



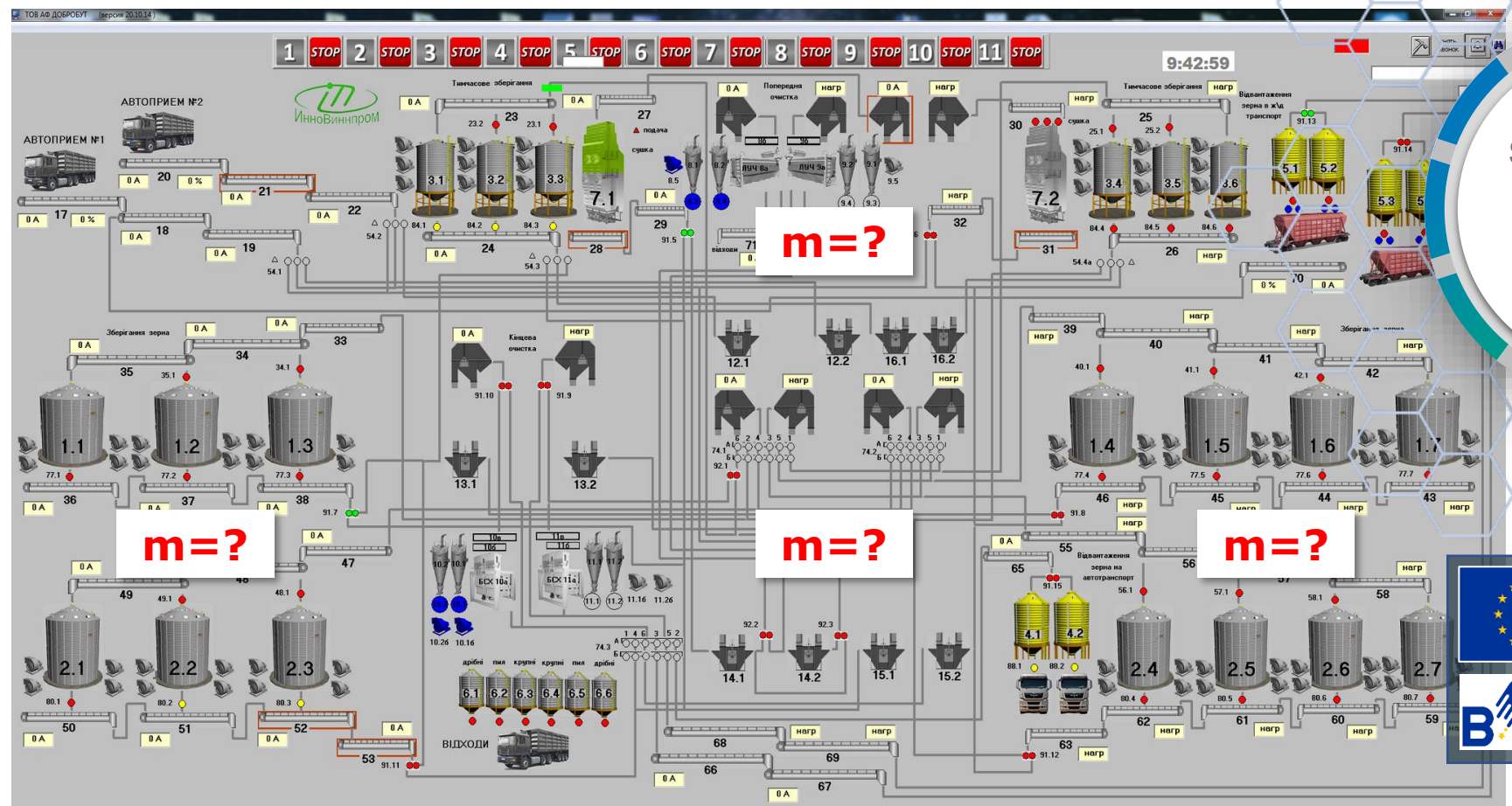
**The Project of Developing of a Multifunctional Device for Flow Measurement of the Weight of Bulk Products and Sampling «FWS»**  
**Pre-Seed Stage**





When deploying SAKURA-APM cloud services to control and optimize production efficiency in grain storages, we have a significant problem - the impossibility of measuring the weight of grain crops moved between grain storage warehouses. If there are automobile, railway, and bunker scales for receiving and shipping grain crops at grain storages, then there are no scales for internal movement of grain, for example, for drying.

Compact scales are needed for flow weighing of grain crops.



