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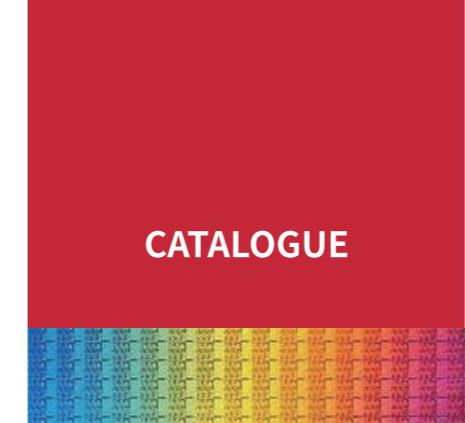
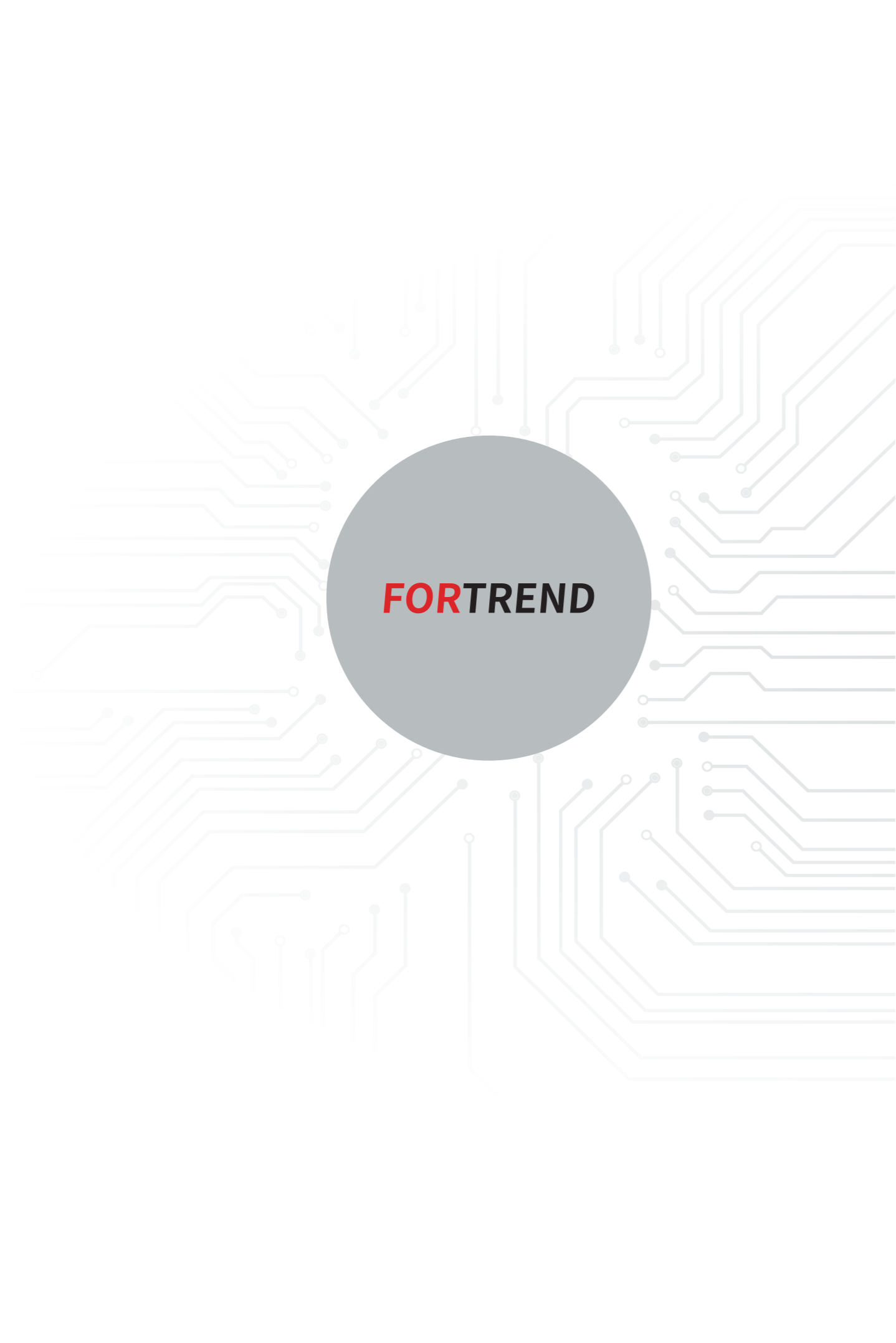
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## ABOUT FORTREND



## 200MM SMIF SOLUTIONS

Enterprise Introduction

### ABOUT FORTREND

Founded in 1979 in Silicon Valley, USA, Fortrend has always been the top leader in batchwafer transfer technologies, Standard Mechanical Interface (SMIF) technologies, ultra-clean automation solutions, and wafer surface curing processes for the semiconductor and PV industries. Fortrend SMIF products have become the crucial automation connections between process equipment and the factory delivery system and between different processing equipment.

Fortrend's standard 200mm and 300mm front end automation modules are readily integrated into processing tools reliably and cost effectively. Fortrend's 3DIC thermal curing tools set the industrial standards for wafer surface curing processes. Fortrend offers not only standard automation and thermal curing modules, but also custom solutions allowing us to meet custom challenges and difficult configuration requirements quickly with a minimum of expenses. Contact Fortrend and experience our engineering excellence first hand.



Enterprise Introduction

### ABOUT FORTREND

- ◆ Original inventor of 200mm SMIF pod loader and micro-environment technology
- ◆ Serving 200mm SMIF automation market since 1985 and the dominant solution provider for 200mm SMIF retrofit market today
- ◆ Complete complementary products: RFID lot tracking hardware systems, material logistic management software, clean room subtract handling robots, automated 200mm and 300mm wafer and reticle carrier openers
- ◆ Over 30 USA and International patents
- ◆ Complete reticle handling automation solutions

Enterprise Introduction

### GRANTED PATENTS



200mm SMIF Solutions

### BACKGROUND INFORMATION

SMIF (Standard Mechanical Interface) technology is a material isolation technology pioneered by HP to provide ISO class-2 wafer cassette transfer environment in a sub-class (ISO class-6 or better) IC manufacturing FAB. SEMI research data have proven that SMIF technology provides 100x, 30x, and 10x better cleanliness wafer protections compared to open cassette transfers in ISO class-5, ISO class-4, ISO class-3 facilities, respectively. In addition, SMIF technology also enabled active material logistic controls to improve production management and profitability. Consequently, over 200 200mm SMIF manufacturing facilities have been constructed since the early 1990s.

