

# Smart Manufacturing



## Ready for Industry 4.0

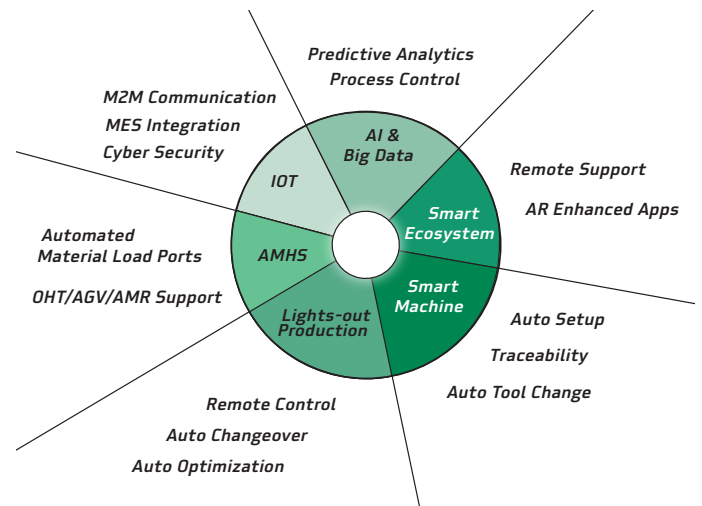
Besi focuses on the development of features to enable a rapid adaption of Industry 4.0 requirements in semiconductor backend fabs.

Customers have the choice of using turn-key integration options and customized solutions to fulfil current and future needs in Smart Manufacturing.

The equipment core design incorporates advanced features and solutions to enable automated operation and the use of data analytics to improve manufacturing performance and monitor the production process.

Our Smart Machines can be complemented with a Smart Ecosystem to deliver value-added solutions.

## Future Proof Equipment



### MATERIAL AND DEVICE TRACKING

- Track material location / flow
- Substrate, device and consumables traceability



### DEVICE TRACEABILITY

- Trace components through entire process chain



### WAFER AND SUBSTRATE MAPPING

- Wafer binning
- Bad module mark-out
- Transfer data
- S12, E142, G84



### PROCESS VERIFICATION

- Check process relevant process settings and parameters



### AUTOMATED MATERIAL HANDLING

- Load carriers by OHT, AGV, AMR
- E84 / E87 support



### RECIPE MANAGEMENT

- Server managed recipes
- Offline programming



### PROCESS MONITORING

- Inspection results
- Sensor data



### PERFORMANCE MONITORING

- Monitor OEE, UPH, MTBF...



### SETUP VERIFICATION

- Check setup (material, tool, consumables)



### REMOTE CONTROL

- Production control
- Automated changeover



**Besi**

INDUSTRY 4.0 READY



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## Connectivity

- SEMI SECS/GEM compliant interface
- IPC-SMEMA and IPC-HERMES M2M interface
- IP port firewall and virus scan enabled
- User access control



## Smart Machine

- Product data import from CAD data
- Smart adaption to material variations
- Offline programming
- Closed-loop control system



## Automated Material Handling

- Automated load ports for OHT / AGV / AMR access
- E84 handover protocol to material robots
- E87 CMS to SECS host / MES
- Automated consumables replenishment



## Big Data and AI

- Big data enabled data interface
- Yield and root-cause analysis
- Performance monitoring
- Material, consumables, tools traceability



## AR and Remote Support

- AR enabled applications for remote support and process visualization
- VNC remote control

SEMI SECS/GEM compliant  
Supported features are product dependent