



SMART IRIS - Innovative assembly process supervision





SMART IRIS

INNOVATIVE ASSEMBLY PROCESS SUPERVISION

ASK and Airmatic provide with SMART IRIS customized tools for Industry 4.0.

IRIS equipment is intended to supervise assembly processes, ensuring working according to the specifications to improve productivity of the process and quality. The system is composed of the two following main components:

A special camera to monitor working area, which is placed over the work station to determine, with high accuracy, the spatial position of objects located within its angle of view.

Software to control the working process, running on a dedicated computer while processing, at high speed, data provided by the camera, and it is able to supervise the assembly process by evaluating these data.

THE MOST IMPORTANT ADVANTAGES OF THE SYSTEM:

Easy to integrate, since the existing workplaces can be made compatible with the IRIS equipment with minimal mechanical modifications.

Low installation cost, because there is no need for expensive sensors to monitor assembly steps (like for Pick to light system).

Easy to customize, considering that the modification of the arrangement of the stations does not require any complicated electrical and software modifications because these can easily be modified with the help of the interactive interface of the control software.

Interactive process supervision, thanks to which the worker gets continuous feed back on the current work phase like, for example, illustrated and textual assembly instructions, error signals and acoustic signals during working.

Independent or integrated operation, i.e. IRIS can function as an independent unit or integrated into a system, as required.



FUNCTIONS FULFILLED BY THE IRIS SYSTEM:

- Interactive, training-based area calibration
- Area monitoring with various functions (reaching, taking out, tool monitoring)
- Transparent assembly process design
- Barcode-based basic material storage identification
- Managing barcode printing/control
- Managing digital output/input modules
- Supporting several working area spacing
- Supporting several types of assembly instructions
- Managing users and authorizations
- Employee identification with card
- Creating assembly statistics
- Managing other peripheries
- Creating virtual controls
- Managing two-hand processes

MAIN PARAMETERS OF THE IRIS SYSTEM

| | |
|---|---|
| Minimum distance from the camera: | ~0,5 m |
| Maximum distance from the camera: | ~3,0 m |
| Field of view: | 70° x 60° |
| Maximum number of calibrated areas: | Tested up to 50 pieces |
| Minimum resolution: (expressed as angle of vision) | 0,7° (15 mm * 15 mm at a distance of 1,2 m) |



Establishing supervision over manual work stations in operation. An ideal opportunity to develop work stations being operated without central supervision, because it is a more competitive solution, considering both price and efficiency, compared to conventional solutions (PLC controlled 'Pick to light' work station equipped with sensors and indicators).

Implementing universal work stations to manufacture several products with various assembly requirements. Since the storage spaces for parts can be identified with bar code, the software allows that several different types of products assign different types of parts to the same storage space, depending upon which type of product is to be manufactured, and even specific work stations can be established for various types of products. This universal arrangement cannot be implemented with conventional systems.



IRIS uses a graphical interface for process parameterization.

It has an easy and quick setup for work area and a simple design with quick installation.

The display shows the process instruction and a corresponding picture with an automatic selection of active process instruction. The supervision of work process gives a warning picture and tone in case of process error by usage of a virtual error acknowledge area.

