# EC200U Series

# Dual SIM Dual Standby Application Note

**LTE Standard Module Series**

Version: 1.0

Date: 2021-08-16

Status: Released

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**Quectel Wireless Solutions Co., Ltd.**
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

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## Revision History

| Version | Date | Author | Description |
|---|---|---|---|
| - | 2021-07-10 | Braden HE | Creation of the document |
| 1.0 | 2021-08-16 | Braden HE | First official release |

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# 1 Introduction

This document mainly introduces how to use the Dual SIM Dual Standby (hereinafter referred to as DSDS) function of Quectel EC200U series. The module with DSDS function can identify two (U)SIM cards at the same time. Both (U)SIM cards can independently perform services such as network search, cell search, paging message monitoring, cell reselection, network attachment and activation; and also, they can implement data service simultaneously by switching the modem protocol stack. The module can only fulfil DSSA (Dual SIM Single Active) function because it uses only one set of RF and baseband. In other words, when one (U)SIM card is on a call, the other one is unable to perform data or voice services.

## 1.1 Applicable Modules

**Table 1: Applicable Modules**

| Module Series | Module |
|---|---|
| EC200U | EC200U-CN |
| | EC200U-EU |

**NOTE**

The module supports two (U)SIM interfaces, but (U)SIM2 is an optional function. The software version supporting single (U)SIM card is different from that of dual (U)SIM cards. If DSDS function is needed, contact Quectel Technical Support to obtain the corresponding software version.

# 2 DSDS Related AT Commands

This chapter mainly introduces the DSDS related AT commands.

## 2.1. AT Command Introduction

### 2.1.1. Definitions

- **<CR>** Carriage return character.
- **<LF>** Line feed character.
- **<...>** Parameter name. Angle brackets do not appear on the command line.
- **[...]** Optional parameter of a command or an optional part of TA information response. Square brackets do not appear on the command line. When an optional parameter is not given in a command, the new value equals to its previous value or the default settings, unless otherwise specified.
- **Underline** Default setting of a parameter.

### 2.1.2. AT Command Syntax

All command lines must start with **AT** or **at** and end with **<CR>**. Information responses and result codes always start and end with a carriage return character and a line feed character: **<CR><LF><response><CR><LF>**. In tables presenting commands and responses throughout this document, only the commands and responses are presented, and **<CR>** and **<LF>** are deliberately omitted.

**Table 2: Types of AT Commands**

| Command Type | Syntax | Description |
|---|---|---|
| Test Command | **AT+<cmd>=?** | Test the existence of corresponding Write Command and return information about the type, value, or range of its parameter. |
| Read Command | **AT+<cmd>?** | Check the current parameter value of a corresponding Write Command. |
| Write Command | **AT+<cmd>=<p1>[,<p2>[,<p3>[...]]]** | Set user-definable parameter value. |

| | |
|---|---|
| Execution Command **AT+<cmd>** | Return a specific information parameter or perform a specific action. |

## 2.2. Declaration of AT Command Examples

The AT command examples in this document are provided to help you learn about the use of the AT commands introduced herein. The examples, however, should not be taken as Quectel's recommendation or suggestions about how you should design a program flow or what status you should set the module into. Sometimes multiple examples may be provided for one AT command. However, this does not mean that there exists a correlation among these examples and that they should be executed in a given sequence.

## 2.3. AT Commands Description

### 2.3.1. AT+QDSIM Select (U)SIM Card

This command selects the (U)SIM card to be used for current scenario.

| **AT+QDSIM Select (U)SIM Card** | |
|---|---|
| Test Command<br>**AT+QDSIM=?** | Response<br>**+QDSIM: (**list of supported **<simID>**s**)**<br><br>**OK** |
| Read Command<br>**AT+QDSIM?** | Response<br>**+QDSIM: <simID>**<br><br>**OK** |
| Write Command<br>**AT+QDSIM=<simID>** | Response<br>**OK**<br>Or<br>**ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300 ms |
| Characteristics | The command takes effect immediately.<br>The configuration will not be saved. |

### Parameter

| | |
|---|---|
| **<simID>** | Integer type. (U)SIM card ID.<br>0 (U)SIM card 1 (hereinafter referred to as SIM1)<br>1 (U)SIM card 2 (hereinafter referred to as SIM2) |
| **<err>** | Error code. For more details, see ***document [1]***. |

