

# MERLIN increases revenue by 20%

## Improves machine utilization from 30% to 65%

### TOSOH SMD PROFILE

As “The Global Leader in Target Technology™” Tosoh SMD is a leading provider of thin film deposition materials and of solutions to manufacturers in the semiconductor, display, solar, and large area coating markets.

Headquartered in Grove City, Ohio Tosoh utilizes advanced engineering and state-of-the-art equipment to produce speciality materials machined to a high degree of tolerance.

### BUSINESS SITUATION

As a market leader with hundreds of patents, Tosoh experienced a high-demand for both product quantity and quality. To fulfill this demand, the company needed to improve the efficiency and utilization of its industrial machines.

Plant managers at Tosoh were aware of the presence of non-value added time in the production process but had difficulty in identifying specific tasks

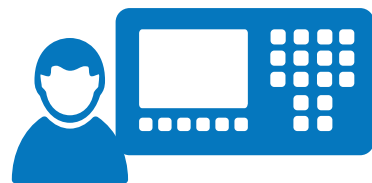
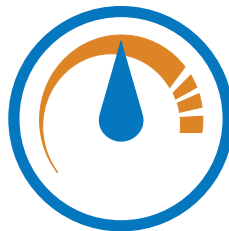
to be improved. Additionally, operators in production, to ensure efficiency, were demanding information about production runs.

To meet these challenges and generate higher production throughput along with better quality and traceability, Tosoh choose to undertake process improvement.

### TECHNICAL SITUATION

At Tosoh it took typically 16 hours to machine a part, and the company ran three shifts with operating lathes and mills. Tosoh had no data collection mechanism in place on the shop-floor to track time spent in each operation state. Once an operator started the job he/she had no visibility into the manufacturing process or the state of operation.

Even though the company employed a DNC system to move part programs to the machine, Tosoh lacked reporting systems that would calculate quantitative tracking of efficiency and report metrics.



MERLIN is an IIoT Shop-Floor-To-Top-Floor communications platform that provides manufacturing analytics in Real-Time.

## SOLUTION

To improve efficiency, machine utilization, ensure quality and traceability Tosoh required a system that monitored and measured availability, performance and quality as part of the Overall Equipment Effectiveness(OEE) metric. The system also had to offer full traceability of the exact clock for all defined events on a machine. This would then result in the creation of a detailed log of what happened at the machine in a historical database, for immediate visibility as well as long-term reporting. Additionally, the company needed an enterprise-based system built under a MS-SQL database environment that utilized the latest software tools and was easy to use. Tosoh identified that for the company the ideal system would be an off the shelf packaged toolkit that could be adapted to many machines and was self-maintaining.

The company undertook a formal buying process, evaluating very carefully many automated manufacturing data collection products and their vendors. Tosoh needed a vendor that would assist in the installation of the equipment and had a reliable track record in the industry. This process led Tosoh to select the MERLIN communications platform by MEMEX. Tosoh deployed:

- MERLIN communications platform software
- MERLIN Ax9150 Universal Machine Interface
- MERLIN Handheld HMI for downtime recording
- ERP Interface
- Reporting, Charting, Real-Time KPI screen and Dashboards

**MEMEX is an IIoT leader that offers MERLIN, an Industrial Internet of Things software communications platform that provides manufacturing analytics in Real-Time.**

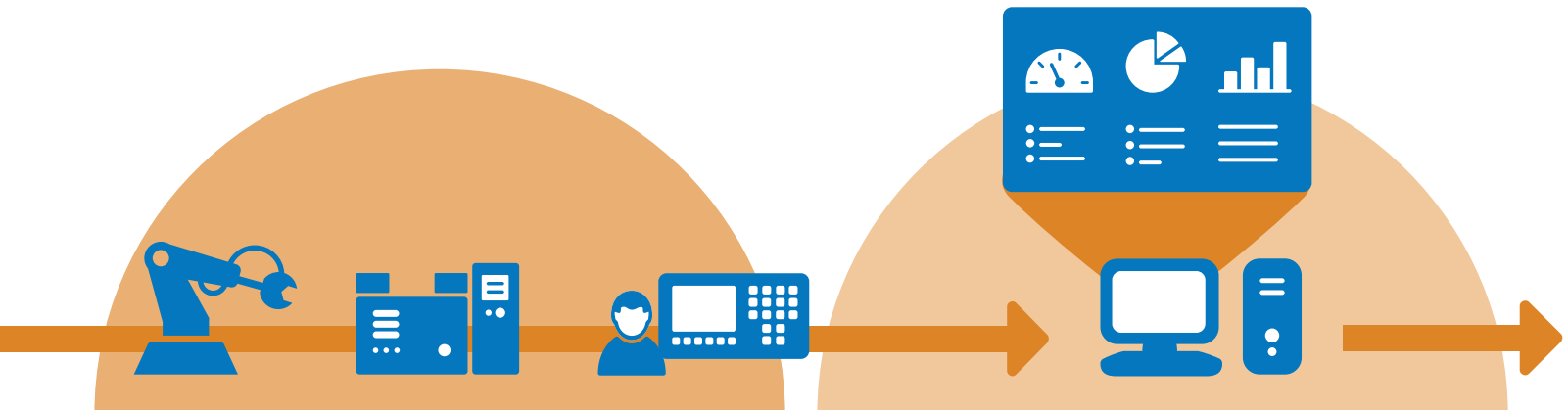
A key requirement for MERLIN was to minimize operator involvement, and create an automated system connected directly to the machine, essentially a “black box”. Tosoh installed the MERLIN machine monitoring technology on various machines benchmarking the initial data and analyzing the information very carefully to determine opportunities for improvement. Sharp manufacturing engineers at Tosoh made a number of operational changes and were able to see positive results very clearly.

