X-Series for fast-changing applications

Cost-effective Pick & Place for high-mix, small batches

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Assembléon

Integrated electronics manufacturing solutions

The fastest way from CAD data to first products

Lean manufacturing benefits from fast ramp-up of new applications. The Assembléon X-Series provides this. The X-Series is a cost-effective, Pick & Place platform for low- to medium-volume manufacturing at up to 20k components per hour (cph). Machines are easily optimized for ultra-high feeder count, and large boards – you simply mix and match modules to suit.

The versatile X-Series places everything from 01005 components to large CSPs, Flip Chips, BGAs and fine-pitch QFPs. The Emerald-X^{II} even handles odd-shaped components up to 20mm tall. So if you need to develop and produce new applications quickly, the X-Series speeds up the route from CAD data to first products. New jobs can be set up offline or on the machine. And once programs are optimized, data is centrally stored to guarantee the correct program and vision information is loaded each time.

Flexibility assured, performance guaranteed

X-Series modules (Opal-X^{II}, Topaz-X^{II} and Emerald-X^{II}) complement each other to deliver cost-effective production, outstanding flexibility and fast ramp-up. Benefits for manufacturers of small- to medium batches with a high product mix include:

- Fast and simple machine setup with real-time component inventory check
  (up to 90 RFID-enabled smart feeders)
- Fast production-run changeovers with user-friendly feeder exchange trolleys (20 position)
  (off-line setup and feeder exchange trolley verification)
- Extra flexibility without impacting maximum board width or feeder capacity
  (large component sequencer – LCS – that holds 120 unique tray components)
- Easy-to-use and quick to learn
  (one of the best graphical user interfaces in the industry with on-line help and board
  file configuration wizard)
- Easy networking and centralized component database
  (industry-standard Windows NT).

Opal-X[II]
Scalable solution for entry-level manufacturing

The Opal-X[II] places at up to 11.6k cph (expandable to 17.7k cph) with 40-micron accuracy (QFPs). A second Opal-X[II] machine can easily be incorporated in line for doubling capacity. The Opal-X[II] handles components from 01005 to large connectors (45mm x 100mm), fine-pitch QFP, BGA, µBGA and CSP packages, and components up to 11mm tall. It holds up to 100 RFID-enabled smart feeders including stick and bulk parts. The high-precision single-placement beam carries four or eight independent standard heads (SF).

Other features include:
- Optional tray handler that allows 120 trays without sacrificing board width or feeder positions
- Custom vacuum nozzles to handle any component
- Board clamping system for stable board positioning and maximum placement accuracy (eliminates the need for tooling holes in the board).

Technical specifications Opal-X[II]

Optimal output per hour:	11.6k with 4 heads, 17.7 with 8 heads
IPC 9850 output per hour:	9.6k with 4 heads, 13.8 with 8 heads
Head design with SF:	one single beam with 4 super fine heads or one single beam with 8 super fine heads
Placing accuracy at 3 sigma:	50 micron for chips, 40 micron for QFP's
Component range:	01005 (0402) to 45 x 100mm (BGA, µBGA, CSP, Connector, Odds)
Maximum component height:	11mm (0.4") (area CCD camera required)
Toolbit exchange:	automatic nozzle or gripper exchange
Maximum board size (L x W):	460 x 440mm (18.1 x 17.3")
Minimum board size (L x W):	50 x 50mm (2 x 2")
Large Board Application:	650 x 850mm (25.6 x 33.5")
Board thickness:	0.4 to 4.0mm (0.016 x 0.16")
Tape feeding positions (8mm):	100 (CLi)
Tray feeding:	LCS tray feeder with 40 pallets
Other feeder options:	tape, stick, tray, tube, etc.
Feeder trolleys:	2 x 20 position (CLi) front side (50 position (CLi) fixed rear side)
Alignment principle:	line array camera, are CCD camera
Footprint (L x W):	1650 x 1408mm (5.4 x 4.5 ft)
Operating system:	Windows NT™

Topaz-X[II]
Powerful module for very high production rates

The Topaz-X[II] places at rates up to 20k cph, and offers a wide component range, very high production rates and 35-micron accuracy at high speeds (on fine-pitch components). It handles components ranging from 01005 to large connectors (45mm x 100mm), fine-pitch QFP, BGA, μBGA and CSP packages, and components up to 11mm tall. The Topaz-X[II] holds up to 90 RFID-enabled smart feeders, or 160 twin tape-feeders, including stick and bulk parts. Its high-precision single-placement beam carries eight standard heads (SF), or four flying nozzle exchange (FNC) heads plus four standard heads (SF).

Other features include:
- Optional tray handler that allows 120 trays without sacrificing board width or feeder positions
- Custom vacuum nozzles to handle any component
- Line array camera for primary alignment, assisted by a high-precision, on-the-fly co-planarity camera
- Board clamping system for stable board positioning and maximum placement accuracy (eliminates the need for tooling holes in the board).

