High-speed Modular Placement System

FX-3RA Features:
• 66,000 CPH (IPC9850)
• Electronic & Mechanical Tape Feeders
• 22” x 32” Maximum Board Size

LOWEST COST OF OWNERSHIP
From the pioneer of the modular assembly line comes the latest technology in high volume production at the lowest cost of ownership. Offering an interchangeable electronic and mechanical feeder solution combined with a new 22" x 32" maximum board size, the continuously evolving FX-3RA offers the utmost in flexibility, reliability, and ease of use for both high speed and high mix manufacturing environments.

- **IPC8850 (chip): 66,000CPH**
- Four multi-nozzle laser heads (24 total nozzles)
- Components 01005 (0402 metric) to 33.5mm square
- Feeder inputs: Max. 240 8mm tape feeders when using Electronic Dual Lane

### User-friendly Operation

- 15-inch Touch-panel
- Color LCD Display
  - Easy teaching using touch screen while looking at the component
  - The graphical user interface is designed for simple operation
  - The language can be changed at any time
- High-speed Modular Placement System

### High-speed Modular Placement System

**FX-3RA**

Supporting Electronic & Mechanical Tape Feeders and 22" x 32" Maximum Board Size

High Volume with a Minimal Footprint

High-speed Placement: Supporting Customer Needs

On-the-fly Simultaneous Centering using the 6-nozzle Multi-laser Head

Independent Z / θ control

Note: The right station parts shown as an enhanced view.
Before production, electronic feeders communicate with the production program to verify the type of feeder and feeder pitch. An LED flashes if there is a discrepancy. The LED display also alerts the operator to running out of components and incorrect feeder position. During machine operation the LED display shows its feeder position.

**Laser Centering Technology / JUKI’s original technologies for high-speed and high-quality placement.**

**Laser Sensor: LNC60**

Chip placement speed is greatly improved
Simultaneous picking and on-the-fly parallel recognition with six nozzles are achieved by using the high resolution LNC60 laser sensor.

**Unrivaled placement range from 01005 (0402 metric) to 33.5mm square components**
The LNC60 brings a new concept in laser centering to the market. This sensor has the unique ability to center components from 01005 (0402 metric) to 33.5mm square parts. From ultra-small, ultra-thin, chip-shaped parts to small QFP, CSP, BGA, a wide range of parts can be mounted by the laser recognition system at high-speed and with high-accuracy.

**A New Concept in Component Centering that is Capable of On-the-Fly Centering of 6 Components Simultaneously.**

- **Tangential Line Centering™** achieves both a wider component range and higher accuracy all at the same time. The LNC60 accurately measures the component’s center, dimensions, and angular correction all in a single sweep. The optical design has been simplified to give higher reliability in a thinner and lighter package.

**Low Loss Ratio**

**Component Check Function Improves Placement Reliability**

Since the laser is mounted on the head, it can be used to monitor the presence of components the entire time from pick to placement. This is difficult to accomplish with vacuum detection only. The placement reliability is also improved because the release of the component is confirmed after placement.

**Equipped with Standard Features that Support Diverse Manufacturing Requirements**

- **Fast and Easy Setup, Low Defect Ratio**
- **Auto Teaching of Pick Position**
  - **HMS (Height Measurement System)**
  
  The HMS is used to quickly and accurately measure the component pick height. A laser sensor measures the distance instantly without any physical contact.

- **Flexible Recognition**

  The OCC lighting system supports a wide variety of board materials including FPC (Flexible Printed Circuit board). Programmable brightness and directional lighting improves fiducial recognition.

- **Fiducial Recognition**

  Camera Bad Mark Detection

  Bad mark detection is performed using the machine’s standard downward looking camera (also used for fiducials and teaching), which accurately detects a wide range of marks on various substrates, including flex circuits.

