EEC engineering presents

CATALOGUE OF INNOVATIVE SOLUTIONS IN THE AREA OF AUTOMATION

Create the Factory 4.0 !

Intralogistics Storage

Control, Measurement and Digital Marking solutions

Automatic Feeders / Unfeeders

Digital Enterprise Model

Robotized Individual, Group and Transport Packaging Operations

Developed in accordance with the concept: INDUSTRY 4.0

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FACTORY 4.0

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TRANSITION TO THE FACTORY 4.0

Industry 4.0 actually means a transition to the next level of the production management and is a powerful tool for increasing production performance.
We suggest Factory 4.0 transition in the following way:

1. Creation of the most complete information flow on the production process (digital enterprise model) for its analysis and synchronization of production processes.
2. Evaluation of the production performance based on the analysis of the information received.

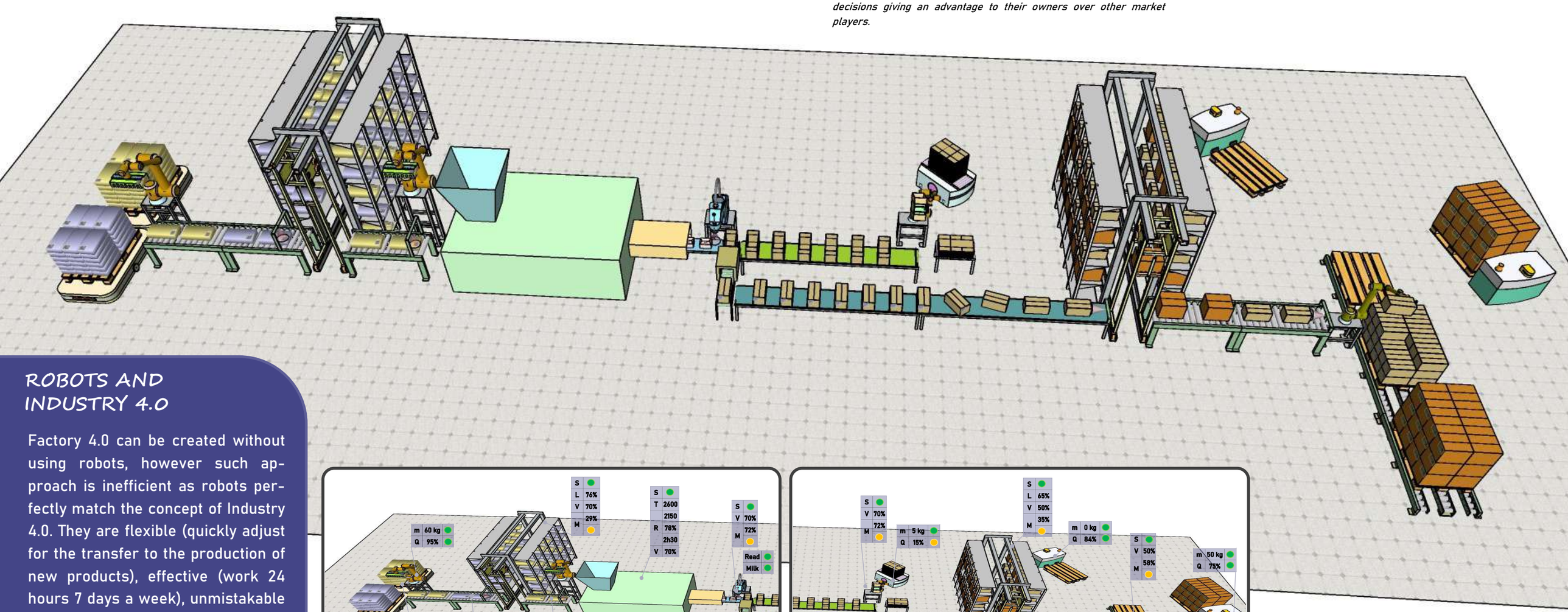
FACTORY 4.0: DEVELOPMENT PROSPECTS

Factory 4.0 will significantly reduce the personnel of the company that is engaged in making logistic, commercial, production and engineering decisions. This work can be performed by machines with prescribed algorithms and elements of artificial intelligence.*

