

**SOLVEWARE AS
MAINTENANCE**

INDUSTRIES & MARKETS

Department of Business Development
SOLVEWARE AS

MAINTENANCE IN INDUSTRY

In Solveware AS we deliver solutions in three main areas: Augmented Reality, Tracking and Navigation, and 3D scanning, planning and modeling.

If you want to learn more about these solutions separately check also "Search by Product, Use and Solution" in "Integrated Solutions" at solveware.no

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We invite you to add your organization's name to the list of distinguished clients in industry, such as Siemens or Nokia, who have already implemented our solutions in their workplaces.

Industry is highly complex and dynamic, and recently more than ever it is evolving towards automation, energy efficiency and sustainability. In Solveware AS we strongly believe that AR and IT solutions should be a part of this change.

Equipment & Reparations:

SMART PANELS:

By using our Smart Panels you are replacing bulky, technically complex, expensive, and highly energy consuming machinery operation panels that require extensive maintenance and constant check-ups, that can easily be operated by accident or by third parties that are not supposed to.



Smart Panels are cheap and easy to mass-produce layers of metal or plastic, or even stickers, with a certain code that can be read and operated hands-free by AR glasses at meters of distance. These panels can also be operated from a physical device such as a phone instead, however on sea-side or indoors industrial environments we recommend the use of AR glasses, as they allow you to work hands-free instead of carrying a bulky device. They require no maintenance nor any physical contact, and they have no internal mechanical or electronic components.

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At the same time, Smart Panels are fully customizable, and can be easily adapted to incorporate any custom machine routine or operation process as a new button or a new user interface. The elements on the panel can be re-arranged by operators, or even to fit the needs of a certain user, we understand that different employees will focus on different tasks, with this we can simplify that as much as possible.

These panels are also very valuable for reparation and security reasons, as they can only be operated and viewed by authorized personnel. At the same time they can log or record all actions performed in the panel. If there is a problem on the operation of a machine it will be fast and simple to determine the cause, how to fix the problem, and exposes the people involved on the error as well as the actions taken to fix it, if any.

Another interesting feature of Smart Panels is that they can be operated without access to internet, as the actions performed in the panel will be logged into the application, and will be updated automatically once the device finds internet access.

Smart Panels are compatible with AR and VR glasses, phones and tablets, as well as many other devices with a camera and internet connection.

SMART CHECKLISTS:

Smart Checklists work similarly to the Smart Panel, as they can be operated hands-free and have access to real-time information about the machine. Their main utility is to ensure that certain routines or procedures are being followed in order to properly operate equipment or machinery.



Smart Checklists can either be created manually by an operator, or automatically by creating some kind of script that analyzes information from the machine and determines the tasks that must be followed by staff.

All information will be updated automatically and online, eliminating the need of submitting information manually to the server, which is a waste of time.

At the same time, Smart Checklists can be operated remotely by staff or support if needed.

SMART EYES:

Industry has to deal with an environment where the work conditions are always changing and operators are constantly facing technical challenges. Smart Eyes is a game-changing solution that provides a hands-free virtual operation environment, which can be enhanced with online technical support. By using Smart Eyes, operators can connect their AR glasses with online support, which allows for real-time communication with technical experts or supervisors.

