EC2x&EG9x&EG25-G Series
QuecOpen Wi-Fi API Reference Manual

LTE Standard Module Series

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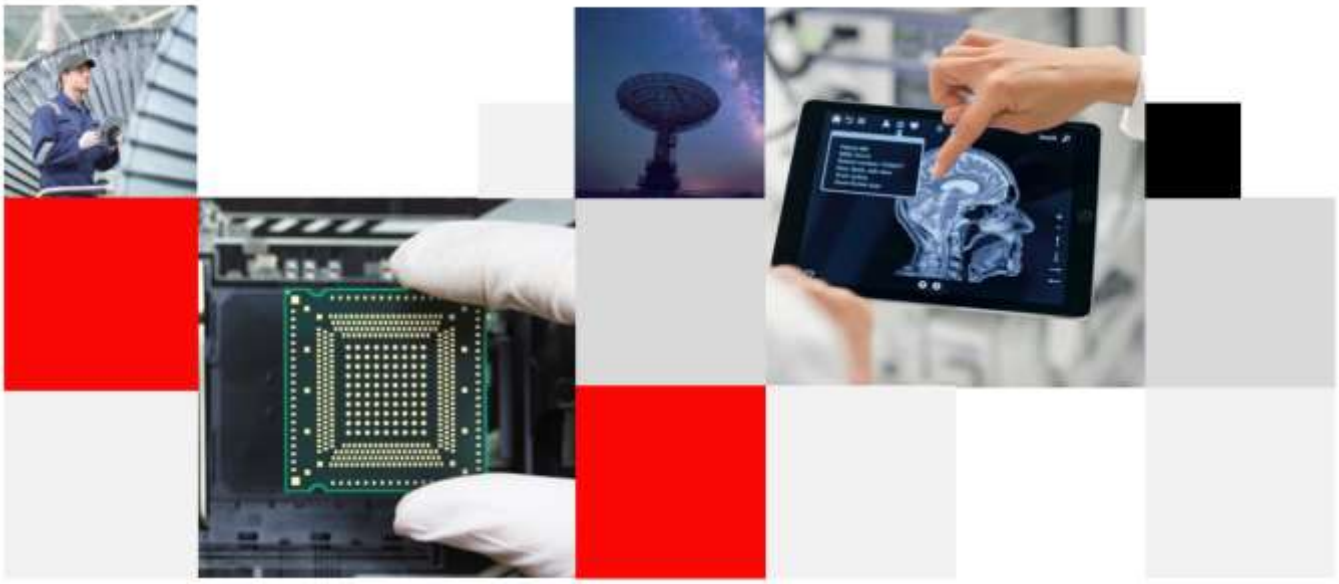

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About the Document

Revision History

Version	Date	Author	Description
-	2021-01-27	Arthur CHEN	Creation of the document
1.0	2021-03-15	Arthur CHEN	First official release

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1 Introduction

Quectel LTE standard EC2x series and EG25-G modules support QuecOpen® solution. QuecOpen® is an open-source embedded development platform based on Linux system. It is intended to simplify the design and development of IoT applications. For more information, see ***document [1]***.

This document introduces Wi-Fi related APIs and examples for Quectel EC2x series, EG9x series and EG25-G QuecOpen® modules.

The Wi-Fi function on Quectel EC2x series, EG9x series and EG25-G QuecOpen® modules is designed to be used with Quectel Wi-Fi & Bluetooth FC20 series and FC21 modules. For detailed information about the two modules, see *Quectel_FC20_Series_Hardware_Design and Quectel_FC21_Hardware_Design* respectively. Quectel FC20 series and FC21 modules support four working modes, namely:

1) AP Mode

In AP mode, FC20 series and FC21 only enable one hotspot, supporting 2.4 GHz or 5 GHz frequency bands, but only one of the frequency bands is activated at a time.

2) STA Mode

In STA mode, FC20 series and FC21 work as a wireless network card and connect to hotspots in the 2.4 GHz and 5 GHz frequency bands.

3) AP-STA Coexistence Mode

In AP-STA coexistence mode, FC20 series and FC21 run AP and STA modes simultaneously.

