



**VELUX Commercial**  
delivered by Asseco CEIT

## MANUFACTURING

Once AGV that serves also as a workbench reaches the workstation, its height is automatically adjusted to fit the actual body height of currently present worker.

# 10%

increase in productivity

## Background

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# Global Leader and Innovator of Windows and Skylights

VELUX Commercial is a new division under the VELUX brand, based in Denmark, producing roof glazing solutions to provide daylight and fresh air through the roof. VELUX Modular Skylights manufactured in Ostbrirk, Denmark, can be combined in a number of rooflight configurations, creating perfect solutions for a wide variety of building types: narrow corridors, internal courts, studios, large circulation spaces, as well as private houses.

## Goals

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# Enabling Continuous Improvement

VELUX Modular Skylights production went through extensive transformation of production processes, from manufacturing by hand into semi-automatic and fully-automatic processes. Digital Twin is enabling the transformation of physical world into a digital one, where:

- possible scenarios and ideas are tested to prove their benefits;
- production on wheels generates endless amount of data, which are transformed into valuable information for relevant decision-making;
- daily operational management is supported by real time information;

- production setup creates an ergonomically suitable and safer environment for the employees;
- virtual trainings for operators support safety, quality, and productivity;
- automatic data collection, real time monitoring and analytics create full image of the factory environment based on the facts;
- trends and analytic tools are the base for the future improvement of the whole system.

### Challenges

## A Digital Twin Integrating Multiple Systems

To support the current and future use cases, the system needs to collect data from multiple sources, such AGVs, operators, forklifts, machines. Then those data are transferred and processed into understandable, transparent and valuable information which are presented in 3D through various applications of Digital Twin of the real-life factory.

## Solution

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# Real-time Digitalization of Movement Across Two Halls

To digitize movement, 12 UWB direct anchors are used, covering two production halls, each of 1,152 m<sup>2</sup>. There are 40 personal tags, 17 tags on AGVs and 2 forklifts providing **real-time localization of the people and machines** operating within the facility. The real-time location data is integrated with production, Track & Trace and Plant Simulation, and the whole system is orchestrated via Ella platform.

### Solution Numbers:

**2,304 m<sup>2</sup>**

area covered  
(two halls)

**12**

receivers (=anchors)

**59**

tracked objects (=tags)



**Robert Zalman**

Head of the Smart Factory  
Department at Asseco CEIT

*"It's more than four years since we started the first project with VELUX, and it makes me proud that we continue being their partner in their key initiative of digitization, and our solution has quickly become a reliable backbone of their daily work."*

## Results

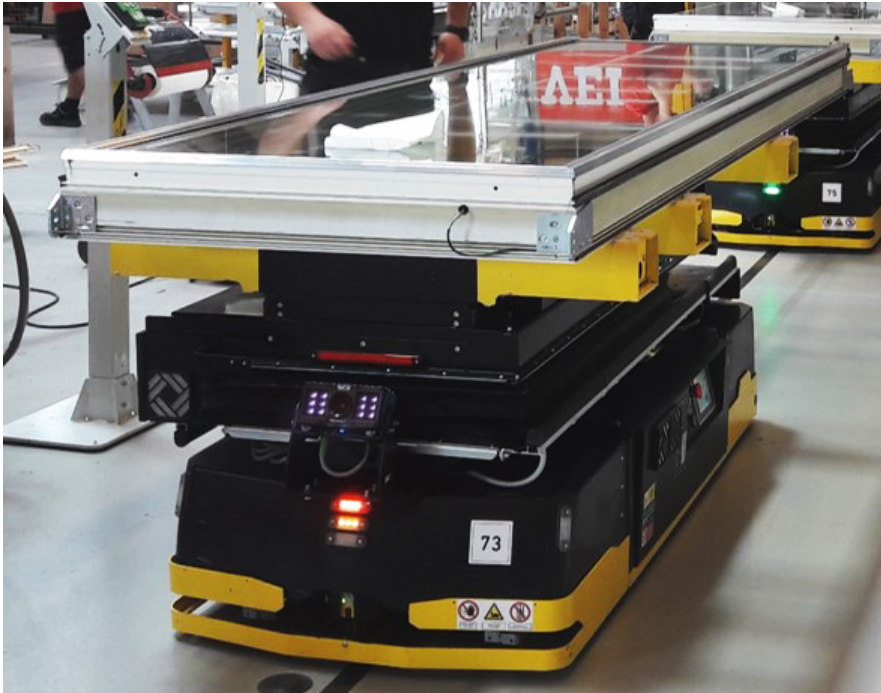
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# Boosting Efficiency Through Human-Machine Collaboration

Knowing in real time knowledge about status and position of 2 out of 4 production elements, Man and Machine, unlocks **multiple use cases**, along with the following benefits:

- **Fully automated ergonomic adjustment of the AGVs**

AGVs at VELUX Commercial have a gripper that holds and transports window frames across the halls. Once one of them reaches the workstation, its height is automatically adjusted to fit the height of the currently present worker or machine to provide the best ergonomic experience.