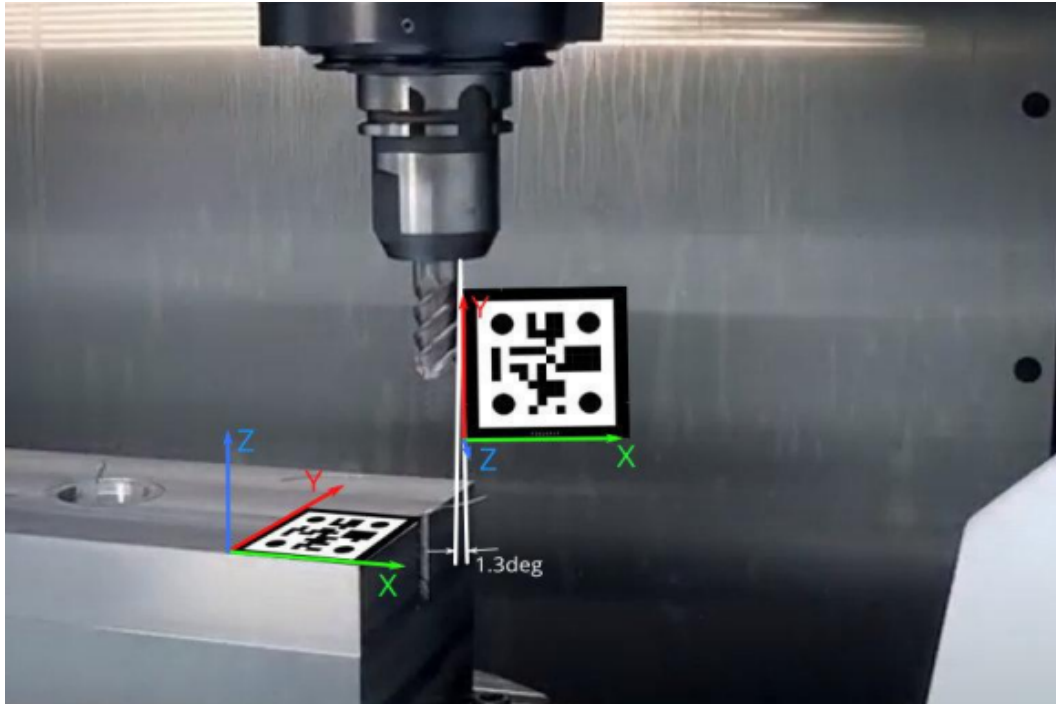


One of the key benefits of Smart Eyes is the ability to display real-time data from machines or equipment in the field of view of the operator's AR glasses. This enables operators to quickly and easily access critical information, such as machine status, performance metrics, and other important data, without the need to look away from the task at hand. Additionally, operators can receive guidance and technical support from experts who can see exactly what the operator is seeing in real-time, ensuring faster resolution of technical issues and reducing downtime.

Quality Control:

SMART MARKERS:

Smart Markers represent the next stage in the evolution of QR codes. These markers are significantly faster to read, as they can be accurately read in real-time by machines from multiple meters away, and can be also read with low luminosity and from almost any angle.



By employing our Smart Markers, users are able to conduct precise, real-time measurements with an accuracy of up to the millimeter. These measurements can include the distance between objects, positioning, inclination, and various other measurements that are made completely hands-free, without the need for any additional measuring or precision tools.

Smart Markers can also offer real-time machine status and operation information, that can be accessed hands-free with AR glasses, or with the use of any phone or tablet.

Smart Markers offer a wide variety of different uses in industry, and will be explored accordingly in the following categories.

HANDS-FREE PDF READER

With our Hands-Free PDF reader solutions for AR glasses you can have access to instructions and information and navigate through them without the need of holding a device or a physical instruction manual, thus allowing you to inspect machinery freely and efficiently while having access to information in regards of it.