**The advantage of AI is seen in stock market operations where machines analyze huge amount of information and instantly make decisions giving an advantage to their owners over other market players.*

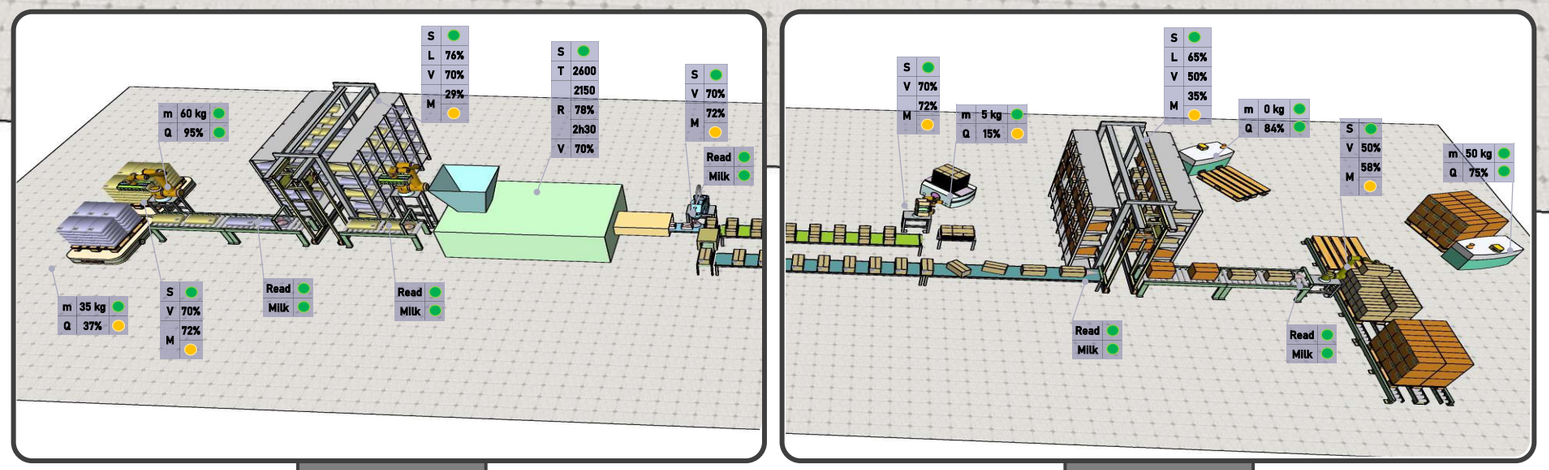
Economic effect will be achieved due to the improvements in planning, elimination of downtime for equipment and personnel, reduction of inefficient stock of components, and minimization of rejection rate.

In the long run Factory 4.0 can have such enterprises integrated into one network with communication performed by machines.



ROBOTS AND INDUSTRY 4.0

Factory 4.0 can be created without using robots, however such approach is inefficient as robots perfectly match the concept of Industry 4.0. They are flexible (quickly adjust for the transfer to the production of new products), effective (work 24 hours 7 days a week), unmistakable (increase the quality of products and reduce rejection rate) and informative (provide full information on the work implemented for the following analysis and improvement of technological process).



