

TECH OFFER

Low Power Wireless Reception Technology



KEY INFORMATION

TECHNOLOGY CATEGORY:

Infocomm - Wireless Technology

Green Building - Sensor, Network, Building Control & Optimisation

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175126**

OVERVIEW

Sensor technology for smart homes and smart building services has undergone significant evolution and advancements over time. Initially designed as stand-alone devices without communication capabilities, sensors have advanced to interconnected wireless communication systems with built-in antennas powered by batteries. The latest advancements include next-generation low-power wireless reception technology, enabling the design and manufacture of long-lasting wireless sensors with miniature batteries. These advancements have greatly benefited the development of wireless sensors such as smoke and carbon monoxide detectors, sirens, fire alarms, heat alarms, and more.

A Japanese corporation has developed a new low-power wireless technology that significantly enhances synchronization, standby reception, and driver processes during the sensor's wireless communication cycle.

TECHNOLOGY FEATURES & SPECIFICATIONS

This low power wireless reception technology aims to achieve precise time synchronization during communication between the base station and connected devices. In instances of asynchrony, intermittent reception at high frequencies is employed to detect radio waves due to uncertain timing in incoming communication. However, with this new synchronous method, clear timing alignment between the base station and connected devices allows intermittent reception to synchronize with communication timing, thereby reducing the frequency of high-frequency checks. This synchronization is facilitated by several techniques:

- **Synchronization:** The software ensures precise timing alignment between communication partners. This approach aligns communication schedules instead of frequently checking for signals. It allows intermittent reception to match communication events, reducing the need for constant high-frequency checks.
- **Standby Reception:** Beacon signals are transmitted from the base station for synchronization. By reducing the duration of these signals, power consumption is minimized. The firmware ensures that the connected device waits attentively before and after beacon reception, shortening the base station's transmission time.
- **Driver Management:** Control the switching between low-power standby and active reception states. With precise synchronization, the driver accurately predicts when to activate reception circuitry, ensuring readiness without energy wastage on constant checks.

POTENTIAL APPLICATIONS

The technology can be applied to a wide range of wireless sensing uses for smart buildings and smart homes:

- Interconnected smoke detectors, fire alarms, and call buttons
- Sensors for HVAC controls and building management
- Occupancy sensors for presence detection and people counting
- Sensors for access and lighting control

The technology owner is seeking business collaborations with application developers and product OEMs to manufacture new wireless sensors and enhance existing ones.

UNIQUE VALUE PROPOSITION

This low power wireless reception technology is superior to Bluetooth (BLE) in communication range and to ZigBee in power consumption.

- Reduced need for battery replacement, longer intervals between maintenance for labor savings, and a compact battery for improved design and aesthetics.
- Reference target for the technology:
 - 10-year battery life based on battery capacity of 1600mAh
 - Communication distance of 100m or more

The overall energy savings from implementing this technology compared to conventional methods can be up to 82%.