The ideal dispensing system for lean manufacturing, the FX-D combines unparalleled price/performance with "plug and play" configurability in the field.
Camalot FX-D

**FLEXIBILITY**

The Camalot FX-D, from Speedline, is a revolutionary new dispensing system that features a unique “plug and play” system design. Configurable as stand alone or in-line, this new platform provides a lower cost dispenser with mid-to-high end performance. The FX-D employs a combination of industry proven technologies in an easy-to-use, configurable, and reliable dispensing system. Controlled using Benchmark software within the Windows® XP environment facilitates quick, “hassle free” program creation and fast product changeovers.

**PUMP TECHNOLOGY**

The pumps used on the Camalot FX-D platform are based on proven designs that have been enhanced with closed-loop DC servo motors. These new motors provide finer dispense resolution and adjustable speeds that deliver faster, more precise amounts of material onto your product. Different auger screw pitches are available for applications that have more stringent volume requirements.

**PUMP HIGHLIGHTS**

- Ideally suited for Dot type applications
- Uses footed or unfooted needles
- Precise material delivery
- Minimal maintenance

- Ideally suited for Line type applications
- Uses patented no-drip design
- Carbide parts as standard
- High flow rates

**Dispense Matrix**

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>635SD</th>
<th>680SD</th>
<th>SmartStream</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Contact Stream</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Auger Screw</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Piston</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Carbide</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Positive Shut-Off</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Level Sensor</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Heat</td>
<td>*x</td>
<td></td>
<td>x</td>
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</tbody>
</table>

**PROCESS**

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>635SD</th>
<th>680SD</th>
<th>SmartStream</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMT Glue</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solder Paste</td>
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<td></td>
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<tr>
<td>Silver Epoxy</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edge/Corner Bond</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>Underfill/Encapsulation</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Dam</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UV Selective Coat</td>
<td></td>
<td>x</td>
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</tbody>
</table>

* Optional

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The Camalot FX-D offers a range of highly accurate closed-loop, servo drive auger, piston and streaming pumps. Pump maintenance is simplified with quick, easy removal of all wetted parts.
Dual head configurability allows dispensing of different materials within one process. Both Z-axes are independently controlled, facilitating both high positional accuracy and fast axis movement.

Patented closed-loop weighing process allows measurement of both global and actual dispense patterns for maximum accuracy. Changes in material viscosity are controlled with automatic compensation.

Dual Head Modes
With identical pumps and materials configured to both heads, the platform allows 2 new modes of operation. Synchronous mode dispenses simultaneously and reduces dispense time by approximately 50%. Asynchronous mode dispenses alternately with the heads reducing dispense time by up to 20% while maintaining system accuracy.

Height Sensing
A laser or mechanical probe (LVDT) is available to sense product height prior to dispensing.

Auto Vision
Vision system accurately aligns dispense patterns to any fiducials. For underfill, vision pinpoints component edges ensuring a parallel dispense path.

Part Handling
Optional transport system features up to 3 conveyor zones supporting contact or non-contact heat chucks or SMT edge clamps. Unique pipeline mode reduces transfer time up to 50%.

Power Your Process
The Camalot FX-D provides flexibility and performance previously found only at the high end of the market, making it an ideal system for manufacturers who demand an accurate, reliable, cost-effective machine that is easily adaptable to changing requirements. Cost effectiveness does not, however, compromise the system’s performance. A robust, welded steel frame, closed-loop DC servo motors and precision ball screw drives in all axes ensure reliability and high process yields. Stand-alone or in-line, the FX-D’s large dispense area and open architecture provide ultimate flexibility with an easily configurable platform for virtually any dispensing application. Available options include weight scale, needle cleaner, height sensing, heat harness, and second Z-head. All of these, and even a conveyor system, can be retrofitted in the field.
CAMALOT FX-D SPECIFICATIONS

SMT Applications
- SMA, solder paste, conductive adhesives
- Semiconductor Packaging
- Underfill, encapsulant, thermal grease, lid seal, die attach

XY AXIS
- XY Placement Accuracy*: +/-50 microns @ 3 sigma
- Repeatability*: +/-15 microns @ 3 sigma
- Speed: 900 mm/sec (19.7'/sec)
- Encoder Resolution: 2 microns
- Gantry Drive System: Closed-loop DC servo, ball-screw drive

Z AXIS
- Z Axis Accuracy*: +/-25 microns (0.001") @ 3 sigma
- Repeatability*: +/-10 microns @ 3 sigma
- Speed: 188 mm/sec (7.38"/sec)
- Encoder Resolution: 0.3 microns
- Z-Axis Type: Closed-loop DC servo, Ball-screw drive
- Z-Sense Type: Mechanical probe or CCD laser

DOT PLACEMENT PERFORMANCE
- 3.00mm pitch**: 30,000 DPH
- 1.27mm pitch**: 36,000 DPH
- IPC 9850 test PCB**: 23,000 DPH

TRAVEL
- Max Dispense Area (XY)**: 508 mm x 508 mm (20" x 20")
- Z-Axis Travel: 100 mm (4")

BOARD HANDLING
- Conveyor Type: Flat belt with auto width adjust
- Min Conveyor Width: 25.4 mm (1.0"")
- Above Board Clearance: 25.4 mm (1.0"")
- Underboard Clearance: 30.5 mm (1.2"")
- Transport Height: 790 mm to 965 mm (32.2" to 38")

Protocol: SMEMA

Conveyor Options SMT
- Edge clamp w/vacuum support
- Lift Chucks: Up to three 13" x 10" chucks
- Conveyor Weight Capacity**: 3.66 kg total (8.1 lbs.)
- Gantry Drive System: Closed-loop DC servo, ball-screw drive
- Lift Chuck Options: Heated contact w/vacuum or non-contact (convection)
- Chuck Temperature Range: Ambient to 130°C

DISPENSE METHOD
- Pump Temperature Range: Ambient to 70°C
- Pump Control: Closed-loop DC servo axis
- SmartStream: Non-contact and low level sensor included
- DC Servo Pumps: Rotary positive displacement pumps for dot or line applications with low level sensor included

STANDARD FEATURES
- Auto-Width Conveyor: XYZ calibration station
- Pre-dispense Station: Purge station
- Flip Chip Calculator: Auto-vision alignment
- Vision System: Split beam on-axis illumination — red or blue light
- Computer: Internally mounted desktop
- Operating System: Microsoft Windows XP
- Program Storage: Local hard drive, CD-RW, Ethernet and USB ports
- Program Method: Teach camera, off-line programming, or text file download
- Pipeline conveyor: Parallel product transfer

FACILITIES
- Power Requirements: 208 to 240 VAC, 50/60 Hz 20A
- Air Supply Requirements: 10 CFM (4.7l/s) at >80 PSI (5.5 bar) filtered @ 5 microns
- Machine Footprint: 1270 mm x 1475 mm x 1730 mm (W x D x H) (50" x 58" x 68"")
- Machine Weight: 680 kg (1500 lbs.)
- Crated Weight: 890 kg (1962 lbs.)
- Crated Dimensions: 1752 mm x 2133 mm x 2032 mm (W x D x H) (69" x 84" x 80"")
- Industry Standards: CE, SMEMA, SEMI S2 & S8

OPTIONS
- Dual Mode Weight Scale: Die edge detection algorithms
- Needle Cleaner: Needle Detector
- Time Pressure Dispensing: Secondary Z Axis
- Prewire for Heat: Synchronous Dual Head

*At Full Speed
**0.5mm dot diameter 2.5mm needle lift
***Consult factory for specifics.

Electronic data sheet available on request.

Specifications are subject to change without notice.