# OWMH-DS6311-01
# Product Specification

| Version | Issue date | Changes | Remark |
|---|---|---|---|
| 0.1 | 2018/11/14 | Initial Version | |
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IMPORTANT

This document contains important Information and therefore
should not be disclosed to third parties without prior written consent of ORing Industrial Networking Co. Ltd.

Signature:

| Author: | Reviewed by: | Approved by: | Remarks: |
|---|---|---|---|
| Rino Pan | | | |

# 1. Introduction

OWMH-DS6311-01 module is designed for easy-design-in low cost and suitable for Wi-Fi applications. The module can support WAN, LAN, UART, SPI, I2S, SDXC and GPIO interfaces and work for 2T2R mode.

# 2. Technical specification

<table>
<tr><th colspan="2">Items</th><th>Specification</th></tr>
<tr><td colspan="2">Supported Standard and Protocol</td><td>IEEE 802.11n, IEEE 802.11g, IEEE 802.11b, IEEE 802.11a, IEEE 802.3, IEEE 802.3u, CSMA/CA, CSMA/CD, TCP/IP, DHCP, ICMP, NAT, PPPoE</td></tr>
<tr><td colspan="2">Dimension</td><td>80x70x1.6mm</td></tr>
<tr><td colspan="2">Power consumption</td><td>< 350mA</td></tr>
<tr><td colspan="2">Operating Temperature Range</td><td>-30 ~ 75 deg. C</td></tr>
<tr><td colspan="2">Storage Temperature Range</td><td>-40 ~ 85 deg. C</td></tr>
<tr><td rowspan="2">LAN</td><td>WAN Port</td><td>4 x 10/100M adaptive RJ45 port</td></tr>
<tr><td>LAN Port</td><td>1 x 10/100/1000M adaptive RJ45 port</td></tr>
<tr><td>RF Parameters</td><td>Frequency Range</td><td>2.4~2.4835GHz<br>5.180~5.240 GHz & 5.745~5.825 GHz</td></tr>
<tr><td></td><td>Baud Rate</td><td>1T1R:
<table>
<tr><th rowspan="3">MCS index</th><th colspan="4">Data rate (Mbit/s)</th></tr>
<tr><th colspan="2">20 MHz channel</th><th colspan="2">40 MHz channel</th></tr>
<tr><th>800 ns</th><th>400 ns</th><th>800 ns</th><th>400 ns</th></tr>
<tr><td>0</td><td>6.5</td><td>7.2</td><td>13.5</td><td>15</td></tr>
<tr><td>1</td><td>13</td><td>14.4</td><td>27</td><td>30</td></tr>
<tr><td>2</td><td>19.5</td><td>21.7</td><td>40.5</td><td>45</td></tr>
<tr><td>3</td><td>26</td><td>28.9</td><td>54</td><td>60</td></tr>
<tr><td>4</td><td>39</td><td>43.3</td><td>81</td><td>90</td></tr>
<tr><td>5</td><td>52</td><td>57.8</td><td>108</td><td>120</td></tr>
<tr><td>6</td><td>58.5</td><td>65</td><td>121.5</td><td>135</td></tr>
<tr><td>7</td><td>65</td><td>72.2</td><td>135</td><td>150</td></tr>
</table>
2T2R
<table>
<tr><th>MCS</th><th>Data rate (Mbit/s)</th></tr>
</table></td></tr>
</table>