200mm SMIF Solutions

### FORTREND SMIF ADVANTAGES

- ◆ Fortrend introduced the first 200mm SMIF loader/Unloader (PLUS-500) and built the first 200mm SMIF manufacturing facility at HP-Corvallis facility in 1995
- ◆ On 7 USA and international SMF patents
- ◆ Only SMIF provider offers total solution retrofit programs Flexible software and hardware configurations
- ◆ Compatible CI integration to competitors
- ◆ Readily applicable to all existing tools
- ◆ Patented Technologies (granted)
- ◆ Integrated active ULPA Fan Filter Unit (FFU) for best environmental isolation
- ◆ Flexible configurations, two body designs and 6 robots to meet all custom applications
- ◆ Positive gripper design for easy cassette handling
- ◆ Tilt and rotate cassettes
- ◆ Slide cassettes to left or right of center line to meet open cassette narrow pitch tools
- ◆ Smallest footprint
- ◆ Compatible with OHT and AGV loading
- ◆ Optional SEMI E84 Communication card for OEM tools that cannot handle E84 handshakes
- ◆ SEMI E19.4.S2,S8,CE, UKCA Certified

## ADAPTIVE LOAD PORTS PLUS 150 & 500 SMIF ARMS



### Features

- Into OEM open cassette tools Nine Robot arm designs, two body sizes to meet the challenges of loading cassette
- Less than 60-second load or unload cycle times maximizes production
- Small footprint saves valuable FAB floor-space
- Adjustable loading height provides ergonomic efficiency
- Built-in mini-environment and clean airflow system maintain Class 1 cleanliness

### EASY TO INTEGRATE

The fully automatic Fortrend Plus 500 transfers 200mm cassettes from SMIF pods onto process stages in 60 seconds or less. The system can also be used to load cassettes into process tools in a non-SMIF environment. With a total footprint not much larger than a SMIF pod, the Plus 500 SMIF arm is easy to integrate with OHT or AGV systems and into small areas. A programmable robotic arm with end-effector that tilts wafers into the vertical position accommodates a wide variety of process tools

### SAFE AND RELIABLE

A patented, built-in mini-environment and airflow control system help protect wafers from contamination, while the robot is transferring pod between SMIF pods and tool stages. With many fail-safe features including pod present sensor, wafer protrusion sensor, cassette overload sensors, constant torque dc stepper motors (with encoder feedbacks) for accurate and reliable motion controls, the Plus 500 SMIF arms the best choice for both OEMs and system integrators

### SIMPLE TO MAINTAIN

All Plus 500 models feature a variety of tool interface options: diamond-pin interface plate with quick-release latches and stand-alone floor mount enabling reconnection to and from virtually any process tool within 15 minutes or less. Considering that during ramp-up a pod loader may be disconnected and reconnected as often as twice a day to adjust the process tooling, this feature significantly reduces downtime and simplifies preventive maintenance

## ADAPTIVE LOAD PORTS PLUS 150 & 500 SMIF ARMS

### OUTSTANDING SUPPORT

Installation, on-site training, worldwide supports and variety choices of economical long-term maintenance contracts are available from Fortrend. Established in 1979, Fortrend's expertise in robotics, mechanics and software provide the optimum solution for semiconductor manufacturers who are driven to improve yield, increase throughput and reduce costs.

SMIF FUNCTION								
MODEL	Body Height	With Robot	Tilt (90degree)	Rotation (180degree)	Waving left (80mm)	Waving Right (80mm)	Heavy -load arm	E84 Controller (option)
PLUS-150/500S	1840mm	✓	✓					✓
PLUS-150/500R	1840mm	✓		✓				✓
PLUS-150/500SD	1840mm	✓						✓
PLUS-150/500SX	1840mm	✓	✓		✓	✓		✓
PLUS-150/500SX-B	1709mm	✓	✓		✓	✓		✓
PLUS-150/500CX	1520mm	✓	✓		✓	✓		✓
PLUS-150/500TX	1840mm	✓						✓
PLUS-150/500UX	1210mm	✓						✓
PLUS-150/500SDH	1210mm	✓					✓	✓
PLUS-150/500SH	1210mm	✓	✓				✓	✓
PLUS-150/500RH	1210mm	✓		✓			✓	✓
PLUS-150/500F	1770mm	✓		✓				✓
PLUS-150/500LM	1530mm							✓
PLM-150/200	815mm							✓

 **PLUS 150/500 S-X**  
Standard Features

- Straight arm Movement
- Put the POD box level or vertical to the toolbage
- Wafer mapping function
- Progressive sensor of wafer chips
- Cassette Present Sensor
- SMIF pod in place Sensors
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover




 **PLUS 150/500 R-X**  
Standard Features

- Straight arm Movement with cassette able to rotate up to 359°
- Put the POD box level or vertical to the toolbage
- Wafer mapping function
- Progressive sensor of wafer chips
- SMIF pod in place Sensor
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



SPECIFICATIONS				
MODEL	PLUS 500S-L PLUS 150S-L	PLUS 500S-R PLUS 150S-R	PLUS 500S-L-OHT PLUS 150S-L-OHT	PLUS 500S-R-OHT PLUS 150S-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x184 cm(H)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<60 sec.(S Model without tilt and leave pod open after load)			
Cycle time (Unload)	<60sec.(S Model without tilt with pod left open after load)			
Arm Extension	390mm	Arm Z Travel	135mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Tilt axis precision	+0.15 degree	
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system			

SPECIFICATIONS				
MODEL	PLUS 500R-L PLUS 150R-L	PLUS 500R-R PLUS 150R-R	PLUS 500R-L-OHT PLUS 150R-L-OHT	PLUS 500R-R-OHT PLUS 150R-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x184cm(H)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<60 sec.(S Model without tilt and leave pod open after load)			
Cycle time (Unload)	<60 sec.(S Model without tilt and leave pod open after load)			
Arm Extension	305mm	Arm Z Travel	135mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Wrist axis precision	+0.15 degree	
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series ; RFID Read/write Module - Fortrend or Hermos or Other RFID ; Intellion Lot Track system			




# PLUS 150/500 SD-X

Standard Features

- Straight arm Movement
- Put the POD box level or vertical to the toolbage
- Wafer mapping function
- Progressive sensor of wafer chips
- SMIF pod in place Sensors
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



SPECIFICATIONS				
MODEL	PLUS 500SD-L PLUS 150SD-L	PLUS 500SD-R PLUS 150SD-R	PLUS 500SD-L-OHT PLUS 150SD-L-OHT	PLUS 500SD-R-OHT PLUS 150SD-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x184cm(H)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<60 sec.(SD Model and leave pod open after load)			
Cycle time (Unload)	<60 sec.(SD Model and leave pod open after load)			
Arm Extension	440mm	Arm Z Travel	135mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm			
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system			



# PLUS 150SX-X

Standard Features

- Straight arm Movement
- Put the POD box level or vertical to the toolbage
- Slide the POD box to the right side of the center or right to 80mm
- Wafer mapping function
- Wafer protrusion sensor
- SMIF pod in place Sensors
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



