OPTIMUM
datamanagement solutions

HW Technologies
www.hwtechnologies.com.au

4.O

OK

„ZERO-ERROR is achievable!"

Reducing complexity, relieving pressure from employees, preventing errors directly at their source

Instruct   Check   Confirm   Document

Know what's what.

Almost all information about products, processes and procedures is already stored digitally within the company right now. It is therefore easy to access and can be used productively straight away. We still frequently have the luxury of being able to process this data in the form of manual work guides and instructions and provide it in the workplace in print. Even elaborate training is often not enough, as complex process and product knowledge overloads employees and makes them overworked. Errors easily creep in at many points.

Under the maxim **"know what's what."**, we are taking a new, pragmatic approach and incorporating relevant master data automatically in our training time. We are thus networking already existing information (master data) and using it, enriched with our training data, to optimise processes and for the automation of sequences. In doing so, we show the employee in real-time the respective necessary process steps, look directly over their shoulder with the four-eye principle and confirm that they have completed their task with 0 errors. If desired, the outcomes can be logged and mirrored back directly in your IT system. You can therefore demonstrate at any time when which process and item was worked on and know 100% when it has left your company in flawless condition. We call that **"knowing what's what."**.

PRAGMATIC SOLUTIONS

for almost any area of application

As specialists in industrial image processing and intelligent database systems, we have developed assistance systems that enable cooperation between people and computers in real-time as "thinking workstations". Through the close interaction of cognitive ergonomics and direct integration in your process, we achieve the highest efficiency and at the same time clear relief for employees.

The objective: zero errors through intelligent quality testing in real-time

Even complex process chains in assembly, commissioning, logistics and quality assurance are visualised and processes are thereby made easier and safely designed. Employees will not only notice relief, but with every substep they will receive an active target of action and confirmation of success. Errors are combated directly at the source and actively avoided. The employees are thereby guided safely through the process as though by a navigation device.

Right away, expensive subsequent deliveries or returns are a thing of the past. With the "Schlauer Klaus" (Smart Marc), you will achieve a recording of zero errors! The ease of use and innovative user control means that new versions, products and components can be self-programmed extremely easily.

With the new module systems, the areas of application of the "Smart Marc" are even more diverse, and individual modifications can be carried out even more quickly and flexibly.

Ask for us – we are always there for you!

Wolfgang Mahanty
Sales Director

Incoming goods

Identification

Outgoing goods

AREAS OF APPLICATION

Assembly

Final check

Commissioning
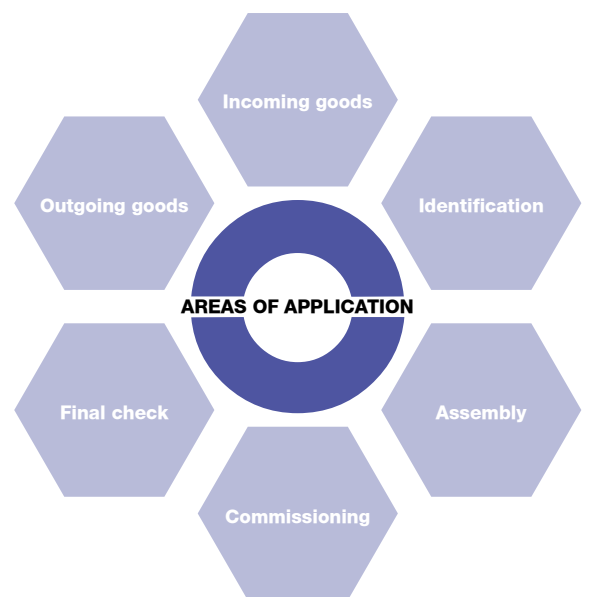
Wolfgang Mahanty is an expert in the fields of **Work 4.0** and **Industry 4.0**.

In his talks, he explains to a broad audience nationwide not just the prerequisites for the success of the digital transformation, but at the same time provides practical examples from his daily work with the "Smart Marc".
The assistance systems work productively in the most varied of areas.

Since 2015, the „**Smart Marc**" has been distinguished with five prizes for innovation.

APPROVE: "SCHLAUER KLAUS"
– Your guarantee for a ZERO ERROR LOG!