| | | |
|---|---|---|
| | | index / 20 MHz channel / 40 MHz channel<br>800 ns / 400 ns / 800 ns / 400 ns<br>8: 13.00 / 14.40 / 27.00 / 30.00<br>9: 26.00 / 28.90 / 54.00 / 60.00<br>10: 39.00 / 43.30 / 81.00 / 90.00<br>11: 52.00 / 57.80 / 108.00 / 120.00<br>12: 78.00 / 86.70 / 162.00 / 180.00<br>13: 104.00 / 115.60 / 216.00 / 240.00<br>14: 117.00 / 130.00 / 243.00 / 270.00<br>15: 130.00 / 144.40 / 270.00 / 300.00 |
| | | IEEE 802.11g：54/48/36/24/18/12/9/6(adaptive) |
| | | IEEE 802.11b：11/5.5/2/1M (adaptive) |
| | Number of Channel | 13 |
| | Modulation Scheme | DBPSK、DQPSK、CCK and OFDM(BPSK/QPSK/16-QAM/64-QAM) |
| | Sensitivity @ PER | 802.11a: -92dBm ± 2dBm@6Mbps, 802.11a: -76dBm ± 2dBm@54Mbps<br>802.11b: -98dBm ± 2dBm@1Mbps, 802.11b: -85dBm ± 2dBm@11Mbps<br>802.11g: -76dBm ± 2dBm@54Mbps<br>802.11gn HT20: -75dBm ± 2dBm@MCS7, 802.11gn HT40: -72dBm ± 2dBm@MCS7<br>802.11an HT20: -74dBm ± 2dBm@MCS7, 802.11an HT40: -71dBm ± 2dBm@MCS7 |
| | Output Power | 802.11a: 24dBm ± 1.5dBm@6Mbps, 802.11a: 12dBm ± 1.5dBm@54Mbps<br>802.11b: 23dBm ± 1.5dBm@1Mbps, 802.11b: 17dBm ± 1.5dBm@11Mbps<br>802.11g: 16dBm ± 1.5dBm@54Mbps<br>802.11gn HT20: 15dBm ± 1.5dBm @MCS7, 802.11gn HT40: 14dBm ± 1.5dBm @MCS7<br>802.11an HT20: 12dBm ± 1.5dBm @MCS7, 802.11an HT40: 11dBm ± 1.5dBm @MCS7 |
| | Antenna | Two IPEX I connectors for two external antenna(2T2R) |
| WIFI Operation Mode | | AP/Client/Repeater |
| System Service | | Virtual Server：Internal web server for browser to access |
| Device Management | | Area setting<br>Restore to default factory setting<br>Software upgrade<br>Reboot |

| | |
|---|---|
| | Change password |
| **WLAN Security Mode** | OPENWEP<br>SHAREDWEP<br>WEPAUTO<br>WPA<br>WPA-PSK<br>WPA2<br>WPA2-PSK<br>WPAPSKWPA2PSK<br>WPA1WPA2(WPA and WPA2 hybrid mode)<br>802.1x |