**Electronic and Mechanical Tape Feeders can be Switched by the Feeder Trolley**

Mechanical and Electronic feeder trolleys are completely interchangeable allowing the customer to make effective use of existing assets. Using only necessary components fed through an electronic tape feeder (fully interchanged) produces superior cost performance.

When feeder trolleys are installed, the placement system automatically recognizes whether electronic tape feeders or mechanical tape feeders are used.

**Electronic Tape Feeders - ETF Series / High Precision, High Quality**

The motor driven electronic feeder tape feeder is designed for fast, smooth and reliable component feeding.

A new electronic double tape feeder allows up to 240 different components to be loaded, the biggest capacity in the industry. It is ideal for low volume/high mix environments where more files could be clustered into one setup to dramatically reduce change-over time.

**Simple Switching of the Feed Pitch**

Simply press a button to change the feed pitch.

**Automatic Correction of Pick Position**

The variance of the position from the center of each component is detected by the machine head when centering. This information is transmitted to each electronic feeder which automatically adjusts feeding for more stable pick position and for more chance of simultaneous pick.

**Electronic and Mechanical Tape Feeders**

- **Tape Feeders**
- **Stick Feeders**
- **Bulk Feeders**
- **ATF (Splicing tape feeder)**

**Status is displayed with Seven Segment LED**

Before production, electronic feeders communicate with the production program to verify the type of feeder and feeder pitch. An LED flashes if there is a discrepancy. The LED display also alerts the operator to running out of components and incorrect feeder position. During machine operation the LED display shows its feeder position.
Wide Range of Components Supported / Results in Flexible Production Lines

FX-3RA can widely recognize and place angular parts ranging from 01005 (0402 metric) to 33.5mm square. By combining it with a High-speed Flexible Placement System KE2080 or KE3020V, placement parts are effectively sorted supporting highly flexible production capability.

Wide Variety of Options

**Options for LED Placement**

- **Capable of producing long boards (800mm) used in LED lighting**
- **Nozzles for LED components**
  - JUKI has a variety of nozzles for placing LED components. Contact our sales personnel for details.
- **Solder Recognition Lighting Option**
  - The Solder Recognition Lighting Option can be used to view pasted pads as fiducial marks. This option is most commonly used when building a PCB that requires multiple indexing that does not have valid fiducial marks.
- **Component Quantity Control**
  - The Component Quantity Control Option calculates the number of LEDs required to build the PCB versus what is remaining on the existing reel and will not allow production to begin if there are not enough components.

**Compatibility / Reduced Costs by Maintaining Compatibility**

Many parts and accessories are compatible between the FX-3RA and other JUKI placement machines.

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**Easy to Operate and Train New Operators**

**Operator’s Setup Checklist**

This function assists operators in the preparation of a new production program. By simply following a checklist of setup items listed in the menu, an operator can be sure that the necessary steps for production have been completed.

**Simplified Programming**

**Ease-of-Operation Improved by Automatic Component Measurement**

Component data can be programmed just by typing approximate dimensions, type and packaging information. Accurate dimensions, number of leads and lead pitch are measured and programmed by the machine automatically.

**Component Density**

- **FX-3RA**
  - Component density

**Compatibility**

Many parts and accessories are compatible between the FX-3RA and other JUKI placement machines.

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**High Quality**

- **FCS (Flex Calibration System)**
  - JUKI’s superior ease of maintenance just got even easier! The optional FCS calibration jig is a simple to use system to re-calibrate placement accuracy. The machine automatically picks and places components, then measures the error and adjusts all necessary calibrations. (optional)
- **Feeder Position Indicator**
  - LEDs on the feeder bank indicate which feeder needs to be replaced or which feeder has an alarm. This option is most commonly used when building a PCB that requires multiple indexing that does not have valid fiducial marks.

