

# Manufacturer Implements Facility Monitoring and Control System (FMCS) for Its Wafer Fab Facility — Phase 2

A leading designer and manufacturer of analog, digital signal processing and chip technologies needed a cost-effective FMCS to monitor and control human and equipment safety, system uptime, operability and maintenance within its DMOS5 semiconductor wafer fabrication facility.

## Main Objective

The customer required the design and installation of an FMCS to provide continuous monitoring and control of the cleanroom environment, utilities plant and life safety system for the DMOS5 semiconductor 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 comprehends the specific requirements of a wafer fabrication facility. Using cost-effective solutions, the design addresses areas such as human safety, system uptime, equipment safety, operability and maintainability. The high-criticality systems consist of two Siemens 565 hot backup PLCs. One PLC monitors and controls the utility plant, while the other PLC monitors and controls the life safety system. There are six Siemens 555 PLCs for the cleanroom environment controls, one more for the industrial waste treatment plant controls and two others for the administration building environment controls. The PLCs communicate with the SCADA system via TIWAY protocol and with each other via Peerlink protocol.

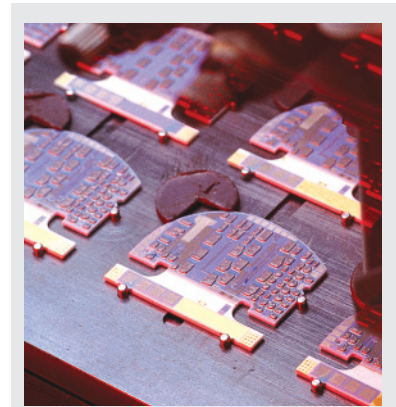
The power monitoring and control system (PMCS) consists of Square D Powerlogic circuit monitors in the substations and Micrologic circuit breakers in the switchgear and distribution panel boards. The PMCS communicates with the SCADA system via SyLink protocol.

The SCADA system is an Intellution FIX32 NT system and consists of one SCADA server, three SCADA nodes, one backup SCADA node and six view nodes connected together via the building's Ethernet LAN.

## Application Description

### ■ Processes Monitored and Controlled by the FMCS

- 6 Fab Makeup Air Units
- 20 Vertical Laminar Flow Units
- 6 Support Air Handling Units
- 5 Exhaust Scrubbers
- 12 Exhaust Fans
- 4 Industrial Waste Lift Stations
- 3 Chilled Water Pumps
- 4 Blend Water Pumps
- 3 Process Cooling Water Pumps and 2 Heat Exchangers
- 2 Hot Water Pumps and 2 Heat Exchangers
- 2 Steam Generators
- 2 Uninterruptable Power Supplies
- Building Evacuations
- Toxic, Flammable, Pyrophoric, Solvent and Hydrogen Detection
- Multiple Toxic, Flammable, Pyrophoric and Corrosive Gas Cabinet Interfaces
- Multiple Manufacturing Tool Interfaces
- 34 Static Transfer Switches
- 2 Plant Vacuum Skids
- 2 High-Temperature Water Pumps



## System Configuration

- **HMI:** Intellution FIX32 for NT
- **NETWORK:** Siemens TIWAY (PLC to MMI)
  - Siemens Peerlink (PLC to PLC)
  - TCP/IP Ethernet (MMI to Building Net)
  - Square D Powerlogic
- **PLC:** Siemens 565 Hot Backup PLC (Critical Systems)
  - Siemens 545 PLC (Distribution Systems)
  - Square D Circuit Monitors, PIFs and Powerlogic Circuit Breakers (Electrical Power Monitoring)
- **I/O Count**

AI	1265	AO	360
DI	1325	DO	723

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## Applications

- Fab Humidity, Pressure and Temperature
- Support Areas Temperature and Humidity
- Chilled Water Temperature and Pressure
- Hot Water Temperature and Pressure
- Non-condensing Cooling Water Temperature and Pressure
- Process Water Temperature, Conductivity and Pressure
- Steam Boilers Pressure and Level
- Multiple Exhaust Systems Pressure
- Scrubber pH, Level, and Recirculation Flow
- Industrial Waste Water pH
- Toxic, Corrosive, Flammable and Pyrophoric Gas Detection
- Life Safety System Shutdowns to Gas, Chemical and Manufacturing Equipment

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