SPECIFICATIONS					
MODEL	PLUS 500SL-L PLUS 150SL-L	PLUS 500SR-R PLUS 150SR-R	PLUS 500SL-L-OHT PLUS 150SL-L-OHT	PLUS 500SR-R-OHT PLUS 150SR-R-OHT	
I/O Panel	Left	Right	Left	Right	
E84 COMM Board	No	No	Yes	Yes	
Dimensions	34.8cm(W)x49.8cm(D)x184cm(H)				
Cycle time (load)	<80ec.(S Model without tilt and leave pod open after load)				
Cycle time (Unload)	<80 sec.(S Model without tilt and leave pod open after load)				
Arm Extension	390mm	Arm Z Travel	135mm	Transit	80mm
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)		
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg		
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm		
Gripper axis precision	±0.5 mm	Tilt axis precision	+0.15 degree		
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant				
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O				
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system				

 **PLUS 500 SX-B**  
Standard Features

- Straight arm Movement
- Loads cassette to tool stage either wafer Horizontally or vertically
- Wafer Mapper
- Wafer protrusion sensor
- Cassette Present Sensor
- SMIF pod in place Sensors
- SMIF pod Present Sensor
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



**SPECIFICATIONS**

MODEL	PLUS 500SL-B	PLUS 500SR-B	PLUS 500SL-B-OHT	PLUS 500SR-B-OHT
I/O Panel	Back	Back	Back	Back
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x170.9cm(H without Wheels)			
Cycle time (load)	<80 sec.(SL Model without tilt and leave pod open after load)			
Cycle time (Unload)	<80 sec.(SL Model without tilt with pod left open after load)			
Arm Extension	305mm	Arm Z Travel	135mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Tilt axis precision	+0.15 degree	
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system			

 **PLUS 150/500 CX-X**  
Standard Features

- Straight arm Movement
- Compact body
- Put the POD box level or vertical to the toolbage
- Slide the POD box to the right side of the center or right to 80mm
- Wafer mapping function
- Wafer protrusion sensor
- SMIF pod in place Sensors
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



**SPECIFICATIONS**

MODEL	PLUS 500CL-L PLUS 150CL-L	PLUS 500CR-R PLUS 150CR-R	PLUS 500CL-L-OHT PLUS 150CL-L-OHT	PLUS 500CR-R-OHT PLUS 150CR-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x152cm(H)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<80 sec.(S Model without tilt and leave pod open after load)			
Cycle time (Unload)	<80 sec.(S Model without tilt and leave pod open after load)			
Arm Extension	390mm	Arm Z Travel	40mm	Transit 80mm
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIF pod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Tilt axis precision	+0.15 degree	
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID;			

 **PLUS 150/500 TX-X**  
Standard Features

- Straight arm Movement with cassette able to rotate up to 359°
- Put the POD box level or vertical to the toolbage
- Wafer mapping function
- Progressive sensor of wafer chips
- SMIF pod in place Sensor
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



 **PLUS 150/500 UX-X**  
Standard Features

- Straight arm Movement
- Ultra Low Body for 70cm cassette stage heights
- Wafer protrusion sensor
- Wafer protrusion sensor
- SMIF pod in place Sensors
- Info Pad Plugs
- Left or Rear I/O panel
- Tool Mount
- Dust cover



SPECIFICATIONS				
MODEL	PLUS 500TL-L PLUS 150TL-L	PLUS 500TR-R PLUS 150TR-R	PLUS 500TL-L-OHT PLUS 150TL-L-OHT	PLUS 500TR-R-OHT PLUS 150TR-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x184cm(H)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<60 sec.(The pod remains open after loading)			
Cycle time (Unload)	<60 sec.(The pod remains open after loading)			
Arm Extension	390mm	Arm Z Travel	135mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Wrist axis precision	+0.15 degree	
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system			

SPECIFICATIONS				
MODEL	PLUS 500UL-L PLUS 150UL-L	PLUS 500UR-R PLUS 150UR-R	PLUS 500UL-L-OHT PLUS 150UL-L-OHT	PLUS 500UR-R-OHT PLUS 150UR-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	59.2cm(W)x42cm(D)x121cm(H)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<80 sec.(S Model without tilt and leave pod open after load)			
Cycle time (Unload)	<80 sec.(S Model without tilt and leave pod open after load)			
Arm Extension	390mm	Arm Z Travel	40mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	3.2 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Tilt axis precision	+0.15 degree	
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system			

 **PLUS 500 SDH-X**  
Standard Features

- Straight arm Movement
- Loads cassette to tool stage wafer Horizontally
- Wafer Mapper
- Lifts up to 7.5Kg
- Wafer protrusion sensor
- Cassette Present Sensor
- SMIF pod in place Sensors
- SMIF pod Present Sensor
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



 **PLUS 500 SH-X**  
Standard Features

- Straight arm Movement
- Loads cassette to tool stage wafer Horizontally
- Wafer Mapper
- Lifts up to 7.5Kg
- Wafer protrusion sensor
- Cassette Present Sensor
- SMIF pod in place Sensors
- SMIF pod Present Sensor
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



SPECIFICATIONS				
MODEL	PLUS 500SDH-L	PLUS 500SDH-R	PLUS 500SDH-L-OHT	PLUS 500SDH-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x170.9cm(H without Wheels)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<60 sec.(SDH Model and leave pod open after load)			
Cycle time (Unload)	<60 sec.(SDH Model and pod left open after load)			
Arm Extension	390mm	Arm Z Travel	131mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	7.5 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm			
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; Intellion Lot Track system RFID Read/write Module - Fortrend or Hermos or Other RFID;			

SPECIFICATIONS				
MODEL	PLUS 500SH-L	PLUS 500SH-R	PLUS 500SH-L-OHT	PLUS 500SH-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x170.9cm(H without Wheels)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<60 sec.(S Model without tilt and leave pod open after load)			
Cycle time (Unload)	<60 sec.(S Model without tilt with pod left open after load)			
Arm Extension	390mm	Arm Z Travel	135mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	7.5 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Tilt axis precision	+0.15 degree	
Control	Manual (Front Panel): Remote (From OEM Tool or CIM): Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system			

# PLUS 500 RH-X

Standard Features

- Straight arm Movement with cassette able to rotate up to 359°
- for angled cassette stages
- Loads cassette to tool stage wafer Horizontally
- Wafer Mapper
- Wafer protrusion sensor
- Cassette Present Sensor
- SMIF pod in place Sensors
- SMIF pod Present Sensor
- Info Pad Plugs
- Left or Right I/O panel
- Tool Mount
- Dust cover