### Example

```
AT+QDSIM=0          //Select SIM1.
OK
AT+QDSIM?           //Query the current (U)SIM card.
+QDSIM: 0

OK
```

## 2.3.2. AT+QDSIMI Query IMSI of Dual (U)SIM Cards

This command queries the International Mobile Subscriber Identity (IMSI) which is intended to permit the TE to identify the (U)SIM cards or active application in the UICC (GSM or (U)SIM) that is attached to MT.

| **AT+QDSIMI Query IMSI of Dual (U)SIM Cards** | |
|---|---|
| Test Command<br>**AT+QDSIMI=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSIMI?** | Response<br>**+QDSIMI: <simID1>,<IMSI1>**<br>**+QDSIMI: <simID2>,<IMSI2>**<br><br>**OK**<br>Or<br>**ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300 ms |
| Characteristics | / |

### Parameter

| | |
|---|---|
| **<simID>** | Integer type. (U)SIM card ID.<br>0 SIM1<br>1 SIM2 |
| **<IMSI>** | String type without double quotes. International Mobile Subscriber Identity. |
| **<err>** | Error code. For more details, see ***document [1]***. |

### Example

```
AT+QDSIMI?                          //Query the IMSI of SIM1 and SIM2.
+QDSIMI: 0,460016085318106
+QDSIMI: 1,460027156528504

OK
```

## 2.3.3. AT+QDSCCID Query ICCID of Dual (U)SIM Cards

This command queries the Integrated Circuit Card Identifier (ICCID) of dual (U)SIM cards.

| **AT+QDSCCID** | **Query ICCID of Dual (U)SIM Cards** |
|---|---|
| Test Command<br>**AT+QDSCCID=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSCCID?** | Response<br>**+QDSCCID: <simID1>,<ICCID1>**<br>**+QDSCCID: <simID2>,<ICCID2>**<br><br>**OK**<br>Or<br>**ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300 ms |
| Characteristics | / |

### Parameter

| | |
|---|---|
| **<simID>** | Integer type. (U)SIM card ID.<br>0 SIM1<br>1 SIM2 |
| **<ICCID>** | String type without double quotes. Integrated Circuit Card Identifier. |

| | |
|---|---|
| **<err>** | Error code. For more details, see ***document [1]***. |

### Example

```
AT+QDSCCID?                          //Query ICCID of SIM1 and SIM2.
+QDSCCID: 0,89860118830003741022
+QDSCCID: 1,898600E1122115658504

OK
```

## 2.3.4. AT+QDSPIN Query Status of Dual (U)SIM Cards

This command queries the status of dual (U)SIM cards to confirm whether the MT requires a password before it can be operated. The password may be (U)SIM PIN, (U)SIM PUK, etc.

| **AT+QDSPIN Query Status of Dual (U)SIM Cards** | |
|---|---|
| Test Command<br>**AT+QDSPIN=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSPIN?** | Response<br>**+QDSPIN: <simID1>,<code1>**<br>**+QDSPIN: <simID2>,<code2>**<br><br>**OK**<br>Or<br>**ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 10 s |
| Characteristics | / |

### Parameter

| | | |
|---|---|---|
| **<simID>** | Integer type. (U)SIM card ID. | |
| | 0 | SIM1 |
| | 1 | SIM2 |
| **<code>** | String type without double quotes. The password type that the MT requires. | |
| | READY | MT ((U)SIM card) is ready and no password is required. |
| | SIM PIN | MT ((U)SIM card) is locked and (U)SIM PIN is required. |
| | SIM PUK | MT ((U)SIM card) is locked and (U)SIM PUK is required. |
| | SIM PIN2 | MT ((U)SIM card) is locked and (U)SIM PIN2 is required. |

| | | |
|---|---|---|
| | SIM PUK2 | MT ((U)SIM card) is locked and (U)SIM PUK2 is required. |
| **<err>** | Error code. For more details, see ***document [1]***. | |

### Example

```
AT+QDSPIN?                  //Query the status of SIM1 and SIM2.
+QDSPIN: 0,READY            //SIM1 is ready and no password is required.
+QDSPIN: 1,SIM PIN          //SIM2 is locked and (U)SIM PIN is required.

OK
AT+QDSIM=1                  //Select SIM2.
OK
AT+CPIN="1234"              //Enter PIN.
OK

+CPINDS: READY              //URC indicating that SIM2 is ready is reported.
AT+QDSPIN?                  //Query the status of SIM1 and SIM2.
+QDSPIN: 0,READY
+QDSPIN: 1,READY

OK
```

**NOTE**

More details about **AT+CPIN**, see ***document [1]***.

