

## Description

The ZWIR4512 enables secure low-power wireless IPv6 communication for sensors and small devices. IDT provides a user-programmable, royalty-free 6LoWPAN stack with mesh routing capability with the ZWIR4512. 6LoWPAN is an Internet Engineering Task Force (IETF) standard for building wireless, low-power IP-based sensor, and device networks. These networks can easily be integrated into existing IT infrastructure or operate autonomously.

Secure communication is provided by standard-compliant implementations of the Internet Protocol Security (IPSec) protocol suite and the Internet Key Exchange Protocol version 2 (IKEv2), which enable highly secure end-to-end communication, including over unsecure network nodes.

The module is powered by an ARM® Cortex™-M3 (ARM, Ltd. trademark) microcontroller and provides a rich set of GPIO and peripheral interfaces. Up to 192kB of flash and 32kB of RAM are available for applications. Different low power modes are provided to save energy in battery-operated devices. The modules provide superior radio properties without the need for complicated external RF design.

## Firmware Features

- Serial command interface with built-in security and over-the-air update (OTA) functionality
- Royalty-free library bundle for custom firmware: 6LoWPAN communication library with mesh routing capability; IPSec and IKEv2 security libraries; over-the-air update library; several peripheral libraries

## Available Support

- Development Kit
- Programming guide and application notes
- Ethernet, USB and UART gateways
- Free packet sniffer and example programs demonstrating C-API usage
- Windows® (Microsoft Corp. trademark) and Linux® (Linus Torvalds trademark) support tools

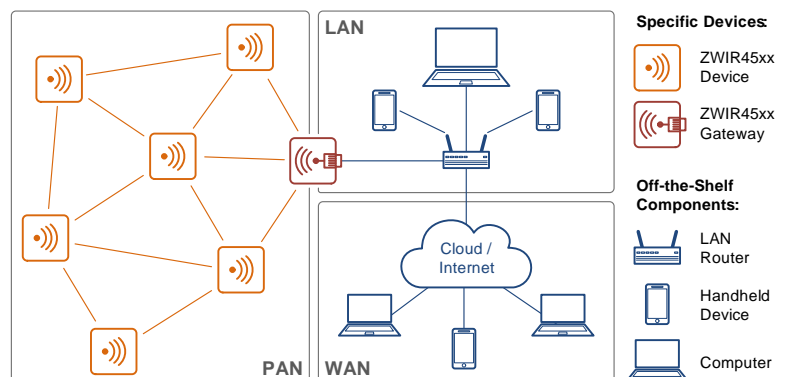
## Typical Applications

- The ZWIR4512 serves as a universal secure radio communication module. Typical applications include home and industry automation, health monitoring, smart metering / smart grid applications, and keyless entry systems.
- Its very low current consumption makes the module suitable for battery-operated devices.

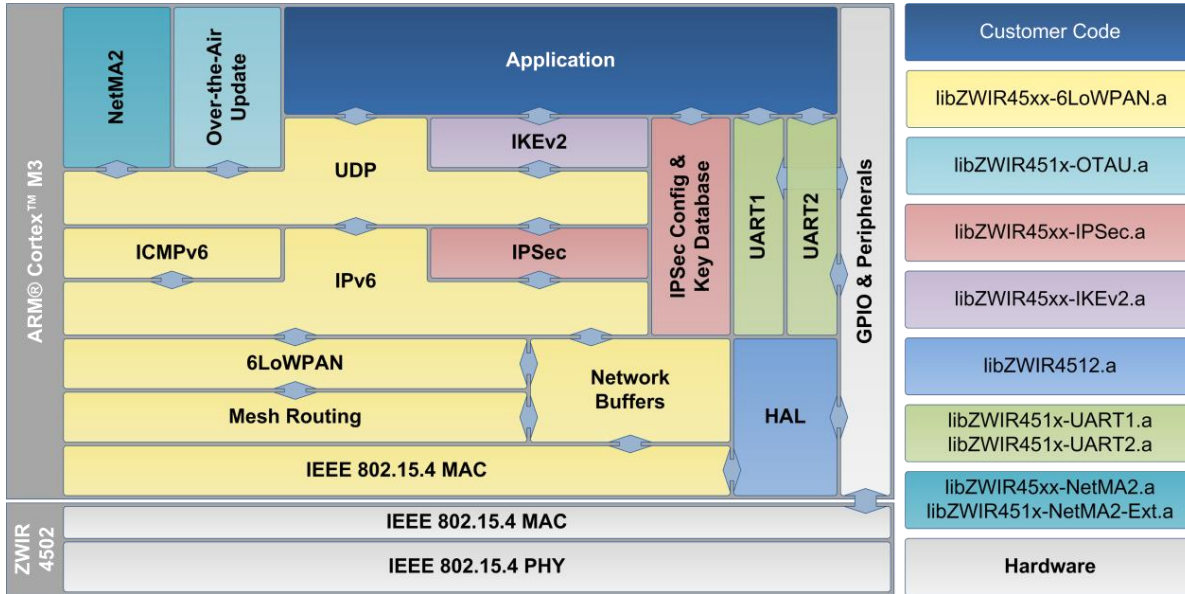
## Hardware Features

- License-free 868/915MHz frequency bands
- ARM® Cortex™-M3 32-bit microcontroller
- ≤192kB flash and 32kB RAM for user applications
- Unique EUI64 address
- 4 channels in EU mode; 10 channels in US mode
- 19 (ZWIR4512AC1) or 21 (ZWIR4512AC2) GPIOs with multiplexed peripheral functions:
  - 2 x UART, SPI, 3 x ADC, 2 x DAC, 11 x PWM, USB, CAN, I2C, 8 x timer
  - Several 5V tolerant I/Os available
- Low current consumption: 3.5µA in Standby Mode; 10.5mA in Receive Mode; 16.0mA in Transmit Mode at 0dBm
- Modulation schemes
  - BPSK (20kBps EU, 40kBps US)
  - O-QPSK (100kBps EU, 250kBps US)
- Receiver sensitivity: up to -110dBm
- TX output power: up to 10dBm (US Mode)
- Uniquely simple programmability
- Standard-compliant security solution
- No need for external microcontroller
- Plug-and-play integration into local and wide-area networks
- No RF design required
- 2D barcode label containing MAC address
- Superior radio propagation
- ETSI/FCC certified
- Supply voltage: 2.0V to 3.6V
- Operating temperature: -40°C to +85°C
- 30-pin edge-board contact package or 32-pin land grid array package

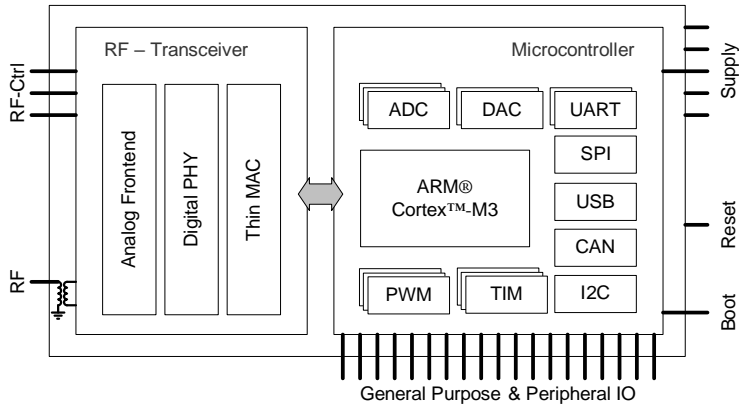
## Typical ZWIR4512 Application Setup



## Stack Architecture



## ZWIR4512 Functional Block Diagram



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