## SPECIFICATIONS

MODEL	PLUS 500RH-L	PLUS 500RH-R	PLUS 500RH-L-OHT	PLUS 500RH-R-OHT
I/O Panel	Left	Right	Left	Right
E84 COMM Board	No	No	Yes	Yes
Dimensions	34.8cm(W)x49.8cm(D)x170.9cm(H without Wheels)			
Wheel Height	6 to 15.3 cm tool dependent			
Cycle time (load)	<60 sec.(R Model leave pod open after load)			
Cycle time (Unload)	<60 sec.(R Model pod left open after load)			
Arm Extension	305mm	Arm Z Travel	135mm	
Power	100 to 240 VAC @ 50/60 HZ	Weight	93 Kg (not including SMIFpod)	
Power-on reset time	<20 Secs	SMIF Arm Payload	7.5 Kg	
Arm Extent axis precision	+0.1 mm	Arm Elevator axis precision	+0.1 mm	
Gripper axis precision	±0.5 mm	Wrist axis precision	±0.15 degree	
Control	Manual (Front Panel); Remote (From OEM Tool or CIM); Pendant			
Communication interface	RS232(Serial)-Fortrend HEX or ASCII or SECS Parallel I/O			
Lot ID Reader Options	IR(Smart) Tag-8200 or 8400 series; RFID Read/write Module - Fortrend or Hermos or Other RFID; Intellion Lot Track system			

# PLUS 500LM

## Product Introduction

The PLUS 500LM is an integrated 200mm Wafer SMIF Pod Opener that allows the OEM tool to use a robot to remove the cassette into the processing tool or remove the wafers from the cassette.

## Features

- ISO Class 2 or better cleanliness with active self-clean air flow design
- All electrical system with field programmable application software
- Wafer Mapping Sensor (Present, Cross Slot)
- Lifts the Pod shell leaving the Wafer Cassette in a sealed mini-environment
  - ♦ Wafers can be removed by OEM Robot
  - ♦ Cassette can be removed by OEM Robot
- SEMI E84 hand-off for OHT pod delivery
- Four programmable Interlock signals
- Wafer Cassette Present Sensor
- SEMI E19.4, S2 and S8 standards and CE certified
- Wafer Protrusion Sensor
- Pod Present Sensor
- RFID reader/writer or IR read/writer



## Specifications

Wafer size	200mm
Dimension	460W x 506D x 1530H mm
Elevator Stroke	240 mm
Load capacity	5.4kg
Pod interface	SEMI E19.4
Power requirement	24 VDC (110V/240V Optional)
Weight	23kg without Pod
Open Pod	< 12 seconds
Close Pod	< 10 seconds
MCBF	50,000 cycles
MTTR	< 1 hour
Communication	Serial or TCP/IP Ethernet or EIA-RS232C (SECS I/II)



PLUS 500LM

# PLUS 150/500 F

## Product Introduction

The PLUS 500F is designed to load 200mm Wafer cassettes to multi-level cassette stages or high-level cassette stages from SMIF pods with the cassette rotated 180° after being picked-up from the cassette. The PLUS 500F is the approved SMIF pod loader by ASM for the A400-Classic and A400 DUO systems.

- Small footprint saves valuable FAB floor space
- ISO Class 2 or better cleanliness with active self-clean air flow design
- Lifts the Pod shell leaving the Wafer Cassette in a sealed mini-environment
- All electrical system with field programmable application software
- Pod Present Sensor
- Wafer Protrusion Sensor
- Wafer Mapper
- SEMI E19.4, S2 and S8 standards and CE certified Teach Pendant
- Teaching machine
- Optional Universal Floor Mount.
- Optional RFID reader/writer
- Optional IR reader/writer
- Used for ASMA400Classic and DUO system
- The SMIF option approved by ASM
- Cassette can be loaded into the A4003 level platform by a robotic arm
- Can directly replace the existing A400 SMIF
- Can be mounted directly onto existing ASMSMIF brackets



PLUS 500F  
SMF Docked to A400 Furnace

# PLUS 150/500 F











POD/Wafer Size	200 mm
Overall, Height	710mm W x 660mm D x 1770mm H
Robot arm payload	8 KG
Weight	185 KG(Depends on configuration)
Rated voltage	AC 220V
Rated power	2200W
The main material	Aluminum alloy, stainless steel (SUS 304)
Noise level	< 75 dBA
Communication	EIA-RS232C, SECS I/II Parallel I/O, SEMI E23-96, IEEE-TTL
Communication protocol	ASCII、TCP/P、ASCII、TCP/P
Optional options	iD read/write device with RFID module or IR Link
Cleanliness	ISO Class 2
Pod Interface	SEMIE19.4
Throughput	70 sec load & 90sec unload
Working Temperature	0 ~ 40°C
Working Humidity	5% ~ 90%

## POM 150 DL & POM 200 DL

### Product Introduction

The POM 150 and POM 200 are Table Top Stand-alone 200 mm SMIF pod opener. Opens the SMIF pod to allow the cassette or wafers to be manually loaded or unloaded. Ideal for use with tools within a SMIF fab that require the cassettes to be loaded by manual operations if the OEM tool cannot be automated with SMIF load ports. The SMIF pod is placed on the loadport by the operator. A press of the run button will unlock the pod door and lift the pod lid clear to allow the cassette to be removed or the wafers to be removed.

### Features and Benefits

-  Support SEMI E19.4 compliant 200mm wafer and reticle SMIF pods
-  All electrical system with field programmable application software
-  Pod Clamp prevents shell from being removed for carrier logistic integrity
-  Optional SMIF pod ID readers -RFID, IR (Smart) tag available.
-  Optional SECS communication board available to connect to the FAB MES system
-  Wafer protrusion sensors protect reticles/wafers during pod closing operation
-  Optional wafer mapper
-  ISO Class 1 cleanliness
-  Easy installation and operations
-  Four programmable Interlock signals



### Specifications







SMIF Pod	SEMI E19.4
Weight	23 Kg
Load Capacity	12 Kg
Size	370mm W x 467mm D x 700mm H
MTBF	50,000 cycles
MTTR	Less than 1 hour
Power	100 -240 VAC 1 amp Max 50/60 Hz
Communication	TSerial,Optional SECS I/II
SMIF Pod ID	RFID
Options	IR (Smart Tag)-8200 or 8400 series Hermos RFID

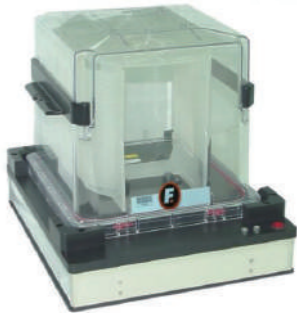
## PLS 200

### Product Introduction

The PLS 200 is a Table Top Stand-alone 200 mm SMIF pod opener. Opens the SMIF pod to allow the SMIF pod lid to be removed by the operator to access the cassette or wafers for manual loading or unloading. Ideal for use with tools within a SMIF fab that require the cassettes to be loaded by manual operations if the OEM tool cannot be automated with SMIF load ports.