*AGV that serves also as workbench, holding and moving the window.*

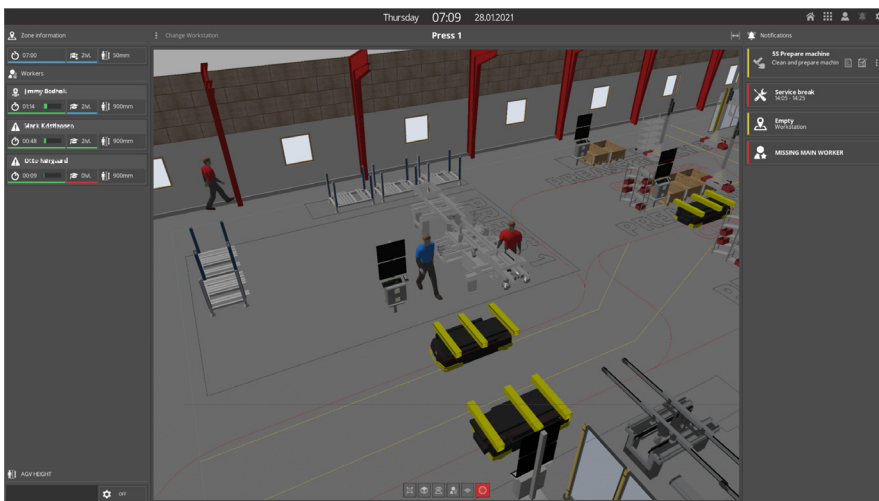
- **Workstation monitoring and management**

Every workstation is monitored and checked for an appropriate number of operators, their right skillset level for the job and the maximum time they can work. If an AGV arrives at a workstation and waits for a particular time for a worker to appear in its proximity, it automatically calls the worker – this information is shown on monitors in the hall as well as in the application running on a PC.

Similarly, if a person with an appropriate skillset is missing or a production step takes longer than usual, an additional support worker with the right skillset is called.



*Hall monitor with real-time data for Production Managers.*



*Workstation monitor with real-time data about particular work zone.*

- **Total Productive Maintenance (TPM) with navigation for operators**

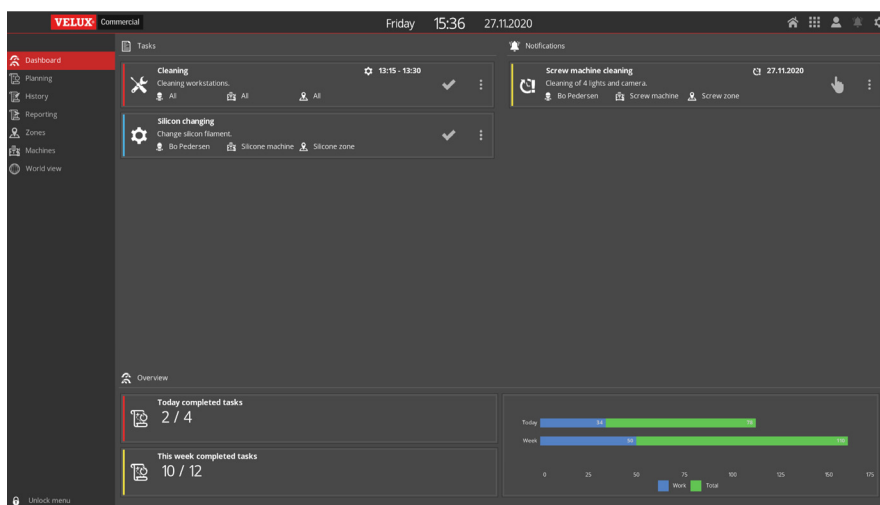
TPM application within Ella platform creates environment where all information related to machines can be stored and easily accessible – standards for daily and long-term TPM activities, logbooks, location of machines, skill matrix of TPM contributors, reports. TPM application features a list of tasks, supported by description and pictures, that need to be performed on machines, how long they should take and who has been assigned to tasks.