Technical specifications Topaz-X[II]	
Optimal output per hour:	20k
IPC 9850 output per hour:	15.4k
Head design with SF:	one single beam with 8 super fine heads
Head design with FNC:	one single beam carrying 4 standard heads and 4 heads with nozzle exchange on-the-fly
Placing accuracy at 3 sigma:	50 micron for chips, 35 micron for QFP's
Component range:	01005 (0402) to 45 x 100mm (BGA, μBGA, CSP, Connector, Odds)
Maximum component height:	11mm (0.4") (area CCD camera required)
Toolbit exchange:	automatic nozzle exchange
Maximum board size (L x W):	460 x 440mm (18.1 x 17.3")
Minimum board size (L x W):	50 x 50mm (2.0 x 2.0")
Large Board Application:	650 x 850mm (25.6 x 33.5")
Board thickness:	0.4 to 4.0mm (0.016 x 0.16")
Tape feeding positions (8mm):	90 (CLi) or 160 (ITF)
Tray feeding:	LCS tray feeder with 40 pallets, single ATS tray feeder with 20 pallets
Other feeder options:	tape, stick, tray, tube, waffle pack, etc.
Feeder trolleys:	4 x 20 position (CLi) or 4 x 20 position (ITF)
Alignment principle:	line array camera, area CCD camera, co-planarity check on-the-fly
Footprint (L x W):	1650 x 1408mm (5.4 x 4.5 ft)
Operating system:	Windows NT™

Emerald-X[II]
Extra accuracy for ultra-fine pitch ICs and odd forms

The Emerald-X[II] offers high placement rates of up to 6.8k cph, including for connectors and odd forms. It maintains a 30-micron accuracy with even the most challenging components. The component range covers 01005 to large connectors (45mm x 100mm), fine-pitch QFP, BGA, µBGA and CSP packages, and components up to 20mm tall. An optional CCD camera allows accurate handling of larger components up to 54 x 54mm. The Emerald-X[II] holds up to 84 RFID-enabled smart feeders, or 148 twin tape-feeders, including stick and bulk parts. Its high-precision single-placement beam carries two standard heads (SF), or two flying nozzle exchange (FNC) heads.

Other features include:
- Optional tray handler that allows 120 trays without sacrificing board width or feeder positions
- Custom vacuum nozzles to handle any component
- Line array camera for primary alignment, assisted by a high-precision, on-the-fly co-planarity camera
- Board clamping system for stable board positioning and maximum placement accuracy (eliminates the need for tooling holes in the board).

Technical specifications Emerald-X[II]

Optimal output per hour:	6.8k
IPC 9850 output per hour:	5.9k
Head design with SF:	one single beam with 2 heads with independent Z-servo control
Head design with FNC:	one single beam with 2 heads each carrying six nozzles, with nozzle exchange on-the-fly and independent Z-servo control
Placing accuracy at 3 sigma:	50 micron for chips, 30 micron for QFP's
Component range:	01005 (0402) to 54 x 54mm, 45 x 100mm (BGA, µBGA, CSP, Connector, Odds)
Maximum component height:	20mm (0.79") (20 over 20mm)
Toolbit exchange:	on-the-fly nozzle or gripper exchange
Maximum board size (L x W):	460 x 440mm (18.1 x 17.3")
Minimum board size (L x W):	50 x 50mm (2.0 x 2.0")
Large Board Application:	650 x 850mm (25.6 x 33.5")
Board thickness:	0.4 to 4.0mm (0.016 x 0.16")
Tape feeding positions (8mm):	84 (CLi) or 160 (ITF)
Tray feeding:	LCS tray feeder with 40 pallets, single ATS tray feeder with 20 pallets
Other feeder options:	tape, stick, tray, tube, waffle pack, etc.
Feeder trolleys:	4 x 20 position (CLi) or 4 x 20 position (ITF)
Alignment principle:	line array camera, area CCD camera, co-planarity check on-the-fly
Footprint (L x W):	1650 x 1408mm (5.4 x 4.5 ft))
Operating system:	Windows NT™

Installed Base Solutions (IBS) — keeping your lines competitive!

We have increased the range of services available from our Installed Base Solutions (IBS), to keep your production lines competitive for years to come. As part of our IBS integrated approach, X-Series machines can be easily slotted into existing lines, extended or upgraded. This increases your flexibility and productivity. What's more, our on-site and remote services ensure both continuous performance improvement and operational cost reductions. IBS is an added-value, customised solution, regularly reviewed to suit individual customer needs:

- At its most basic level, it covers upgrades, spare parts and preventive maintenance
- At its more advanced level it can be linked to services such as Remote 'LIFEsupport'. For example, real-time monitoring of your line data and machine parameters will allow us to maximise your first pass yield
- Tailor-made service level agreements can be drawn up to specify agreed performance parameters, backed up by process guarantees
- Cost-down services are also possible as part of a customised IBS contract ensuring reduction of operational expenses

The X-Series, with the support of Assembléon's Installed Base Solutions:

Flexibility assured, performance guaranteed

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