### Features

-  Ultra small footprint saves valuable FAB floor space
-  Support SEMI E19.4 compliant 200mm wafer and reticle SMIF pods
-  All electrical system
-  ISO Class 1 cleanliness
-  Optional IR or RF ID read/write
-  LED Status Indicator



### Specifications

SMIF Pod	SEMI E19.4
Weight	6.5 Kg
Load Capacity	12 Kg
Size	340mm W x 430mm D x 119mm H
MTBF	50,000 Cycles
MTTR	Less than 1 hour
Power	100-240 VAC 1 amp Max 50/60 HZ
Communication	Serial
Options	SECS I/II
SMIF Pod ID	RFID
Options	IR (Smart Tag)- 8200 or 8400 series Hermos RFID intellion Reader

## Integrated SMIF Load ports PLM 200W SMIF Pod Opener

### Product Introduction

Fortrend PLM-200W is a simple, reliable pod opener designed to open 200mm SMIF pods by lifting the pod lid. Wafers remain in a sealed micro-environment where they can be accessed by a process tool's robot. Active airflow keeps the sealed micro-environment in better than ISO class-1 cleanliness. Designed for quick installation and removal, the PLM interfaces easily with most semiconductor tools. An integrated wafer protrusion sensor and provisions for tool interlock signals further prevent the pod cover from closing on protruding wafers. Active pod presence sensor and pod base/cover sticktion detection algorithm detect the presence of the SMIF pod and faulty SMIF pods prevent mistaken pod operations, assuring optimal performance of the tools. Optional E84 COMM Board for E84 Handshake is OEM tool does not have the capabilities.

### Features and Benefits

- Class 1 cleanliness with active self-clean airflow design
- Support SEMI compliant 200mm wafer and reticle SMIF pods
- All electrical system with field programmable application software
- Easy installation to all existing tools
- Substrate protrusion sensors protect reticles/wafers during operation
- Optional SEMI E63 Bolt-M Interface Mount
- Four programmable Interlock signals
- OHT/AGV Ready
- Static dissipative transparent panels
- SEMI S2, S8, CE Certified
- Wafer/Reticle protrusion sensor



### Specifications

Weight	23 Kg
Size	431.2mm W x 421.2mm D x 770.2mm H
Cycle Time	<10 Seconds to Open or Close SMIF Pod
MTBF	50,000 cycles
MTTR	Less than 1 hour
Power	24VDC 1amp or 100–240 VAC 50/60Hz 1amp.
Communication	TCPIP– Fortrend HEX      Serial–Fortrend HEX
Options	Serial-Fortrend HEX Serial-Versaport ASCII Serial-SECS I/II

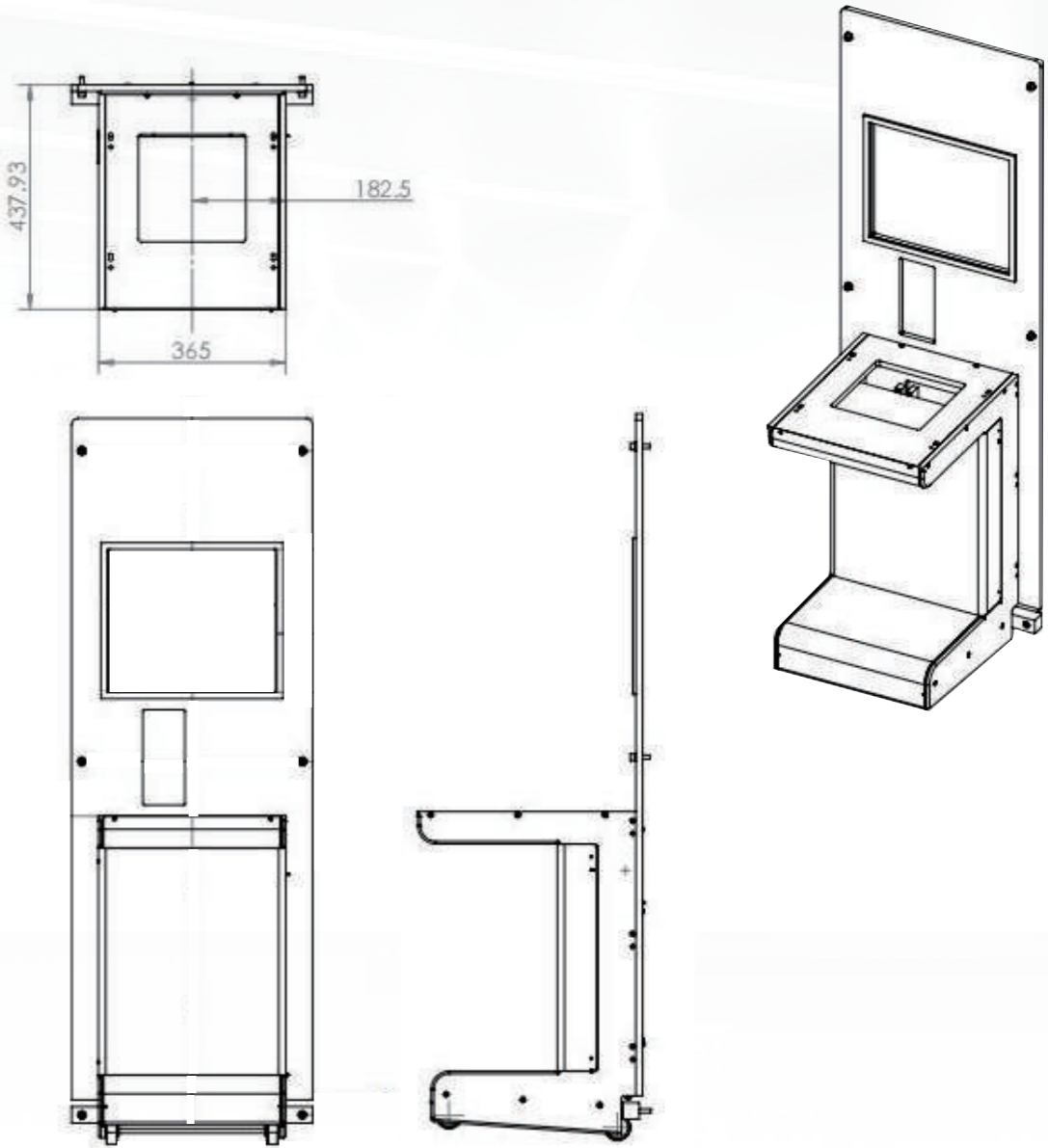


2x PLM 200W on Bolts interface mounts

## PLM LOAD PORT

### Product specification

PLM LOAD PORT is the installation bracket of the PLM series machine. Its design meets the SEMI standard. The bracket and machine split modular design subsequent demolition and maintenance upgrade is simple and convenient.