After execution of TPM tasks, reports are created with comparison of plans and reality, e.g. if the task was executed – proven by localization of assigned operator, what materials and lubricants were used, time needed, issues identified.

*“Ella platform, empowered with Sewio RTLS, has opened a whole range of use cases that we are continuously delivering, with each step reaching a higher digital maturity level, boosted efficiency and what’s most important, getting the competitive advantage. We’re looking forward to continued success with the future phases.”*



**Rastislav Ruckay**  
Supply Contributor at  
VELUX Commercial



*Total Productive Maintenance (TPM) with navigation for operators.*

- **RTLS enhanced virtual reality trainings**

The Digital Twin of the factory enables virtual-reality training in which the trainees do the training in the real-life and real-time reproduction of the actual environment. The training, in POV (Point Of View) camera mode, shows an AGV approaching a workstation and the monitor shows them the next operational steps they can practice during the training.



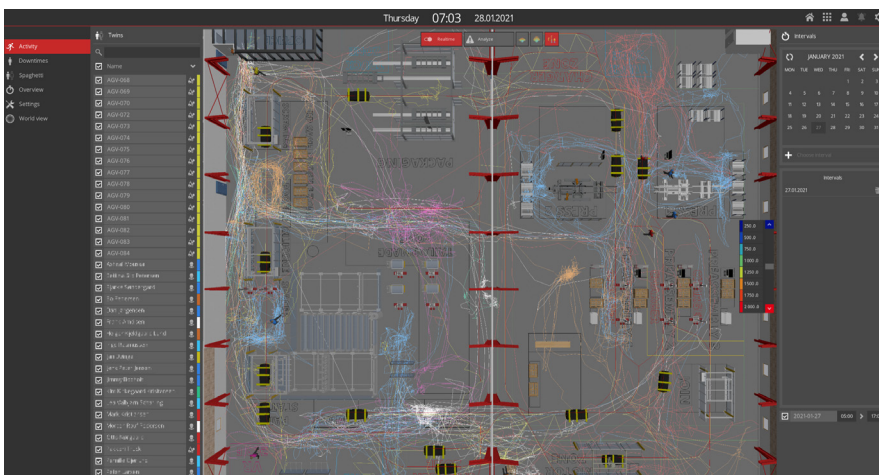
*POV camera mode of virtual training.*



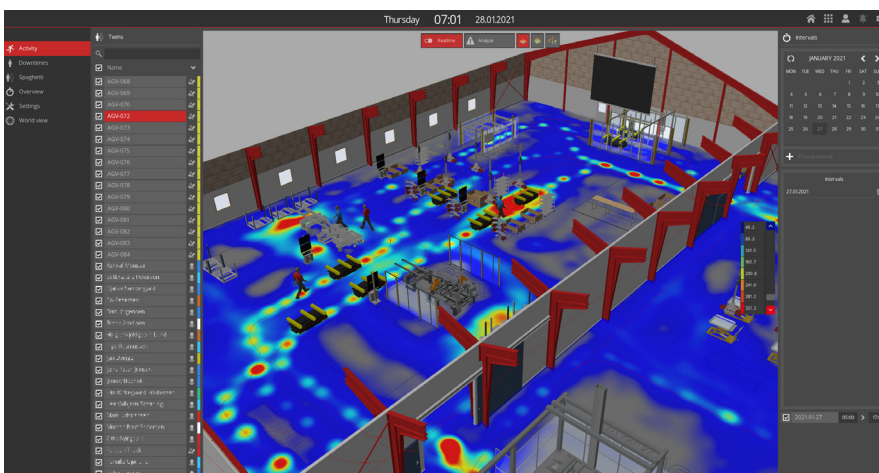
- **Advanced tools for visualizing complex statistical data**

A spaghetti diagram gives a visual representation using a continuous flow line tracing the path of employees and machines (AGVs) within the facility. As a process analysis tool, the continuous flow line enables process teams to identify redundancies in the workflow and opportunities to expedite process flow.

Additionally, a heatmap shows traffic density within the hall to help managers understand the concentrations of labor over time. The heatmap provides a powerful visual image of where efficiency opportunities may exist within a hall operation.



