



LIQUID LEAK DETECTION SYSTEMS

Case Study

TTK WATER LEAK DETECTION SYSTEMS

AT

TSMC - TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY

PROJECT BACKGROUND

- For more than a decade, TTK systems have been installed to protect numerous TSMC manufacturing sites across Taiwan, delivered through TTK's local partner, ProVision Technology Co., Ltd.
- Sites already protected include six 12-inch GIGAFAB® and several Advanced Backend fabs, safeguarding large raised-floor areas such as HPM zones and laboratories, false-ceiling sprinkler pipe networks, diesel day tanks, among other critical areas.
- A standout project is Advanced Backend Fab 6, a cutting-edge facility, where TTK's water leak detection system monitors over 50,000 m² space 24/7.

PROJECT OVERVIEW

Client	TSMC (Taiwan Semiconductor Manufacturing Company Limited)
Project	Advanced Backend Fab 6
Location	Miaoli, Taiwan
Application	Semiconductor industry/cleanroom
Project Type	New build
Project followed by	TTK Asia
Contract Scope	TTK local partner ProVision Technology Co., Ltd supplied the leak detection system and supported its design and commissioning.
Complete Date	2023
Technology	FG-NET digital monitoring units; FG-EC addressable water sense cable



ABOUT TSMC

- TSMC (Taiwan Semiconductor Manufacturing Company Limited) is Taiwan's largest company and the world's largest dedicated independent (pure-play) semiconductor foundry.
- Apart from its main base of operations in Taiwan, where several of its fab facilities are located, TSMC also has fabs at its subsidiaries in China, Singapore and the USA.

CLIENT CHALLENGE

- Every layer beneath the cleanroom's raised floor required an addressable water leak detection system able to pinpoint the exact location and condition of any leak close to the sensitive back-end assembly and test equipment above.
- TSMC needed to detect leaks from its Process Cooling Water (PCW) and chemical piping at the earliest possible stage, the need was triggered by the risk of PCW piping leakage within the facility.

PROJECT REQUIREMENTS

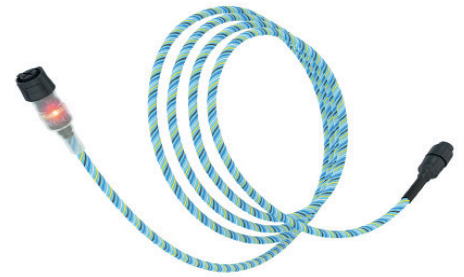
- A reliable, locating detection system able to identify multiple simultaneous leaks from Process Cooling Water (PCW) and chemical piping, a major potential leak source inside the cleanroom.
- Precise leak and cable-fault location on every layer beneath the raised floor, critical for technicians working close to sensitive equipment.
- Alarm signal integration with the client's Facility Monitoring Control System (FMCS) via RS-485 Modbus.

TTK's SOLUTION

- For this project, 9 FG-NET digital monitoring panels together with 338 lengths of FG-EC15 - over 5 km addressable water sense cable are installed beneath the raised floor throughout the cleanroom.
- Unlike analog cables, each FG-EC length carries an embedded microprocessor for continuous, real-time status reporting to the FG-NET panels, with a visible LED for quick fault identification in the dark under-floor space.
- The alarm signal was integrated with TSMC's FMCS (Facility Monitoring and Control System) via RS-485 Modbus, giving the facility team a single, real-time point of monitoring.

OUTCOME

- The system delivers early risk reduction on PCW and chemical piping leaks, supports business continuity and operational safety through real-time, addressable leak location, and improves efficiency via single-point FMCS monitoring. The cleanroom has remained in continuous operation since installation.



Addressable water sense cable: FG-EC



Digital monitoring unit FG-NET

