

PUMA SMD Pick & Place System

Version 2.0 / February 2023

Specifications

| | | PUMA ¹ | | PUMA ² | | PUMA ⁴ | |
|-----------------------------|------------------------------------|--|---|--|---|---|---|
| | | Stand Alone | In Line | Stand Alone | In Line | Stand Alone | In Line |
| Productivity ⁽¹⁾ | Optimum placement speed chip | 6'700 cph | | 11'200 cph | | 18'100 cph | |
| | Speed (IPC 9850) | Chip 5'800 cph QFP 5'200 cph | | Chip 10'100 cph QFP 5'200 cph | | Chip 15'300 cph QFP 7'200 cph | |
| | Speed (IPC 9850A) | Chip 5'600 cph QFP 4'200 cph | | Chip 9'600 cph QFP 4'200 cph | | Chip 14'200 cph QFP 5'300 cph | |
| | Dispensing speed | Piezo jet valve up to 145'000 dots/h | | | | | |
| | Job changeover time | < 1 min (loading job, adjust conveyor/table, restart production) | | | | | |
| Feeder ⁽²⁾ | Feeder system | EVO and hyQ (intelligent single feeder) CLM (intelligent cassette feeder) | | | | | |
| | Feeder capacity (8mm tape) | 260 | 140 | 260 | 140 | 260 / 280 ^(*) 140 / 160 ^(*) <i>^(*)with optional Extended Rack, pick position cannot be taught with top camera</i> | |
| Components | Component size range | 008004 (imp.) – 80 x 80 mm | | → Complete range, see constraints below | | | |
| | | Constraints: | | → Standard | | | |
| | | 0201 (imp.) – 33 x 33 mm incl. leads | | → With optional MFOV ^(*) software license | | | |
| | | 0201 (imp.) – 80 x 33 mm incl. leads | | → With opt. MFOV license and Vision Box ^(**) | | | |
| | | Up to 80 x 80 mm incl. leads | | → With opt. Nozzle 0 and EVO feeder type | | | |
| | | 01005 (imp.) | | → With opt. Nozzle 0 and EVO feeder type | | | |
| | | 008004 (imp.) / 0201 (m) ⁽³⁾ | | | | | |
| | | | | ^(*) Multi Field of View | | | |
| | | | | ^(**) Requires space up to 18 hyQ/EVO - 30 CLM Feeder lanes, front side mounting only (see System Description) | | | |
| | | Mass moment of inertia | 60 g x cm ² | | | | |
| | Min. lead pitch | 0.3 mm (12mil) | | | | | |
| | Min. ball diameter / pitch | 0.2 mm | | | | | |
| | Min. component height | > 0.0 mm | | | | | |
| | Max. component height | Standard: 18 mm / On request other heights | | | | | |
| | Process height | ± 18 mm (0.71") from zero height | | | | | |
| Accuracy | Linear encoder resolution (x,y) | 0.2 µm | | | | | |
| | Rotation axis resolution | 0.007° | | | | | |
| | Overall placement accuracy XY chip | ± 40 µm (3σ) ⁽⁴⁾ | | | | | |
| | Overall placement accuracy XY QFP | ± 30 µm (3σ) ⁽⁴⁾ | | | | | |
| PCB | Min. PCB dimensions | 20 x 20 mm (0.8 x 0.8") | 50 x 50mm (2 x 2") | 20 x 20 mm (0.8 x 0.8") | 50 x 50mm (2 x 2") | 20 x 20 mm (0.8 x 0.8") | 50 x 50mm (2 x 2") |
| | Max. PCB dimensions | 560 x 610 mm (22 x 24") | | | | | |
| | PCB thickness | 0.5 – 3.5 mm (0.02 – 0.13") | 0.5 – 5.0 mm (0.02 - 0.2") | 0.5 – 3.5 mm (0.02 – 0.13") | 0.5 – 5.0 mm (0.02 - 0.2") | 0.5 – 3.5 mm (0.02 – 0.13") | 0.5 – 5.0 mm (0.02 - 0.2") |
| | PCB edge clearance | 3.0 – 5.0 mm (0.11 – 0.2") (varies with PCB thickness) | T: 3.0 mm (0.11") B: 5.0 mm (0.2") | 3.0 – 5.0 mm (0.11 – 0.2") (varies with PCB thickness) | T: 3.0 mm (0.11") B: 5.0 mm (0.2") | 3.0 – 5.0 mm (0.11 – 0.2") (varies with PCB thickness) | T: 3.0 mm (0.11") B: 5.0 mm (0.2") |
| | Max. board weight | - | 4 kg (8.8 lb) | - | 4 kg (8.8 lb) | - | 4 kg (8.8 lb) |
| | Conveyor height | - | SMEMA 940 – 965 mm | - | SMEMA 940 – 965 mm | - | SMEMA 940 – 965 mm |
| | Clearance below PCB | 40 mm (1.57") | 27 mm (1.1") | 40 mm (1.57") | 27 mm (1.1") | 40 mm (1.57") | 27 mm (1.1") |

