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Application Note

mxchipWNet-DTU

Firmware update log

4.0	Date	Application Note

Overview

mxchipWNet™ firmware is a software system running run on EMW Wi-Fi modules developed by MXCHIP. These firmware embedded with multiple M2M applications, TCP/IP stack and Wi-Fi driver can greatly reduce your development time and improve competitiveness on your M2M products.

Firmware: mxchipWNet™-DTU is used to implement the Wi-Fi data transmission on serial devices. Two primary functions are provided: EMSP command and direct data transmission between UART and Wi-Fi. It is widely used in establishing wireless communication on serial devices.

Main functions:

• Two working modes: EMSP command mode and direct data transmission mode

• Multiple configuration interface

• Build-in web site

• Firmware updating using serial and web

• Wi-Fi driver features:

• WLAN standard: IEEE 802.11 b/g/n

• RF frequency: channel 1-13 on 2.4GHz

• Greatly reduce power consumption

• Roaming between multiple access points

• Support station mode,, soft AP mode and Wi-Fi direct

• Security: WEP and WPA/WPA2 PSK enterprise

• Auto detect security mode

TCP/IP features:

• DHCP client and server

• DNS, mDNS (bonjour)

• Two sockets working at the same time

• TCP client/server with keep-alive detection and auto reconnection

• UDP unicast/broadcast

• Support 8 clients in TCP server mode

• HTTP, FTP and SMTP client

• Sock4/5 proxy
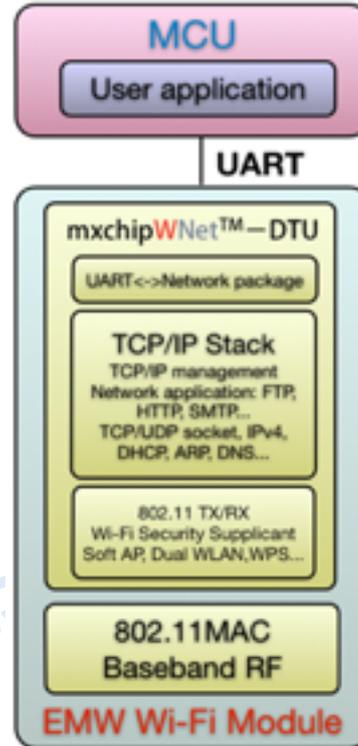
UART features:

• Baud rate: 2400-3686400

• CTS/RTS hardware flow control

• Multiple UART data package mode

• High-speed data transfer by DMA

Contents

1. Update log on EMW3280 (02060302.xxx)

1.1. 02060302.001-02060302.003

Bug fixed: IO1 function does not work.

1.2. 02060302.003-02060302.004

Optimize the mechanism that module reconnect to access point

Station mode: Reconnect interval = 100 milliseconds in the first 5 times, Reconnect interval = 10 seconds afterwards.

Station mode + Soft AP mode: Reconnect interval = 60 seconds.

1.3. 02060302.004-02060302.005

Bug fixed: "Security mode: Auto mode" does not work in extra 4 SSID configuration.

1.4. 02060302.005-02060302.007

Bug fixed: "EMSP command: Reset" does not return the result.

Bug fixed: "UART Stop bits" does not display correctly on the build-in web page.

Optimize the compatibility of build-in web pages on different web browsers (chrome, safari).

1.5. 02060302.007-02060302.008

New function: Send and receive EMSP commands over network: protocol: UDP, port: 8089.

New function: "EMSP command EMSP_CMD_RECV_DATA" would return immediately if module receive data from network, rather than a request.

New function: Command: EMSP_CMD_SEND_DATA and EMSP_CMD_RECV_DATA, content in "result" segment present which socket is used in network data stream, bit 0 = socket 1, bit 1 = socket 2, and result = 0 means to use both of the two sockets.

New EMSP command: read the signal strength of the current wireless connection. Command ID: 0x0070, return data type: 32bit data.

Function removed: Old UDP search command is removed.

1.6. 02060302.008-02060302.011

Bug fixed: UDP client cannot recover automatically from a wireless router crush or reboot.

Bug fixed: WEP hex mode does not work if it is set by build-in web server.

Function change: New algorithm in calculating the signal strength.

Function change: NFC INT pin is changed to pin 13

1.7. 02060302.011-02060302.013

Bug fixed: Port number is not correct in UDP broadcast mode.

Bug fixed: The max length is changed from 31 bytes to 32 bytes.

