# MicSense™

The AI-based Automated Micro-invertebrate Detector for Water Quality

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MicSense™ is an innovative AI-based automated detector for regular monitoring of chironomids (micro-invertebrates) at water treatment plants and distribution systems that is necessary and important for the early detection of chironomid larvae infestation, which is an important indicator of poor water quality, ensuring safe water for everyone.

To date, MicSense™ systems have been deployed with water utilities in Singapore.
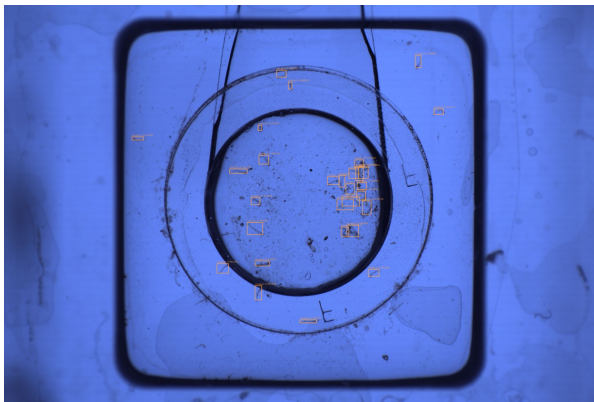

Large Scale Chironomids Detection

Our proprietary automated micro-invertebrate detector system consists of 2 subsystems: a concentrator and an optical detector, that is capable of detecting chironomid larvae in 1000 L of treated water within 1 hour with quasi-continuous detection mode (up to 24 samples/day) and can achieve high throughput concentration (up to 50 litres/min) with minimal maintenance requirements.

Quick and Easy Field Tests for Water Quality

- ✓ Detection accuracy > 80% for spiked chironomid larvae samples
- ✓ Testing time < 2 hours
- ✓ Continuous operation for at least one week without maintenance (24/7 operation)
- ✓ Able to detect viability of chironomid larvae in water (database of 6 different micro-invertebrates)
- ✓ System's stability and reliability has been validated with more than 1,400 water samples

Operation Procedure
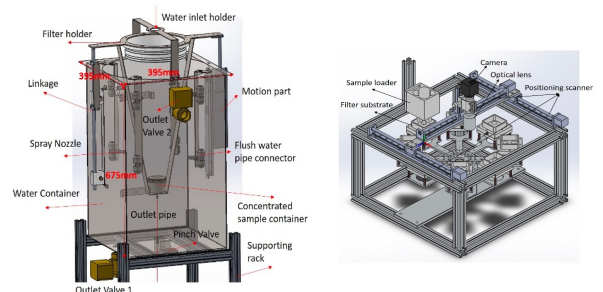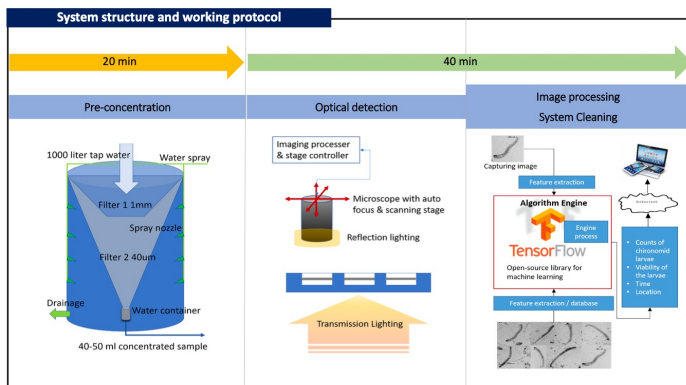
Technical Specifications

MicSense AI-based Automated Micro-invertebrate Detector for Water Quality

Method	• Chironomids detection (6 different micro-invertebrates)
Concentration Module	• Automatic concentration with multiple filtration process (from 1000 litre of treated water into 40 ml water sample); • Stainless-steel filter (pore size: 40 μm) with large surface area to concentrate any micro-invertebrates present • High throughput concentration (up to 50 litres/min) with automatic back flush
Optical detector – Filtration Module	• Automatic loading of 40 ml water sample within 10 mins; • Automatic cleaning or filter exchange process;
Optical detector – Imaging Module	• Automatic capturing the images of filtered chironomid larvae within 20 mins; • Identifiable images are captured with the help of transparent PEGDA micro-filters and camera with scanning
Optical detector – Analysis Algorithm	• Sample volume of 40 ml concentrated treated water • Recovery and limit of detection (LOD) comparable with manual microscopic observation method; • Detection accuracy > 80% for spiked sample; • Testing time < 2 hours; • Morphology of the particles and their movement information are recorded and analysed with a computing processor using AI-based algorithm;
Application Scenarios	• Treated/surface/underground water test • Civil water test • Community water test • Rural water test

At Nm3 Tech, we aspire to become the leading provider of innovative and comprehensive environmental sensing and monitoring solutions that empower organisations and communities to safeguard our planet. With our expertise in IoT and big data analytics, we aim to provide advanced and reliable systems that covers water, air and soil quality monitoring, enabling our stakeholders to make informed decisions and take effective action towards environmental sustainability and responsible resource management for future generations.

For more information, please visit https://www.nm3.sg.

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Innovating Monitoring. Empowering Action.