# PLM 200UL

## Product Introduction

Fortrend PLM-200UL is an Ultra Low Pod 200mm SMIF Opener designed to be integrated into OEVtools front end to make the tool SMIF compatible. The SMIF pods are manually loaded to the load portThe PLM 200UL will automatically unlock the SMIF pod and lift the pod lid clear of the cassette. Thecassette can be programmed to move towards the OEM robot to reduce the distance to the wafersActive airflow keeps the sealed micro-environment in better than ISO class-2 cleanliness. An integratedwafer protrusion sensor and provisions for tool interlock sianals further prevent the pod cover fromclosina on protrudina wafers,Active pod present sensor and pod baselcover stiction detectionalgorithm detect the presence of the SIMIF pod and faulty SMIF pods prevent mistaken pod operationsassures optimal performance of the tools.

## Features

- Small footprint low height ideal for upgrading Open stage tooling to SMIF compatible tooling.
- SO Class 2 or better cleanliness with active self-clean airflow design.
- Lifts the Pod shell leaving the Wafer cassette ih a sealedmini-environment
- Pod base moves forward to presènt wafefs closer to aidrobot pick up and drop off.
- All electrical system with field programmable application software
- Four programmable Interlock signals
- Pod present and wafer protrusion sensors
- SEMI S2 and S8 standards and CE certified
- Mounts directly into a process Tool or to a manual load port adaptor to convert open station to a SMIF compatible station.
- Optional Wafer Mapper Sensor

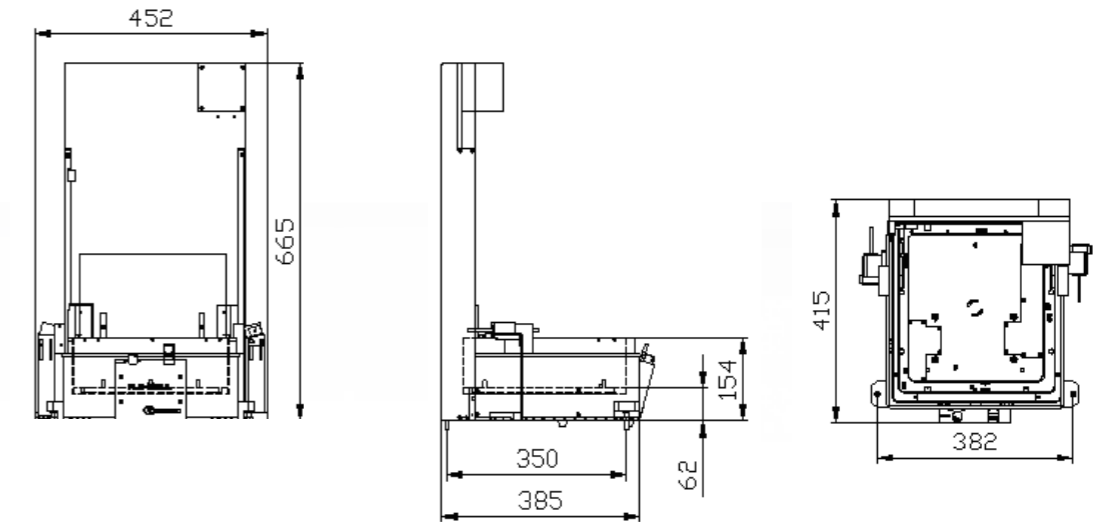


# PLM 200UL

Specifications

Wafer size	200 mm (8 inch)
Dimension	351W x 414D x 524H mm
Elevator Stroke	240 mm
Load capacity	5.4kg
Pod Types	SEMI 200mm Cassette
Pod interface	SEMI E19.4 with pod guide exceptions
Power requirement	110V/220V 3A/1.4A 50/60Hz
Weight	18kg without Pod
Open Pod	< 12 seconds
Close Pod	< 10 seconds
MCBF	50,000 cycles
MTTR	< 1 hour
Pod PIP sensor	1 set
Wafer Protrusion sensor	1 set
Cassette Present sensor	1 set
Communication	Parallel and/or Serial
Communication (Optional)	EIA-RS232C(SECS I)
ID device (Optional)	RF ID module or IR Link
Operation	Local operation or Host comm

## Layout Drawing



## PLM-150W-OHT & PLM-200W-OHT (Standard)

### Product Introduction

PLM is a relatively mature box. It is equipped with a sensor compatible with 6 -inch and 8 -inch wafer box to detect it. It can accurately detect the round state of the POD box. PLM can be connected with a variety of devices, and the rich feature options provide more solutions for the client's production line upgrade.

### Features and Benefits

- The standard PLM-200W-OHT device is fully in line with SEMI standards and has high-throughability and compatibility
- The original factory is equipped with a MAPPING system, compatible with 150/200mm wafers, can detect problems such as stacks, oblique films, and eliminate risk of collision
- A variety of customized components that are available to meet different working conditions on the scene, such as whether to connect the cars.



### Specifications

Pod/WAFER size	150/200 mm(SMIF)
Size	491mm W x 364mm D x 815mm H
Weight	35 Kg(Depends on configuration)
Rated voltage	DC 24V
Rated power	60W
The main material	Aluminum alloy, stainless steel (SUS 304)
Noise level	< 60 dBA
Communication	Serial EIA-RS232C , Parallel I/O
Communication protocol	HEX、 SECSA
Cleanliness	Class 1@0.1μm
Cleanliness	ISO 2
Options	The ID read and write device is equipped with an RFID module or Irlink

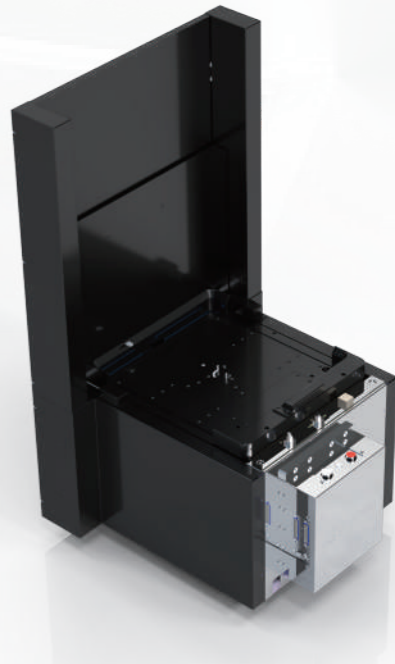
## PLM-150W-OHT&PLM-200W-OHT(widened )

### Product Introduction

PLM-200W-OHT is the latest machine of the Tianghe that is developing and upgraded. Compared with the original machine, there are more secure space for docking with Tiangham. Its transformation meets the safety needs of domestic and foreign cars.

