

# Out-of-box star-network solution: TI 15.4-Stack

Save development time and resources with the SimpleLink™ star-network solution



SWAT015

## What is the TI 15.4-Stack?

The TI 15.4-Stack is a complete network solution for developing low-power, long-range, robust and secure wireless star-network solutions for the Sub-1 GHz and 2.4 GHz frequency bands. Flexible and easily configurable, developers can quickly change the network parameters of the TI 15.4-Stack to suit their application requirements. The TI 15.4-Stack is included in the SimpleLink™ SDK and is based on the IEEE 802.15.4 MAC and PHY specification. For Sub-1 GHz frequencies, the TI 15.4-Stack also implements a frequency-hopping scheme for enhanced robustness.

### TI 15.4-Stack

Application Layer

MAC

PHY  
(Sub-1 GHz or 2.4 GHz)

## What are the layers of the stack?

### Application Layer:

- Contains highly configurable network formation controller and example applications that can be used as building blocks.
- Examples include sensor and collector, over the air download, and TI 15.4-Stack + *Bluetooth®* low energy concurrency.
- The developer can set the MAC and PHY modes of operation, security, and network parameters through simple function calls.

### MAC:

- Three modes of operation: beacon, non-beacon, and frequency hopping (for robustness against channel disturbances).
- Built-in security: AES-128 encryption with key management.
- Robust two-way communication with acknowledgments, CSMA/CA, listen before talk, and retries.

### PHY:

- Characterized for both Sub-1 GHz (433, 863, and 915 MHz) and 2.4 GHz applications.

## How can the TI 15.4-Stack help developers?

- Reduce barrier to entry in developing low-power, long-range Sub-1 GHz applications
- Lower development costs and reduce time to market with a fully-tested, pre-built star-network solution
- Launch a security-enabled 250+ node network within minutes with a CC1312, CC1352R, or CC1352P collector
- Increase packet transmission success rates with frequency hopping, two-way communication, acknowledgments, CSMA/CA, listen before talk, and retries
- Enable engineers to focus on developing their application rather than building a network from the ground up

## Key resources

Getting started	Development and training	Want to add BLE or a cloud connection?
Estimate battery life: <a href="#">TI 15.4-Stack Power Calculator</a>	Get a network up and running within minutes: <a href="#">SimpleLink Academy TI 15.4-Stack examples</a>	Add a concurrent BLE connection: <a href="#">Learn more about the Dynamic Multi-Protocol Manager</a>
Finding the right TI 15.4-Stack mode: <a href="#">Choosing between synchronous and asynchronous mode</a>	Explore the stack's configuration modes: <a href="#">TI 15.4-Stack User's Guide</a>	Add a cloud connection: <a href="#">Learn more about the Sensor to Cloud solution</a>
Download the stack from the SDK: <a href="#">CC13x0 SDK</a> <a href="#">CC13x2 SDK</a> <a href="#">CC26x2 SDK</a>	Learn how to pass events and data from the MAC to the application: <a href="#">TI 15.4-Stack API Guide</a>	

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