SaaS  
SAKURA-APM

- Industrial Internet of Things
- Big Data & Data Sharing
- Cloud Computing
- Autonomous Factories
- Digital Twins
- AI & ML



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**SIEMENS**

*Ingenuity for life*



There are high-quality high-precision flow meters for the weight of bulk, granular and powder products SIEMENS solids flow meter "SITRANS" and HENSE solid flow meter "FlowSlide" on the market.

These are excellent engineering solutions, but they have certain limitations for the implementation of our task, namely:

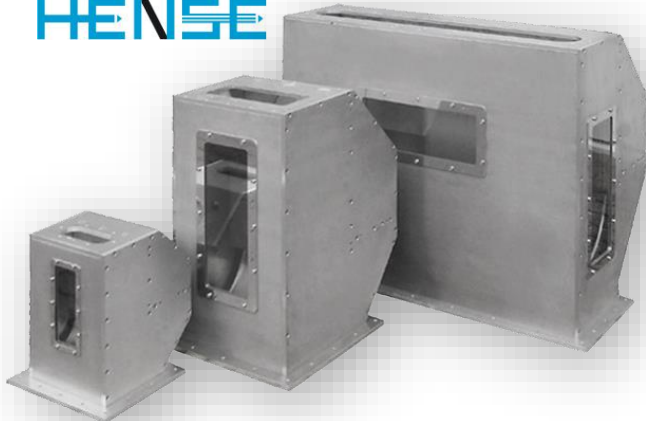
- ❖ the stations are calibrated for a specific grain crop, in the case of switching to another crop, they need to manually enter information about the crop or transfer information from the ACS TP.

But in our situation, we sometimes do not know which grain is moving through the Flow Meter, its automatic recognition is necessary.

- ❖ the systems are very expensive, as well as their installation and calibration, which is performed exclusively by the manufacturer's engineers.

If a typical grain elevator in Ukraine with a capacity of 100,000 tons requires simultaneous storage of grain in at least 10 pieces of flow meter, the projected payback of such an installation exceeds 10 years, which exceeds the service life provided by the manufacturer.