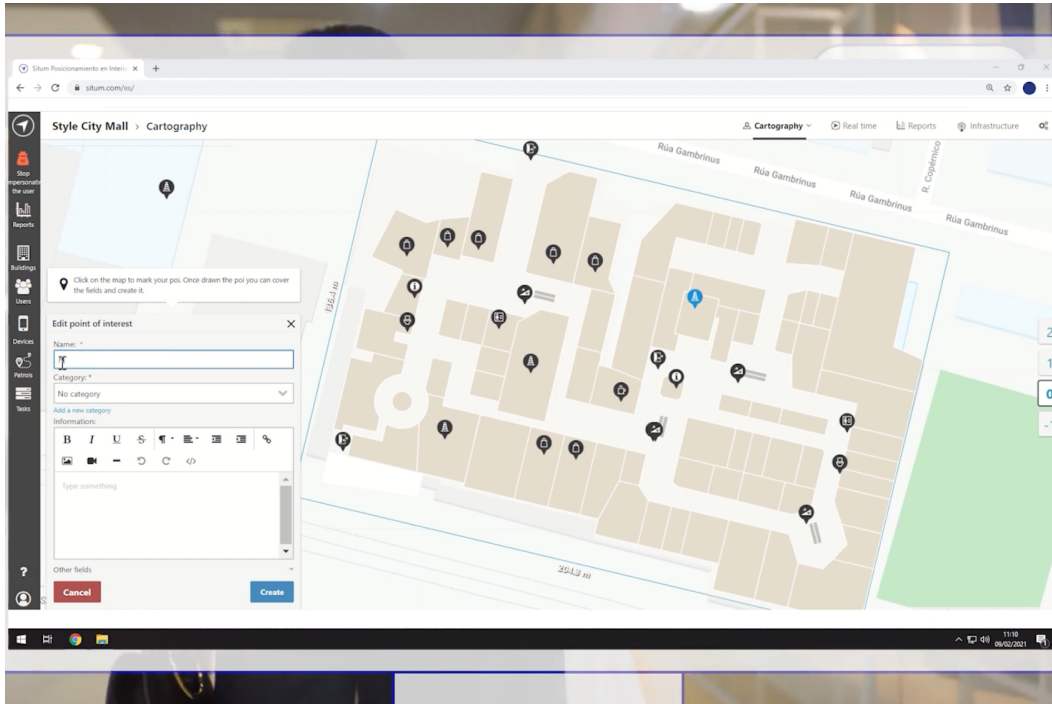
Our hands-free PDF reading solution can be operated with simple voice commands, with gestures or by touching the smart glasses, depending on the preference of the customer.

The information can also be updated online both by the operator or by an external agent that will send information instantly to the user, without the need of manually importing it to your smart glasses.

You can customize the size and location of the display of the pdf documents in order to have access to information while working on a comfortable manner easily adjustable to your needs and preferences.

TRACKING AND SMART NAVIGATION SOLUTIONS:

We offer two alternative Tracking Solutions to locate on real time any employee or visitor in your facilities. This is a way of ensuring security as well as that all check-ups and quality controls are being actually done, as well as that safety protocols are being enforced.



One way of achieving this is with the use of Smart Markers, which has the advantage that it logs these routines or procedures offline, and will be uploaded to the server as soon as the AR glasses gain access to internet connection. This is very advantageous in environments with connectivity problems, such as in Faraday Cages, underground facilities, or others.

We can also achieve this with an algorithm that creates a coordinate system with your wifi network and using some repeaters or beacons. The main advantage of this procedure is that we no longer rely on using AR glasses or any camera, and works perfectly on any phone or tablet. We are currently testing this on smaller devices similar to Apple Tags that can be carried like a pin, and that would monitor the location inside the facilities.

This second method is significantly more economical and easier to implement among a large amount of workforce, as it works on many kinds of devices and does not depend on the camera to detect Smart Markers to locate you on real time.

3D SCANNING FOR FACILITIES:

With our advanced 3D scanning technology and devices, industry professionals can generate highly accurate 3D point cloud maps with an astounding 99% precision rate perfect for measurements. These maps can be quickly and easily converted into detailed 3D models or floor plans.



Gone are the days of relying solely on engineers to update facility layouts, including new machinery, piping, or expansions. With our solution, most of the modeling process can be automated, enabling you to make necessary adjustments with ease.

In addition to simplifying facility updates, our 3D scanning solution is a game-changer in the field of Quality Control. With the ability to evaluate work environments, facilities, machinery proximity and location, piping, and more, this technology streamlines QC tasks like never before.

