

AUTOMATED THROUGH-HOLE COMPONENTS ASSEMBLY

A FLEXIBLE SYSTEM ADAPTED TO YOUR NEEDS



MARKET CHALLENGE

The manual assembly of THT components is a tedious and error-prone process. The initial component forming stage followed by transfer to the assembly stations risks damage or deformation to the delicate leads. It is also difficult to assemble components with many leads, irregular shapes or which require proper orientation. Errors or elements

missed at this stage are most often detected at the end of the production process, when repair is impossible or expensive. The way to eliminate these problems is to use a solution that improves and monitors the component assembly in real time, which will positively affect the quality and efficiency of the production process.

OUR SOLUTION

Our automated THT station is a response to the problems of manual assembly and growing employment costs. It assembles various types of THT components and precisely forms their leads, ensuring high quality and efficiency of production and reducing the factory's operating costs.

Our solution from AI:Rob product family:

- automates the time-consuming process of manually forming and assembling THT components;
- fits atypical elements packed in standard packaging (plastic tubes, radial tapes, trays) or delivered loose;
- verifies whether the component has been correctly fitted and repeats the process if necessary;
- reduces the risk of damaging the component thanks to integrating the forming process with assembly.

ONE MACHINE – MANY POSSIBILITIES

- Assembly of components with non-standard shapes and dimensions, such as chokes, varistors and connectors.
- Assembly of items packed in trays*, tubes, tapes or loose*.
- Assembly of components that require preforming; they are formed in the machine at the same time and not in a separate process.
- Short changeover time (less than 1 minute) when the order is changed without the need to replace the feeders.
- Quick and easy programming: a program for assembling several components can be created in less than 30 minutes.

STRENGTHS

AUTOMATION INSTEAD OF MANUAL WORK

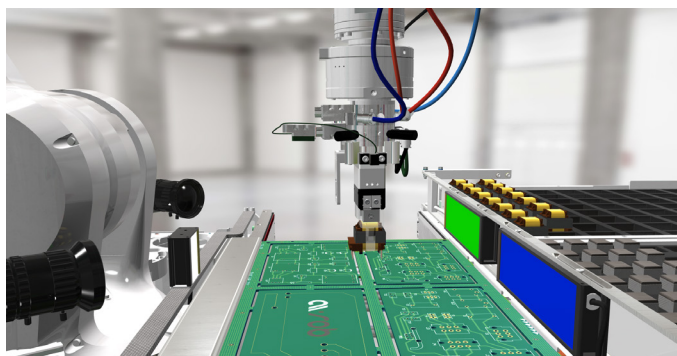
Our station automates the monotonous assembly process of THT components, during which elements with many variables, such as shape, size, lead spacing, type of packaging and the need for forming, are assembled.

EASY PROGRAMMING

Intuitive process program generator does not require programming knowledge. It enables the operator to quickly enter or edit the assembly sequence for new or existing products (it takes < 10 minutes to add 4 additional components to the sequence).

3D VISUAL INSPECTION

Our 3D vision system offers quick and precise inspection of THT components. Through detecting a component's edges and shape, it reads the dimensions and the exact position of the components and their parts in 3D space to achieve reliable and accurate measurement results. This way efficiency of the assembly process can be leveraged up to 99%.



CUSTOMIZATION

To extend the basic functionality of our solution, we offer additional options:

- a mounting plate for removable feeders for mounting various types of elements in one process;
- a wide range of gripping, cutting and forming tools;
- feeders for various types of THT components;
- a vision system that streamlines the process, a scene camera that allows components to be collected from the trays and a camera to verify the component leads*.



KEY FACTS

QUALITY

Full stability and repeatability of the station's operation guarantees the highest quality assembly process. The machine precisely controls the process of fitting each element, thanks to which the product will not leave the machine without the mounted components.

FLEXIBILITY

The station can be easily adapted to the assembly of various types of components (transistors, connectors, relays, capacitors, varistors, chokes) and adjusts the width of the transporter to the PCB. The stations can work in line or separately.

SIMPLE OPERATION

Thoughtful and standardised design and an intuitive graphical interface do not require engineering or programming knowledge for operating the machine. Manual assembly operators without expert knowledge can operate the machine themselves.

EFFICIENCY

The assembly time for connectors and relays averages 4 seconds, with an assembly efficiency of 99.8%. This result is comparable to an operator's working time.

COMPACTNESS

The machine is easy to use on both the hardware and software levels. Neither engineering, nor programming skills are required.