4) AP-AP Mode

In AP-AP mode, FC20 series and FC21 run two hotspots simultaneously. The most common scenario is to set the same SSID, one with 2.4 GHz frequency band and the other with 5 GHz frequency band.

1.1. Applicable Modules

Table 1: Applicable Modules

Module Series	Module
EC2x series	EC25 series

	EC21 series
	EC20 R2.1
EG9x series	EG95 series
	EG91 series
EG25-G	EG25-G

2 Wi-Fi APIs

2.1. Header File

The Wi-Fi API header file *ql_wifi.h* is located in the directory of *ql-ol-crosstool/sysroots/armv7a-vfp-neon-oe-linux-gnueabi/usr/include/quectel-openlinux-sdk* in SDK.

Table 2: API Summary

APIs	Description
ql_wifi_register_handle	Register the callback function for Wi-Fi status reporting
ql_wifi_unregister_handle	Unregister Wi-Fi callback function
ql_wifi_enable	Enable Wi-Fi
ql_wifi_disable	Disable Wi-Fi
ql_wifi_enable_async	Enable Wi-Fi asynchronously
ql_wifi_disable_async	Disable Wi-Fi asynchronously
ql_wifi_module_enable	Load the Wi-Fi driver according to the currently set working mode
ql_wifi_module_disable	Unload the Wi-Fi driver according to the currently set working mode
ql_wifi_work_mode_set	Set current working mode
ql_wifi_work_mode_get	Get current working mode
ql_wifi_ap_ssid_set	Set the SSID in AP mode
ql_wifi_ap_ssid_get	Get the SSID in AP mode
ql_wifi_ap_ssid_hide_set	Set to hide SSID in AP mode
ql_wifi_ap_ssid_hide_get	Get the SSID hiding status in AP mode

ql_wifi_ap_mode_set	Set working protocol mode in AP mode
ql_wifi_ap_mode_get	Set working protocol mode in AP mode
ql_wifi_ap_bandwidth_set	Set the bandwidth in AP mode
ql_wifi_ap_bandwidth_get	Get the bandwidth in AP mode
ql_wifi_ap_channel_set	Set the channel in AP mode
ql_wifi_ap_channel_get	Get the channel in AP mode
ql_wifi_ap_auth_set	Set the security authentication in AP mode
ql_wifi_ap_auth_get	Get the security authentication in AP mode
ql_wifi_ap_max_sta_set	Set the maximum number of connections for terminals in AP mode
ql_wifi_ap_max_sta_get	Get the maximum number of connections for terminals in AP mode
ql_wifi_ap_sta_info_get	Get the client information in AP mode
ql_wifi_ap_start	Enable the upper application hostapd in AP mode
ql_wifi_ap_stop	Disable the upper application hostapd in AP mode
ql_wifi_ap_restart	Restart the upper application hostapd in AP mode
ql_wifi_status_get	Get current Wi-Fi status
ql_wifi_sta_ssid_set	Set the SSID in STA mode
ql_wifi_sta_ssid_get	Get the SSID in STA mode
ql_wifi_sta_auth_set	Set the security authentication in STA mode
ql_wifi_sta_auth_get	Get the security authentication in STA mode
ql_wifi_sta_connect	Enable the upper application wpa_supplicant in STA mode
ql_wifi_sta_disconnect	Disable the upper application wpa_supplicant in STA mode
ql_wifi_sta_status	Get STA mode connection status

NOTE

Unless otherwise specified, you shall not call several Wi-Fi APIs simultaneously.

2.2. Wi-Fi API Description

2.2.1. ql_wifi_register_handle

This function registers the callback function for Wi-Fi status reporting.

- **Prototype**

```
int ql_wifi_register_handle(wifi_event_handle event_handle, void *arg);
```

- **Parameter**

event_handle:
[In] Define the reported callback function.

arg:
[In] User-defined parameter.

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.2. ql_wifi_unregister_handle

This function unregisters Wi-Fi callback function.