The benefits of our solution extend beyond mere mapping and modeling. With the use of these 3D point clouds and models, industry professionals can perform highly accurate measurements, create 3D tours, deploy the facilities to physics simulations and even virtual rendering engines, providing an immersive and comprehensive view of your facility.

SMART CHECKLISTS:

With our Smart Panels you can deploy Smart Checklists in your workplace, streamlining quality control processes and improving overall productivity.

By leveraging this easy-to-integrate technology, quality control routines can be configured and automatically deployed with ease, along with protocols and conditional statements to ensure maximum precision and efficiency.

With Smart Checklists, you and your clients can enjoy greater peace of mind knowing that every critical aspect of your operations has been accounted for and streamlined to ensure optimal performance.

SMART EYES:

As previously explained, with Smart Eyes you can combine online support with a hands-free virtual operation environment, in which the support team can be granted access and collaborate with operators and workers.

Maintenance Tasks:

SMART ALERTS:

Join Nokia on the list of companies upgrading their alert systems to include our Smart Alerts solutions, which provide a more comprehensive alert system with more detailed information easily accessible with your smart-watch, AR glasses or any device.

Give your supervisors or operators more information about alerts, such as parameters, real-time data from the facility or machinery as well as indications on the relevance of the alert.



SMART EYES:

As previously explained Smart Eyes is a solution that allows connectivity between technical support and machine operators and supervisors, as well as technicians evidently.

This allows experts on the maintenance of a machine or a piece of equipment, for example the manufacturer or a technical support team, to involve in the maintenance or inspection of said machine.

This solution also allows companies, specially those with limited resources, to instruct their employees with instructions on the maintenance of machinery instead of hiring a technician for the task.

SMART PANEL:

Smart Panels not only require no maintenance, they also offer technical advantages over traditional control panels, as they can be operated on the dark, they can be easily moved or adjusted, and the lay-out of the buttons can be adjusted depending on the task.

SMART CHECKLISTS:

Smart Checklists can be used both to guide workers on maintenance tasks as well as ensuring that maintenance routines are being followed.

This solution can be programmed to require proof of work, such as automatically recording the actions of the machine operator or allowing him to submit photo, video or audio if necessary.

Measurements & Scanning:

3D SCANNING FOR FACILITIES:

At Solveware AS, we understand the unique challenges presented by industry. The hard and dynamic work environment present in factories, facilities, or other industrial environments, can make facility expansion and design a daunting task. That's why we offer a 3D scanning technology that is specifically designed to meet the needs of this industry.

Our 3D scanning technology is fast, simple to use, and boasts an incredibly high level of accuracy. It simplifies the facility design process, makes it faster, and minimizes human error. Additionally, it streamlines the entire process of updating blueprints or floor plans, significantly reducing the number of engineers and architects required to perform this work. This is particularly beneficial for organizations working within tight budgets and strict timelines.

Additionally, our team of experts is committed to providing comprehensive support throughout the 3D scanning process, ensuring that industry professionals can achieve their facility design and expansion goals in a timely and cost-effective manner.

Work Routines & Employee Management:

TRACKING SOLUTIONS:

In large industrial environments keeping track of work routines and employee performance can be a daunting task for managers and supervisors. At Solveware AS we understand the importance of effective employee management, and thus we are committed to integrate these solutions to simplify the process.

Our tracking solutions use advanced technology to automatically determine whether employees have completed their tasks and followed work routines or procedures. This not only ensures productivity and efficiency, but also maintains safety and compliance in dynamic and complex work environments.

We offer two different types of solutions depending on the specific needs of the customer. Our first solution is specialized for online and offline use, and it records all interactions of workers with equipment or machinery through the use of AR glasses.