1.8. 02060302.013-02060302.016

Function changed: when module is in soft AP mode and UDP "server" mode, module send message to each device using UDP unicast instead of use UDP broadcast.

Function changed: "EMSP_CMD_OPEN_SOCKET" and "EMSP_CMD_CLOSE_SOCKET" command can only operate the second socket connection. They cannot affect the socket defined by "EMSP_CMD_SET_CONFIG". If the second socket is already established, the "EMSP_CMD_OPEN_SOCKET" command would return a frailer, and you should closed it using "EMSP_CMD_CLOSE_SOCKET".

Function added: The max TCP connection number can be configured by EMSP_CMD_SET_TCP_NUM and EMSP_CMD_GET_TCP_NUM, the default value is 2. The range of this number is 1-10. The fewer the connection is configured, the faster every connection will be, and UART->Net data performance will also be better. A TCP client consume one connection and every connection under TCP server consume one connection. The default value is 2. But one TCP server can only be connected by 8 clients.

Performance improved: The delay from network to UART is reduced.

Bug fixed: If module is not connected to an access point, the build-in web server and EMSP command "EMSP_CMD_GET_IP" return a "0.0.0.0"IP address even module is using a static IP address. Now, module can return the correct static IP address

Bug fixed: Fix the problem that module may delete its TCP server socket under some circumstances.

1.9. 02060302.016-02060302.017

Bug fixed: The second socket can operate correctly now.

1.10. 02060302.017-02060302.020

Add a new command which can set the MAX clients number that Soft AP can be connected:

EMSP_CMD_SET_MAX_STA_NUM= 0x0075：Set the MAX clients number

EMSP_CMD_GET_MAX_STA_NUM= 0x0076：Read the MAX clients number

Add a new command which can disable the the EMSP command over UDP protocol :

EMSP_CMD_SET_UDP_CONFIG = 0x0077: Enable/Disable UDP configuration，parameter is a byte length, 1: Enable, 0: Disable。

EMSP_CMD_GET_UDP_CONFIG = 0x0078: Read the current state of UDP configuration, the result is a byte, 1: Enable, 0: Disable。

Add legitimacy check to EMSP command delivered by UDP over wlan.

Increase the re-transmission speed on TCP protocol

Disable 802.11n mode

2. Update log on EMW3161 (31610302.xxx)

2.1. 31610302.001-31610302.002

New function: Wi-Fi roaming function. User can define a target signal strength, if current signal strength is lower than this predefined signal strength, module will search the new AP in background and switch to the new one if a new AP which has a better signal strength is exist.

New function: EasyLink configuration

2.2. 31610302.002-31610302.003

New test function: EMW316x add an advanced power save mode, which reduce the power consumption to 5-8mA if module is connected to an access point.

Improve: EasyLink configuration is much more stable.

2.3. 31610302.003-31610302.005

New function: Send and receive EMSP commands over network: protocol: UDP, port: 8089.

Function changed: EMW3161 advanced power save mode need not to be configured any more, this function would be activated if LoPow (pin 24) pin is in low level and deactivated if LoPow (pin 20) pin is in high level.

Function changed: Module will reboot in the following situations:

1. EasyLink and WPS configuration is successful

2. Module cannot get IP address in 10 seconds from DHCP server.

Bug fixed: Receive duplicated serial data if internal data buffer is full.

Bug fixed: Hardware flow control is unusable.

2.4. 31610302.005-31610302.006

1. New EMSP command: EMSP_CMD_GET_RX_RSSI = 0x0070.

Note: Get current signal strength (RSSI).

2. New EMSP command: EMSP_CMD_SET_ROAM_VAL = 0x0071.

Note: Set the RSSI value for roaming, module would try to detect and connect another AP if the current signal strength is below the pre-set value.

3. New EMSP command: EMSP_CMD_GET_ROAM_VAL = 0x0072.

Note: Get the RSSI value for roaming,

4. New EMSP command: EMSP_CMD_START_WPS = 0x0080.

Note: Start WPS function.

5. New EMSP command: EMSP_CMD_START_EASYLINK = 0x0081.

Note: Start EasyLink function.

Bug fixed: WEP encrypted AP cannot be connected.

Bug fixed: EMSP command: 0x0044 and EMSP command 0x0045 are not working.

2.5. 31610302.006-31610302.009

Function added: Pull down wakeup pin to enter the standby mode. Reset to wakeup.

Function changed: EMW3161 led status is changed.