The modular construction and elaborate design enable the "Smart Marc" to be integrated at all points - even retrospectively. Expansions and additional modules can be easily added on at any time. Your assistance system will therefore grow with its tasks and always adapt itself individually to every challenge. High-quality materials and components guarantee not just longevity, but also optimal work results.

High-resolution HD 21.5" touchscreen:
Direct, easy operability, even with work gloves, processes are clearly visualised and can be controlled directly.

Light sources:

Energy efficient LED panels, optimised for image processing in 120cm x 80cm format and with a light intensity of up to 2000 lux on a work surface guarantee reliable illumination.

An additional light underneath can be used to delineate contours better. The lights underneath enable interaction with the operator on the work surface. Input requirements and feedback are directly shown on the work surface.

Alternating coloured light to support the optical signal

- ☐ White: system checked,
- ☐ Yellow: system awaiting action by employee,
- ☐ Red: outcome is outside of the permitted error tolerance,
- ☐ Green: process carried out well and correctly
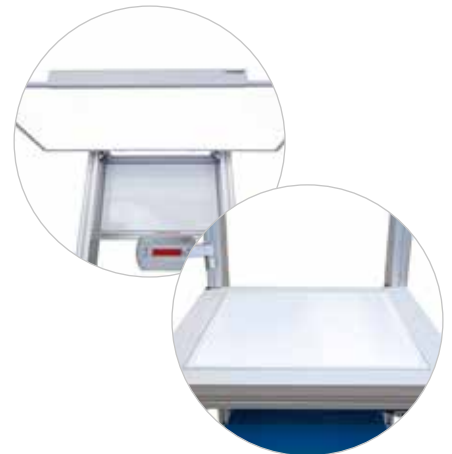
Keyboard:
As an alternative to the touchscreen, the system can also be controlled via the keyboard. Via the serially built-in swivel arm, it can be placed freely.

"Smart Marc" processor unit:

Powder-coated switch cabinet. High-performance PC with min. 4 Ghz quad core processor and hyper-threading technology, based on Windows 8.1 Industry Pro. All necessary connections for external devices are built-in serially. Among other components, up to two integrated gigabyte network adapters are available for connection to other systems.

Other additional options:

○ IO module
○ Interfaces with all client systems possible

Scales:

In some application cases, the sole operation of one or more cameras is not enough. To determine the weight, a set of scales along with an evaluation unit, weigh bridge and technical accessories can be added. The standard is max. 15kg with 1g resolution.

Camera:

One or more USB 3.0 industrial cameras with 0.5" CMOS sensors by Sony. Extremely high resolution of up to 18 megapixels (4912 x 3684). Objectives are selected and built-in according to the task.

Workstation:

The components of the "Smart Marc" can be easily integrated on existing workstations or throughout as a new workstation.

Accessories:

We provide selected accessories for special tasks and applications, so that processes can be made even more effective. The possibilities thereby range from barcode readers and RFID readers to electronic measuring devices such as torque wrenches and calliper gauges with integrated Bluetooth technology.

All you need to do is get in touch.

Simple principle, resounding effect!

Over four steps, people and computer systems work hand-in-hand together in real-time. Processes are separated into substeps and can therefore be checked easily. The "Smart Marc", image processing soft-ware supported by an intelligent database, connects real processes with digital data streams using industrial cameras.

Instruct

Check

Confirm

Document

The interface between the real and the virtual world

Even complex, safety-relevant components can be safely identified and made digitally detectable. Each item property being tested is automatically compared with the specifications entered. Errors are recognised straight away and the system prompts correction. Correctly completed substeps are confirmed. The visual documentation of all substeps can be stored by the system as a record if required and serve as proof of the test results. No more expensive training times - once programmed, functions and checks will never be forgot again. The data is fed back to the quality management system and other systems via integrated interfaces.

Instruct

The employee is led through the process audiovisually via a touchscreen; they are shown which work steps are necessary. This means that any new employee can safely and correctly operate the process even after very short periods of training. Employees are led through the whole process in real-time and can be used considerably more flexibly. Sequences are safer, and there is no physical stress in the first place.

Check

Using one or more cameras, the "Smart Marc" checks whether the work step is being carried out correctly. The system checks every substep automatically and communicates directly with the employee. Via the integrated quality assurance, measurement, weighing, counting and identification is carried out in real-time.