- **Prototype**

```
void ql_wifi_unregister_handle(void);
```

- **Parameter**

N/A

- **Return Value**

N/A

2.2.3. ql_wifi_enable

This function enables Wi-Fi.

- **Prototype**

```
int ql_wifi_enable(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.4. ql_wifi_disable

This function disables Wi-Fi.

- **Prototype**

```
int ql_wifi_disable(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.5. ql_wifi_enable_async

This function enables Wi-Fi asynchronously.

- **Prototype**

```
int ql_wifi_enable_async(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.6. ql_wifi_disable_async

This function disables Wi-Fi asynchronously.

- **Prototype**

```
int ql_wifi_disable_async(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.7. ql_wifi_module_enable

This function loads the Wi-Fi driver according to the currently set working mode.

- **Prototype**

```
int ql_wifi_module_enable(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.8. ql_wifi_module_disable

This function unloads the Wi-Fi driver according to the currently set working mode.

- **Prototype**

```
int ql_wifi_module_disable(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.9. ql_wifi_work_mode_set

This function sets current working mode.

- **Prototype**

```
int ql_wifi_work_mode_set(ql_wifi_work_mode_e mode);
```

- **Parameter**

mode:
[Out] Gets current working mode.

QL_WIFI_WORK_MODE_STA	STA mode
QL_WIFI_WORK_MODE_AP0	AP mode
QL_WIFI_WORK_MODE_AP0_STA	AP-STA mode
QL_WIFI_WORK_MODE_AP0_AP1	AP-AP mode

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.10. ql_wifi_work_mode_get

This function gets current working mode.

- **Prototype**

```
int ql_wifi_work_mode_get(ql_wifi_work_mode_e *mode);
```

- **Parameter**

mode:
[Out] Gets current working mode.

QL_WIFI_WORK_MODE_STA	STA mode
QL_WIFI_WORK_MODE_AP0	AP mode
QL_WIFI_WORK_MODE_AP0_STA	AP-STA mode
QL_WIFI_WORK_MODE_AP0_AP1	AP-AP mode

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.11. ql_wifi_ap_ssid_set

This function sets the SSID in AP mode.

- **Prototype**

```
int ql_wifi_ap_ssid_set(ql_wifi_ap_index_e idx, char *ssid);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

ssid:
[In] The set SSID. It should be within 32 bytes and is not empty.

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.12. ql_wifi_ap_ssid_get

This function gets the SSID in AP mode.

- **Prototype**

```
int ql_wifi_ap_ssid_get(ql_wifi_ap_index_e idx, char *ssid);
```

- **Parameter**

idx:
[In] AP mode index.
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

ssid:
[Out] The obtained SSID.

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.13. ql_wifi_ap_ssid_hide_set

This function sets to hide SSID in AP mode.

- **Prototype**

```
int ql_wifi_ap_ssid_hide_set(ql_wifi_ap_index_e idx, bool hide);
```

- **Parameter**

idx:
[In] AP mode index.
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

hide:
[In] Sets whether to hide SSID in AP mode.
true Enable to hide SSID
false Disable to hide SSID

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.14. ql_wifi_ap_ssid_hide_get

This function gets the SSID hiding status in AP mode.

- **Prototype**

```
int ql_wifi_ap_ssid_hide_get(ql_wifi_ap_index_e idx, bool *hide);
```

- **Parameter**

idx:
[In] AP mode index.
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

hide:
[Out] The obtained SSID hiding status.

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.15. ql_wifi_ap_mode_set

This function sets the working protocol mode in AP mode.

- **Prototype**

```
int ql_wifi_ap_mode_set(ql_wifi_ap_index_e idx, ql_wifi_mode_type_e mode);
```

- **Parameter**

idx:
[In] AP mode index.
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

mode:
[In] The working protocol mode.

QL_WIFI_MODE_80211B	IEEE 802.11b (2.4 GHZ)
QL_WIFI_MODE_80211BG	IEEE 802.11b/g (2.4 GHZ)
QL_WIFI_MODE_80211BGN	IEEE 802.11b/g/n (2.4 GHz)
QL_WIFI_MODE_80211A	IEEE 802.11a (5 GHz)
QL_WIFI_MODE_80211AN	IEEE 802.11a/n (5 GHz)
QL_WIFI_MODE_80211AC	IEEE 802.11a/c (5 GHz)

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.16. ql_wifi_ap_mode_get

This function gets the working protocol mode in AP mode.

- **Prototype**

```
int ql_wifi_ap_mode_get(ql_wifi_ap_index_e idx, ql_wifi_mode_type_e *mode);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

mode:
[Out] The working protocol mode.

