K-LCS [NODE]
MANUAL

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1. General Description

K-LCS [Node] is a specification for a suite of high level communication protocols using small, low-power digital radios based on an IEEE 802 standard for personal area networks. K-LCS [Node] is often used in mesh network form to transmit data over longer distances, passing data through intermediate devices to reach more distant ones. This allows K-LCS [Node] networks to be formed ad-hoc, with no centralized control or high-power transmitter/receiver able to reach all of the devices. Any K-LCS [Node] can be tasked with running the network.

K-LCS [Node] is targeted at applications that require a low data rate, long battery life, and secure networking. K-LCS [Node] has a defined rate of 250 kbit/s, best suited for periodic or intermittent data or a single signal transmission from a sensor or input device. Applications include wireless light switches, electrical meters with in-home-displays, traffic management systems, and other consumer and industrial equipment that requires short-range wireless transfer of data at relatively low rates. The technology defined by the K-LCS [Node] specification is intended to be simpler and less expensive than other WPANs, such as Bluetooth.

1.1 Features

- IEEE 802.15.4 Standard Compatible　Wireless Networking
- Dimming (1 – 10 V),　dimming range (10% ~ 100)
- Power on/off
- Power consumption, Current detection, Voltage detection
- Data report　(voltage/Current)
- Power Consumption : < 2.5W
- Independent　RTC IC
- Remote program update / Hardware Reset
- Compact design 30mm × 40mm × 4.8mm
- Distance Outdoor: approx. 100m

1.2 Applications

- BEMS Applications
- Street Lamp Applications
- High-bay Lamp Applications
- Parking Lamp Application

1.3 Notice

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.

A label must be affixed to the outside of the host product with the following statements:

This device contains FCCID: ORI-ZBNODE

1.4 Caution Statement for Modifications

CAUTION : Any Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

1.5 Mobile Device RF Exposure Statement

RF Exposure - This device is only authorized for use in a mobile application. At least 20 cm of separation distance between the transmitting antenna device and the user's body must be maintained at all times.

1.6 Mobile Device RF Exposure Statement

The module is limited to OEM installation only.

OEM integrators must ensure that the end-user has no manual instructions to remove or install the module.. OEM's must comply with FCC marking regulation part 15 declaration of conformity (Section 2.925(e)).

This module is to be installed only in mobile or fixed applications (Please refer to FCC CFR 47 Part 2.1091(b) for a definition of mobile and fixed devices).

The separate approval is required for all operating configurations, including portable configurations with respect to FCC CFR 47 Part 2.1093 and different antenna configurations.

The K-LCS [Node] module has been designed to operate with the following antenna and gains. Use with other antenna types or with these antenna types at higher gains is strictly prohibited.

Type of Antenna	Gain (dB)	Type of Connector
Planar Inverted F antenna	2.59 dBi	MCX(F) type

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2. Specification

2-1. Electrical Specification

Type No.	Description
Zigbee chip	RP-S2450, embedded 8051 with 96kB flash memory (Tx:43mA, Rx:36mA, Sleep: 25uA)
Memory	128kB Serial Flash
Clock	**16MHz Crystal for System Clock** **32.768kHz Crystal for Sleep Timer**
RF Tx Power	+8dBm
RF Rx sensitivity	-96dBm
Data rate	250kbps
Dimmer Level	PWM, 0 ~ 100%
ADC 입력Level	0 ~ 3V
Power consumption	< 2.5W (5V, 500mA)
Interface	UART0(DMX512), UART1(Debug & Download)
Dimensions (W x L)	76.2 x 51.4 mm

2-2. Environmental Specification

Storage Temperature	−40 ℃ ~ +85 ℃
Operating Temperature	−30 ℃ ~ +70 ℃
Humidity (Operating)	5% ~ 95% (No dew condensation)

2-3. EMS Specification

PORT	PROTECT MODE
ANT Port	Common (± 0 – 1 kV / 8/20 μs)

2-4. ESD Specification

EN55024 (Transient / BURST)

Contact discharging	±4KV
Air discharging	±8KV

2-5. EMI Specification

EN 55022 (Emission) Class B