## 2.3.5. AT+QDSREG Query CS Domain Network Registration Status of Dual (U)SIM Cards

This command queries the CS domain network registration status of dual (U)SIM cards and the status of result code presentation.

| **AT+QDSREG** | **Query CS Domain Network Registration Status of Dual (U)SIM Cards** |
|---|---|
| Test Command<br>**AT+QDSREG=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSREG?** | Response<br>**+QDSREG: <simID1>,<n1>,<stat1>[,<lac1>,<ci1>[,<AcT1>]]**<br>**+QDSREG: <simID2>,<n2>,<stat2>[,<lac2>,<ci2>[,<AcT2>]]**<br><br>**OK**<br>Or |

| | |
|---|---|
| | **ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300 ms |
| Characteristics | / |

## Parameter

| | |
|---|---|
| **<simID>** | Integer type. (U)SIM card ID.<br>0 SIM1<br>1 SIM2 |
| **<n>** | Integer type. Enable/disable network registration URC.<br>0 Disable network registration URC<br>1 Enable network registration URC:<br>**+CREG: <stat>** SIM1 network registration URC in CS domain<br>**+CREGDS: <stat>** SIM2 network registration URC in CS domain<br>2 Enable network registration URC with location information:<br>**+CREG: <stat>[,<lac>,<ci>[,<AcT>]]** SIM1 network registration URC in CS domain with location information<br>**+CREGDS: <stat>[,<lac>,<ci>[,<AcT>]]** SIM2 network registration URC in CS domain with location information |
| **<stat>** | Integer type. Network registration status.<br>0 Not registered. ME is not currently searching a new operator to register to.<br>1 Registered, home network.<br>2 Not registered, but ME is currently searching a new operator to register to.<br>3 Registration denied.<br>4 Unknown.<br>5 Registered, roaming. |
| **<lac>** | String type. Two bytes location area code in hexadecimal format. |
| **<ci>** | String type. 16-bit (GSM) or 28-bit (LTE) cell ID in hexadecimal format. |
| **<AcT>** | Integer type. Access technology selected.<br>0 GSM<br>7 E-UTRAN |
| **<err>** | Error code. For more details, see ***document [1]***. |

## Example

```
AT+QDSREG?                  //Query the CS domian network registration status of SIM1 and SIM2.

+QDSREG: 0,0,1
+QDSREG: 1,0,1
```

```
OK
AT+QDSIM=0                          //Select SIM1.
OK
AT+CREG=2                           //SIM1 enables the CS domain network registration URC
                                    with location information.
OK
AT+QDSIM=1                          //Select SIM2.
OK
AT+CREG=2                           //SIM2 enables the CS domain network registration URC
                                    with location information.
OK

+CREG: 1,"550B","0D89",0            //SIM1 has registered on network.

+CREGDS: 1,"550B","0D8A",0          //SIM2 has registered on network.
AT+QDSREG?                          //Query the CS domain network registration status of SIM1
                                    and SIM2.
+QDSREG: 0,2,1,"550B","0D89",0
+QDSREG: 1,2,1,"550B","0D8A",0

OK
```

**NOTE**

1. More details about **AT+CREG**, see ***document [1]***.
2. GSM network is optional to EC200U-CN.

### 2.3.6. AT+QDSGREG Query PS Domain Network Registration Status of Dual (U)SIM Cards

This command queries the PS domain network registration status of dual (U)SIM cards and the status of result codes presentation.

| AT+QDSGREG | Query PS Domain Network Registration Status of Dual (U)SIM Cards |
|---|---|
| Test Command<br>**AT+QDSGREG=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSGREG?** | Response<br>**+QDSGREG: <simID1>,<n1>,<stat1>[,<lac1>,<ci1>[,<AcT1>]]**<br>**+QDSGREG: <simID2>,<n2>,<stat2>[,<lac2>,<ci2>[,<AcT2>]]**<br><br>**OK**<br>Or |

| | |
|---|---|
| | **ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300 ms |
| Characteristics | / |

