Product Overview

The IWRL6844: Advancing 60GHz Radar Sensing for Factory and Building Automation

Figure 1. Radar-Based Applications in Modern Day Homes

Radar-based sensor integrated circuits (ICs) are increasingly popular in position and proximity sensing due to their long-range capabilities, high precision, and environmental advantages. With their high accuracy, radar sensors are widely used today in building and factory automation for applications such as people presence detection, object tracking, safety monitoring, and object classification through artificial intelligence.

In recent years, 60GHz and 77GHz radar sensors have gained prominence over 24GHz designs, offering higher resolution, improved accuracy, and more compact designs. The IWRL6844 is a next-generation 60GHz radar sensor that builds on the capabilities of Texas Instruments previous high performance 60GHz sensor, the IWR6843. Some of the main benefits to the IWRL6844 include lower power consumption (<500 mW average), enhanced angular resolution through the use of a fourth transmitter (total of four transmitters and four receivers), and increased processing power through the new C66x digital signal processor (DSP). With 2.5MB of memory, the IWRL6844 supports more complex algorithms and machine learning models, expanding application scope and allowing higher accuracy object or surface classification models. These additional hardware and software features allow for the IWRL6844 to lead the way in industrial automation, building security, and safety-critical applications that utilize radar today.

Enhanced Radar Sensing for Building Automation

Smart buildings and homes require continuous environmental awareness to avoid the false errors caused from small animals, trees, and other objects that plague sensors today for improved energy efficiency, security, and safety. The IWRL6844 meets these demands with advanced sensing capabilities, enabling multi-layered filtering techniques to avoid false errors, high-resolution people counting (9+ people), presence detection, and fall detection all at distances up to 20m and beyond 100m for presence detection. IWRL6844 helps reduce the design burden through reusing the proven open-source antenna reference designs of the IWR6843 while benefiting from increased angular resolution, making IWR6843 highly effective for multi-zone presence detection in both indoor and outdoor environments.

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Figure 2. IWRL6844 Found in Occupancy Sensors, Doorbells, and Security Applications

Key applications in building automation include:

- Outdoor security monitoring – Detecting unauthorized movement with high accuracy and minimal false alarms with the use of artificial intelligence.
- Occupational sensing – Improving energy efficiency in office spaces through intelligent presence-based lighting or climate control in HVAC.
- Elderly care monitoring – Enabling fall detection through artificial intelligence and continuous activity monitoring without compromising privacy.

With lower power consumption than previous generations and robust performance, the IWRL6844 is a good design for smart buildings that require always-on sensing without excessive power draw.

High-Resolution Radar for Industrial Automation

As industries move toward full factory and manufacturing automation, reliable object detection and safety monitoring become critical. The IWRL6844 provides higher-resolution sensing for factory automation, improving safety guard accuracy and presence detection in dynamic environments. The additional memory on the IWRL6844 allows for larger machine learning models, opening possibilities to implement human versus non-human detection inside factory floors. Artificial intelligence allows for radar to help industrial, mobile, or other applications to take specific actions based on the object, or surface underneath, creating a safer environment in the factory automation setting.

Figure 3. IWRL6844 Found in Robotics, Off-Highway Vehicles and Drones

Key applications in industrial automation include:

- Industrial robots and safety scanners – Enhancing worker safety by detecting nearby personnel and stopping when needed, or taking specific actions based on if a human or non-human is detected.
- Off-highway vehicles – Improving situational awareness for agricultural, mining, and construction machinery to avoid collisions.
- Drones and autonomous vehicles – Enabling accurate obstacle detection and navigation, even in challenging environmental areas.

With the increased processing power and memory, the IWRL6844 supports advanced machine learning algorithms for real-time decision-making, making the device an essential component for next-generation factory automation designs.

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Conclusion

The IWRL6844 sets a new benchmark for 60GHz radar sensors, lower power consumption from previous generations with enhanced sensing capabilities. The ability to enable high accuracy presence detection, object tracking, false error mitigation, and increased support to machine learning models makes IWRL6844 a versatile designs for building security, elderly care, industrial robotics, and autonomous systems alike. By offering a balance of performance and efficiency, the IWRL6844 enables smarter, safer, and more responsive sensing applications across building and factory automation industries.

Additional Resources

Order a IWRL6844 Sample Today.

See the TI portfolio of industrial mmWave sensors.

Learn more in the TI Developer Zone.

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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