**HENSE**

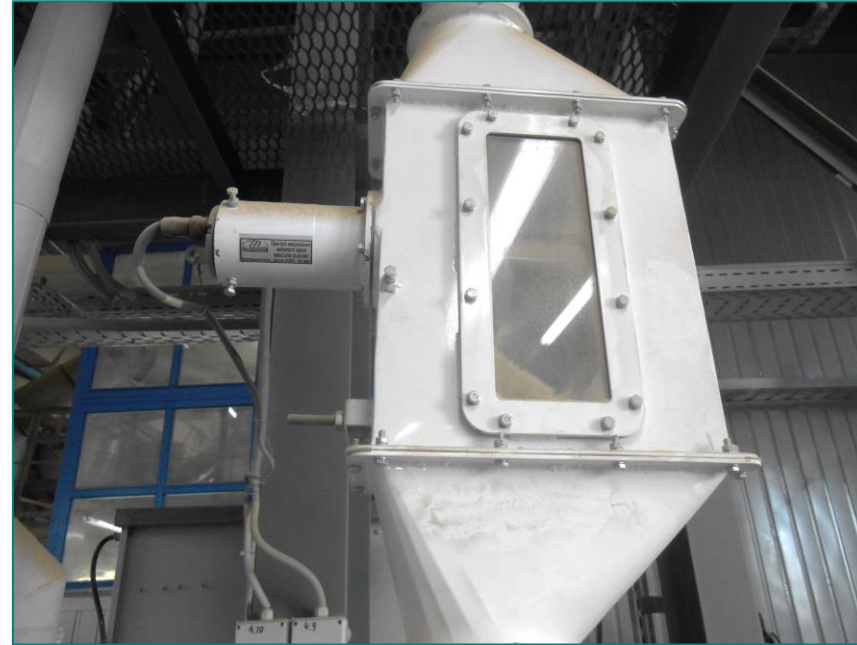




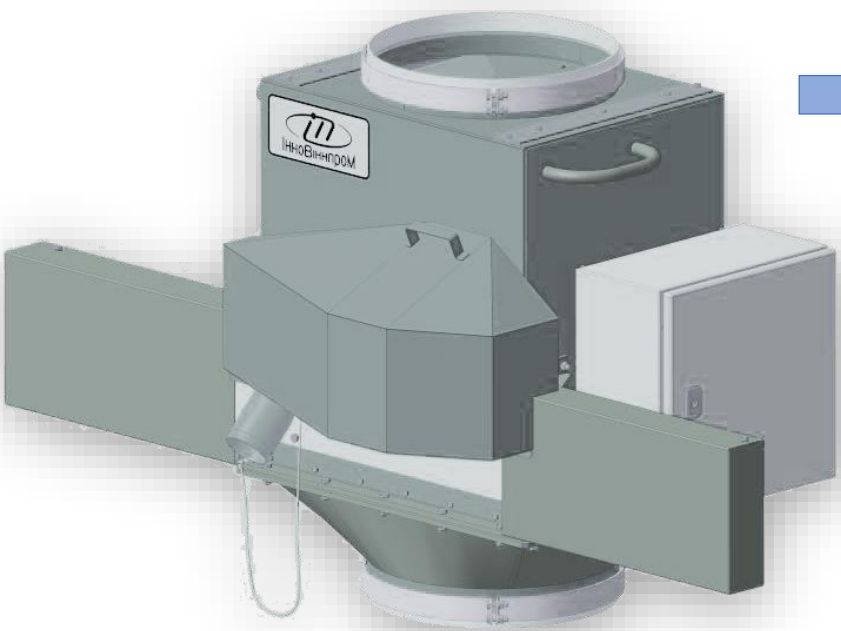
# Our Own Experience

We have produced and successfully implemented dozens of the following autonomous systems with processor control:

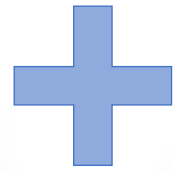
- ❖ Automatic systems of weighing and regulating the flow of grain crops;
- ❖ Automatic sampling systems from the flow of grain crops;
- ❖ Sensor installation systems for express analysis of grain crop parameters.



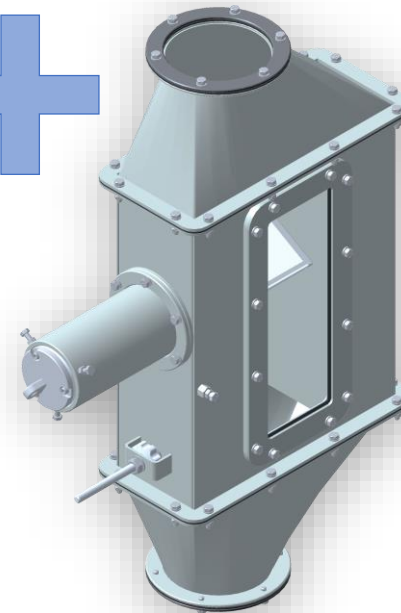
Combine the following systems in a single body:



Flow Sampler



Flow Meter



Sensor installation unit



Machine Vision Camera

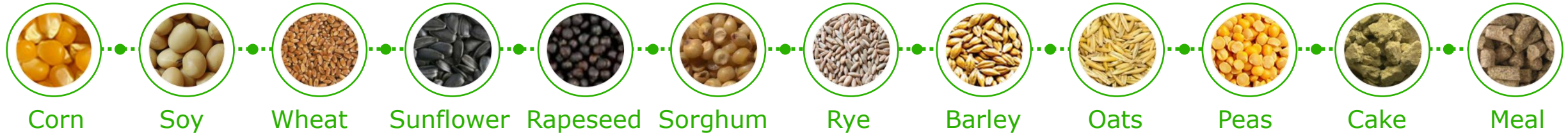


A universal smart device **Flow Weight Sampler** for stream recognition of the type of grain crops, measurement of key parameters (humidity and graininess), weight measurement and sampling in case of crop changes or inconsistency of parameters.



# Basic Requirements for Flow Weight Sampler

❖ The ability to recognize, determine parameters, and take samples of the following grain crops:



- ❖ Automatic self-calibration for each crop.
- ❖ High dust resistance.
- ❖ Work in difficult environmental conditions:
  - Temperature range -40 ... + 60 0C
  - Humidity 0 ... 100%
  - Wind speed up to 25 m/s
- ❖ Work in difficult environmental conditions
- ❖ Minimal maintenance during operation
- ❖ Availability of self-cleaning equipment
- ❖ The controlling component of the system should be a serial programmable logic controller (PLC).

We focus special attention on the choice of Machine Vision Video Camera, as thanks to its data, the device should be automatically adjusted according to the parameters of the grain crop that is in the process of operation.

The camera must be connected to the PLC of the FWS.