QL_WIFI_MODE_80211B	IEEE 802.11b (2.4 GHZ)
QL_WIFI_MODE_80211BG	IEEE 802.11b/g (2.4 GHZ)
QL_WIFI_MODE_80211BGN	IEEE 802.11b/g/n (2.4 GHz)
QL_WIFI_MODE_80211A	IEEE 802.11a (5 GHz)
QL_WIFI_MODE_80211AN	IEEE 802.11a/n (5 GHz)
QL_WIFI_MODE_80211AC	IEEE 802.11a/c (5 GHz)

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.17. ql_wifi_ap_bandwidth_set

This function sets the bandwidth in AP mode.

- **Prototype**

```
int ql_wifi_ap_bandwidth_set(ql_wifi_ap_index_e idx, ql_wifi_bandwidth_type_e bandwidth);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

bandwidth:
[In] The working bandwidth.

QL_WIFI_BANDWIDTH_HT20	20 MHz
QL_WIFI_BANDWIDTH_HT40	40 MHz
QL_WIFI_BANDWIDTH_HT80	80 MHz

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.18. ql_wifi_ap_bandwidth_get

This function gets the bandwidth in AP mode.

- **Prototype**

```
int ql_wifi_ap_bandwidth_get(ql_wifi_ap_index_e idx, ql_wifi_bandwidth_type_e bandwidth);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

bandwidth:
[Out] The working bandwidth.

QL_WIFI_BANDWIDTH_HT20	20 MHz
QL_WIFI_BANDWIDTH_HT40	40 MHz
QL_WIFI_BANDWIDTH_HT80	80 MHz

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.19. ql_wifi_ap_channel_set

This function sets the channel in AP mode.

- **Prototype**

```
int ql_wifi_ap_channel_set(ql_wifi_ap_index_e idx, int channel);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

channel:
[In] Set to 2.4 G or 5 G channel.

0/1/2/3/4/5/6/7/8/9/10/11/12/13/14	2.4 G channel
36/40/44/48/52/56/60/64/100/104/108/112/116/120/124/128/132/136/140/144/149/153/157/161/165/175/181	5 G channel

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.20. ql_wifi_ap_channel_get

This function gets the channel in AP mode.

- **Prototype**

```
int ql_wifi_ap_channel_get(ql_wifi_ap_index_e idx, int *channel);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

channel:
[Out] Set to 2.4 G or 5 G channel.

0/1/2/3/4/5/6/7/8/9/10/11/12/13/14	2.4 G channel
36/40/44/48/52/56/60/64/100/104/108/112/116/120/124/128/132/136/140/144/149/153/157/161/165/175/181	5 G channel

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.21. ql_wifi_ap_auth_set

This function sets the security authentication in AP mode.

- **Prototype**

```
int ql_wifi_ap_auth_set(ql_wifi_ap_index_e idx, ql_wifi_ap_auth_s *auth);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

auth:
[In] Security authentication. See ***Chapter 2.2.22.1*** for details.

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.22. ql_wifi_ap_auth_get

This function gets the security authentication in AP mode.

- **Prototype**

```
int ql_wifi_ap_auth_get(ql_wifi_ap_index_e idx, ql_wifi_ap_auth_s *auth);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

auth:
[Out] Security authentication. See ***Chapter 2.2.22.1*** for details.