**Software**

Supported by IS NPI+ and IFS-NX Verification System which includes:

- CAD, Gerber and ASCII or centroid data software package that automatically and efficiently creates complete JUKI program files in seconds
- Employs a client-server architecture that connects the IS server throughout the factory via Ethernet for factory wide control to:
  - Create Production Programs
  - Perform Line and Factory optimization
  - Supports Cluster groups for maximum optimization of the line
  - Supports downloading production programs to multiple lines
  - Supports Line Monitoring and On-Demand Job Production
  - Provides a factory status display and performance calculation
  - Utilizes RFID Smart Feeder technology to guarantee accurate production builds:
    - Closed Loop System set to ensure proper feeder setup
    - Improved component Inventory control
    - Provides traceability functionality down to the referenced designator level

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*Please ask for details.
## Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>High-speed modular placement system FX-3RA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L size (410x360mm) (800mm long optional)</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>L-Wide size (510x360mm) (800mm long optional)</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>XL size (610x560mm) (800mm long optional)</td>
<td>○</td>
<td></td>
</tr>
<tr>
<td>Component height</td>
<td>6mm</td>
<td></td>
</tr>
<tr>
<td>Component size</td>
<td>Laser recognition</td>
<td>01005 (0402 metric) to 33.5mm square</td>
</tr>
<tr>
<td>Placement speed (chip)</td>
<td>IPC9850</td>
<td>66,000CPH&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Placement accuracy</td>
<td>Laser recognition</td>
<td>±0.05mm (Cpk ≥ 1)</td>
</tr>
<tr>
<td>Feeder inputs</td>
<td>Max. 240 8mm tape feeders (using dual lane electronic)</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>200 to 415 VAC, 3-phase</td>
<td></td>
</tr>
<tr>
<td>Apparent power</td>
<td>Maximum 9.5KVA</td>
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</tr>
<tr>
<td>Operating air pressure</td>
<td>0.5±0.05Mpa</td>
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</tr>
<tr>
<td>Air consumption</td>
<td>Max.150L/min</td>
<td></td>
</tr>
<tr>
<td>Machine Dimensions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(WxDxH)&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L size</td>
<td>2,650 X 1,650 X 1,530mm</td>
<td></td>
</tr>
<tr>
<td>L-Wide size</td>
<td>2,880 X 1,650 X 1,530mm</td>
<td></td>
</tr>
<tr>
<td>XL size</td>
<td>2,880 X 1,650 X 1,530mm</td>
<td></td>
</tr>
<tr>
<td>Mass (approximately)</td>
<td>L, L-Wide size</td>
<td>3,500kg</td>
</tr>
<tr>
<td></td>
<td>XL size</td>
<td>3,750kg</td>
</tr>
</tbody>
</table>

<sup>1</sup>: This speed does not apply to XL board size.

<sup>2</sup>: Height described is for conveyor height 900mm

### Options

- **Recognition system**: Bad Mark Reader / Placement Monitor / Solder Lighting / Component Quantity Control / Offset Placement After Solder Screen-Printing (OPASS)
- **Operation system**: Long Board Option / Trolley Kits
- **Inspection function**: Component Verification System (CVS) / SOT Direction Check Function
- **Others**: FCS Calibration Jig / Feeder Position Indicator / Pin Reference
- **Software**: IS NPI+ / IFS-NX
- **Component handling and feeders**: Mechanical Feeder Trolley / Mechanical Tape Feeder 8~56mm / Mechanical Adhesive Tape Feeder 32mm /
  Mechanical Stick Feeder / Mechanical Bulk Feeder / IC Collection Belt / Trash Box / Tape Reel Base /
  Connector Bracket / Electric Tape Feeder 8~56mm / Electric Feeder Trolley / Electronic Stick Feeder

*Please refer to the product specifications for details.*

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**JUKI CORPORATION**

Electronic Assembly & Test Systems Division

2-11-1, Tsurumaki, Tama-shi
Tokyo 206-8551, JAPAN
TEL.81-42-357-2293
FAX.81-42-357-2285

**JUKI Americas**

507 Airport Blvd.
Morrisville, NC 27560
Phone: 919-460-0111
Email: sales@jas-smt.com
www.jukiamericas.com

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