### Features and Benefits

- The standard PLM-200W-OHT device is fully in line with SEMI standards and has high-throughability and compatibility
- The original factory is equipped with a MAPPING system, compatible with 150/200mm wafers, can detect problems such as stacks, oblique films, and eliminate risk of collision
- A variety of customized components that can be used to deal with different working conditions on the scene, such as:  
Do you need to connect to the car



### Specifications

Pod/WAFER size	150/200 mm(SMIF)
Size	491mm W x 468mm D x 815mm H
Weight	40 Kg(Depends on configuration)
Rated voltage	DC 24V
Rated power	120W
The main material	Aluminum alloy, stainless steel (SUS 304)
Noise level	< 60 dBA
Communication	Serial EIA-RS232C , Parallel I/O
Communication protocol	HEX、 SECSA
Cleanliness	Class 1@0.1μm
Cleanliness	ISO 2
Options	The ID read and write device is equipped with an RFID module or Irlink

# SMIF OHT Load Port Manual Station

## Product Introduction

The 200mm OHT load port station is designed to integrate with the FAB OHT system to allow SMIF pods to be loaded and removed from the OHT system. This standalone system is located below the OHT track system for SMIF pods to be dropped off or picked up. Fully integrated with a E84 handshake and SECS I/II communication to the FAB MES system.

## Features and Benefits

- Dual SEMI E19.4 200mm SMIF Pod load Ports
- Pod Present and Lid Sensors
- Pod RFID Tag Read/Writer
- Manual OHT load/Unload switch
- Load port Status indicator light strip
- OHT Compatible
- GUI for setting up and configuration of station Hand held tablet
- Meets SEMI E84 and E110 requirements
- SEMI S2,S8 and CE certified.



Smart Load Port Station

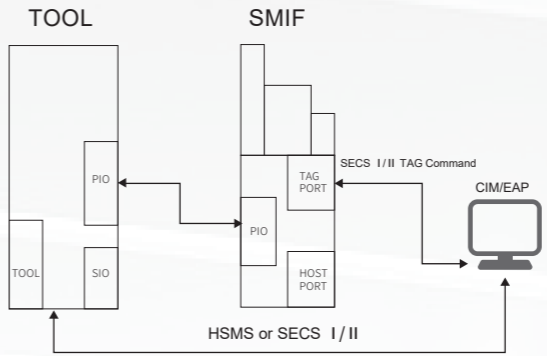
## Specifications

Pod size	200mm SMIF Pod
Number of Ports	2
Dimension	864mm W x 457mm D x1586mm H
Pod interface	SEMI E19.4
Power requirement	110V -240V 1A/1.4A 50/60Hz
SEMI E84	Parallel
Communication Host	EIA-RS232C(SECS I/II)Ethernet (Optional)
ID device	RF ID module IR (Smart) Tag reader optional
Operation	Host comm

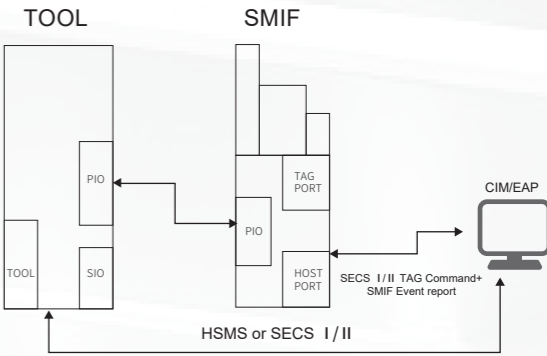


# SMIF Tool Communication Scenario

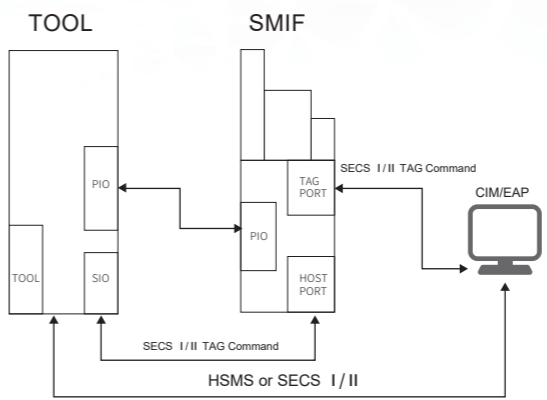
Communication Options #1  
Tool control SMIF using PIO



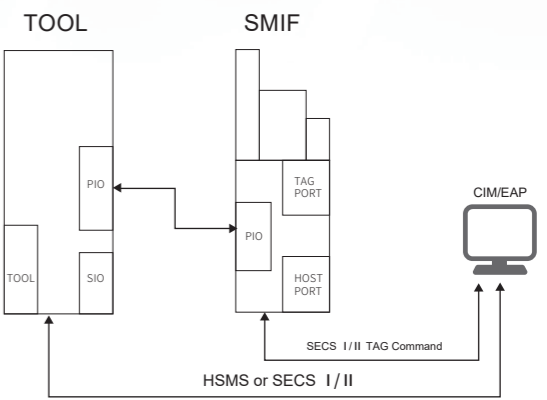
Communication Options #2  
Tool control SMIF using PIO



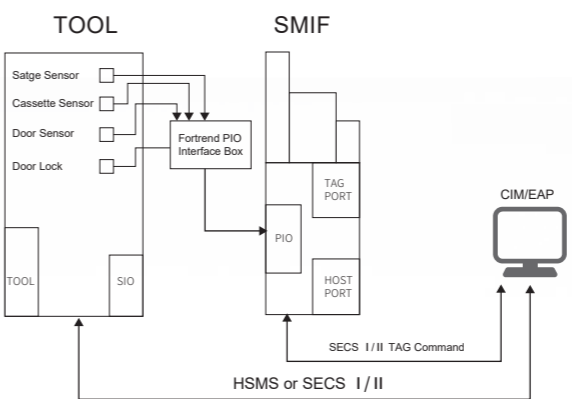
Communication Options #3  
Tool control SMIF using ASCII or SECSB



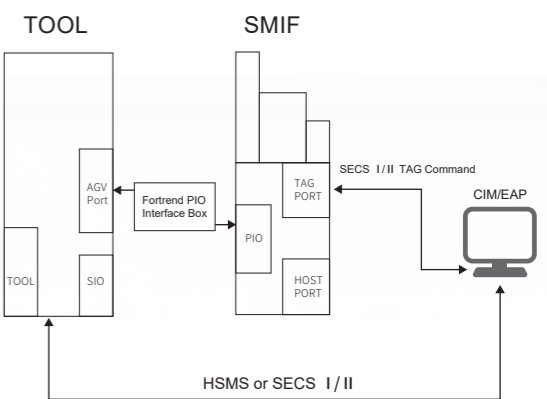
Communication Options #4  
CIM control SMIF using SECS