FACTORY 4.0: IN DETAILS

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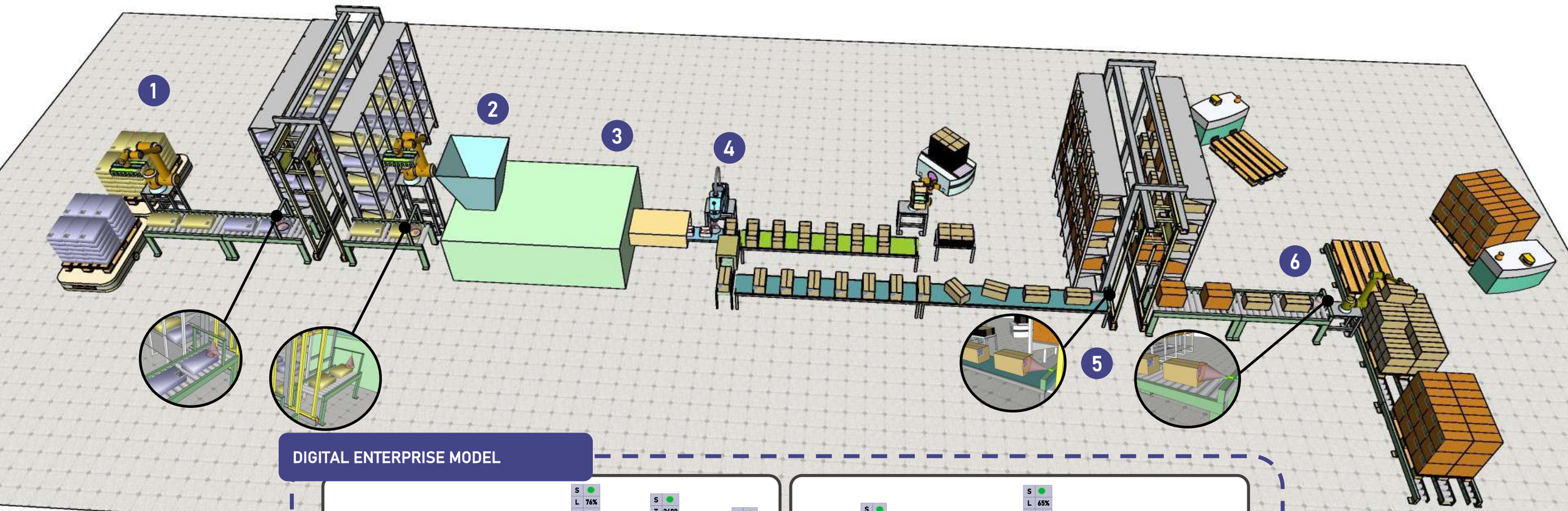
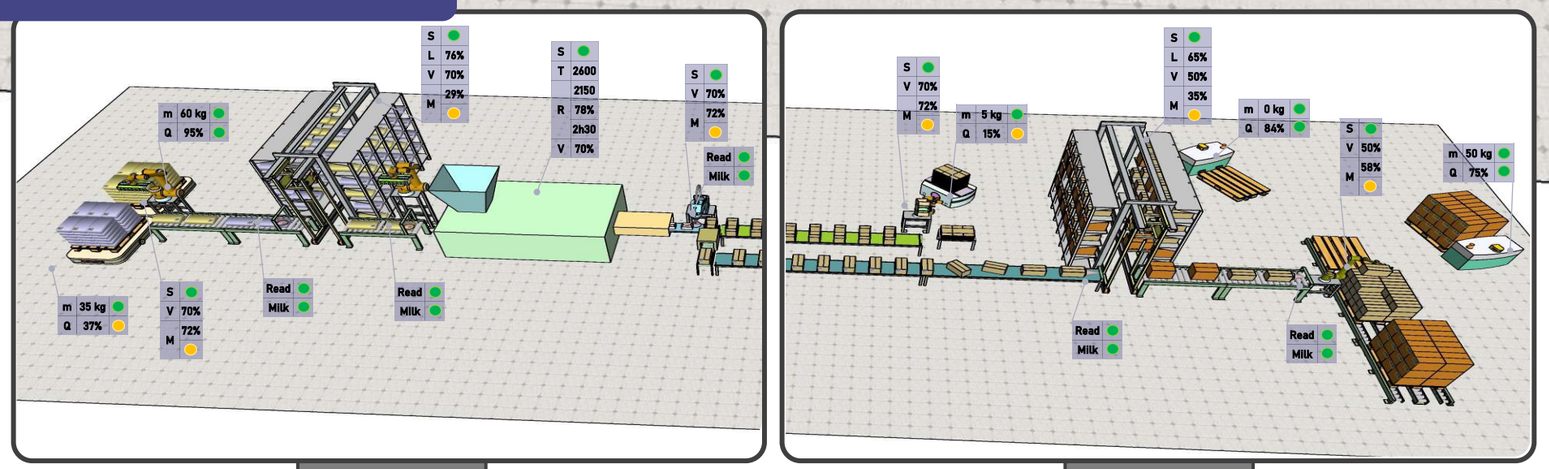
1. RECEPTION AND STORAGE OF RAW MATERIALS
2. GENERAL PRODUCTION PROCESS
3. INDIVIDUAL PRODUCT PACKAGING
4. GROUP PACKAGING
5. INTERMEDIATE STORAGE OF FINISHED GOODS
6. TRANSPORT PACKAGING FOR FURTHER SHIPMENT



