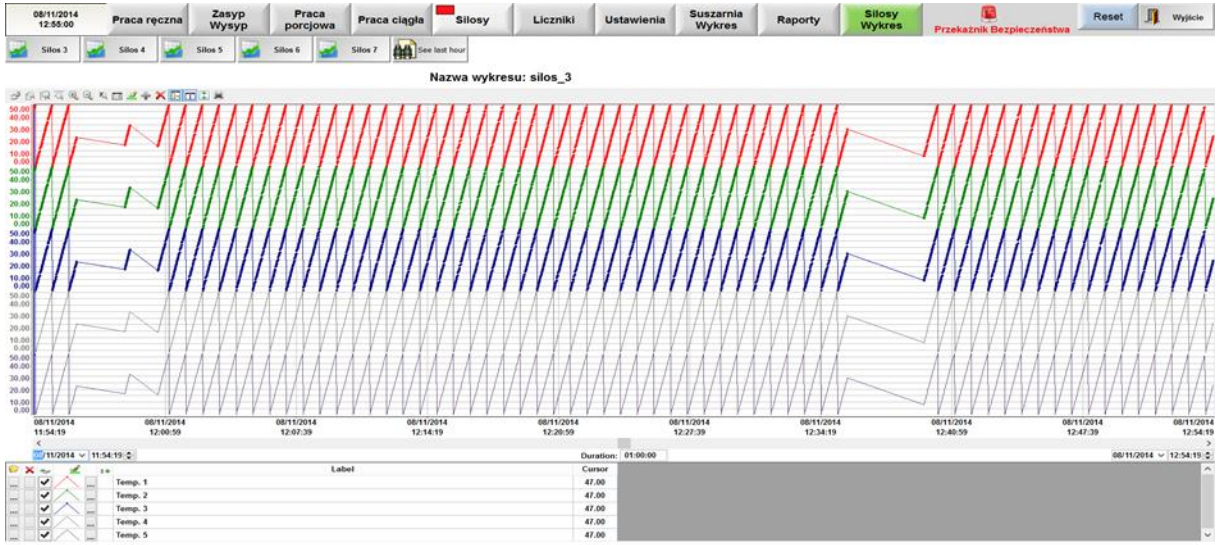
By archiving the burner data, we can verify the effectiveness of the burner controller that maintains the temperature setpoint.
You can see how quickly the dryer has reached the set temperature, what temperature at the time prevailed at each sensor.



Silo charts

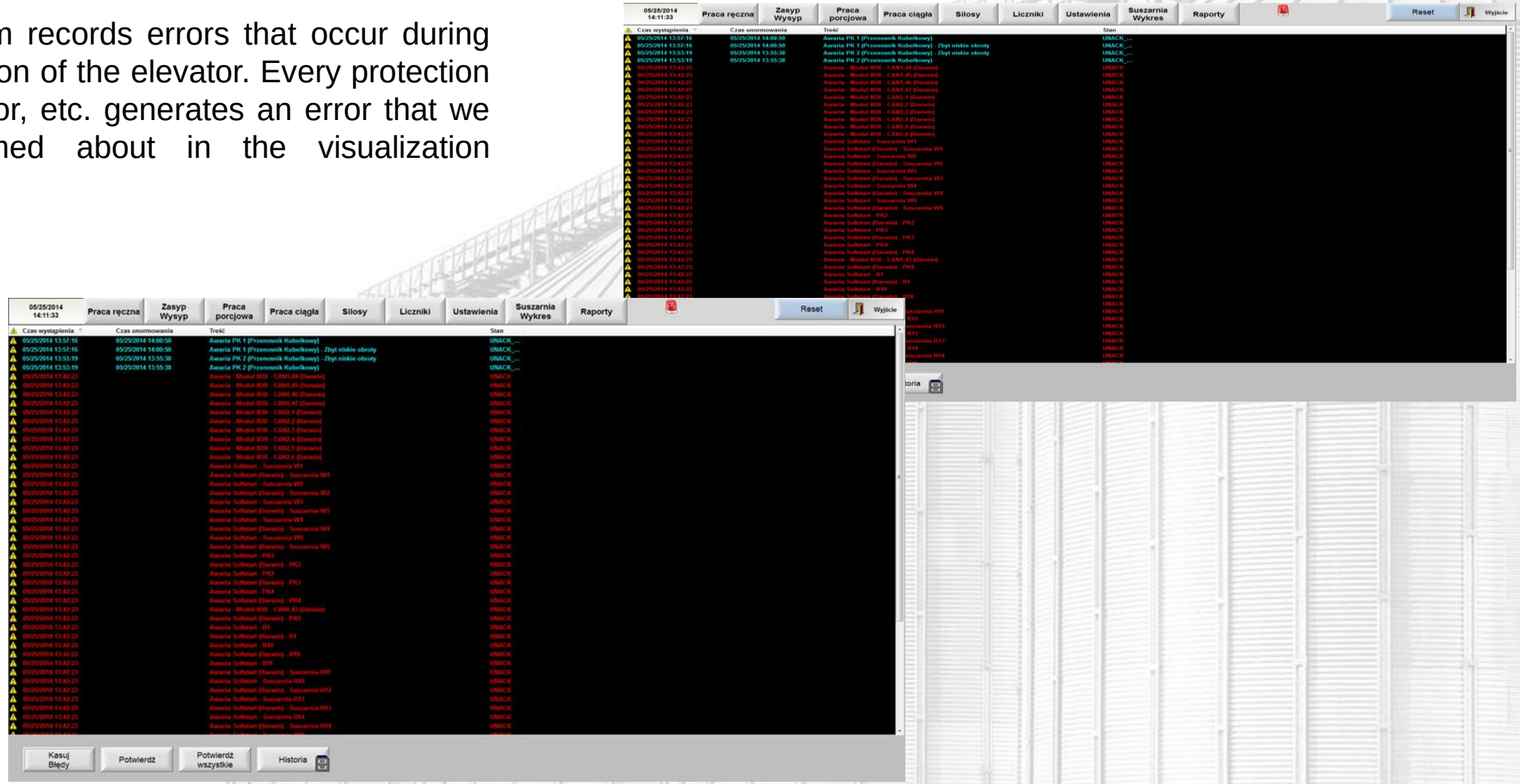
The temperature graph in the silos - presents the state of the grain kept in the silo. Thanks to monitoring of temperatures and its archiving, we can reproduce data such as: temperatures at a given time, and whether the aeration of grain is effective, at what time the grain temperature has been lowered.





