fluidIQ BY MAGNALYTIX

Immersion Canary

Continuous Environmentally Induced Degredation (EID) Monitoring for Immersion-Cooled Systems

Product Overview

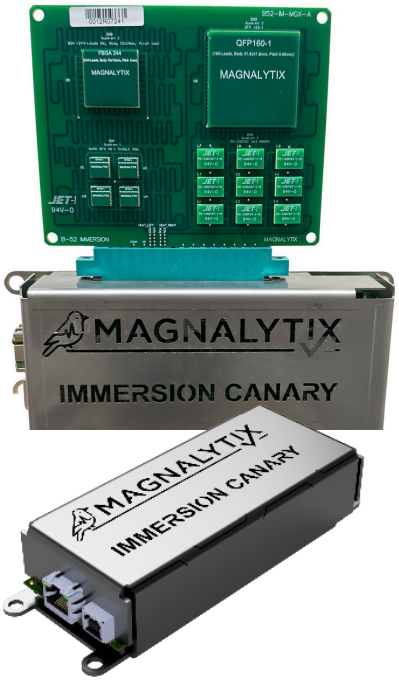
FluidIQ Immersion Canary is a one-cable installation drop-in real-time in-situ fluid-health monitoring platform designed for single-phase and two-phase immersion cooling environments. It applies high-reliability electrochemical Environmentally Induced Degradation (EID) test methods to detect contamination, oxidation, and bulk dielectric loss. Like a canary in a coal mine, it provides the earliest possible warning of fluid-driven electrochemical conditions that can lead to degradation long before they threaten reliability or production hardware.

Key Capabilities

- Continuous contaminant monitoring directly inside production immersion tanks
- Heated EID test card simulates active hardware and accelerates detection of electrochemical failure mechanisms
- Bulk dielectric property measurement to identify fluid degradation
- Early-warning detection of contamination events that could lead to hardware failure
- In-tank operation with hardware designed to live permanently in immersion environments
- PoE powered for unobtrusive single-cable installation

Benefits

- Prevents costly hardware failures by detecting contamination early
- Extends fluid life by identifying oxidation or contamination trends
- Improves system uptime with real-time monitoring
- Provides evidence of fluid and hardware reliability for warranty
- JSON and Redfish API for plug-and-play integration with monitoring systems
- Modbus TCP for PLC interoperability and OEM tank integration
- Built in Web Interface for immediate, no-code integration
- Single cable power over ethernet design allows for extremely straightforward installation using pre-existing hardware
- Fleet software available to manage multiple devices



Applications

- Fluid health monitoring for data centers, HPC, AI clusters, and test labs
- Immersion System Qualification
- Process cleanliness verification for immersion-deployed electronics
- Predictive maintenance for fluid filtration and replacement cycles
- OEM and CM reliability assurance for immersion-cooled hardware

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Immersion Canary

Detection

- Bulk Dielectric Properties
- PCB Surface Contaminant Deposition
- Fluid Oxidation / Aging
- Moisture
- Corrosive Contaminants
- Plasticizer

Electrical & Thermal

Parameter	Specification
Input Power	PoE (802.3af/at/bt)
Heater Control	Voltage (2.33-8.43V) + duty cycle (0-100%)
Max Test Card Temp.	>300F in air *Supports nucleated and film boiling in two-phase fluid*
Test Card Connector	Magnalytix Extended Capability Test Card Connector
Op. Fluid Temp.	-40C - 85C
Embedded Test Card Heater Power	Up to 55W per Test Card

Connectivity

Interface	Details
Poll Rate	1 sample / second *No onboard storage- data retrieved via API*
USB Serial	Plug-and-play access for configuration and continuous telemetry without network dependencies
Modbus TCP/ RTU	Allows existing PLC installations to monitor readings and control heaters
HTTP/JSON	REST API Polling up to 1Hz
Redfish	DMTF Standard *Presents as a chassis with four sensors (one for each channel)* *Sensors are considered "Valve", measured in "Ohms"*

Mechanical Dimensions - Enclosure

Dimension	
Length	6.29”
Width	1.36”
Height (With Test Card)	2.88” (6.25”)
Weight (With Test Card)	261 g / 9.2 oz

Measurement Functions

Parameter	Specification
Leakage Current	4 Independent Test Card Channels
Resistance Range	1MΩ to 1TΩ
Bias Voltage	0-19V DC, Variable *(5V Default)*
Volume Resistivity	Requires compatible volume resistivity test card
Temperature	2 Independent Test Card Channels