

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

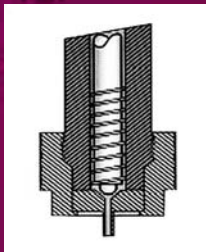


# Camalot

FX-D<sup>®</sup> Dispensing System  
Flexibility, Performance, Value

# Camalot

## FX-D



680SD Positive Shut-Off

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.

### 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



635 SD

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



680 SD

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



MPP

- Ideally suited for lower viscosity material (<50000 cps)
- Patented continuous flow piston design means zero recharge time
- Carbide pump components resist wear from filled materials
- 10cc to 6oz. cartridges direct mount to the pump
- Positive displacement design ensures volume output remains constant as material viscosity changes



SmartStream®

- New, non-contact dispense pump is well-suited for underfill applications
- Patent pending design uses a positive displacement technique to create a “Stream” of material
- Closed-loop servo drive ensures fast, repeatable performance
- Innovative design eliminates mechanical ball-to-seat contact, thus reducing wear on parts
- Narrow stream width for access into densely packed areas

|          | 635SD                   | 680SD | MPP | SmartStream |   |
|----------|-------------------------|-------|-----|-------------|---|
| FEATURES | Non Contact Stream      |       |     | x           |   |
|          | Auger Screw             | x     | x   |             |   |
|          | Piston                  |       |     | x           | x |
|          | Carbide                 | *x    | x   | x           | x |
|          | Positive Shut-Off       |       | x   |             |   |
|          | Low Level Sensor        | x     | x   | x           | x |
| PROCESS  | Heat                    |       | *x  | *x          | x |
|          | SMT Glue                | x     |     |             |   |
|          | Solder Paste            | x     |     |             |   |
|          | Silver Epoxy            | x     |     |             |   |
|          | Edge/Corner Bond        | x     | x   | x           | x |
|          | Underfill/Encapsulation |       | x   | x           | x |
|          | Dam                     |       | x   |             |   |

\* Optional

## 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.

### Dual Head Modes

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.



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.



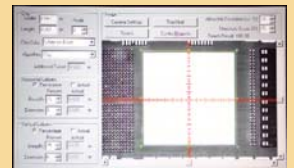
### Height Sensing

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



### Dual Mode Weight Scale

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.



### 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%.

#### WORLD HEADQUARTERS

16 Forge Park, Franklin, MA 02038  
Tel: +1 (508) 520-0083  
Fax: +1 (508) 520-2288

www.speedlinetech.com

#### MANUFACTURING AND CUSTOMER SUPPORT FACILITIES

ACCEL/ELECTROVERT  
Highway 5 South, Camdenton, MO 65020  
Tel: +1 (573) 346-3341  
Fax: +1 (573) 346-5554

CAMALOT/MPM  
16 Forge Park, Franklin, MA 02038  
Tel: +1 (508) 520-0083  
Fax: +1 (508) 520-2288

#### SALES AND CUSTOMER SUPPORT OFFICES

MEXICO  
Carretera Base Aerea #5850 Km.  
Edificio 5  
Zapopan, Jalisco, Mexico  
Tel: +52 (33)33-65-6511  
Fax: +52 (33) 38-18-9019

EUROPE  
Speedline Technologies GmbH  
Im Gefierth 14  
D-63303 Dreieich, Germany  
Tel: +49 (0) 6103-8320  
Fax: +49 (0) 6103-832-299

ASIA/PACIFIC  
Speedline Technologies Asia Pte Ltd  
132 Joo Seng Road  
#03-01 Uniplus Building  
Singapore 368358  
Tel: +65-6286 6635  
Fax: +65-6289 9411

© 2009 Speedline Technologies

Speedline, Accel, Camalot, Electrovert, MPM, Protect, FX-D, and SmartStream are trademarks of Speedline Technologies or its subsidiaries and affiliated companies. Windows is a registered trademark of Microsoft Corporation. All other brands may be trademarks of their respective holders.