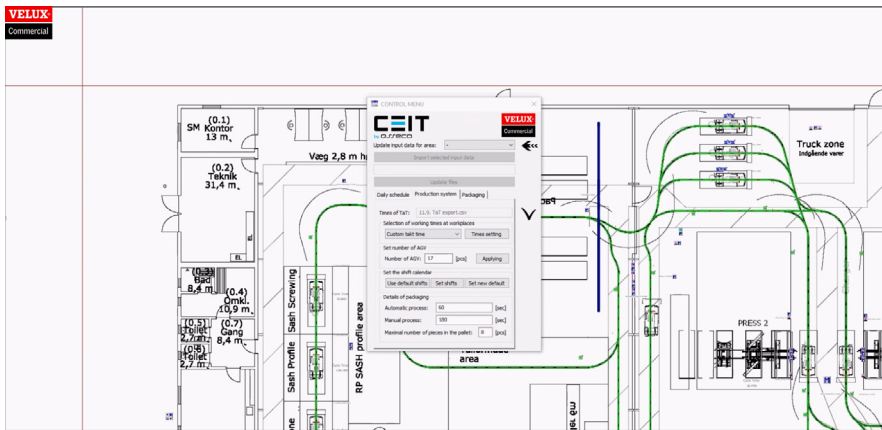
*Spaghetti analysis.*



*Heatmap analysis.*

- **Parametric simulation model**

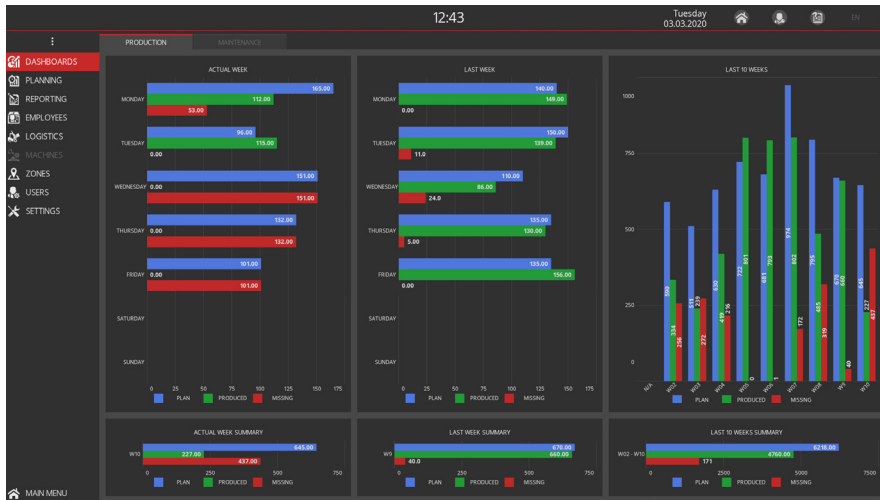
The data from SAP, TaT and RTLS is combined within the Plant Simulation, allowing the identification of the constraints and bottlenecks that affect the efficiency of the production process, the definition of the capacity of the production and logistics resources, and the simulation and planning of production on a daily basis. It helps production managers to find the best efficiency variant that exactly meets customer demand.



*Parametrization of production simulation.*

- **Single Source of Truth of Real-Time KPI  
Production Dashboard**

Plant and production managers leverage the real-time data provided by the production dashboard for planning, monitoring, and optimizing the production process. The dashboard shows the current and historical production data and allows quick overview.



*Admin Dashboard for Production Managers.*

## Results:

### Improved safety

awareness overview, understanding through the safety training

### 3D

Real-time Digital Twin overview of production

## 10%

increase in productivity through better shop-floor management

## 50%

performance boost on TPM activities

## 10%

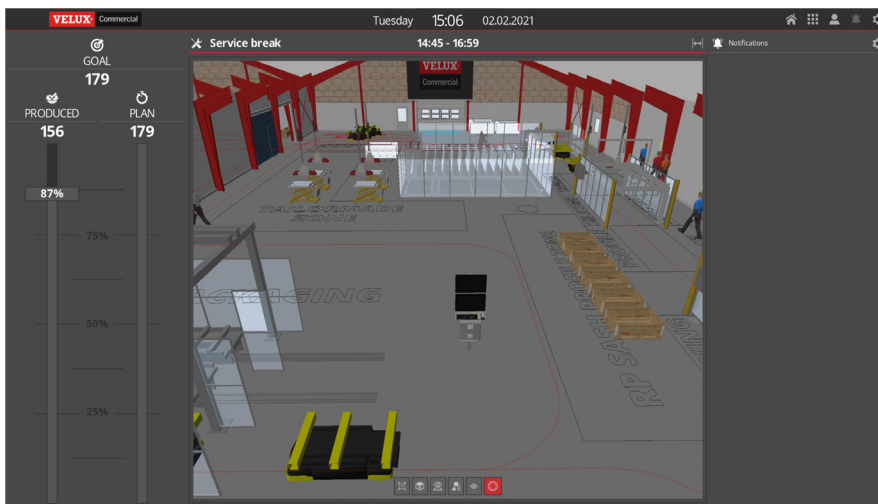
decrease of WIP thanks to improved communication channels