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.22.1. ql_wifi_ap_auth_s

The security authentication type is defined as follows, usually it only uses wpa_psk in union:

```
typedef struct {
    int auth;
    union {
        struct {
            int default_index;
            char passwd[4][64];
        } wep;

        struct {
            short pairwise;
            char passwd[64];
            int group_rekey;
        } wpa_psk;
    };
} ql_wifi_ap_auth_s;;
```

- **Parameters**

Type	Parameter	Description
int	*auth*	Security authentication type
int	*default_index*	The configured index of WEP
char	*passwd*	The password of WEP
short	*pairwise*	Encryption
char	*passwd*	The password of WPA/WPA2
int	*group_rekey*	Group key update

2.2.23. ql_wifi_ap_max_sta_set

This function sets the maximum number of connections for terminals in AP mode.

- **Prototype**

```
int ql_wifi_ap_max_sta_set(ql_wifi_ap_index_e idx, int max_sta_num);
```

- **Parameter**

idx:
[In] AP mode index
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

max_sta_num:
[In] Set the maximum number of connections for terminals in AP mode. Maximum quantity: 16

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.24. ql_wifi_ap_max_sta_get

This function gets the maximum number of connections for terminals in AP mode.

- **Prototype**

```
int ql_wifi_ap_max_sta_get(ql_wifi_ap_index_e idx, int *max_sta_num);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

max_sta_num:
[Out] Get the maximum number of connections for terminals in AP mode.

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.25. ql_wifi_ap_sta_info_get

This function gets the client information in AP mode.

- **Prototype**

```
int ql_wifi_ap_sta_info_get(ql_wifi_ap_index_e idx, ql_wifi_ap_sta_info_s *sta_info);
```

- **Parameter**

idx:
[In] AP mode index.

QL_WIFI_AP_INDEX_AP0	Index of hotspot 0
QL_WIFI_AP_INDEX_AP1	Index of hotspot 1

sta_info:
[Out] The obtained client information. See ***Chapter 2.2.25.1*** for details.

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

2.2.25.1. ql_wifi_ap_sta_info_s

The client information is defined as follows:

```
typedef struct {
    int num;
    struct {
        unsigned char mac[6];
        in_addr_t addr;
        char hostname[33];
    } sta[16];
} ql_wifi_ap_sta_info_s
```

- **Parameters**

Type	Parameter	Description
int	*num*	Number of client devices
unsigned char	*mac*	MAC address of the device
in_addr_t	*addr*	IP address of the device
char	*hostname*	Host name

2.2.26. ql_wifi_ap_start

This function enables the upper application hostapd in AP mode to make the new configuration information effective.

- **Prototype**

```
int ql_wifi_ap_start(ql_wifi_ap_index_e idx);
```

- **Parameter**

idx:
[In] AP mode index.
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.27. ql_wifi_ap_stop

This function disables the upper application hostapd in AP mode.

- **Prototype**

```
int ql_wifi_ap_stop(ql_wifi_ap_index_e idx);
```

- **Parameter**

idx:
[In] AP mode index.
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.28. ql_wifi_ap_restart

This function restarts the upper application hostapd in AP mode to make the new configuration information effective.

- **Prototype**

```
int ql_wifi_ap_restart(ql_wifi_ap_index_e idx);
```

- **Parameter**

idx:
[In] AP mode index.
QL_WIFI_AP_INDEX_AP0 Index of hotspot 0
QL_WIFI_AP_INDEX_AP1 Index of hotspot 1

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.29. ql_wifi_status_get

This function gets current Wi-Fi status.

- **Prototype**

```
int ql_wifi_status_get(ql_wifi_status_e *status);
```

- **Parameter**

status：
[Out] Current Wi-Fi status.

QL_WIFI_STATUS_ENABLE	Currently Wi-Fi is enabled
QL_WIFI_STATUS_DISABLE	Currently Wi-Fi is disabled
QL_WIFI_STATUS_ERR_DRIVER	Driver error
QL_WIFI_STATUS_ERR_SOFTWARE	Software error

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.30. ql_wifi_sta_ssid_set

This function sets the connected SSID in STA mode.

- **Prototype**