DIGITAL ENTERPRISE MODEL



INDUSTRY 4.0

"I cannot say whether things will get better if we change; what I can say is that they must change if they are to get better."

Georg Lichtenberg,
scientist, philosopher and publicist

The Fourth Industrial Revolution, which is happening in the world right now, leads toward the liberation of the human from routine manual work and toward the increased competitiveness. Helping our customers to keep up with time, we suggest making a transition to Industry 4.0 and to the unmanned production based on our solutions.

Advantages of our solutions

- Reduced rejection rate and improved quality due to the elimination of human factor
- Compact solutions that do not require an increase in space due to the use of robots and unique technologies
- Online production control

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CONTENT

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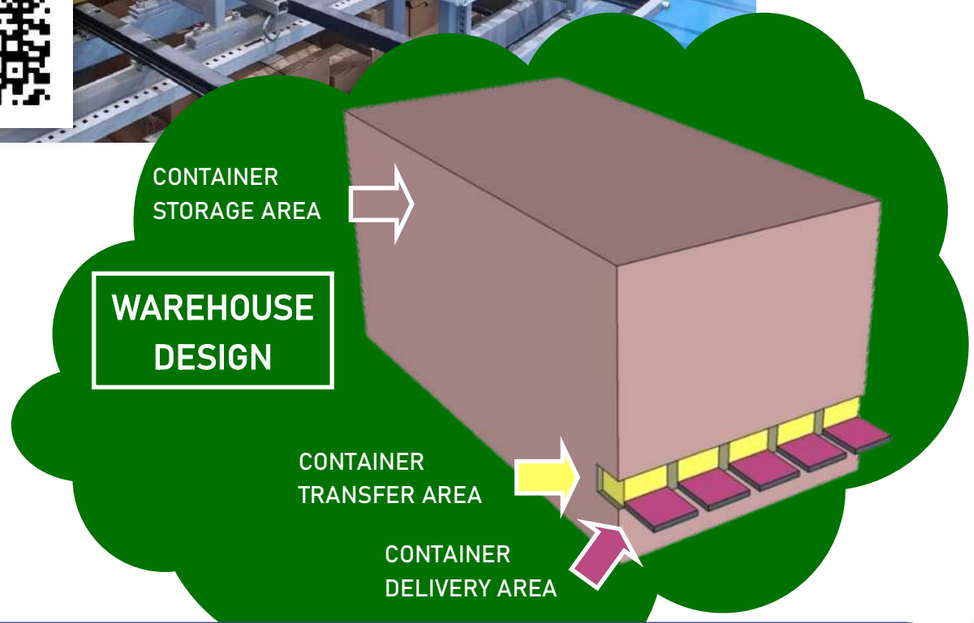
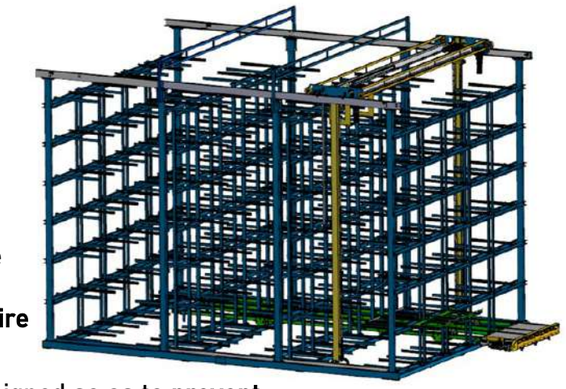
INTRALOGISTICS AND STORAGE

AUTOMATIC WAREHOUSE SYSTEM

WATCH THE VIDEO :)





AUTOMATIC WAREHOUSE

Container or pallet handling operations inside the warehouse are performed by a specially-designed robot that **doesn't require much space for movement**.