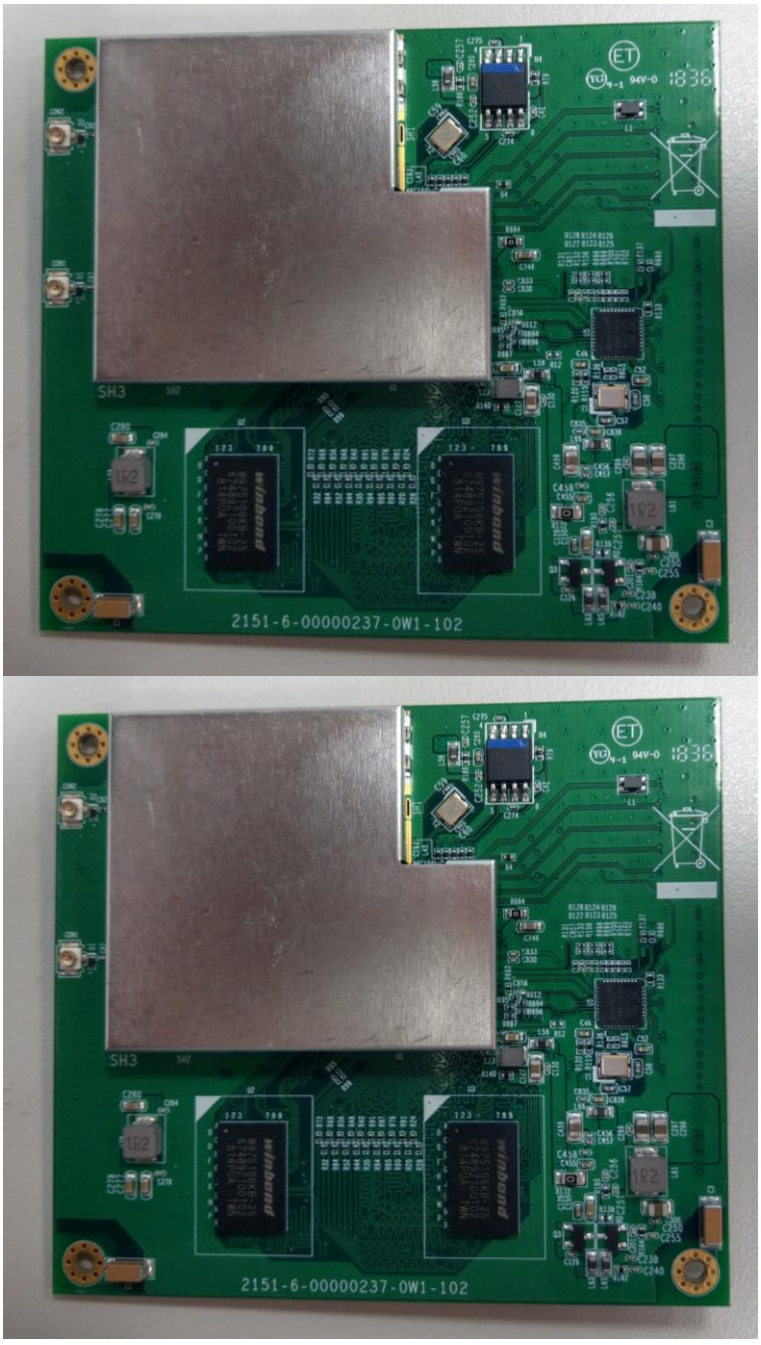
# 3. Software features

- Support AP（Access point）、Client (Wi-Fi Station) mode、Repeater(AP-Client) mode
- **AP mode**
  - Default operation mode. In this mode, the module work as an Access Point, don't need any configuration.
  - User can use PC via RJ45 or smart phone via Wi-Fi to login AP mode and change the default configuration (through browser).
- **Client mode**
  - In this mode, module is a Wi-Fi station.
- **Repeater mode**
  - In this mode, module is AP + Client mode.

# 4. Development tool:

We provide development tool for easy connection of power, RS-232, LAN, WAN, and USB port.

# 5. Module Dimension: 80x70x1.6mm



# 6. Pin Assignment

## J1:

| Description | Function | Pin # | Pin # | Function | Description |
|---|---|---|---|---|---|
| 5V input | 5V | **1** | **2** | 5V | 5V input |
| 5V input | 5V | **3** | **4** | 5V | 5V input |
| 5V input | 5V | **5** | **6** | 5V | 5V input |
| 3.3V input | 3.3V | **7** | **8** | 3.3V | 3.3V input |
| 3.3V input | 3.3V | **9** | **10** | 3.3V | 3.3V input |
| 3.3V input | 3.3V | **11** | **12** | 3.3V | 3.3V input |
| Power ground | GND | **13** | **14** | GPIO21 | LED_LAN_LINK |
| Media-dependent interface A | TXVPA | **15** | **16** | GPIO22 | NA |
| Media-dependent interface A | TXVNA | **17** | **18** | GPIO18 | LED_SIM1 |
| Power ground | GND | **19** | **20** | GPIO20 | LED_LAN_ACT |
| Media-dependent interface B | TXVPB | **21** | **22** | GPIO19 | LED_SIM2 |
| Media-dependent interface B | TXVNB | **23** | **24** | GPIO0 | LED_STATUS |
| Power ground | GND | **25** | **26** | GPIO1 | LED_WLAN |
| Media-dependent interface C | TXVPC | **27** | **28** | GPIO2 | NA |
| Media-dependent interface C | TXVNC | **29** | **30** | GPIO3 | NA |
| Power ground | GND | **31** | **32** | GPIO4 | LED_WAN |
| Media-dependent interface D | TXVPD | **33** | **34** | PCIE_RST_OUT | PCI Express reset |
| Media-dependent interface D | TXVND | **35** | **36** | PCIE_TX_N | Differential transmit |
| Power ground | GND | **37** | **38** | PCIE_TX_P | Differential transmit |
| for 10/100 BASE-T link | LED_10_100 | **39** | **40** | PCIE_CLKOUT_N | Differential reference clock |
| for 1000 BASE-T link | LED_1000 | **41** | **42** | PCIE_CLKOUT_P | Differential reference clock |
| for 10/100/1000 BASE-T activity | LED_ACT | **43** | **44** | PCIE_RX_N | Differential receive |
| Power ground | GND | **45** | **46** | PCIE_RX_P | Differential receive |