Confirm

Once the task has been completed correctly, the system confirms this with "OK". If the employee commits an error during assembly, the system gives an acoustic signal and also instructs the employee optically to carry out the step correctly. Through the dialogue between computer and humans, feedback is provided in real-time. Errors can be prevented directly at their source.

Document

Every process that is correctly carried out can be documented in individual steps. If requested, later verification is possible at any time. Recall actions or expensive complaints and subsequent delivery of missing parts are a thing of the past.

Surveys of workforces in companies that use the "Smart Marc" in production confirm success: Employees mention clear relief and see our assistance systems as "intuitive colleagues" and "helpful assistants". Quality managers and technicians report a dramatic reduction in error ratios since the system has been in use.

AREAS OF APPLICATION

A low-maintenance, versatile problem solver

The "Smart Marc" has many faces and can be used in various different areas. We will accompany and advise you from the first day onwards and design your "Smart Marc" exactly according to your require-ment profile. We will be on-site during the start phase to instruct your employees.

Incoming goods

Identification

Even after the transfer, we will be at your service at any time. All our clients are independently administrating new data after a maximum of half a day's training time. Simple, intuitive menu guidance makes it possible.

Incoming goods

Whether you are measuring, weighing or testing: Delivered goods, of which the specific properties are programmed once in the system, are reliably identified and determined via the camera system. Manual activities are reduced, and employees are led safely through the process and directed to the next step. The data transfer of measurement data in your systems (WMS, MES etc.) is carried out automatically.

An innovative special company for pipe and filter technology relies on the "Smart Marc" for the safe handling of incoming goods and the logging of returns. Shortened throughput times and the omission of the manual comparison of catalogue documents and products simplify processes and make work in the incoming goods department much easier.
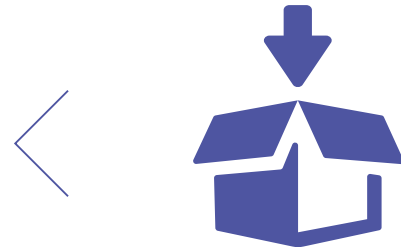
Identification

An item unknown to the employee is recognised by the camera over the work area and safely identified. Thereby, the "Smart Marc" not only displays the item, but also provides information in a split second about subsequent process steps and indicates the next work award. Additional information, such as the storage space, can also be shown.

A leading global logistics service provider from Germany carries out the sorting and storage of so-called trays, that are used as carriers in the manufacturing of computer chips, for one of their clients. The specific carriers are as varied as the number of different computer chips is high. These are collected after use regardless of their type and must be sorted again for recycling. With the approximately 1,800 different variants, the differences are sometimes within the millimetre range. The camera-based assistance system identifies safely and reliably in the shortest possible time.

Assembly

As the "Smart Marc" always has its work area in view and recognises and aligns even the smallest details, complex assembly situations can be reliably projected. The employee is led through the process and receives direct feedback as to whether an error has been made or whether the product has been correctly fitted.

Household appliance manufacturer Miele uses the "Smart Marc" for the pre-assembly of switch panels and small parts in the production of dishwashers. Despite an unbelievable range of variants, incorrectly assembled pieces are a thing of the past and relaxed employees are happy that their "colleague Marc" always looks over their shoulder virtually at the right time.
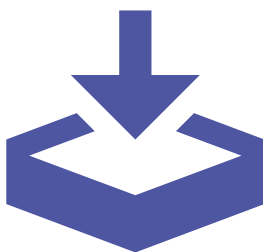
Commissioning

Unlike conventional text, image and video instructions that are intended to support employees, the "Smart Marc" watches in real-time and helps by showing the packing list and checking that the products being commissioned are correct and complete. Error ratio: Zero! If it discovers an error, it reports it clearly and requests action. Errors no longer remain undiscovered and are corrected straight away.