The second solution is designed to be mass-integrated among employees to record their movements with higher accuracy while not requiring AR glasses, as previously explained this can be done with the use of smartphones, tablets, and we are currently testing small pins similar to Apple Tags that are much more comfortable and light-wear. As this is a more specific solution with a wifi-network based approach, it does not track interactions with machines directly, but it can be done indirectly as well.

Both solutions are fully customizable and can be integrated together if needed, providing a comprehensive tracking system for employee management in any industrial environment.

Security:

TRACKING AND SMART NAVIGATION SOLUTIONS:

In industrial environments security is of the utmost importance due to the high-risk nature of the work environment. At Solveware AS, we offer tracking and smart navigation solutions to enhance security measures in facilities. Our tracking solutions not only allow managers to monitor employee and equipment movements within the facilities, but also track external agents such as technicians or inspectors to ensure they do not access restricted areas.

Due to technical and security matters, we further recommend our solution based on creating a coordinates system using wifi networks, as it does not require the use of AR glasses. This solution allows for accurate tracking of individuals and equipment in real-time, ensuring that all movements are accounted for and any potential security breaches are quickly identified and addressed.

SMART PANEL:

As previously mentioned, our Smart Panel technology provides an extra layer of security as it can only be operated by authorized users, unlike traditional control panels. This ensures that only trusted individuals have access to machinery, reducing the risk of accidents or unauthorized usage.

Environmental Impact:

Further elaborating on the technical aspect, our Augmented Reality solutions require significantly less energy consumption and resources compared to traditional means of machine operation, maintenance and alarm systems. This is because our solutions are based on smart approaches to industrial equipment focused on simplifying and updating equipment, in a certain manner that reduces the amount of energy, work and resources needed to operate, modify, and maintain them.

SMART PANEL:

The concept is very simple, with traditional means every single control panel is directly connected to electricity and to a machine, having hundreds of energy consuming panels within the work space of a facility. With our Smart Panels one set of AR glasses can operate an infinite amount of panels, that do not require to be connected to power and neither physically to the machine, they are a physical interaction method with your control server.

SMART EYES:

Smart Eyes is a solution that provides remote assistance and video collaboration in real-time, allowing experts to remotely guide workers on site. This technology helps to significantly reduce costs and carbon emissions, as experts can avoid traveling to remote locations for inspections, maintenance, and repair tasks.

Overall, our solutions offer a practical and effective way for modern industry to transition towards a more environmentally friendly and energy-efficient future, in which less physical travel is required as we let technology bring us closer instead.

Data Management:

Our advanced AR solutions provide industries with a reliable and efficient way of keeping track of the operation of machinery and equipment, as well as inventories and production processes. We offer a sophisticated way of logging all information related to the production of goods, from the input of raw materials to the output of finished products. This includes tracking the number of units produced, the status of equipment, and any maintenance or repairs required. This information is automatically submitted to the server and updated in real-time, ensuring that managers and operators have access to the most up-to-date data at all times.

This level of automation provides a significant advantage to all industries, reducing the likelihood of human error and streamlining the tracking process. Our AR solutions provide a reliable and efficient way of keeping track of inventory and production data, allowing businesses to make informed decisions and optimize their operations.

Training:

At Solveware AS, we understand the importance of properly training employees, particularly in complex and dynamic industrial environments such as the ones being shaped nowadays. That's why we offer various AR and IT solutions that can greatly benefit employee training and development.

For example, our Smart Markers can be used to provide hands-free and precise training on various measurements, such as distance, positioning, inclination, and more. This allows for a more interactive and engaging learning experience, while also reducing the need for expensive measurement or precision tools.

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In addition, our tracking solutions can be integrated into employee training programs to ensure that work routines and procedures are being followed accurately. This helps to prevent human errors and ensure consistency in training across all employees.

Furthermore, our AR glasses with Smart Eyes technology can also be used to connect employees with online support and technical supervision during training. This provides a valuable resource for employees to receive guidance and assistance in real-time, without the need for the support team to be physically present.