


**Ketra Inc.**

# **Ketra VER006 2.4GHz ZigBee Module**

## **User Manual**

**Part #: 830-000057-xx**

	<b>Title</b> <b>Ketra VER006 2.4GHz ZigBee Module - User Manual</b>		
	<b>Size</b> <b>A</b>	<b>Ketra Part Number</b> <b>830-000057-xx</b>	<b>Rev</b> <b>B</b>
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## Description

The Ketra VER006 2.4GHz ZigBee Module (Ketra Part Number: 830-000057-xx) is utilized in Ketra lighting and control systems. The module is used for communication over private wireless network and not used for other commercial purposes not designated by Ketra.

Ketra, Inc. designed the ZigBee Module compliant with the IEEE 802.15.4 standard. The module is based upon the EM385x ZigBee SOC. The module's key application is for use with Ketra lighting control systems.


The Silicon Laboratories EM358x is a fully integrated System-on-Chip that integrates a 2.4 GHz, IEEE 802.15.4-2003-compliant transceiver, 32-bit ARM® Cortex™-M3 microprocessor, flash and RAM memory, and peripherals of use to designers of ZigBee-based systems.

The transceiver uses an efficient architecture that exceeds the dynamic range requirements imposed by the IEEE 802.15.4-2003 standard by over 15 dB. When operating on channel 26, the radio transmit power shall be set no higher than +10dBm. When operating on channels 11-25 the transmit power may be set as high as +20dBm. The integrated receive channel filtering allows for robust co-existence with other communication standards in the 2.4 GHz spectrum, such as IEEE 802.11-2007 and Bluetooth. The integrated regulator, VCO, loop filter, and power amplifier keep the external component count low.

The Zigbee Module uses a FEM from RFMD. The RF6525 FEM integrates the PA plus harmonic filter in the transmit path and the LNA with bypass mode in the receive side. It also integrates a diversity switch that is connected to PCB antenna and to RFOUT castellation pin of the edge 33-pin connector. Antenna designs that use the Aux RFOUT must have a gain of less than 6dBi.

The Zigbee Module communicates over wireless network to control the color point and intensity (among other items) of the end product lamp and/or luminaire. The Zigbee module can be designed into various end products for communication needs. Examples are Ketra S38 lamp, Keypad wireless controller and Satellite controller. Software and firmware are defined by Ketra per product as required.

The ZigBee Module is intended to interface with compatible Ketra products and is powered and controlled per manufacturers recommended operating conditions.

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## Electrical Requirements

### ABSOLUTE MAXIMUM RATINGS

Description	Ketra ZigBee Module		Unit
	Min	Max	
Power Supply Voltage (V <sub>DD</sub> )	-0.3	3.6	VDC
Voltage on any I/O Line	-0.3	V <sub>DD</sub> + 0.3	VDC
Storage Temperature Range	-40	125	°C
Reflow Soldering Temperature	–	260	°C

**Note:** Exceeding the maximum ratings may cause permanent damage to the module or devices.

### RECOMMENDED OPERATING CONDITIONS


Description	Ketra ZigBee Module			Unit
	Min	Typ	Max	
Power Supply Voltage (V <sub>DD</sub> )	2.1	3.3	3.6	VDC
Input Frequency	2405	–	2480	MHz
Ambient Temperature Range	-40	25	85	°C

## Device Label




Figure 1 Device Label



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**FCC ID**

FCC ID: 2AB3C4ZV

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## AGENCY CERTIFICATIONS

### FCC Compliance Statement (Part 15.19)

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

### Warning (Part 15.21)

Changes or modifications not expressly approved by Ketra could void the user's authority to operate the equipment.


### 40 mm Separation Distance

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 40 mm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

### OEM Responsibility to the FCC Rules and Regulations

The VER006 2.4GHz ZigBee Module has been certified per FCC Part 15 rules for integration into products without further testing or certification. To fulfill the FCC certification requirements, the OEM of the Module must ensure that the information provided on the Label is placed on the outside of the final product. The Module is labeled with its own FCC ID Number. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2AB3C4ZV" or "Contains FCC ID: 2AB3C4ZV"

The OEM of the VER006 2.4GHz ZigBee Module must only use the approved antenna, (PCB Trace Antenna) that has been certified with this module. The OEM of the VER006 2.4GHz ZigBee Module must test their final product configuration to comply with Unintentional Radiator Limits before declaring FCC compliance per Part 15 of the FCC rules.

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## Industry Canada Requirements

### Scope: ICES-003:

CAN ICES-3 (B)/NMB-3(B)


This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

This radio transmitter ( IC: 12066A-4ZV) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.


Le présent émetteur radio ( IC: 12066A-4ZV) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est

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supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Antenna Types approved with transmitter :

1. Antenna with less than 6dBi gain

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