A popular machine-building company tasked Optimum with the clear objective of significantly reducing the number of commissioning errors during packaging. Feedback just a few weeks after the beginning of use: The error ratio is clearly approaching zero, motivation has increased in the department as a result of direct feedback. The visual confirmation and display of the rendered service in the system is confirmed by the employee, who is under no more pressure to perform.
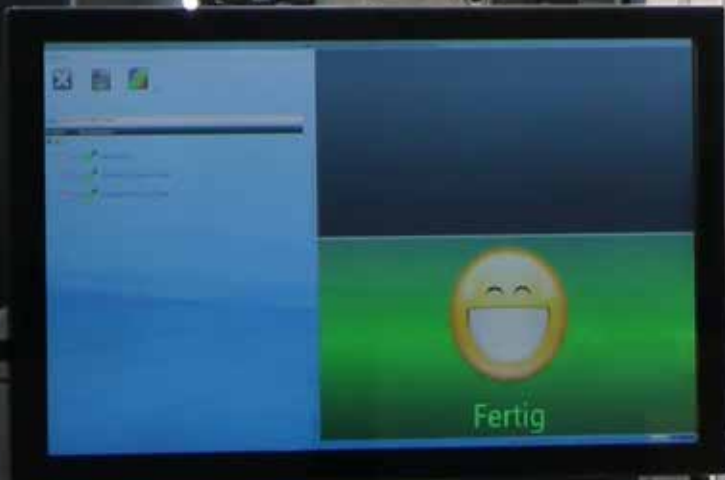
Final check

Reliable presence checks and quality testing of screw fittings, seals, bolts, attachment parts and safety instructions on six sides with over 100 different test items. A manual challenge for all involved - children's play for the "Smart Marc".

HOSA Aircraftcompletions GmbH uses the "Smart Marc" to check complex interior linings of helicopters on all six sides. Clear result: 100% precision in the final check and absolute customer satisfaction because of significantly faster and safer delivery.

"The Optimum assistance systems have reduced the test time by 90% and the error ratio per set of interior lining by 100%. We are delighted about having satisfied customers and safe processes"
(Uwe Sander, managing director of HOSA).
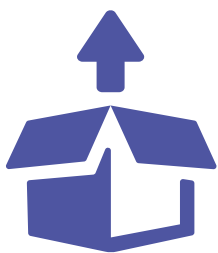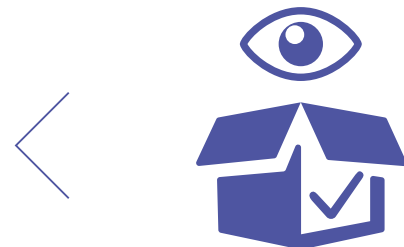
Outgoing goods

Errors often occur in outgoing goods departments due to complexity and variant diversity. Our assistance systems lead people safely through the process and look over the shoulder of employees as part of the four-eye principle. With the logged images, it can be demonstrated at any time that the goods have been shipped completely and in faultless condition. Even elaborate manual activities become transparent and controllable.

You can also find further information on our YouTube channel at: https://www.youtube.com/user/OptimumGmbH

THE "Smart Marc"
– Modules & add-ons

With our new module system, the "Smart Marc" can now be even more easily configured and adapted to your specific requirements. Firstly, you select the function type and the modules. You then select the add-ons - the additional services you can allocate to certain functions as an expansion.

„Schlauer Klaus WE" for INCOMING GOODS:

WE basis	Assistance systems for easy, automatic and error-free identification of items in the incoming goods department. Previously programmed items are safely identified using optical features in any sequence.
Module 1	**Underneath lighting** for the backlighting of work surfaces and the depiction of functions and visual instructions directly in the work area.
Module 2	**Scales** for the automatic identification of items by weight.
Module 3	**Completeness check.** The system also reliably checks that the amounts are correct.
Module 4	**Position check.** Reliable, error-free check to make sure all the item's components are fitted in the right places.
Module 5	**Random sample testing.** The assistance system also helps testing in accordance with ISO standard 2859.

„Schlauer Klaus IDENT" for IDENTIFICATION:

IDENT basis	Assistance systems for the easy, automatic and error-free identification of items. The system automatically reports on subsequent process and work steps. Previously programmed items are identified in any sequence using optical characteristics.
Module 1	**Underneath lighting** for the backlighting of work surfaces and the depiction of functions and visual instructions directly in the work area.
Module 2	**Scales** for the automatic identification of items by weight.