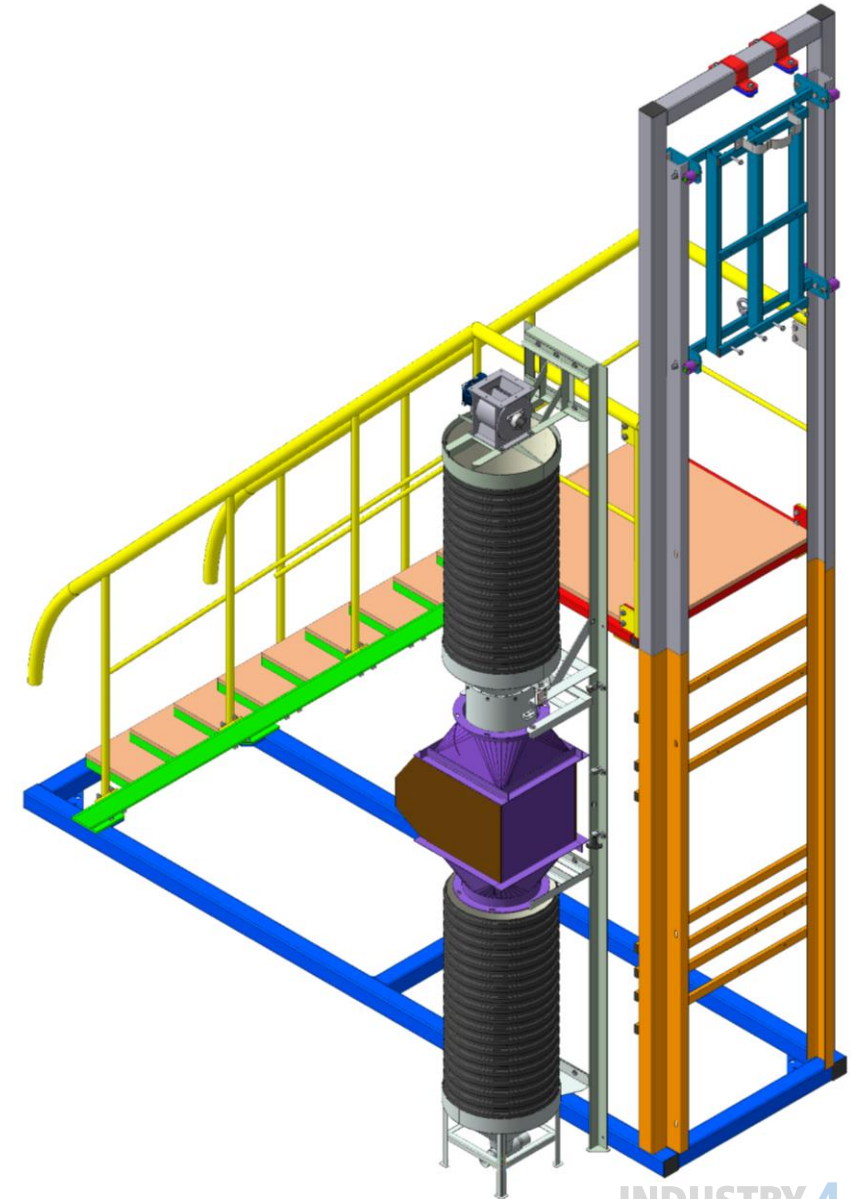
To test the idea, we developed and assembled several variants of the concept and a test stand.



The test bench includes:

- ❖ Bunker with product
- ❖ Test node
- ❖ Receiving hopper
- ❖ Pneumatic transport system

In this way, we managed to check and test several variants of the concept and be sure of the possibility of implementing the task.





# Evaluation of the Potential Market

First of all, we focus on **our customers**.  
We also receive requests for the purchase  
of similar systems every month.



**SCADA**  
> 1000 I/O



**Car Samplers**



**Railway Samplers**



**SAKURA-B**  
MES/ERP/PLM



**SAKURA-T**  
Energy Efficiency



**SAKURA-ECO**  
Environmental monitoring



# Project and Investment Budget

We are looking for pre-seed financing for the implementation of the project, which includes:

- ❖ salary;
- ❖ development of design documentation;
- ❖ purchase of components and collection of test samples;
- ❖ software writing and testing;
- ❖ purchase of various grain crops;
- ❖ conducting test trials;
- ❖ calibration of the FWS;
- ❖ development of user manual and datasheet;
- ❖ development of advertising products



[Company website](#)



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