## Parameter

| | |
|---|---|
| **<simID>** | Integer type. (U)SIM card ID.<br>0 SIM1<br>1 SIM2 |
| **<n>** | Integer type. Enable/disable network registration URC.<br>0 Disable network registration URC<br>1 Enable network registration URC:<br>**+CGREG: <stat>** SIM1 network registration URC in PS domain<br>**+CGREGDS: <stat>** SIM2 network registration URC in PS domain<br>2 Enable network registration URC with location information:<br>**+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]** SIM1 network registration URC in PS domain with location information<br>**+CGREGDS: <stat>[,<lac>,<ci>[,<AcT>]]** SIM2 network registration URC in PS domain with location information |
| **<stat>** | Integer type. Network registration status.<br>0 Not registered. ME is not currently searching a new operator to register to.<br>1 Registered, home network.<br>2 Not registered, but ME is currently searching a new operator to register to.<br>3 Registration denied.<br>4 Unknown.<br>5 Registered, roaming. |
| **<lac>** | String type. Two bytes location area code in hexadecimal format. |
| **<ci>** | String type. 16-bit (GSM) or 28-bit (LTE) cell ID in hexadecimal format. |
| **<AcT>** | Integer type. Access technology selected.<br>0 GSM<br>7 E-UTRAN |
| **<err>** | Error code. For more details, see ***document [1]***. |

## Example

```
AT+QDSGREG?                    //Query the PS domain network registration status of SIM1 and SIM2.

+QDSGREG: 0,0,1
+QDSGREG: 1,0,1
```

```
OK
AT+QDSIM=0                          //Select SIM1.
OK
AT+CGREG=2                          //SIM1 enables the PS domain network registration URC
                                    with location information.
OK
AT+QDSIM=1                          //Select SIM2.
OK
AT+CGREG=2                          //SIM2 enables the PS domain network registration URC
                                    with location information.
OK

+CGREG: 1,"DE10","5A29C0B",7        //SIM1 has registered on network.

+CGREGDS: 1,"550B","F2D4A44",7      //SIM2 has registered on network.
AT+QDSREG?                          //Query the PS domain network registration status of SIM1
                                    and SIM2.
+QDSGREG: 0,2,1,"DE10","5A29C0B",7
+QDSGREG: 1,2,1,"550B","F2D4A44",7

OK
```

**NOTE**

1. More details about **AT+CGREG**, see ***document [1]***.
2. GSM network is optional to EC200U-CN.

### 2.3.7. AT+QDSEREG Query EPS Network Registration Status of Dual (U)SIM Cards

This command queries the EPS network registration status of dual (U)SIM cards and the status of result code presentation.

| AT+QDSEREG Query EPS Network Registration Status of Dual (U)SIM Cards | |
|---|---|
| Test Command<br>**AT+QDSEREG=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSEREG?** | Response<br>**+QDSEREG: <simID1>,<n1>,<stat1>[,<tac1>,<ci1>[,<AcT1>]]**<br>**+QDSEREG: <simID2>,<n2>,<stat2>[,<tac2>,<ci2>[,<AcT2>]]**<br><br>**OK** |

| | |
|---|---|
| | Or<br>**ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300 ms |
| Characteristics | / |

## Parameter

| | | |
|---|---|---|
| **<simID>** | Integer type. (U)SIM card ID. | |
| | 0 | SIM1 |
| | 1 | SIM2 |
| **<n>** | Integer type. Enable/disable network registration URC. | |
| | 0 | Disable network registration URC |
| | 1 | Enable network registration URC: |
| | | **+CEREG: <stat>** SIM1 EPS network registration URC |
| | | **+CEREGDS: <stat>** SIM2 EPS network registration URC |
| | 2 | Enable network registration URC with location information: |
| | | **+CEREG: <stat>[,<tac>,<ci>[,<AcT>]]** SIM1 EPS network registration URC with location information |
| | | **+CEREGDS: <stat>[,<lac>,<ci>[,<AcT>]]** SIM2 EPS network registration URC with location information |
| **<stat>** | Integer type. Network registration status. | |
| | 0 | Not registered. MT is not currently searching an operator to register to. |
| | 1 | Registered, home network. |
| | 2 | Not registered, but MT is currently trying to attach or searching an operator to register to. |
| | 3 | Registration denied |
| | 4 | Unknown. |
| | 5 | Registered, roaming. |
| **<tac>** | String type. Two-byte tracking area code in hexadecimal format. | |
| **<ci>** | String type. 28-bit (LTE) cell ID in hexadecimal format. | |
| **<AcT>** | Integer type. Access technology selected. | |
| | 7 | E-UTRAN |
| **<err>** | Error code. For more details, see ***document [1]***. | |

