ESSON TECHNOLOGY INC.

# User Manual

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| **PRODUCT：** | **ESM8196** |
| **DESCRIPTION：** | 802.11b/g/n 1x1 Mini Module |

## Description

Esson Solution is a small-size, 802.11n AP board that achieves a data rate up to 150Mbps. It is 3 times faster than the legacy 11g model but is priced less, making it more cost-effective.

This product supports WIFI Application. It is ideal for multi-purpose installation to share wireless connection.

By supporting 64/128-bits WEP, TKIP,WPA, WPA2,AES and WPS, helps to protect your data and privacy during transmission.

This module could be used in WIFI application such as WIFI drive, baby monitoring, WIFI IP CAM, WIFI accessory…etc.

## Features

- Realtek RTL8196C chipset with Interface USB, GPIO, UART and GPIOs.
- Support boot from Flash
- Data Rate up to 150Mbps
- Security: 64/128-bits WEP, TKIP,WPA, WPA2,AES,WPS
- Multi-modes: AP/Client

## Specification

**Hardware Features:**

| | |
|---|---|
| Standard | IEEE 802.11 b/g/n standards compliant |
| Wireless LAN | 1T1R Mode |
| Antenna | iPex Connector *1 (on-board chip antenna optional ) |
| 16-pin Interface | USB*1 ( Host )<br>UART*1<br>GPIOs<br>VCC/GND |
| Frequency Range | 2.412GHz~2.462GHz ( subject to local regulations) |
| Number of Selectable Channels | 802.11n 20MHz/40MHz ;<br>802.11b/g<br>USA, Canada (FCC):11 channels (2.412GHz~2.462GHz) |
| Data Rate | 802.11n: up to 300Mbps<br>802.11b: 1, 2, 5,5, 11Mbps<br>802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps |
| Coverage Area | Up to 3 times faster then existing 802.11 b/g products |
| Transmit Power(EIRP) | 11n HT40 MCS7 : +13 dBm<br>11b CCK: +18 dBm<br>11g OFDM: +15 dBm |
| Receiver Sensitivity | -66dBm at HT40 MCS7<br>-73dBm at 54Mpbs<br>-86dBm at 11Mpbs |
| Dimension | 25x35 mm |
| Certifications | FCC/CE by request |

**Software Features:**

- **Network Features:**
  - DHCP Client/Relay/Server
  - Dynamic DNS
  - NTP Client
  - DNS Cache/Proxy
  - Firewall
    1. MAC/IP/Port Filter
    2. Virtual Server
    3. DMZ
    4. Content Filter
- **WiFi:**
  - Mode: AP/Router/Client/AP-Client/Router-Client
  - One Transmit and One Receive paths(1T1R)
  - 20MHZ/40MHZ bandwidth.
  - Support Multiple SSID
  - Clock rate up to 400MHzLegacy and High Throughput Modes.
  - Support WPS
  - High security with build-in: WEP 64/128, TKIP, WPA, WPA2 mixed,802.1x and 802.11i
  - 802.1X Authentication with RADIUS Client
  - QoS-WMM.WMM-PS

# Pin Definition

| Description | Pin | Pin | Description |
|---|---|---|---|
| +3.3V | 2 | 1 | +3.3V |
| UART_Rx | 4 | 3 | GND |
| UART_Tx | 6 | 5 | Wake up |
| GND | 8 | 7 | WPS/Reset to Default # |
| LED_WLAN# | 10 | 9 | GND |
| LED_WPS# | 12 | 11 | USB_D+ |
| AP/Client selection | 14 | 13 | USB_D- |
| Reserved | 16 | 15 | GND |
| RJ45 (TX+) | 18 | 17 | RJ45(TX-) |
| RJ45(RX+) | 20 | 19 | RJ45(RX-) |

**Size:**

1. Size: 25*35 mm
   Double row 1.27 pitch on the 35mm side
2. Reserved: Available for use
3. Reserved is ACTIVE LOW
4. LEDs and WPS/Reset to Default are active LOW
5. Reset /Reset to default function is share AP/Client selection pin.

**Antenna Selection**

In order to maintain compliance with FCC regulations, an antenna with no more than 0 dBi gain must be used.

This module has been tested with the following antennas:

| Part Number | Antenna Type | Anteenna Gain | DTS mode |
|---|---|---|---|
| **ANT-915-C** | **CHIP** | **0dBi** | **Approved** |
| **ANT-915-N** | **male/female/SMT connector** | **0dBi** | **Approved** |

FCC RF Exposure Statement

The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.
This device complies with part 15.203.

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

Additional FCC Testing Requirements

While the module's FCC certification can be inherited (presuming the guidelines are met), additional testing will be required to achieve full FCC compliance for your end-product. The integrator is required to perform unintentional radiator testing on the final product per FCC sections 15.107 and 15.109.

## FCC Statements of Compliance

### Statement and Conditions of Modular Compliance

## FCC NOTICE (FCC ID: RKOESM8196)

**This device complies with the rules set forth in Part 15 by the Federal Communications Commission. 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.**

**Any changes or modifications not expressly approved by Esson Technology Inc. could void the user's authority to operate the equipment.**

**The RKOESM8196 module is provided with an Limited FCC Modular Certification. This certification may be install in an end-user product, negating the need for FCC part 15 intentional radiator testing on this module, provided that the following guidelines are met:**

**1. An approved antenna must be directly coupled to the module's connector.**

**2. The module must not be modified in any way. Coupling of external circuitry must not bypass the provided connectors.**

**3. End product must be externally labeled with "Contains FCC ID: RKOESM8196"**

**4. The integrator must not provide any information to the end-user on how to install or remove the module from the end-product.**

**5. this radio should not be installed to operating simultaneously with other radio.**