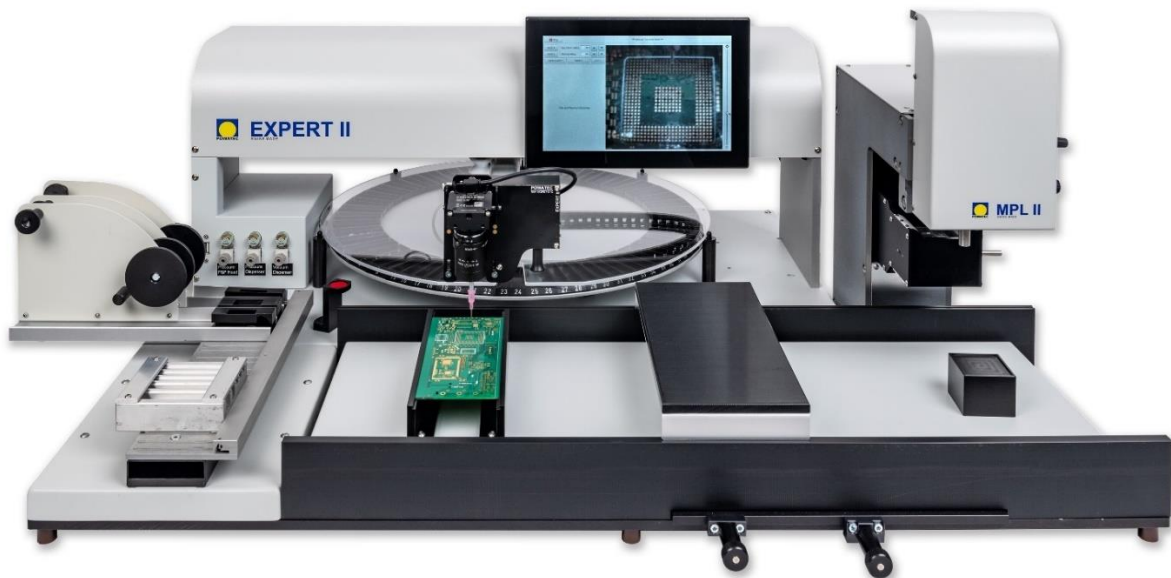# Expert II SMD Pick & Place and Dispensing System

High-End Semi-Automatic Collaborative Device with SW & optical technology to handle BGA's, QFN's and parts sizes of 0201 with an accuracy up to 0.03mm on circuit boards up to 450mm x 250mm. Reaches up to 800 SMD parts per hour.

Expert II – SMD assembly for prototypes and special series production

The absolute x-y position system on the cartesian lever together with the latest SW and graphics, provides direct guidance of the placement sequence and a position information accuracy of 0.05mm for the part placing based on the PCB layout import via USB stick. A 10" touch display serves as interface to operate all required process steps. A motorized table rotates automatically to the correct picking bin according to the imported PCB project. Ergonomic perfection is provided with detection sensors in the cartesian lever head which recognizes the operators picking and placing intend which both, automatically controls the nozzle vacuum and displays the correct process visual on the screen. Prism technology in the motorized Microplacer allows visual superposing of backside pins of BGA's & QFN's with the PCB contact pins. An automated stabilizer of either x or y axis of the cartesian lever serves to conveniently dispense or place repeatedly within one of the cartesian dimension. Latest SW comes along with algorithms for quality monitoring which prevent the operator from placing parts mistakably or inaccurately.

The Expert II system is the successor of the widely known Expert of Essemtec which is globally used in more than 4000 production facilities, laboratories and educational institutions. Also, this new generation offers you a big variety of options and features to fit the system to the needs of your application.

Features and options

High precision mechatronic ensures x-y-z positioning and accurate placement. Optionally with independent brake per axis.

Monitor your placement with the high-resolution camera (1080x1920) and a prism for parallax free view.

Turn table drive for 45 or 90 different single part type bins.

Adjust the head lowering force with the patented air damping.

Load you project data for enhanced SW guidance and quality control.

Precisely adjust the head lifting force, part gripping force and dispensing parameters.

EXPERT II
SWISS MADE

Flexible interface for your part feeding needs. Mount Tray feeders, tape feeders, stick feeders or design your own part storage.

Dispense fast and efficiently solder paste, glue or resign out of 5ccm or 10ccm cartridge.

Intuitive and guided operation of the system over the movable 10.1″ touch display

PCB support with magnets for best workflow placement.

Enable semi-automatic project execution for part pick and place guidance and monitoring for enhanced quality assurance.