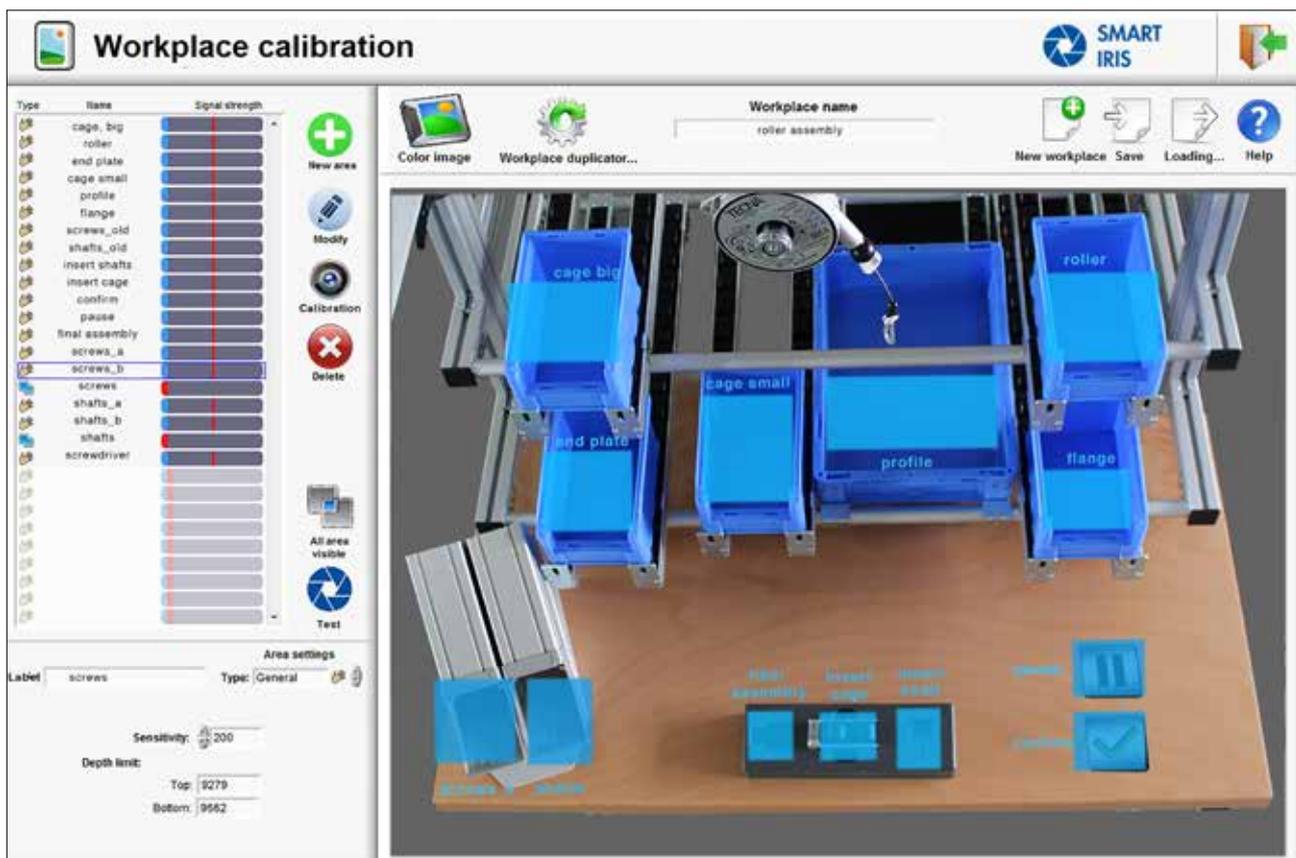
IRIS offers editable setup instructions by type with barcode reader verification, editable process instructions and pictures and editable process steps for each product type. Furthermore it has an easy setup of process evaluation order with editable and erasable process steps. The three dimensional breach area (X-Y-Z) has a self calibrating functionality.

IRIS can be expanded with different kind of peripherals. These can use IRIS's digital I/O support to communicate. With these extensions IRIS can monitor assembly which can't be tracked by the camera sensor because they are too small or they are out of camera's view. Addition example: it can control a tightening system with digital I/O.

IRIS support integration with any kind of PLC system* through OPC flag communication.

*Supported by NI OPC Server.