## J2 :

| Description | Function | Pin # | Pin # | Function | Description |
|---|---|---|---|---|---|
| Tx positive for port 1 | P1_TX+ | **1** | **2** | GND | Power ground |
| Tx negative for port 1 | P1_TX- | **3** | **4** | GPIO11 | LED_WLAN_RSSI1 |
| Rx negative for port 1 | P1_RX- | **5** | **6** | SW_RESET | Software reset |
| Rx positive for port 1 | P1_RX+ | **7** | **8** | GPIO17 | Power ON/OFF |
| Rx positive for port 0 | P0_RX+ | **9** | **10** | GPIO15 | LED_WLAN_RSSI3 |
| Rx negative for port 0 | P0_RX- | **11** | **12** | GPIO12 | LED_WLAN_RSSI2 |
| Tx positive for port 0 | P0_TX+ | **13** | **14** | GPIO16 | SIM_SEL |
| Tx negative for port 0 | P0_TX- | **15** | **16** | UART_TXD | UART TXD signal |
| USB signal poistive | USB_D+ | **17** | **18** | UART_RXD | UART RXD signal |
| USB signal negative | USB_D- | **19** | **20** | GND | Power ground |

| IDS-6311GTH+ GPIO Signals pin define | | | |
|---|---|---|---|
| GPIO | Signal | Description (Default) | Direction |
| GPIO0 | LED_STATUS | TCK | Input |
| GPIO1 | LED_WLAN | TDI | Input |
| GPIO2 | NA | TDO | Output |
| GPIO3 | NA | TMS | Input |
| GPIO4 | LED_WAN | CLK_OBS5[1] | Output |
| GPIO5 | **SPI_nCS** | **SPI_CS** | Output |
| GPIO6 | **SPI_CLK** | **SPI_CLK** | Output |
| GPIO7 | **SPI_MOSI** | **SPI_MOSI** | Output |
| GPIO8 | **SPI_MISO** | **SPI_MISO** | Input |
| GPIO9 | **UART_Rx** | **UART0_SIN** | Input |
| GPIO10 | **UART_Tx** | **UART0_SOUT** | Output |
| GPIO11 | LED_WLAN_RSSI1 | Output Software configurable | Output |
| GPIO12 | LED_WLAN_RSSI2 | Output Software configurable | Output |
| GPIO13 | **INT_9344 for AR8035 interrup** | Output Software configurable | Input |
| GPIO14 | **SW default reset** | Output Software configurable | Input |
| GPIO15 | LED_WLAN_RSSI3 | Output Software configurable | Input |
| GPIO16 | SIM_SEL | Output Software configurable | Output |
| GPIO17 | Power ON/OFF | Output Software configurable | Input |
| GPIO18 | SIM1_LED | Output Software configurable | Output |
| GPIO19 | SIM2_LED | Output Software configurable | Output |
| GPIO20 | LED_LAN_ACT | Output Software configurable | Output |
| GPIO21 | LED_LAN_LINK | Output Software configurable | Output |
| GPIO22 | NA | Output Software configurable | Output |

# 7. Memory configuration

Depending on customer's request, the module can be shipped with following configuration:

Flash size: 8MB, 16MB NOR Flash
DDR2 size: 64MB, 128MB

# 8. Mechanical Application Notes

1. CON0 and CON1 are IPEX1 connectors on top side
2. J1 is 2*23 pins 1.27mm female header on bottom side for signals
3. J2 is 2*10 pins 1.27mm female header on bottom side for signals
4. The mechanical drawing in .dxf format is available under request.

# 9. Professional installation instruction

1. Installation personal
   This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change.
2. Installation location
   The product shall be installed at a location where the radiating antenna can be kept 20cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.
3. External antenna
   Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC Part15C/E & Canada limit and is prohibited.

# 10.Compliance

**FCC Statement**

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.

Device cannot be sold via retail to the general public or by mail order; it must be sold to authorized dealers or installers only.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in visible area with the following: “Contains FCC ID: WHD-OWMDS6311-01”
”

End Product Manual Information

The user manual for end users must include the following information in a prominent location “IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter.” 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.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or colocation 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 reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization. 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 a 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.).