SW supported multiple identical PCBA assembly at the same time.

Precisely adjust zoom and focus of the motorized high resolution camera and dim pin position light source.

Precise part lifting and theta aligning with the Microplacer

MPL II

Work with panels up to 450mm x 250mm and up to 450mm x 500mm by flipping.

Position BGA, CSP or flip chip parts in an overlay picture by the split optic and two-color illumination.

Ergonomic hand support for a convenient SMD placing.

Position alignments down to 0.03 mm with Microplacer, fine pitch table and auto Z function.

Engineered and manufactured in Switzerland

Expert II basic configuration

- x-y-z cartesian lever with assembly head
- high-resolution camera (1080x1920 px)
- integrated and movable 10" touch display with 1080x1920 px
- adjustable LED intensity work area illumination
- x-y absolute positioning sensor system
- pick and place recognition pattern with automatic vacuum control
- precise vacuum control at the pick-up nozzle
- controllable pressure adjustment for z-axis damping
- vacuum nozzle for part placement
- pedal for foot operation of the vacuum
- magnetic stands and magnetic slide-in bar for flexible PCBA fixation
- slidable hand rest
- Part flip table
- interface for external monitor, mouse and keyboard
- SW with basic function and trial version of the full SW package

The device requires compressed air for operation.

Initial configurations

The following configurations are combinable with each other but cannot be added later and require to be ordered initially.

Fine Pitch table adjuster & x-y cartesian lever stabilizer

This feature allows convenient dispensing or placing of parts within a repeated cartesian dimension. The adjustment accuracy of the fine pitch table adjuster reaches +- 0.03 mm in following working sequence:
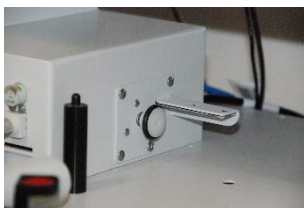
1. Block Z axis with picked part close above the PCB within placement proximity.
2. Block X and Y axis.
3. Adjust precise position with fine pitch table adjuster supported by the high resolution camera and display.
4. Start Auto Z function. The nozzle places part onto the PCBA automatically.

Dispenser (UP5001 II)

Adjustable pressure valves for dispenser flow and vacuum drop-stop function. The dispensing time is controlled by the basic SW.

Contains the holder and tube to operate 5ccm and 10ccm standard cartridges.

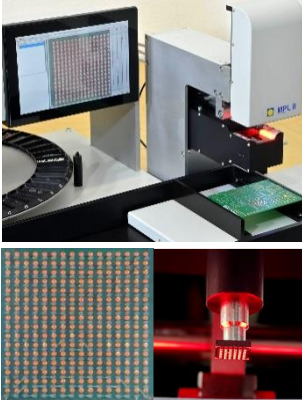### Automatic turn table drive (EXP520-24VDC)

Motorized turn table rotating to the required part bin.

The motor is either operated by two buttons on the assembly head or automatically by the SW (full package) according to a project import.

Options

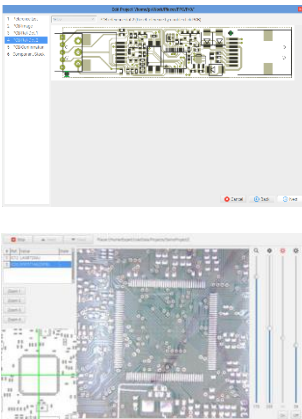The following options can be added later if required[1].

MPL II & Fine Pitch table adjuster

The micro placer MPL II serves to place BGA, micro-BGA, QFN, MLF, QFP, PQFP, CSP or flip chip parts.

With a motorized high-resolution beam splitter camera both pin layers and PCB pad are visually overlayed. The red highlighted part bottom pins are then optically overlayed onto the white illuminated PCB pin positions. Fine adjusters allow to align x-y and theta in an accuracy of 0.03 mm. The head lowers and rises motorized.

The MPL II is delivered with a fine pitch table to ensure the precise positioning of the parts.

Expert II Full Software Package

The Place Software is activated with a license key and ensures full supervision of your project based on the imported PCBA design data. All feeding options are be stored and made available for repeated actions and projects. The software monitors the correct pick and place location of the part and eliminates placement mistakes. With the optional automated turn table drive the correct part bin is automatically brought into picking position right after having placed the previous part correctly. The display automatically switches between camera and assembly plan.
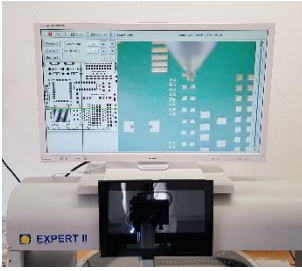
Key features of the SW are:

- Reference the PCB position based on a loaded reference point list. Drag and drop functions ease the visuals on the touch screen.
- Direct import of part lists and layout from the PCBA design tool via USB stick. Import assembly lists to enable guided and controlled placement of parts.
- Import circuit board images to support visual guidance.
- Create and store feeder inventory. The tables and trays can then be re-activated for the next project.
- Create your own feeders and their inventory.
- Create assembly projects for single PCBs or panels with repetitive PCB pattern.
- Automatic calibration feature to ensure placement accuracy quality at all times.

