

Semiconductor Manufacturer Implements Facility Monitoring and Control System (FMCS)

This advanced semiconductor fabrication plant needed a cost-effective FMCS to address issues of compliance, safety, constructability, system uptime, operability and maintenance.

Main Objective

The customer Semiconductor required the design and installation of an FMCS to provide continuous monitoring and control of the cleanroom environment, utilities plant and support areas for its wafer fabrication facility.

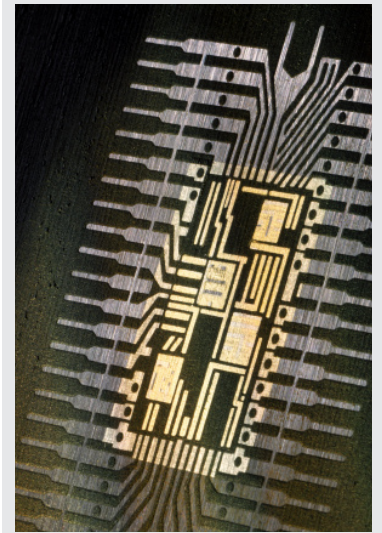
Customer Results

The FMCS was designed and installed using proven, reliable technology and practices for the semiconductor manufacturing industry. The FMCS design addresses the specific requirements of a wafer fabrication facility. Using cost-effective solutions, the design specifically takes into account issues such as applicable code compliance, human safety, constructability, system uptime, equipment safety, operability and maintainability. The distributed control system (DCS) is a Honeywell TDC 3000 system consisting of two processing module units in the fab, two units in the CUB and one unit in the site's main electrical substation. Additionally, there are six field terminal assemblies (FTA) in the fab, three units in the CUB and one FTA unit in the site's main electrical substation. The TDC 3000 is used to monitor and control temperature, space pressure and relative humidity in the class 1 cleanroom environment, the class 100 support areas and the central utility building support systems. The DI water system, VOC system and waste treatment system are Allen-Bradley PLC5-based systems with some hardwired interfacing to the site's TDC 3000 DCS system.

The electrical power monitoring system consists of Square D Powerlogic circuit monitors in the substations and medium voltage vacuum circuit breakers in the fab and CUB. Feeders are sized at 50 percent capacity, and tie-breaker activation through the Powerlogic system is automatic. The Powerlogic system communicates with the TDC 3000 system via the SyLink serial communications protocol.

Applications

- Temperature, Humidity, and Pressure Control
- Chilled Water, Hot Water, Steam, Process Cooling Water and Process Vacuum Control
- Exhaust and Scrubber Control
- Tank and Sump Level Control
- Electrical System Monitoring
- Historical Data Archival and Retrieval
- Report Generation



System Configuration

- **HMI:**
 - 4 Honeywell GUS Nodes
 - 1 SCADA Node
 - 1 View Node
 - 2 Printers
- **NETWORK:**
 - AB DH+
 - Honeywell TDC 3000
- **PLC:**
 - 10 Honeywell TDC 3000 FTAs
 - 5 Honeywell TDC 3000 FTAs
 - 4 AB PLC 5s
- **I / O Count**

AI	273	AO	272
DI	554	DO	566

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Application Description

■ Processes Monitored and Controlled by the FMCS

- 6 Fab Makeup Air Units
- 42 Vertical Laminar Flow Fan Towers
- 26 Support Air Handling Units
- 4 Acid Exhaust Scrubbers
- 2 Alkali Exhaust Scrubbers
- 6 General and Specialty (Including Pyrophoric, Flammable and Polyimide) Exhaust Fans
- 5 High -Temperature Chilled Water Pumps
- 4 Low-Temperature Chilled Water Pumps
- 4 High-Temperature Chilled Water Chillers
- 3 Low-Temperature Chilled Water Chillers
- 6 Uninterruptable Power Supplies
- 8 Condenser Water Pumps with 8 Built-Up Cooling Tower Cells
- 3 Medium Pressure Oil and Natural Gas-fed Boilers and Associated Equipment
- 6 Process Cooling Water Pumps and 2 Heat Exchangers
- Two 140°F Hot Water Pumps and Heat Exchanger Skid
- Two 160°F Hot Water Pumps and Heat Exchanger Skid
- Two 180°F Hot Water Pumps and Heat Exchanger Skid
- 2 High-Temperature Water Pumps
- 7 Waste Tanks for Fab Process Waste Staging and Accumulation
- 2 Plant Vacuum and House Vacuum Skids
- Building Evacuations

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