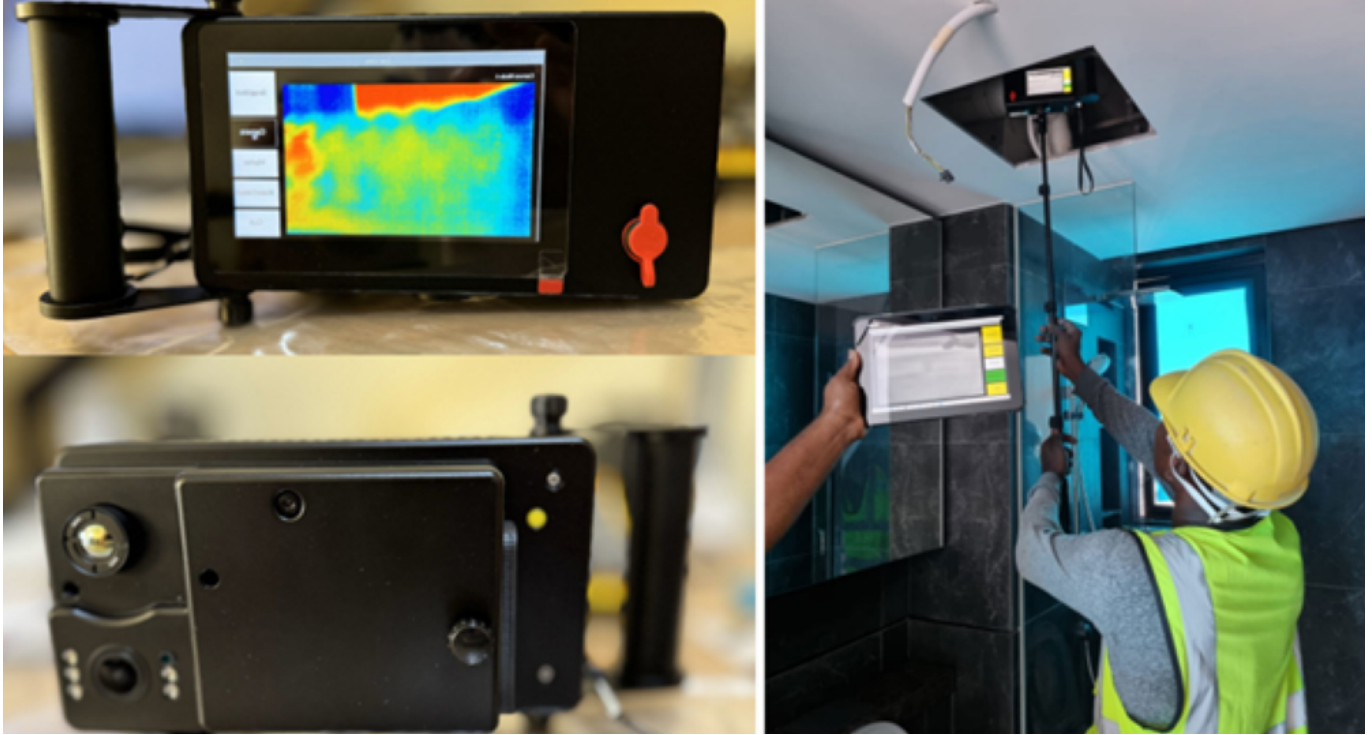**TECH OFFER**

Smart Imaging-Based Water Seepage System for Building & Construction Industry

KEY INFORMATION

TECHNOLOGY CATEGORY:
Environment, Clean Air & Water - Sensor, Network, Monitoring & Quality Control Systems
Infocomm - Video/Image Processing
Manufacturing - Surface Finishing & Modification

TECHNOLOGY READINESS LEVEL (TRL): TRL9
COUNTRY: SINGAPORE
ID NUMBER: TO175179

OVERVIEW

In the construction sector, manual inspections have traditionally been the primary method for detecting water seepage surface defects, a mandatory requirement for construction projects. However, these inspections often suffer from the inherent subjectivity of human judgment, leading to potential inconsistencies and inaccuracies. To overcome these limitations, a handheld water seepage detection system was developed and rigorously tested in collaboration with the Building and Construction Authority (BCA). This innovative system is designed as a portable, intelligent alternative to traditional methods, aiming to enhance the objectivity and reliability of water seepage detection.

The system utilizes advanced Long-Wave Infrared (LWIR) thermal sensing technology to accurately detect temperature variations indicative of water seepage. Unlike manual inspections, which can be prone to error, this system offers precise differentiation between genuine water seepage defects and common artifacts found on construction sites, such as glue and paint.

By minimizing false alarms, it provides a more dependable and efficient approach to identifying and addressing water-related issues. This advancement not only improves the accuracy of inspections but also ensures that potential water damage is detected early, reducing the risk of costly repairs and enhancing the overall integrity of construction projects.

TECHNOLOGY FEATURES & SPECIFICATIONS

1. The system uses a high-resolution **OEM 640 x 512 Long-Wave Infrared (LWIR) thermal camera**, accurately capturing subtle temperature variations, ideal for detecting water seepage.

2. An integrated **HD RGB camera with an Infrared (IR) illuminator** enables clear imaging in both normal and low-light conditions. This dual-sensor setup enhances inspection reliability by providing both thermal and visible-light data.

3. The system runs on a **10AH Lithium Polymer (LiPO) battery**, offering long-lasting power for extended use. The battery is easily removable, allowing for quick replacement and minimizing downtime during field inspections.

4. Featuring an **ARM-based single-board computer** with 32GB SSD storage and 8GB DDR RAM, the system provides robust data processing. A **5-inch touch screen** offers a user-friendly interface for real-time data management and image viewing.

5. The system includes **Application Software with advanced image processing algorithms** to enhance detection accuracy by reducing noise and emphasizing temperature contrasts.

POTENTIAL APPLICATIONS

The smart imaging-based water seepage detection system is highly effective for detecting water seepage in both completed and under-construction buildings, especially in areas with restricted access. It is particularly valuable for enclosed spaces, such as private residential buildings with hidden plumbing behind false panels, where traditional water tightness tests are less comprehensive due to accessibility limitations.

The technology owner is seeking collaboration with companies in the building & construction and environmental services industries.

UNIQUE VALUE PROPOSITION

An alternative technology to manual water seepage monitoring.

- Utilizes advanced LWIR thermal imaging and algorithms to precisely detect true water seepage, minimizing false positives.
- Enables non-invasive inspections, reducing the need for destructive testing and enhancing worker safety.
- Greater Efficiency by offering real-time data processing with immediate results, reducing inspection time.
- Portable design with easily replaceable battery allows for continuous use, optimizing field operations and increase productivity

- Able to detect water on surfaces of concrete and plastic material at distance of up to 3m. This is extremely helpful when the presence of water is unable to be verified by visual or touch.
- Equipped with automatic data logging function for future reference and traceability.