02/09

## 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* | +/-75 microns (0.003") @ 3 sigma |
|------------------------|----------------------------------|

|                |                        |
|----------------|------------------------|
| Repeatability* | +/-15microns @ 3 sigma |
|----------------|------------------------|

|       |                        |
|-------|------------------------|
| Speed | 500 mm/sec (19.7"/sec) |
|-------|------------------------|

|                    |           |
|--------------------|-----------|
| Encoder Resolution | 2 microns |
|--------------------|-----------|

|                     |                                       |
|---------------------|---------------------------------------|
| Gantry Drive System | Closed-loop DC servo, ballscrew drive |
|---------------------|---------------------------------------|

|                              |                         |
|------------------------------|-------------------------|
| Total System Accuracy (TSA)* | +/-125 microns (0.005") |
|------------------------------|-------------------------|

|           |           |
|-----------|-----------|
| CpK > 1.0 | @ 3 sigma |
|-----------|-----------|

### Z AXIS

|                  |                                  |
|------------------|----------------------------------|
| Z Axis Accuracy* | +/-25 microns (0.001") @ 3 sigma |
|------------------|----------------------------------|

|                |                        |
|----------------|------------------------|
| Repeatability* | +/-10microns @ 3 sigma |
|----------------|------------------------|

|       |                        |
|-------|------------------------|
| Speed | 188 mm/sec (7.38"/sec) |
|-------|------------------------|

|                    |             |
|--------------------|-------------|
| Encoder Resolution | 0.3 microns |
|--------------------|-------------|

|             |                                       |
|-------------|---------------------------------------|
| Z-Axis Type | Closed-loop DC servo, Ballscrew 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 (32.1" to 38") |
|------------------|---------------------------------|

|          |       |
|----------|-------|
| Protocol | SMEMA |
|----------|-------|

|                      |                                  |
|----------------------|----------------------------------|
| Conveyor Options SMT | SMT edge clamps w/vacuum support |
|----------------------|----------------------------------|

|                      |                              |
|----------------------|------------------------------|
| Conveyor Lift Chucks | Up to three 13" x 10" chucks |
|----------------------|------------------------------|

|                             |   |
|-----------------------------|---|
| Conveyor Weight Capacity*** | 3.66 kg total (8.1 lbs.) w/ 3 lift chucks |
|-----------------------------|---|

|                    |   |
|--------------------|---|
| 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, positive displacement Streaming pump for underfill, low level sensor |
|-------------|---|

|                |  |
|----------------|--|
| DC Servo Pumps | Rotary positive displacement pumps line applications with low level sensor |
|----------------|--|

|                            |  |
|----------------------------|--|
| Multi-Piston Pump (Heated) | Standard or low-volume designs, low level sensor |
|----------------------------|--|

### 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 (W x D x H) | 1270 mm x 1475 mm x 1730mm (50" x 58" x 68") |
|-------------------------------|--|

|                |                    |
|----------------|--------------------|
| Machine Weight | 680 kg (1500 lbs.) |
|----------------|--------------------|

|               |                    |
|---------------|--------------------|
| Crated Weight | 890 kg (1962 lbs.) |
|---------------|--------------------|

|                    |                         |
|--------------------|-------------------------|
| 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 |  |
|------------------|--|

\*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.

## ABOUT SPEEDLINE TECHNOLOGIES

Speedline Technologies is the global leader in process knowledge and expertise for the PCB assembly and semiconductor industries. Based in Franklin, Massachusetts, U.S.A., the company markets five best-in-class brands – Accel microelectronics cleaning equipment; Camalot dispensing systems; Electrovert wave soldering, reflow soldering, and cleaning equipment; MPM stencil and screen printing systems; and PROTECT global services, support, and training solutions. For more information, visit us at [www.speedlinetech.com](http://www.speedlinetech.com).

Speedline Technologies maintains an ongoing program of product improvement that may affect design and/or price. We reserve the right to make these changes without prior notice or liability.



Knowledge in process