```
int ql_wifi_sta_ssid_set(char *ssid);
```

- **Parameter**

ssid:
[In] The set SSID. It should be within 32 bytes and is not empty.

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.31. ql_wifi_sta_ssid_get

This function gets the connected SSID in STA mode.

- **Prototype**

```
int ql_wifi_sta_ssid_get(char *ssid);
```

- **Parameter**

ssid:
[Out] The obtained SSID.

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.32. ql_wifi_sta_auth_set

This function sets the security authentication in STA mode.

- **Prototype**

```
int ql_wifi_sta_auth_set(ql_wifi_sta_auth_s *auth);
```

- **Parameter**

auth:
[In] Set the security authentication. See ***Chapter 2.2.33.1*** for details.

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.33. ql_wifi_sta_auth_get

This function gets the security authentication in STA mode.

- **Prototype**

```
int ql_wifi_sta_auth_get(ql_wifi_sta_auth_s *auth);
```

- **Parameter**

auth:
[Out] The obtained security authentication. See ***Chapter 2.2.33.1*** for details.

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.33.1. ql_wifi_sta_auth_s

The security authentication is defined as follows:

```
typedef struct {
    int auth;
    union {
        struct {
            char passwd[64];
        } wep;

        struct {
            short pairwise;
            char passwd[64];
        } wpa_psk;
    };
} ql_wifi_sta_auth_s;
```

- **Parameters**

Type	Parameter	Description
int	*auth*	Security authentication type
char	*passwd*	The password of WEP
short	*pairwise*	Encryption
char	*passwd*	The password of WPA/WPA2

2.2.34. ql_wifi_sta_connect

This function enables the upper application wpa_supplicant in STA mode to make the new configuration information effective.

- **Prototype**

```
int ql_wifi_sta_connect(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.35. ql_wifi_sta_disconnect

This function disables the upper application wpa_supplicant in STA mode.

- **Prototype**

```
int ql_wifi_sta_disconnect(void);
```

- **Parameter**

N/A

- **Return Value**

0 This function is executed successfully.
-1 It fails to be executed.

2.2.36. ql_wifi_sta_status

This function gets STA mode connection status.

- **Prototype**

```
int ql_wifi_sta_status(ql_wifi_station_status_e *status);
```

- **Parameter**

status:
[Out] The connection status in STA mode.

QL_WIFI_STATION_DISABLE	STA mode is disabled
QL_WIFI_STATION_CONNECTED	STA mode is connected
QL_WIFI_STATION_DISCONNECTED	STA mode is disconnected

- **Return Value**

0	This function is executed successfully.
-1	It fails to be executed.

3 Wi-Fi API Example

3.1. STA Mode Configuration

See example *example/wifi/example_wifi.c* for details. Run the program as follows:

```
Please input case: 7
Please input WiFi handle register(0-register/1-unregister): 0      //Register the callback function.

case 1: Configure WiFi
case 2: Enable WiFi
case 3: Activate Hostapd
case 4: Activate WPA Supplicant
case 5: Get WPA Supplicant status
case 6: Get WiFi configuraction
case 7: Register Event Callback
case 8: Enable Module WiFi
case 9: Get WiFi status
case 100: exit
Please input case: 1
Please input WiFi work mode(0-STA/1-AP0/2-AP0+STA/3-AP0+AP1): 0 //Set to STA mode.

Please input STA ssid(maximun size 32): quectel_test        //Set SSID.

Please input STA type of authentication(0-OPEN/2-WPA PSK/3-WPA2 PSK/4-WPA2&WPA): 4    //Set
the authentication.

Please input STA WPA PSK pairwise(0-AUTH/1-TKIP/2-AES): 0      //Set the encryption.

Please input STA WPA PSK password: 12345678              //Set the password.

case 1: Configure WiFi
case 2: Enable WiFi
case 3: Activate Hostapd
case 4: Activate WPA Supplicant
case 5: Get WPA Supplicant status
case 6: Get WiFi configuraction
```

```
case 7: Register Event Callback
case 8: Enable Module WiFi
case 9: Get WiFi status
case 100: exit
Please input case: 2
Please input WiFi status(0-Disable/1-Enable/2-Async Enable/3-Async Disable): 2        //Enable Wi-Fi.
asynchronously
```