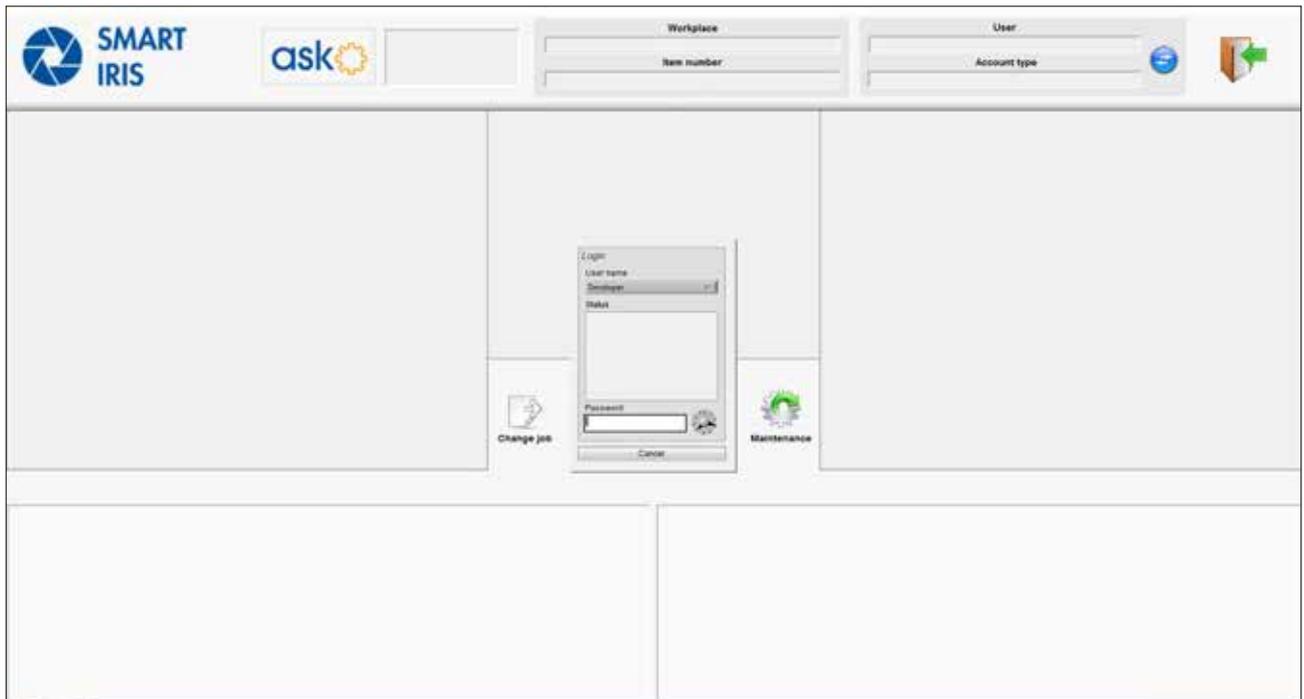
WORKPLACE CALIBRATION



IRIS aids and monitors the assembly process of a product. During assembly you have to pick different parts of the product which are located in different boxes. Left listbox lists the defined areas. Right picture shows the areas on the live image.