The automatic warehouse is designed so as to **prevent operators from entering into the storage area,** where a simple, inexpensive robot manipulator does the job. The robot requires **minimal maintenance**.

The warehouse can be **adapted** to the company's needs **at any stage.**

There is a possibility to add a second (third, …) robot manipulator to ensure **continuous operation**.

INTELLIGENT WAREHOUSE

A dedicated **warehouse management program (EEC EMS)** is in charge of the warehouse intelligence.

The warehouse uses IoT protocol, which allows to receive **a wide access to the information on the items stored** via mobile app, PC or internet, as well as **synchronize with other applications.**

EEC EMS allows to **integrate a few** automatic or non-automatic **warehouses in one system in order to synchronize their operations**.

All the warehouse data can be viewed (or edited) by the authorized users who have different access level assigned.

CONNECTION TO AN ACCOUNTING DATABASE

Accounting and warehouse databases can be **synchronized to** have the waybills and accounting reports generated automatically.

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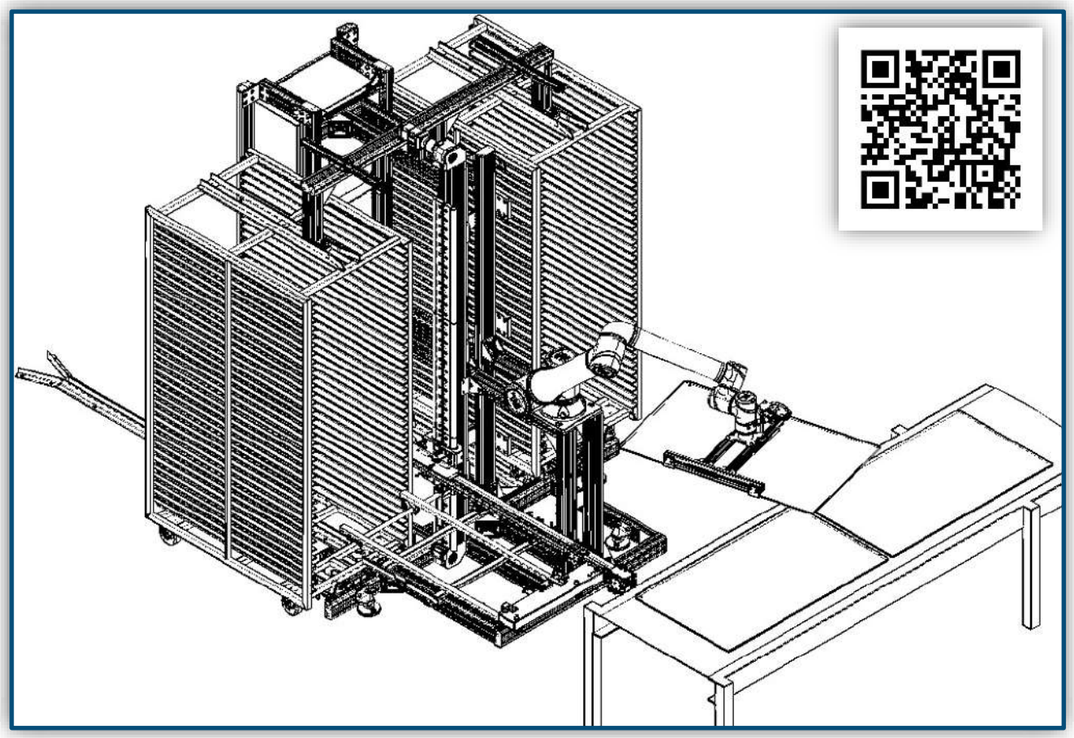
LOADING / UNLOADING OF TECHNOLOGICAL EQUIPMENT

ROBOTIC SYSTEM
for loading / unloading trays (pallets) into containers

WATCH THE VIDEO :)



DESIGNATION

This robotic system is designed for **loading / unloading trays or pallets into containers** for the consequent baking, freezing or storing. The robotic system operates with no friction between trays (pallets) and the container shelves to avoid metal shavings or dust.