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[1] After a certain period the version compatibility needs to be checked by your sales partner.
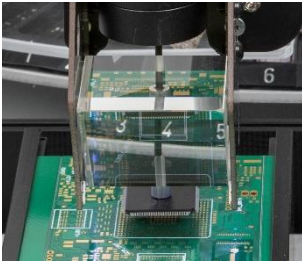
External monitor (VS705-LCD)

It is recommended to supply the qualified monitor from POWATEC. However, principally any HDMI monitor can be connected to the Expert II system[2].

This option includes a plate for the external monitor.

Prism (VS710II)

Glass prism with work area illumination for parallax free top view onto the part placement position.

The prism is supplied with a special nozzle.

Accessories

Turn tables and additions

Turn table for 45 parts
(EXP505)

Turn table for 90 parts
(EXP506)

Cover for the turn table to protect parts while working or when storing. The cover has an opening for picking parts which can be turned to the desired working position. The cover is available in plexiglas or in ESLON for ESD sensitive parts.
- Plexi glass cover (E510)
- ESLON cover (E511)

Locking mechanism for plexi glass or Eslon cover to protect parts from falling out during transportation and exchange of trun tables
(VS)

Feeder

Long base plate for 12 feeders of any type
(E530)

Short base plate for 5x 8mm feeders
(E531)

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[2] Note that the compatibility cannot be guaranteed for all monitors on the market.

Tray table 310mm x 135mm
For sliding bar
(E532)

Feeder for rest pieces of tapes
For sliding bar. (E553-1)

Tape feeder 8mm
(E540)

Feeder for rest pieces of tapes
On base plate. (E553-2)

Tape feeder 12mm
(E541)

Base plate for 3 feeder boxes
(E533)

Tape feeder 16mm
(E542)

Tape feeder 10x 8mm for feeder box

Stick feeder SO8-SO28, SO8L-SO28L
(E545)

Tape feeder 4x 8mm, 3x 12mm, 1x 16mm for feeder box

Stick feeder PLCC28-PLCC44
(E546)

Tape reel holder for feeder box

Stick feeder PLCC52-PLCC84
(E547)

Nozzles

Teflon coated pick-up nozzle for bare die placement (EXP561-T)	Nozzle inner diameter 0.4mm for MPL II (0PL500A-S00.8)
Nozzle for 01005-0201 (EXP-S001)	Nozzle inner diameter 0.7mm for MPL II (0PL500A-S01.2)
Nozzle for 0402-0603 (EXP-S002)	Nozzle inner diameter 1.5mm for MPL II (0PL500A-S003)
Nozzle for >0605 (EXP-S003)	Nozzle inner diameter 3.0mm for MPL II (0PL500A-S004)
Nozzle for QFP, PLCC, BGA (EXP-S004)	Nozzle inner diameter 8.0mm for MPL II (0PL500A-S010)

Specification

Panel size and workable pick and place area	up to 450 x 250 mm
PCB thickness	0.5 up to 5 mm
	Flex PCB and special materials on request
Part size	From 0201 (01005 depending on the part shape)
Part height	Up to 10 mm, up to 16mm with special needle
QFP pitch	From 0.3 mm with MPL
Double side assembly	Possible with part height up to 35mm
Cartesian lever position sensor accuracy	0.05 mm in horizontal directions
Fine pitch table adjuster accuracy	0.03 mm in horizontal directions
Width	760 mm, with MPL 930
	Width increases with some feeder options
Depth	800 mm, 1110 mm incl. outreach
Height	420 mm
Weight	16kg, with MPL 23 kg
Main power	110-240 VAC, 50/60 Hz
Rated power consumption	51 W
Compressed air	6 mm tube
	5-6 bar
	oil-free, dry and clean
Vacuum	no external vacuum needed
Internal display	10.1'' touch display 1920 x 1080 px, laterally movable
Display output	HDMI type A
Network	RJ45, TCP/IP
Peripherals	2x USB type A for mouse and keyboard

Manufacturer

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