Function changed: "EMSP_CMD_OPEN_SOCKET" and "EMSP_CMD_CLOSE_SOCKET" command can only operate the second socket connection. They cannot affect the socket defined by "EMSP_CMD_SET_CONFIG". If the second socket is already established, the "EMSP_CMD_OPEN_SOCKET" command would return a frailer, and you should closed it using "EMSP_CMD_CLOSE_SOCKET".

Function changed: UART DMA function is disabled in package mode.

Bug fixed: Fix the problem that module may delete its TCP server socket under some circumstances.

2.6. 31610302.009-31610302.010

Bug fixed: IO1 can now generate the correct output in HDC mode.

Bug fixed: In time delay mode, firmware convert UART data to Wi-Fi after a predefined time is passed

Bug fixed: NFC configuration can now operate correctly.

Unused IEEE power save information is removed from build-in web pages

2.7. 31610302.010-31610302.013

Bug fixed: Fix a resource reuse issue in low level RF driver.

Function added: Configuration over network can be disabled by build-in web site or a new EMSP command:

a) EMSP_CMD_SET_UDP_CONFIG = 0x0073：set UDP configuration. Parameter (1 bytes): 1=Open UDP configuration，0=close UDP configuration

b) EMSP_CMD_GET_UDP_CONFIG = 0x0074, set UDP configuration status，Return value (1 bytes)，1=Open，0=close

Function added: Add integrity and correctness test on commands over network.

Function added: Add integrity test on commands over UART.

Improved: UART<>Network throughputs is improved.

2.8. 31610302.013-31610302.016

Improved data throughputs from UART to Wi-Fi.

Bug fixed: A memory leak problem in DHCP server

2.9. 31610303.003

Based on a new RF driver 5.90.230.3.

Bug fixed: Hardware flow control cannot work correctly.

Improved: UART<>Network throughputs is improved.

2.10. 31610303.003-31610303.006

Bug fixed: Fix a small memory leak in TCP protocol.

Improved: Easylink has updated to 2.0, and Device name can be set by easylink.

Changed: Bonjour PTR has changed to _easylink._tcp.local

Add a "seed" record in Bonjour's TxtRecord, this number increase every time when EasyLink configuration is finished.

Device name is not changed if name configured by Easylink is NULL.

Instance name in Bonjour is "Device Name#xxxxxx", xxxxxx is the last three bytes of the MAC address,

Bug fixed: Target port number is not correct under UDP broadcast mode.

Bug fixed: The TCP server in module cannot accept more clients if client disconnect from module many times.

New function: Add a new "socket type": MXCHIP Cloud, this kind of socket can log in to MXCHIP cloud. This function can enabled by internal build-in web pages.

3. Update log on EMW3162 (31620302.xxx)

3.1. 31620302.001-31620302.002

New function: Wi-Fi roaming function. User can define a target signal strength, if current signal strength is lower than this predefined signal strength, module will search the new AP in background and switch to the new one if possible.

New function: EasyLink configuration.

3.2. 31620302.002-31620302.003

New test function: EMW316x add an advanced power save mode, which reduce the power consumption to 5-8mA while module is connected to an access point.

Improve: EasyLink configuration is much more stable.

3.3. 31620302.003-31620302.005

New function: Send and receive EMSP commands over network: protocol: UDP, port: 8089.

Function changed: EMW3162 advanced power save mode need not to be configured any more, this function would be activated if LoPow (pin 20) pin is in low level and deactivated if LoPow (pin 14) pin is in high level.

Function changed: Module will reboot in the following situations:

1. EasyLink and WPS configuration is successful

2. Module cannot get IP address in 10 seconds from DHCP server.

Bug fixed: Receive duplicated serial data if internal data buffer is full.

3.4. 31620302.005-31620302.006

1. New EMSP command: EMSP_CMD_GET_RX_RSSI = 0x0070.

Note: Get current signal strength (RSSI).

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Note: Set the RSSI value for roaming, module would try to detect and connect another AP if the current signal strength is below the pre-set value.

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Bug fixed: A memory leak problem in DHCP server

3.10. 31620303.003

Based on a new RF driver 5.90.230.3. Greatly improve the RF performance.

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New function: Add a new "socket type": MXCHIP Cloud, this kind of socket can log in to MXCHIP cloud. This function can enabled by internal build-in web pages.

4. Sales Information

If you need to buy this product, please call MXCHIP during the working hours. (Monday ~ Friday A.M.9:00~12:00; P.M. 1:00~6:00)

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5. Technical Support

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