Configuration

| | | PUMA ¹ | PUMA ² | PUMA ⁴ |
|--|--|-------------------|-------------------|-------------------|
| Machine base | Pick & Place head with 1x spindle, optional up to 2x dispensing axis | ● | | |
| | Pick & Place head with 2x spindles, optional up to 2x dispensing axis | | ● | |
| | Pick & Place head with 4x spindles, optional 1x dispensing axis | | | ● |
| | Dual bottom camera system | | | ● |
| | Stand alone type (PCB table, magnetic PCB holder, support pins) | ○ | ○ | ○ |
| | In line type (conveyor 3 stage, support pins, manual width adjust.) | ○ | ○ | ○ |
| | Dispensing preparation kit (dot plate, purge and z-height calibration station) | ○ | ○ | ○ |
| | Interior lighting LED | ● | ● | ● |
| PCB Handling | Signal tower (3 color) | ● | ● | ● |
| | IPC-HERMES-9852, SMEMA interface | ● | ● | ● |
| | Inline systems: Conveyor direction L/R, R/L, batch mode R/R, L/L | ● | ● | ● |
| | Inline systems: Automatic conveyor width adjustment | ○ | ○ | ○ |
| | Inline systems: Conveyor extensions | ○ | ○ | ○ |
| Control and software | Inline systems: PCB inspection station on conveyor | ○ | ○ | ○ |
| | ePlace P&P/Disp. software (En, De, Fr, Ru, Pl, Zh, Es, Cs, Ja) | ● | ● | ● |
| | Machine PC with Windows 11 OS and 21.5" touch screen | ● | ● | ● |
| Alignment systems | Technical support software | ● | ● | ● |
| | Cognex SMD4 PatMax vision license (fiducials, chip, QFP, asymm. BGA and leads) | ● | ● | ● |
| | Red and blue color illumination for top camera | ● | ● | ● |
| | Multi Field of View license (MFOV) | ○ | ○ | ○ |
| | Vision box for 80x80 mm components | ○ | ○ | ○ |
| Dispensing valves (Cartridge sizes) | Laser height measurement | ○ | ○ | ○ |
| | Piezo jet valve (5, 10, 30 cm ³) | ○ | ○ | ○ |
| | Shockwave jet valve (5, 10, 30 cm ³) | ○ | ○ | ○ |
| | Time/pressure valve (5, 10, 30 cm ³) | ○ | ○ | ○ |
| | Archimedean screw valve (5, 10, 30 cm ³) | ○ | ○ | ○ |
| | Volume dispenser valve (10, 30, 55 cm ³) | ○ | ○ | ○ |
| | Cartridge level control | ○ | ○ | ○ |
| Various | Dispenser needle heating | ○ | ○ | ○ |
| | Standard user level management (software) | ● | ● | ● |
| | Bad mark sensing with vision (software) | ● | ● | ● |
| | Universal CAD conversion (software) | ● | ● | ● |
| | Automatic pick position correction and feeder advance optimization | ● | ● | ● |
| | Automatic placement constraints (software) | ● | ● | ● |
| | Basic calibration set P&P | ● | ● | ● |
| | Maintenance kit | ● | ● | ● |
| | Process Improvement Tool P&P (PIT1 – 3 pictures) (software) | ● | ● | ● |
| | Key Performance Indicator (KPI with SEMI E10 standard) (software) | ○ | ○ | ○ |
| | Barcode reading over top camera (software) | ○ | ○ | ○ |
| | Disp. Process Control Adjustment & Stabilization (PCAS) (software) | ○ | ○ | ○ |
| | Second touch screen for machine backside | ○ | ○ | ○ |
| | Keyboard and mouse holder underneath monitor | ○ | ○ | ○ |
| | Clean room option ISO7 (class 10'000) | ○ | ○ | ○ |
| | CVU (Component Verification Unit) | ○ | ○ | ○ |
| | Tray slider (space for 2 additional JEDEC trays) | ○ | ○ | ○ |
| | Tray changer (space for up to 18 JEDEC trays) | ○ | ○ | ○ |
| | Extended feeder rack (additional feeder lanes) | ○ | ○ | ○ |
| | Recipe import in ePlace (software) | ○ | ○ | ○ |
| Interface for host communication: IPC-CFX, ITAC, SECS/GEM, OIC, EEIP etc. (software) | ○ | ○ | ○ | |

● standard feature ○ optional feature



