

TI ZigBee Module WZ400T

User's Manual

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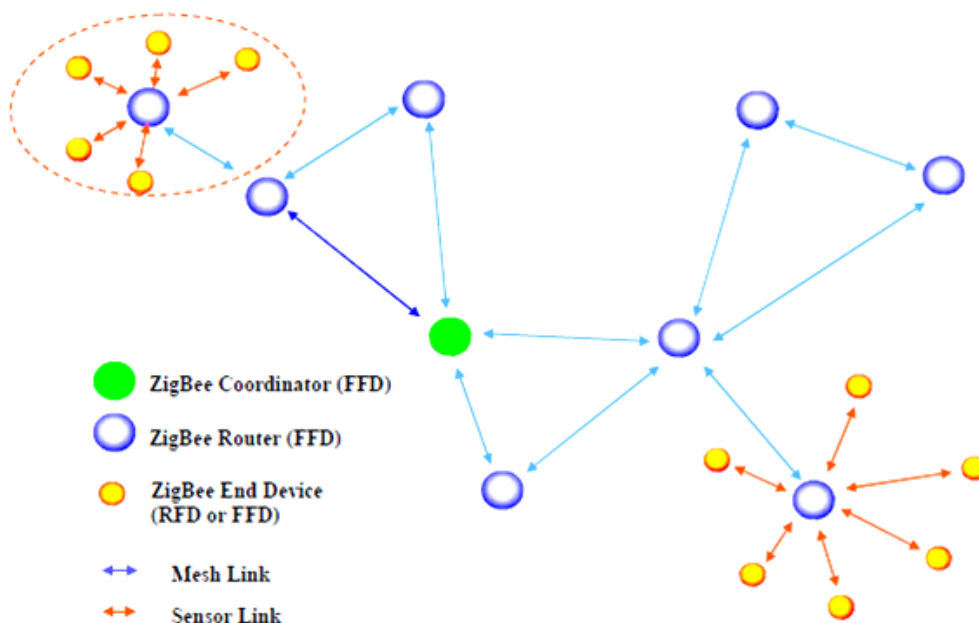
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Introduction of ZigBee

ZigBee is a standard for a suite of high level communication protocols using small, low-power digital radios based on the IEEE 802.15.4-2003 standard for wireless personal area networks (WPANs). The technology defined by the ZigBee specification is intended to be simpler and less expensive than other WPANs, such as Bluetooth. ZigBee is targeted at radio-frequency (RF) applications that require a low data rate, long battery life, and secure networking.

ZigBee protocols are intended for use in embedded applications requiring low data rates and low power consumption. ZigBee's current focus is to define a general-purpose, inexpensive, self-organizing mesh network that can be used for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation, home automation, etc.

ZigBee is a mesh network architecture (see Picture 1). Its network layer supports three types of topologies: both star and tree typical networks and generic mesh networks. As one of its defining features, ZigBee provides facilities for carrying out secure communications, protecting establishment and transport of cryptographic keys, cyphering frames and controlling devices. It builds on the basic security framework defined in IEEE 802.15.4.



Picture 1. ZigBee network model

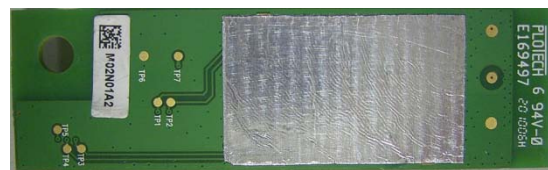
Product Features

The WZ400T is using TI CC2530+CC2591 solution for IEEE 802.15.4, ZigBee and RF4CE applications. It enables robust network nodes to work for ZigBee function. The CC2530 combines the excellent performance of a leading RF transceiver with an industry-standard enhanced 8051 MCU, in-system programmable flash memory, 8-KB RAM, and many other powerful features. The module has various operating modes, making it highly suited for systems where ultralow power consumption is required. Short transition times between operating modes further ensure low energy consumption.

- RF function:
 - 2.4GHz IEEE802.15.4 Compliant RF Transceiver
 - Excellent Receiver Sensitivity and Robustness to Interference
 - Programmable output power up to 17dBm for combination
 - Only a Single Crystal Needed for Mesh Network Systems
- Embedded Microcontroller (8051) in main-chip:
 - High-Performance and Low Power 8051 Core with Code Pre-fetch
 - 256KB In-System-Programmable Flash
 - 8KB RAM with Retention in All Power Modes
- Low power consumption
- Accurate Digital RSSI/LQI Support
- Tiny Form Factor
- CSMA/CA Hardware Support
- AES Security Coprocessor
- RoHS Compliant

Mechanical:

Dimensions (L x W x H): 60mm (+/-0.1mm) x 18 mm (+/-0.1mm) x 1.6mm (+/-0.1mm); Weight: 5g.



User Guide

The driver has been installed in WZ400T, user does not need to do any installation steps. Just connect devices, and then it works.

Federal Communication Commission

Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IMPORTANT NOTE:**FCC Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device is intended only for OEM integrators under the following conditions:

- The antenna must be installed such that 20 cm is maintained between the antenna and users.

As long as condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

- EN60950-1:2001 A11:2004
Safety of Information Technology Equipment
- EN50371 : (2002-03)
Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10 MHz - 300 GHz) -- General public
- EN 300 328 V1.6.1 (2004-11)

Electromagnetic compatibility and Radio spectrum Matters (ERM);
Wideband transmission systems; Data transmission equipment operating
in the 2,4 GHz ISM band and using wide band modulation techniques;
Harmonized EN covering essential requirements under article 3.2 of the
R&TTE Directive

- EN 301 489-1 V1.6.1: (2005-09)
Electromagnetic compatibility and Radio Spectrum Matters (ERM);
ElectroMagnetic Compatibility (EMC) standard for radio equipment and
services; Part 1: Common technical requirements

- EN 301 489-17 V1.2.1 (2002-08)
Electromagnetic compatibility and Radio spectrum Matters (ERM);
ElectroMagnetic Compatibility (EMC) standard for radio equipment and
services; Part 17: Specific conditions for 2,4 GHz wideband transmission
systems and 5 GHz high performance RLAN equipment

This device is a 2.4 GHz wideband transmission system (transceiver),
intended for use in all EU member states and EFTA countries, except in
France and Italy where restrictive use applies.

In Italy the end-user should apply for a license at the national spectrum
authorities in order to obtain authorization to use the device for setting up
outdoor radio links and/or for supplying public access to telecommunications
and/or network services.

This device may not be used for setting up outdoor radio links in France and in
some areas the RF output power may be limited to 10 mW EIRP in the
frequency range of 2454 – 2483.5 MHz. For detailed information the end-user
should contact the national spectrum authority in France.