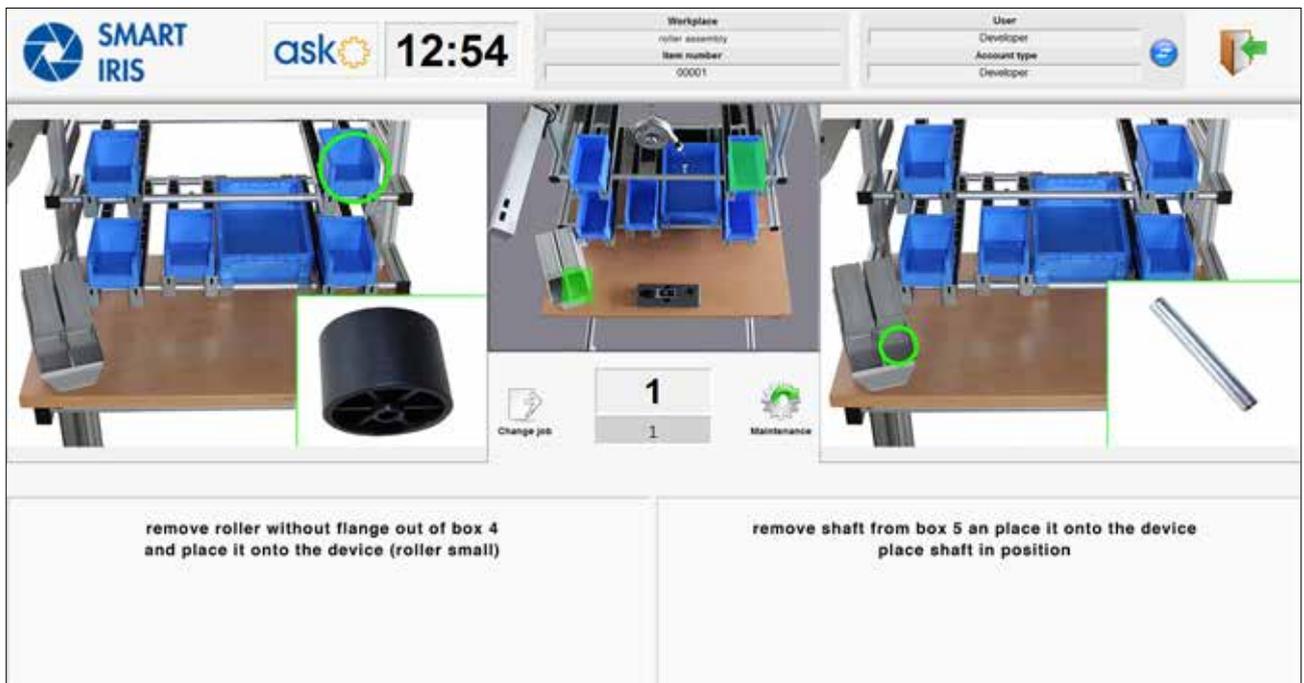


OPERATOR MODE - START SCREEN



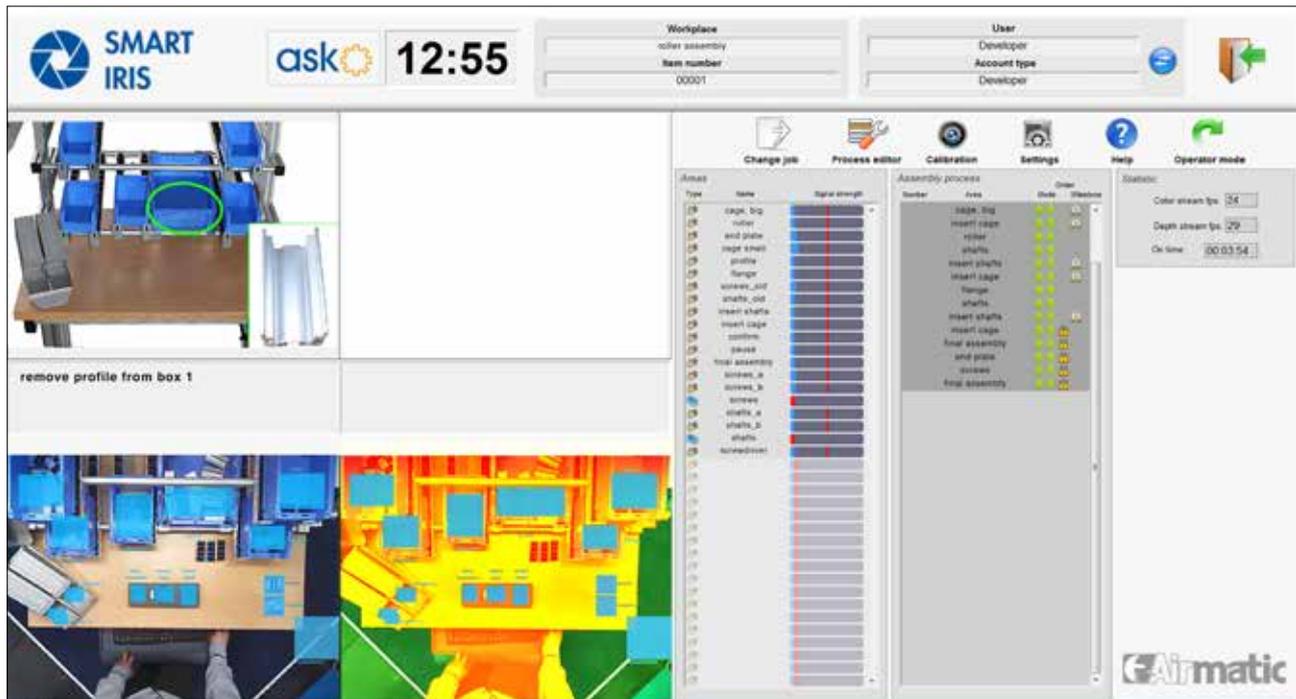
Start screen with a password request.