Communication Options #5  
CIM control SMIF using SECS




Communication Options #6  
Tool control SMIF using AGV Ports




 **SMIF Load port  
Solutions Images**




 **AMAT Endura Wide Body  
2x PLUS 500S**




 **AMAT Verity 2x PLUS 500Sx  
with Mini-Environment**

 **SMIF Load port  
Solutions Images**




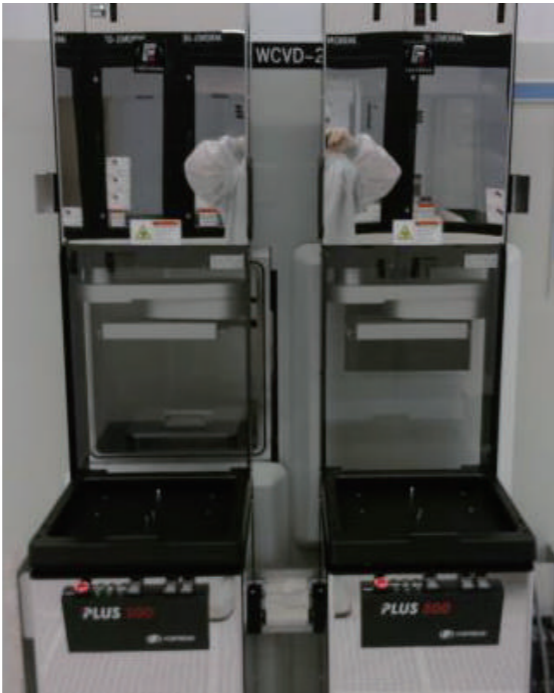
 **AMAT Endura Wide Body  
2x PLUS 500S**




 **Centrothermc.Activator 200  
2x PLUS 500S**




 **AMAT Centura Wide Body  
2x PUS 500S**



 **AMAT Centura Narrow Body  
2x PLUS 500R**




 **AMAT Producer  
2x PLUS 500R**




 **EBARA-FREX 200  
4x PLUS 500S**

 **SMIF Load port  
Solutions Images**




 Screen Z12000  
2x PLUS 500R




 Nikon Opti Station PLUS 500R  
with Mini-Environment

 **SMIF Load port  
Solutions Images**




 Lam Rainbow 4520 with 2x  
PLUS 500S with Mini-Environment




 LAM TCP9608PTX  
2x PLUS 500R




 Hitachi S-9200S  
3x PLUS 500S




 Kokusai KE-DD-853 Furnace  
2x PLUS 500CX




 LAM-TCP-9408SE PIUS  
500SL- & PLUS 500S-R




 MattsOn ASPEN 2x  
PLUS 500Sx

 **SMIF Load port  
Solutions Images**



 Novellus-CONCEPTONE  
2x PLUS 500S & Minienvironment



 Novellus-CONCEPT 2 2x  
PLUS 500S and Mini-Environment



 Axcelis GSD 200E PLUS 500S



 Eaton NV-MC3 3x PLUS 500S



 NovelluS-PEPIRIDIA 2 PLUS 500S



 AMAT P5000 PLUS 500R



 TEL UWO200Z 2x PLUS 500S




 TEI Mark 8 Track 2x PUS 500S


 **SMIF Load port  
Solutions Images**

 **SMIF Load port  
Solutions Images**




 Ushio UV1250 PLUS 500S




 Varian EHP220  
2x PLUS 500S+ Mini-Environment

 **SMIF Load port  
Solutions Images**



 TEL ACT 8 3x PLM 200UL



 TEL ACT 8 PLUS 500SL-L  
PLUS 500SR-R PLUS 500S-R




 SPTS fxP Platform 2x PLUS 500R




 SUSS MA200 Aligner 2x PLUS 500SD




 Akrion GAMA Wet Bench 2x PLUS 500S




 ONTO Imperia 2x PLUS 500S  
+ Mini-Environment

 **SMIF Load port  
Solutions Images**



 ONTO Vertex 2x PLUS 500S  
+ Mini-Environment




 Mechatronics Wafer Sorter 4x PLM  
200W on BoltInterface

 **SMIF Load port  
Solutions Images**




 ASM A400 DUO PLUS 500F



 Evatec Clusterline 200 2x PLUS 500R



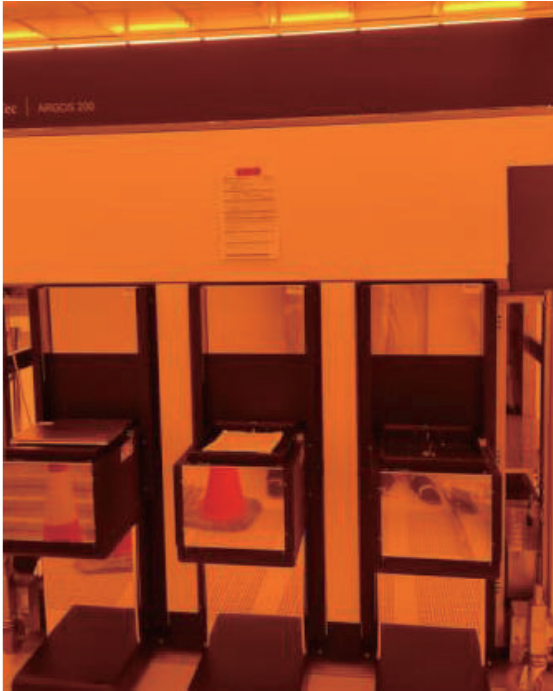
 Picosun Morpher 2x PLUS 500R




 MPI PLUS 500S




 Rigaku TXRF 3760 PLUS 500S




 MueTec Argos 200 3x PLM 200W  
on Bolt interface

 **SMIF Load port  
Solutions Images**




 MueTec DaVinci 200 3x PLM  
200W on BoltInterface




 Micro Control 2x PLM  
200W on BoltInterface

 **SMIF Load port  
Solutions Images**




 RENA Wet Bench 4XPLM 500LM




 Veeco Wafer Storm 2x PLM  
200W on Bolt interface



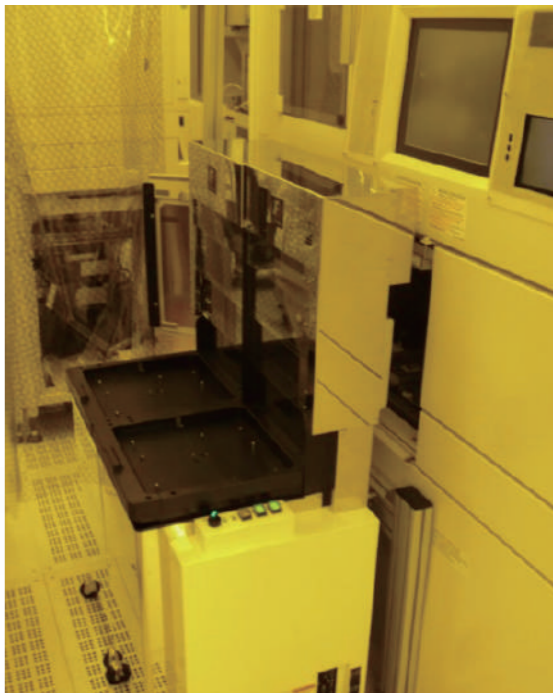
 EVG 850 TB 4x PM 200W on BoltInterface



 DISCO DFD6363  
PLUS 500SDH(Heavy LiftArm)



 AIXTRON 2x PLUS 500R



 CANON STEPPER 2x PLUS 500UX