Reporting an error

The system records errors that occur during the operation of the elevator. Every protection of the motor, etc. generates an error that we are informed about in the visualization window.



Constant measurement sensor

For continuous measurement of grain in a silo we recommend using a non-contact transducer radar LR 560.

This is a radar in modern 78 GHz technology, which is perfect for level measurement not only cereal products but also other products bulk materials used in industry (coal, cement, ash, biomass, sugar, etc.).

Pros of a permanent measurement sensor

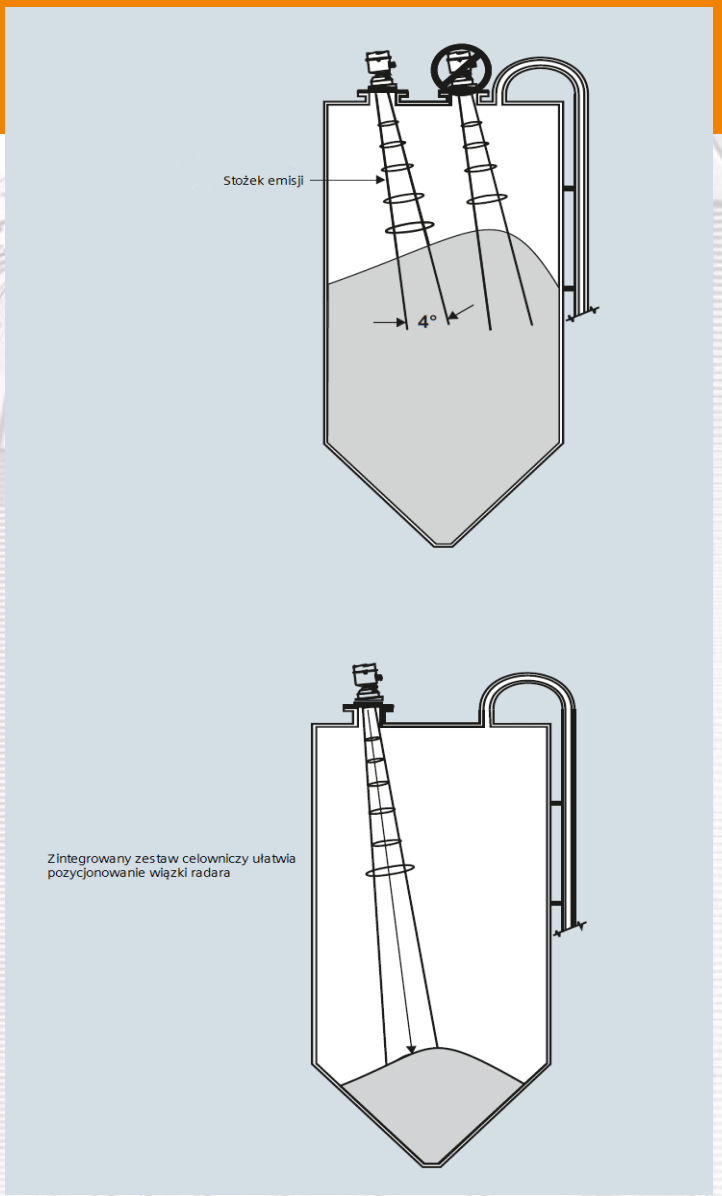
1. Low weight and dimensions - shortening assembly time

2. An integrated viewfinder that allows you to measure the level up to the lowest point in the silo

3. Built-in purge connection, which allows to clean the radar antenna with compressed air in the event of an intensive dust deposition

4. Stable measurement also in conditions of strong dustiness

5. Durable stainless steel construction



Grain balancing system - new!

In the work of transport devices, we use a grain balancing system

- ✓ for controlling conveyor belts (or redlers to receive grain from silos), frequency converters were used
- ✓ for controlling bucket elevators, overload-short-circuit protection with measuring element was use (we measure the current that the engine takes on the PK)

Innovative device control application - two operating modes:

- ✓ manual operation mode - the operator sets a constant grain transport efficiency
- ✓ automatic operation mode - the system analyzes the operation of equipment and tries to maintain maximum efficiency of grain transport operation; It independently detects the uneven load of individual devices and aligns their work by means of a control algorithm

Grain balancing system

Benefits:

- ✓ self-monitoring of grain transport devices
- ✓ protection against backfilling of the bucket lift while making maximum use of its capacity;

Requirements:

- ✓ control cabinet in automatic mode with a controller or operator panel
- ✓ on devices transporting grain from silos – inverter
- ✓ on a bucket lifter, overload and short-circuit protection with a measuring element.

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