„Schlauer Klaus **MONT**" for **ASSEMBLY**:

MONT basis Assistance systems for the simple and error-free positioning of components and support in other assembly tasks. The system automatically provides information about subsequent process and work steps and reliably guides the employee.

„Schlauer Klaus **KOMM**" for **COMMISSIONING**:

KOMM basis Assistance system for the easy visual commissioning of items. Previously programmed items are identified with the help of optical characteristics. Module 3 with its reliable **completeness check** is just part of the basic configuration.

„Schlauer Klaus **END**" for **FINAL CHECK**:

END basis Assistance system for the easy automatic checking of the position of items in the final check. Previously programmed optical characteristics are checked.

Module 6 **Identification.** The assistance system identifies the specimen and carries out the assigned test programme.

„Schlauer Klaus **WA**" for **OUTGOING GOODS**:

WA basis Assistance system for the easy, automatic and error-free identification of items in the outgoing goods department. Previously programmed items are identified in any sequence using optical characteristics.

Module 1 **Underneath lighting** for the backlighting of work surfaces and the depiction of functions and visual instructions directly in the work area.

Module 2 **Scales** for the automatic identification of items by weight.

Module 3 **Completeness check.** The system also reliably checks that the amounts are correct.

Module 4 **Position check.** Reliable, error-free check to make sure all the item's components are fitted in the right places.

SENSIBLE ADD-ONS
for the WE, IDENT, MONT, KOMM, END, WA assistance systems

Add-on 1
Versioning

Here, the version of a checklist is preserved and can no longer be changed. A change will result in a new checklist version. For later traceability and as proof of quality, the basic version of the checklist is saved during the implementation of a test (for MONT and END).

Add-on 2
Variant control

Via a previously programmed catalogue with variant characteristics of an item, the employee can select relevant characteristics for the test automatically. Variants can be programmed in any number (for MONT and END).

Add-on 3
Logging

The "Smart Marc" automatically takes over uninterrupted documentation of the test results. In doing so, the level of documentation can be defined, from no documentation to complete documentation with picture evidence.

Add-on 4
12 Months Support Plus

If you have any questions, our team is available at any time on the phone or via TeamViewer. Short response times, usually within half a day, but within three working days at the latest between 9am and 5pm.

SATISFIED CUSTOMERS
as the backbone of success

With the "Smart Marc", we are offering you well-engineered solutions for the incoming goods, identification, assembly, commissioning, final check and outgoing goods areas. Today, our systems are already being productively used in numerous renowned companies each day.

At various different points, people rely on the intelligent collaboration of people and computers in real-time, count on the Optimum value-added chain and work according to our zero-error strategy.

A "Smart Marc" is always individually adapted to the situation and the assignment on-site. Even beforehand, we use feasibility studies to simulate both the possibilities and the extent of the planned tasks.

We may not know your requirements yet, but we already know that the "Smart Marc" will shift your error ratio to zero, reduce complexity and significantly relieve your employees.

Get in touch!

Right now you will find our systems in aviation technology, logistics companies, machine and plant construction, and in the electronics, white goods and automotive sectors.

Excellent innovations - guaranteed

The high affinity to research and development is not without consequences. In the past 12 months, our "Smart Marc" assistance system has been distinguished with prestigious awards several times for innovation and progress. We are very delighted and regard each individual prize as a duty to carry out further research and development.

Best Assembly Idea 2016

At the 27th German "Montagekongress" (Assembly Congress), we were awarded second place for one of the best assembly ideas of the year. The jury was thrilled by the reduction of complexity and the ergonomic solution approach for staff.

„DIE BESTE MONTAGE-IDEE 2016"

Sparkasse Innovation Prize

The Schwarzwald-Baar Sparkasse bank distinguished the joint project "Workplace 4.0" by Optimum GmbH, Bedrunka + Hirth and the IFL (Institute for Material Handling and Logistics) at the KIT in Karlsruhe with first place as a special encouragement for the innovative performance.

Handling Award

handling award 2015

2. Platz

Arbeitsplatz 4.0
„Schlauer Klaus"

In 2015, Optimum GmbH, Bedrunka + Hirth and the IFL (Institute for Material Handling and Logistics) at the KIT Karlsruhe were given the Handling Award 2015 for the "Workspace 4.0" joint project. The award was given during the MOTEK 2015.