OPERATION SPEED

The operation speed is **up to 10 pick & place operations per minute** for a tray of 1000 mm x 600 mm size.

OPERATION MODE

The robotic system is designed for a **continuous operation** with two containers alternately. If only one container is used, the robotic system stops during the container replacement.

SYSTEM COMPOSITION

This robotic system consists of an industrial collaborative robot with a gripper, one or two container places with a trays (pallets) feeding system, a safety system based on a safety scanner with a set safety area and a protective fence, automation products for synchronization with the conveyor and a PLC-based control system.

COLLABORATIVE MODE

The robotic system can be operated in a **collaborative mode with a reduced operation speed**. Operation in a collaborative mode requires no safety scanner or a protective fence.

STATION DIMENSIONS	Width	2050 mm	**CHARACTERISTICS OF THE TRAY (PALLET)**	Weight with products	up to 4 kg
	Depth	1850 mm		Length	up to 1000 mm
	Height	2200 mm		Width	up to 600 mm
Container height					up to 1800 mm
Transfer cycle at rated load (load factor = 0,8)					7,5 s
Minimum transfer cycle value (load factor = 1)					6 s

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INDIVIDUAL PACKAGING

ROBOTIC SYSTEM
for picking and placing plate-like products in stacks of a set weight and quantity

WATCH THE VIDEO :)

DESIGNATION

This robotic system is designed for **pick & place operations** to form stacks of **plate-like products made from various materials**, for example plate-like chips, crispbreads, cookies.

OPERATION SPEED

The operation speed is **up to 3 pick & place operations per second** depending on the type of the product.

QUALITY INSPECTION

Visual inspection (shape and color) of each product is carried out by machine vision. Bad products are omitted by the robot and are directed into the special place for rejections.

PACKAGING OPTIONS

This robotic system can **form stacks in three ways**: (1) by the quantity of plate-like products in a stack, (2) upon reaching the specified weight in the stack or (3) by the quantity of plate-like products per stack with simultaneous weight check.

ADDITIONAL OPTIONS

If the formed stacks need to be placed into an individual packaging or packaging machine, an additional robot shall be used.

MATERIAL USED AND IP CLASS

Robotic system material is **stainless or painted steel.** Degree of protection is up to IP69k. For food handling food grade material is used.

OPERATION CONDITIONS

The gripper of the robot is resistant to dirt, suspensions, dust, crumbs and **does not require perfect evenness and smoothness of the plate-like products.**

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GROUP PACKAGING

ROBOTIC SYSTEM
for digital marking products and multipack packaging

(with visual quality check)

WATCH THE VIDEO :)

DESIGNATION

This robotic system is designed for **multipack packaging of products of up to 10 kg weight into a box of up to 400 mm high** (for example, in a cardboard box). Digital marking application (QR-code, date and other information) is an **option** during the packaging process.

SYSTEM COMPOSITION

This robotic system is based **on a high-speed SCARA robot** and is equipped with a feed conveyor and a box supply system.

OPERATION SPEED

Operation speed depends on the weight and type of the product and, is generally limited by **one pick-and-place operation of 2 seconds**.

QUALITY INSPECTION

Visual inspection (shape, color and marking verification) of each product is carried out by machine vision. Bad products are omitted by the robot and are directed into the special place for rejections.

ADDITIONAL OPTIONS

The robotic system can be equipped with additional control systems, for example, weight control system. In case palletizing is needed, an additional robot shall be used.

PACKAGING OPTIONS

This robotic system implements packaging in one or more layers using pneumatic, mechanical or electromagnetic gripper.

DIMENSIONS, MATERIAL USED AND IP CLASS

Overall dimensions of the **basic version** of the system**: 2100 mm x 1290 mm**. Robotic system material is **stainless or painted steel.** Degree of protection is up to IP69k. For food handling food grade material is used.