## 25%

shorter adaptation process for new operators by virtual training



*Photo of the packaging hall.*



*Digital Twin of the packaging hall.*

## Key Factors for Choosing Asseco CEIT

- Focus on end-to-end internal logistics automation, optimization, and innovative solutions for smart factories – thus **making manufacturing and logistics processes more effective**
- Specialists on technical, **process and product innovation**
- Mature and advanced **Digital Twin solutions**
- In-house R&D **directly connected** to customer practice
- Providing products and services **for over 20 years** to major industrial companies in Slovakia and abroad
- Being a technical partner for industrial companies seeking state-of-the-art solutions to **maintain competitive advantage and increase effectiveness while lowering operational costs**
- Deployment of **Industry 4.0** solutions with specific target = increase productivity and maintain competitive advantage

## Key Factors for Choosing Sewio RTLS

- **30 cm accuracy**, which allows the full flexibility and variability of virtual zones without any changes of infrastructure
- The ability to easily set an **unlimited number of virtual zones** that can be updated with a single click at any time in the future to adapt to any updates of processes
- Bi-directional seamless third-party integration with a **fully-documented Open API**
- Proven successful IOT projects using methodology and technology, backed up by unrivalled **10+ years of UWB expertise**
- Multi-level support based on SLAs **from the people who built the product**
- The ability to **scale the system easily and quickly** to track more objects and expand the system to more halls

Customer

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VELUX Commercial is a new division under the VELUX Brand. We offer daylight solutions for commercial buildings.

We design, manufacture and market daylight solutions for commercial buildings such as offices, schools, healthcare facilities, airports, shopping malls and retail stores, large public buildings, railway stations and industrial buildings.

The VELUX Group's first step into the commercial market was with VELUX Modular Skylights in 2012, and during 2018, the VELUX Group acquired three skylight companies: Wasco Skylights, Vitral roof glazing and the JET Group.

**Velux A/S**

**Velux Commercial**

Ådalsvej 99

2970 Hørsholm

Denmark

<https://commercial.velux.com/>

Delivered by

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Asseco CEIT is a Slovak technology company that brings innovation to industries. In particular, it focuses on logistics transformation, automation of internal logistics, optimization of production and logistics processes, asset tracking, design and material engineering, the Digital Factory concept, and complex and comprehensive solutions for Smart Factories. These solutions are mainly the result of own research and development.

For over ten years, Asseco CEIT has been delivering cutting-edge solutions for smart factories. Today, Asseco CEIT integrates them from A to Z into a comprehensive system for the Smart Factory of the Future (Smart Factory). Asseco CEIT Smart Factory is a Digital Factory extension that extends this concept to a Virtual Factory and Digital Twin. It is based on data from a real-life factory, obtained through omnipresent sensors. Such data representation of a real-life manufacture with artificial intelligence support is a prerequisite for autonomous control and self-optimization.

Asseco CEIT customers include leading industrial companies in Slovakia and abroad.

**Asseco CEIT, a.s.**

Univerzitná 8661/6A

010 08 Žilina

Slovak Republic

<https://www.asseco-ceit.com>





Powered by

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**Sewio Networks, s.r.o.**

Sewio Networks is a manufacturer of a **real-time location system (RTLS)** for indoor tracking that drives business results for companies in the intralogistics, retail, sport, entertainment and livestock industries. Sewio system is built on **ultra-wide band technology (UWB)** and delivered with RTLS Studio, remote management and visualization software.

It gives partners and customers a precise, easy-to-integrate, reliable and fully scalable IoT solution for indoor tracking that allows process visibility, boosts production efficiency, simplifies the inventory process and increases safety. Founded in 2014, Sewio is headquartered in the Czech Republic with offices in Germany and France. Sewio has 70+ system integration partners and powers customers in 37 countries. Customers include: Volkswagen, Budvar, Pirelli, Matador, TPCA, Škoda.

JIC INMEC, Purkynova 649/127

612 00 Brno

Czech Republic

<https://www.sewio.net/>