3.2. AP Mode Configuration

See example *example/wifi/example_wifi.c* for details. Run the program as follows:

```
Please input case: 7
Please input WiFi handle register(0-register/1-unregister): 0      // Register the callback function.

case 1: Configure WiFi
case 2: Enable WiFi
case 3: Activate Hostapd
case 4: Activate WPA Supplicant
case 5: Get WPA Supplicant status
case 6: Get WiFi configuraction
case 7: Register Event Callback
case 8: Enable Module WiFi
case 9: Get WiFi status
case 100: exit
Please input case: 1

Please input WiFi work mode(0-STA/1-AP0/2-AP0+STA/3-AP0+AP1): 1        //Set to AP mode.

Please input WiFi index 0 ssid(maximun size 32): quectel_test              //Set SSID.

Please input WiFi index 0 IEEE 802.11 mode(0-b/1-bg/2-bgn/3-a/4-an/5-ac): 2     //Set protocol mode.

Please input WiFi index 0 Bandwidth(0-20MHz/1-40MHz/2-80MHz): 0     //Set the bandwidth.

Please input WiFi index 0 channel: 6       //Set the channel

Please input WiFi index 0 maximun station(1-16):16    //Set maximum number of connections

Please input WiFi index 0 type of authentication(0-OPEN/2-WPA PSK/3-WPA2
PSK/4-WPA-PSK&WPA2-PSK): 4    //Set the authentication
```

```
Please input WiFi index 0 WPA PSK pairwise(0-AUTH/1-TKIP/2-AES): 0       //Set the encryption.

Please input WiFi index 0 WPA PSK password: 12345678        //Set the password

case 1: Configure WiFi
case 2: Enable WiFi
case 3: Activate Hostapd
case 4: Activate WPA Supplicant
case 5: Get WPA Supplicant status
case 6: Get WiFi configuraction
case 7: Register Event Callback
case 8: Enable Module WiFi
case 9: Get WiFi status
case 100: exit
Please input case: 2

Please input WiFi status(0-Disable/1-Enable/2-Async Enable/3-Async Disable): 2        //Enable Wi-Fi.
asynchronously
```

3.3. AP-AP Mode Configuration

See example *example/wifi/ap_ap_mode.c* for details. Run the program as follows:

```
ql_wifi_ap_auth_s auth_ap0;
    ql_wifi_ap_auth_s auth_ap1;

    /* setting AP0 */
    ql_wifi_work_mode_set(QL_WIFI_WORK_MODE_AP0_AP1); //Set to AP-AP mode
    ql_wifi_ap_ssid_set(QL_WIFI_AP_INDEX_AP0, "Quectel-WORK_MODE_AP0_AP1"); //Set SSID.
    ql_wifi_ap_mode_set(QL_WIFI_AP_INDEX_AP0, QL_WIFI_MODE_80211BGN); //Set to b/g/n.
    ql_wifi_ap_bandwidth_set(QL_WIFI_AP_INDEX_AP0, QL_WIFI_BANDWIDTH_HT20); //Set the.
bandwidth.
    ql_wifi_ap_channel_set(QL_WIFI_AP_INDEX_AP0, 11);    //Set to 2.4 G channel.
    auth_ap0.auth = QL_WIFI_AUTH_WPA_PSK;      //Set the authentication.
    auth_ap0.wpa_psk.pairwise = QL_WIFI_AUTH_WPA_PAIRWISE_AUTO; //Set the encryption.
    auth_ap0.wpa_psk.group_rekey = 3600; /* one hour */              //Set group key.
    strcpy(auth_ap0.wpa_psk.passwd, "12345678");  //Set the password.
    ql_wifi_ap_auth_set(QL_WIFI_AP_INDEX_AP0, &auth_ap0);

    /* setting AP1 */
    ql_wifi_ap_ssid_set(QL_WIFI_AP_INDEX_AP1, "Quectel-WORK_MODE_AP0_AP1"); //Set SSID.
    ql_wifi_ap_mode_set(QL_WIFI_AP_INDEX_AP1, QL_WIFI_MODE_80211AN);   //Set to a/n mode.
```

```
    ql_wifi_ap_bandwidth_set(QL_WIFI_AP_INDEX_AP1, QL_WIFI_BANDWIDTH_HT20); //Set the
bandwidth.
    ql_wifi_ap_channel_set(QL_WIFI_AP_INDEX_AP1, 149);        //Set to 5G channel.
    auth_ap1.auth = QL_WIFI_AUTH_WPA_PSK;      //Set the authentication
    auth_ap1.wpa_psk.pairwise = QL_WIFI_AUTH_WPA_PAIRWISE_AUTO;     //Set the encryption.
    auth_ap1.wpa_psk.group_rekey = 3600; /* one hour */              //Set group key.
    strcpy(auth_ap1.wpa_psk.passwd, "12345678");  //Set the password.
    ql_wifi_ap_auth_set(QL_WIFI_AP_INDEX_AP1, &auth_ap1);

    ql_wifi_enable();  //Enable Wi-Fi.
    return 0;
```