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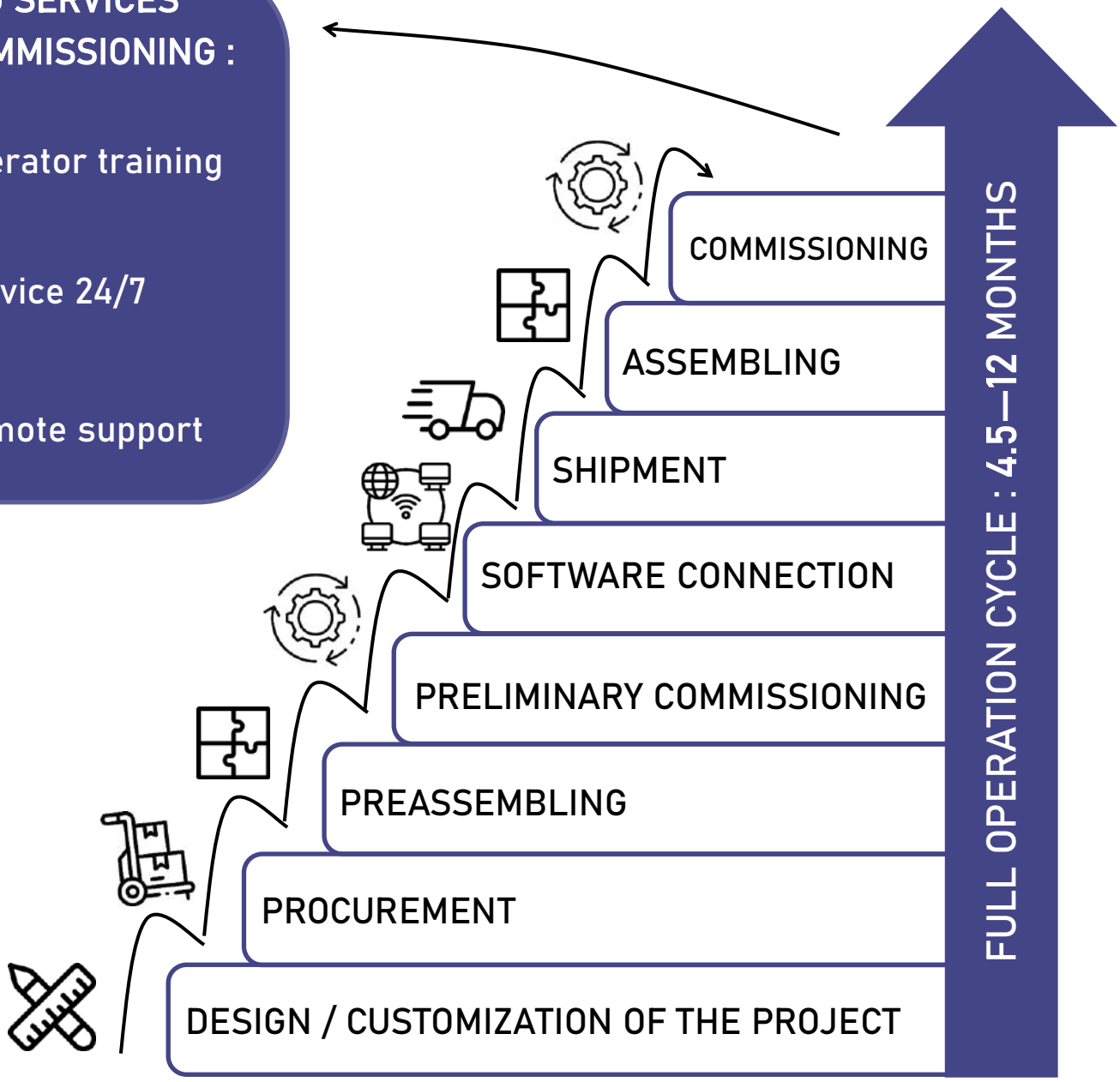
HOW WE ARE WORKING

Describe your task to us, and we will find the best solution for you, present it to you and adjust the solution according to your requirements.

PROPOSED SERVICES AFTER COMMISSIONING :

- Operator training
- Service 24/7
- Remote support



READY TO MAKE INDUSTRY 4.0 TRANSITION ?

INTERESTED IN ANY OF OUR SOLUTIONS ?

NEED A COUNSEL ?

Please, send us your queries by phone, mail or using the electronic form.

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