OPERATOR MODE DURING ASSEMBLY



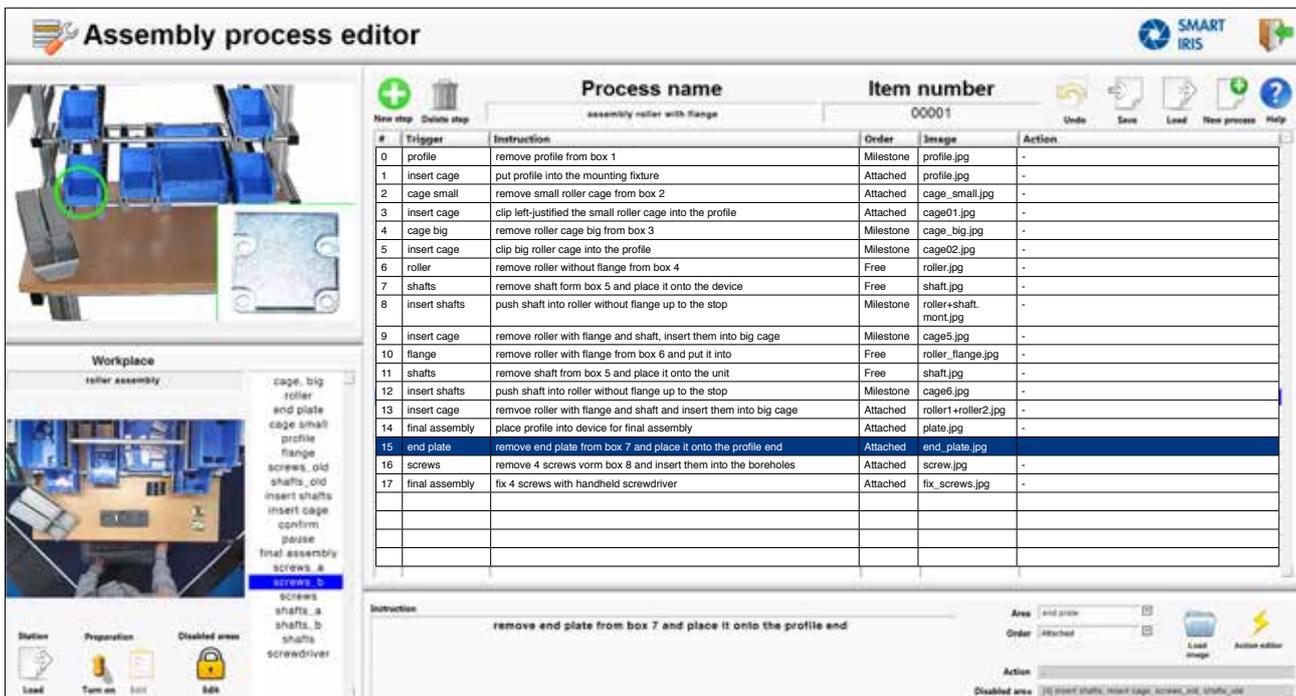
This screen instructs the operator to take the shown two parts from the boxes. IRIS monitors the workflow and shows a warning when the order of work steps is incorrect or when a wrong part is taken.

MAINTENANCE MODE



The process supervision shows an actual color live image (left image) and also the depth camera image (right image) and additional information in the listboxes on the right side to check faults and settings of the actual processes. Additional peripherals: Barcode reader and label printer.

ASSEMBLY PROCESS EDITOR



You can define each necessary step to assemble the product. It's possible to define every step with a picture and an instruction which will be shown for the operator; furthermore add an area where the operator can find the necessary part.

Ask ASK!

Our logical customer focus means we are constructively with you at every stage of your project. With highly qualified employees and modern manufacturing technology in all areas.

We not only equip your business but we also support you at all times with the planning and concept of your project.

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