3.4. AP-STA Mode Configuration

See example *example/wifi/ap_sta_mode.c* for details. Run the program as follows:

```
ql_wifi_ap_auth_s ap_auth;
    ql_wifi_sta_auth_s sta_auth;

    /* setting AP0 */
    ql_wifi_work_mode_set(QL_WIFI_WORK_MODE_AP0_STA); //Set to AP-STA mode.
    ql_wifi_ap_ssid_set(QL_WIFI_AP_INDEX_AP0, "Quectel-WORK_MODE_AP0"); //Set SSID.
    ql_wifi_ap_mode_set(QL_WIFI_AP_INDEX_AP0, QL_WIFI_MODE_80211BGN); //Set to b/g/n
mode.
    ql_wifi_ap_bandwidth_set(QL_WIFI_AP_INDEX_AP0, QL_WIFI_BANDWIDTH_HT20); //Set the
bandwidth.
    ql_wifi_ap_channel_set(QL_WIFI_AP_INDEX_AP0, 11); // Set to 2.4G channel.

    ap_auth.auth = QL_WIFI_AUTH_WPA_PSK;       // Set the authentication.
    ap_auth.wpa_psk.pairwise = QL_WIFI_AUTH_WPA_PAIRWISE_AUTO; //Set the encryption.
    ap_auth.wpa_psk.group_rekey = 3600; /* one hour */  //Set group key.
    strcpy(ap_auth.wpa_psk.passwd, "12345678");    //Set the password.
    ql_wifi_ap_auth_set(QL_WIFI_AP_INDEX_AP0, &ap_auth);


    /* setting STA */
    ql_wifi_sta_ssid_set("Quectel-test");       //Set SSID.

    sta_auth.auth = QL_WIFI_AUTH_WPA_PSK;       //Set the authentication.
    sta_auth.wpa_psk.pairwise = QL_WIFI_AUTH_WPA_PAIRWISE_AUTO;      //Set the encryption.
    strcpy(sta_auth.wpa_psk.passwd, "12345678");   //Set the password.
    ql_wifi_sta_auth_set(&sta_auth);
```

```
ql_wifi_enable();  //Enable Wi-Fi.
return 0;
```

4 Appendix A References

Table 3: Related Documents

SN	Document Name	Remark
[1]	Quectel_EC2x&EG9x&EG25-G_Series_ QuecOpen_Quick_Start_Guide	Quick start guide for QuecOpen solution of EC2x series, EG9x series and EG25-G modules
[2]	Quectel_FC20_Series_Hardware_Design	FC20 Series Hardware Design
[3]	Quectel_FC21_Hardware_Design	FC21 Hardware Design

Table 4: Terms and Abbreviations

Abbreviation	Description
AP	Access Point
API	Application Programming Interface
SDK	Software Development Kit
SSID	Service Set Identifier
STA	Station
WEP	Wired Equivalent Privacy
Wi-Fi	Wireless Fidelity
WPA	Wi-Fi Protected Access