CHECK IT OUT



TECH SPECIFICATIONS

- Six-axis robot
- PLC controller
- Various types of THT component feeders
- Modular mechanical and electrical design
- Adjustable PCB transport width
- Full control of force and torque adjustments using the six-axis force sensor
- Replacement of feeders in the plug & play mode
- Bank for four gripping tools
- Optional vision system to assist with component assembly



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THROUGH-HOLE COMPONENTS ASSEMBLY SYSTEM



TECHNICAL SHEET



DIMENSIONS

Height	2350 (signal tower including)
Width	970 mm
Length	1850 mm
Weight	760 kg

INSTALLATION REQUIREMENTS

Voltage	230 VAC 50/60 Hz
Power	2600 W
Communication	Ethernet
Network bandwidth	100 Mbps
Minimum air pressure	0.6 Mpa
Maximum air consumption, machine without feeders	10 l/h

WORK PARAMETERS

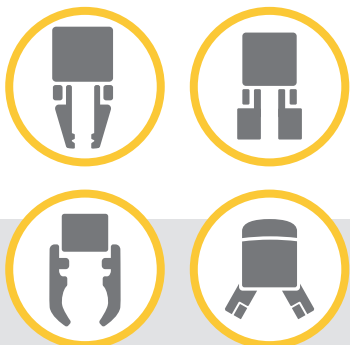
Supported PCB size	Width: 100-250 mm Length: max. 400 mm
Conveyor maximum work speed	Max. 200 mm/s
Conveyor height	850-920 mm
Toolbank	4-tool holder as standard
Supported components size	Max. 45 x 30 x 45 mm
Work speed	Depends on component and package type
Assembly accuracy	0.1 mm

MODULAR CONSTRUCTION

GRIPPERS

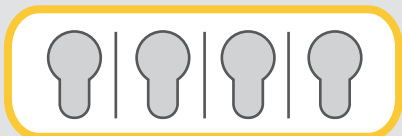
exchangeable,
dedicated to a component

EXAMPLES



TOOLBANK

up to 4 exchangeable tools
for machine operations



CAMERAS

vision system for a dynamic component location
and verification of the components legs



AI-BASED CAMERA
FOR COMPONENTS
LOCATION*



2D CAMERA
WITH 3D ILLUMINATION
FOR LEADS*

FEEDERS

dedicated to various THT components and packaging types:

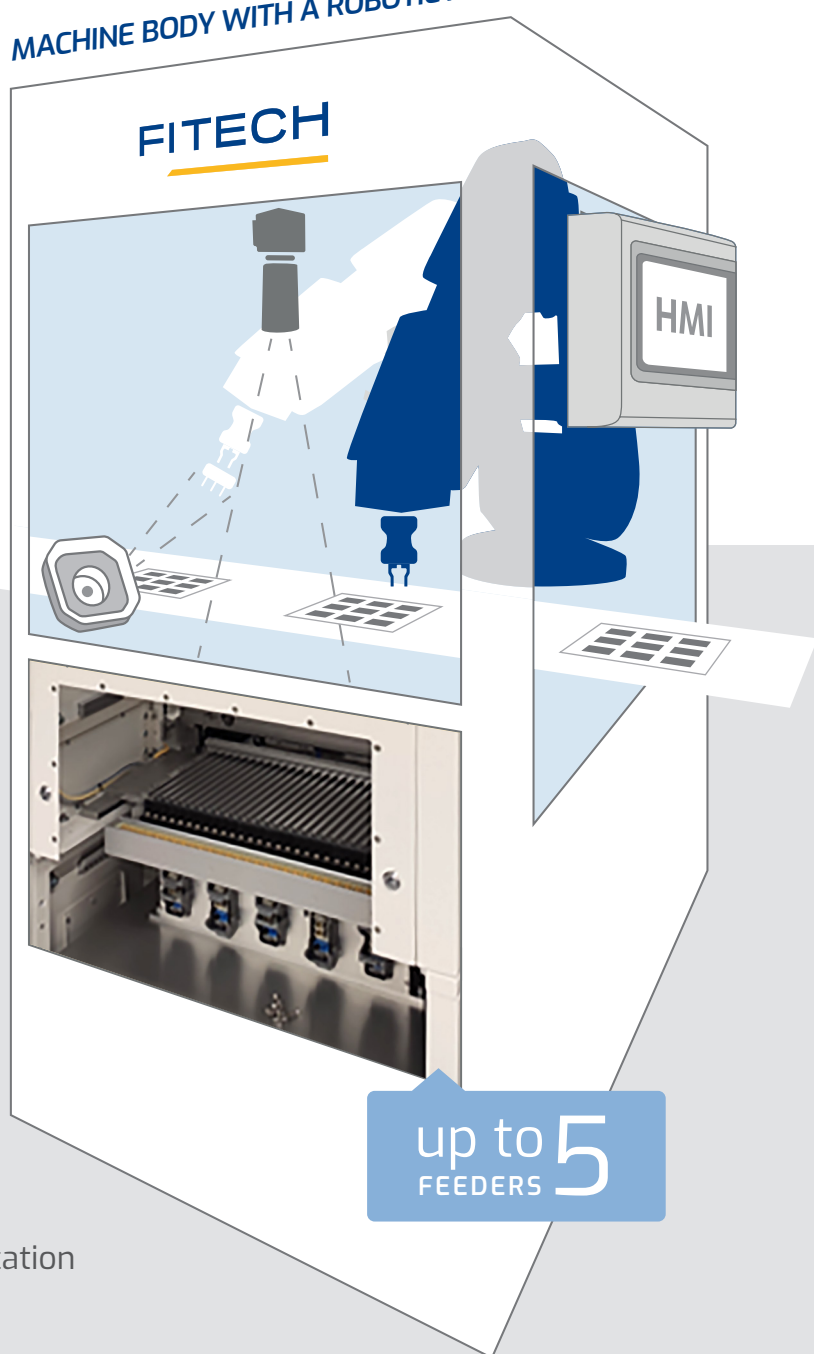
TUBE FEEDER

RADIAL FEEDER

TRAY FEEDER*

MACHINE BODY WITH A ROBOTIC ARM

FITECH



up to 5
FEEDERS

SYSTEM ELEMENTS FROM REPUTABLE PARTNERS

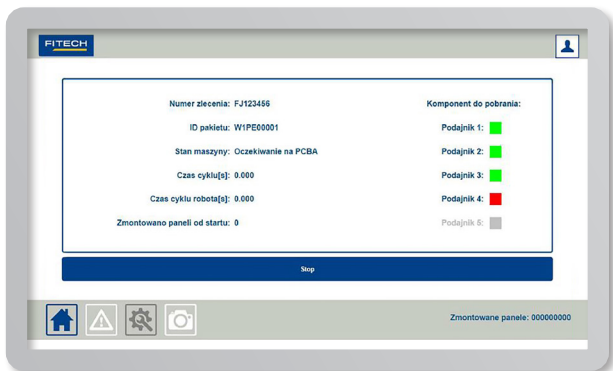
ROBOTS	GRIPPERS	CAMERAS [*]	CONTROLLERS
ABB 	SCHUNK, ROBOTIQ 	BASLER, KEYENCE 	B&R

FEEDERS TYPES

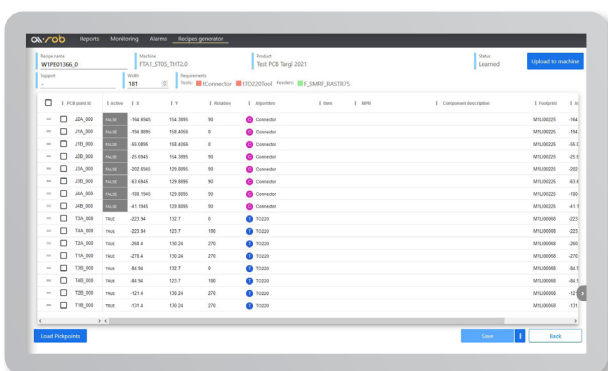
	TUBE FEEDER	RADIAL FEEDER	TRAY FEEDER [*]
PARAMETERS	MIN: 300 x 6 x 10 mm MAX: 600 x 30 x 30 mm	TAPE HOLE PITCH 12.7 mm, 15 mm	MAX: 360 x 255 mm
FORM	For pre-forming Non pre-forming	Ammo pack Reel pack	Single-drawer Two-drawer
TYPE OF COMPONENT	Transistors Relays Connectors 	Capacitors: <ul style="list-style-type: none"> ■ Film Capacitors ■ Electrolytic capacitors Varistors 	Chokes Connectors

OPERATING SOFTWARE

HMI OPERATOR PANEL



PROGRAM GENERATOR PANEL



MONITORING SOFTWARE

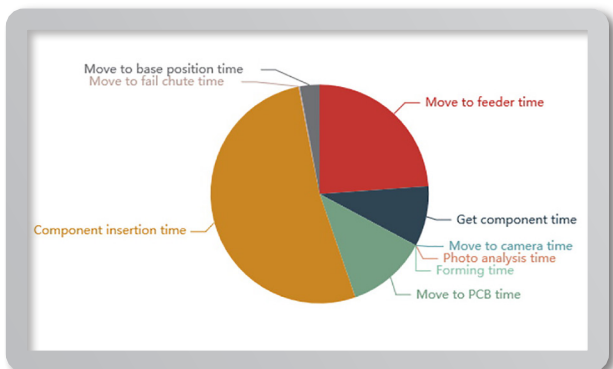
ASSEMBLY EFFICIENCY



OEE STATUS



PARTIAL ASSEMBLY TIMING



MOVING PARTS TIMING