Tosoh’s ERP system attempted to track utilization but was considered inaccurate because it lacked direct information from the machine. The ERP system kept indicating the need to purchase more machines without any consideration for improving the manufacturing process. With MERLIN Tosoh undertook actions to perform lean continuous improvement. Some of the steps included

- Discovery of much non-value-added time spent in machine, such as manual sanding, which could be offline
- Traceability of the complete manufacturing process was now documented in a report
- Visibility of production metrics to all management and shop floor, including the Director of Manufacturing
- Improvement of operator time in material loading and unloading techniques at each of the machines
- Audible alerts for the machine operator prompt for action
- Advanced reporting with text and email alerts to key management

Operator acceptance of MERLIN was an issue initially, until operators realized the software improved their jobs and made machine monitoring easier by collecting information automatically versus manually. Certain operator functions and triggers were desired, which took minimal training. Additionally, the company underwent a cultural change as the Process Engineering department became a part of manufacturing, where the “total team” owned the complete process.

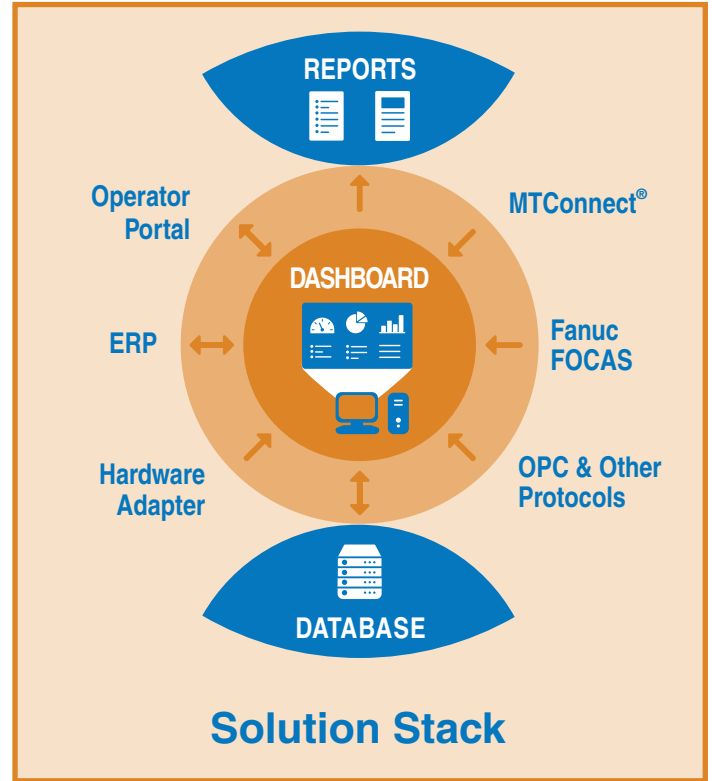
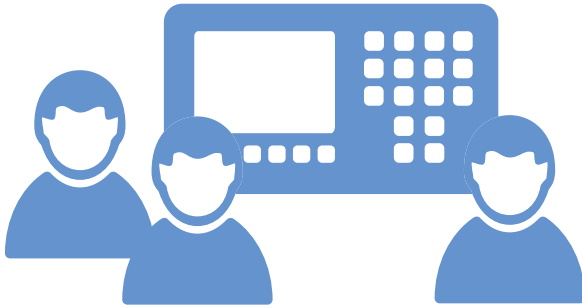
## Data-Driven IIoT Manufacturing