IT Innovation Prize

In the "Quality Management" category, the "Smart Marc" was given 2nd place for the IT Innovation Prize. The combination of intuitive user guidance and error correction in real-time was able to convince the judges once again.

INNOVATIONSPREIS-IT
2016
initiative mittelstand
MITTELSTAND

Senetics Award

At the medical technology symposium in 2016, the "Smart Marc" reached third place in the "Best Supplier or Service Provider in the Field of Healthcare" category. Actually achieving a zero-error ratio was seen in the medical industry as an especially important criterion for the award.

senetics
Innovation-Award 2016
3. Platz
Optimum datamanagement solutions GmbH
Kategorie:
„Bester Zulieferer oder Dienstleister im Healthcare-Bereich"

Already thinking about tomorrow today

Research and development are a hobby horse and motivation at the same time. Therefore, we are already working with dedicated professors and students on the solutions of tomorrow and developing new hypotheses and solution approaches. The results are permanently flowing into the further development of our assistance systems and ensuring that the "Smart Marc" is always being reinvented and permanently further developed.

Technical University of Munich

In the "Learning Factory for Lean Production" (LSP), a real production environment is mapped. Under the supervision of Professor Reinhardt, tests are carried out to measure the extent to which the individual capabilities of individual employees can flow into the configuration of the systems. Thus, the "Smart Marc" recognises the resilience via an ID chip, but also sees the physical limitations of the individual employee, adapts to the situation and provides even more individual support in order to give more effective relief.

TUM
Technische Universität München

ZEMA - Centre for Mechatronics and Automation Technology

Shorter and shorter product life cycles and increasing variant diversity directly affect complexity in assembly planning. As a result, there are completely new correlations, but also restrictions, for the planning and monitoring of processes. In one holistic approach, "product-process-operating materials", new approaches, process chains and operating materials are indicated, developed and tested together with the ZEMA.

ZeMA
Zentrum für Mechatronik und Automatisierungstechnik

Fraunhofer IFF

Modern production systems for the manufacturing of bulk products are shaped by a high degree of automation for processes and production sequences. Optical systems are becoming more and more important in testing. In close coordination with Dr. Bernd, we develop the networking of laser technology and 2D image recognition for a new generation of dimensional and geometric visual testing.

KIT

Within the framework of a European research project, we developed the prototypes for the "Smart Marc" assistance system in cooperation with the IFL at the KIT, and Bedrunka + Hirth. Through the interplay of innovative databases, 2D and 3D camera technology and intuitive gesture control, a system was created that prevents assembly faults and reliably logs processes. Further projects are being planned.

Fraunhofer IAO

In a joint research project, we are developing new approaches for cognitive ergonomics and combining current trends from the key topics of Industry 4.0 and Work 4.0 under occupational aspects. The objectives include the definition of new value-added chains with simultaneous integration and the depiction of an ideal employee environment.

THE DIGITAL TRANSFORMATION
as a driving power for innovation

For over 20 years, we have been occupying ourselves with what people now like to summarise under the catchwords Industry 4.0 and Work 4.0. In doing so, our approach is much more pragmatic and interdisciplinary. This is because we combine the use of intelligent databases and digital image processing systems with the principle of cognitive ergonomics.

Task of the digital transformation: People are at the centre

Thus emerge innovative assistance systems which optimise process chains, as well as automating sequences and reducing complexity. We are also developing human-computer workstations that enable team work in real-time and defuse stressful situations. Employees are therefore significantly relieved by information tuned to the respective process step.

People and computers are thus motivated and work hand-in-hand. Because of this entwined collaboration, we have succeeded in combatting errors at their source and correcting them in real-time.

The results are astonishing and convince our clients across all industries. Error ratios are reduced to zero and employees report a reduction of stress in the workplace.

We do not yet know your problem, but we are already working on the solution

Several research projects illustrate the core of our work, whereby we are always further developing our assistance systems in cooperation with universities. We are thus already working on the solutions of tomorrow.

Flat hierarchies, a highly motivated team of employees with visions and a unique work atmosphere are the basis of our extraordinary success.

Pay us a visit in Karlsruhe and get to know us.

Notes

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