## BENEFITS

This effective deployment of Real-Time automated data collection and OEE performance metrics has resulted in the following benefits for the Tosoh team:

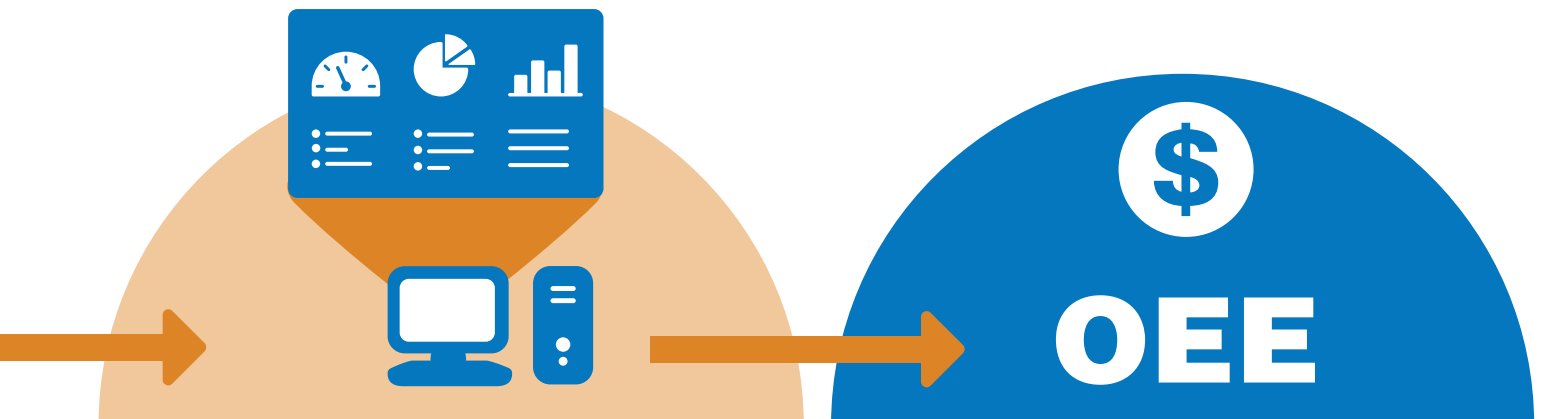
- Increase in OEE expected to be 100% overall as machine utilization moved from 30-35% to over 65%
- Discovered much non-value-added time processes
- Decisions regarding utilization and capital expenditure were taken based on data
- Uptick of 5-10% in machine utilization very early after the system was installed
- Revenue climbed 20% higher and every month saw new records for product shipments
- “Total Team” ownership in the complete process



*“MERLIN gives a real-world view of what the machines are actually doing”.*

*- Tosoh's Process Automation Manager, Rodney Donahue*

## From Shop-Floor-To-Top-Floor



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## ABOUT MEMEX™

The Industrial Internet of Things (IIoT) powered by machine to machine (M2M) connectivity coupled with software capable of collecting, analyzing, and intelligently presenting streams of manufacturing data represents no less than the next Industrial Revolution. MEMEX with its visionary attitude has been on the leading-edge of the convergence of the industry trends in Computing Power, Connectivity of Machines, Industry Standards, Advanced Software Technology, and Manufacturing Domain Expertise. Leading this transformation is MEMEX Inc., the developer of MERLIN, an award winning IIoT technology platform that delivers tangible increases in manufacturing productivity in Real-Time.

MEMEX, with its comprehensive understanding of the manufacturing industry, is the global leader in machine to machine connectivity solutions.

Committed to its mission of “Successfully transforming factories of today into factories of the future” and encouraged by the rapid adoption and success of MERLIN, MEMEX is relentlessly pursuing the development of increasingly innovative solutions suitable in the IIoT era. MEMEX envisions converting every machine into a node on the corporate network, thereby, creating visibility from shop-floor-to-top-floor.

MEMEX, with its deep commitment towards machine connectivity, offers solutions that are focused on finding hidden capacity by measuring and managing Real-Time data. This empowers MEMEX's customers to effectively quantify and manage OEE, reduce costs and incorporate strategies for continuous lean improvement.



### PRODUCTIVITY

10%-50% average productivity increase



### PROFITS

20% + profit improvement based on just a 10% increase in OEE



### PAYBACK

payback in less than four months with an Internal Rate of Return (IRR) greater than 300%



### CONNECTIVITY

connects to any machine, old or new

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Contact MEMEX to implement IIoT data-driven manufacturing now.



**MEMEX**  
Measuring Manufacturing Excellence™

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