## Example

```
AT+QDSIM=0                  //Select SIM1.
OK
AT+CEREG=2                  //SIM1 enables the EPS network registration URC with location information.
```

```
OK
AT+QDSIM=1                              //Select SIM2.
OK
AT+CEREG=2                              //SIM2 enables the EPS network registration URC with
                                        location information.
OK

+CEREG: 1,"DE10","5A29C0B",7            //SIM1 has registered on network.


+CEREGDS: 1,"550B","F2D4A44",7          //SIM2 has registered on network.
AT+QDSEREG?                             //Query the network registration status of SIM1 and SIM2.
+QDSEREG: 0,2,1,"DE10","5A29C0B",7
+QDSEREG: 1,2,1,"550B","F2D4A44",7

OK
```

**NOTE**

More details about **AT+CEREG**, see ***document [1]***.

### 2.3.8. AT+QDSQ Query Signal Strength of Dual (U)SIM Cards

This command queries the signal strength of current network service of dual (U)SIM cards. If the MT is registered with multiple networks in different service modes, you can query the signal strength of networks in each mode. No matter whether the MT is registered with a network or not, you can execute this command to query the signal strength or allow the MT to unsolicitedly report the detected signal strength when the MT registers on the network. If the MT is not using any service network or the service mode is uncertain, **"NOSERVICE"** will be returned as the query result.

| **AT+QDSQ Query Signal Strength of Dual (U)SIM Cards** | |
|---|---|
| Test Command<br>**AT+QDSQ=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSQ?** | Response<br>**+QDSQ: <simID1>,<sysmode1>[,<value1>[,<value2>[,<value3>[,<value4>]]]]**<br>**+QDSQ: <simID2>,<sysmode2>[,<value1>[,<value2>[,<value3>[,<value4>]]]]**<br><br>**OK** |

| | |
|---|---|
| | Or<br>**ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300 ms |
| Characteristics | / |

## Parameter

| | |
|---|---|
| **<simID>** | Integer type. (U)SIM card ID.<br>0 SIM1<br>1 SIM2 |
| **<sysmode>** | String type. Current service mode.<br>"NOSERVICE" NOSERVICE mode<br>"GSM" GSM/GPRS/EDGE mode<br>"LTE" LTE mode |
| **<value>** | The signal strength corresponding to different network. See ***Table 3*** for details. |
| **<gsm_rssi>** | Integer type. Received signal strength indication for GSM mode. Unit: dBm. |
| **<lte_rssi>** | Integer type. Received signal strength indication for LTE mode. Unit: dBm. |
| **<lte_rsrp>** | Integer type. Reference signal received power for LTE mode. Unit: dBm. |
| **<lte_sinr>** | Integer type. Signal to interference plus noise ratio for LTE mode. Unit: dB. |
| **<lte_rsrq>** | Integer type. Reference signal received quality for LTE mode. Unit: dB. |
| **<err>** | Error code. For more details, see ***document [1]***. |

**Table 3: Signal Strength Corresponding to Different Network**

| <sysmode> | <value1> | <value2> | <value3> | <value4> |
|---|---|---|---|---|
| "NOSERVICE" | - | - | - | - |
| "GSM" | **<gsm_rssi>** | - | - | - |
| "LTE" | **<lte_rssi>** | **<lte_rsrp>** | **<lte_sinr>** | **<lte_rsrq>** |

## Example

```
AT+QDSQ?                                  //Query the signal strength of SIM1 and SIM2.
+QDSQ: 0,"LTE",-55,-86,89,-12
+QDSQ: 1,"LTE",-54,-76,113,-4

OK
```

```
AT+QDSIM=1                              //Select SIM2.

OK
AT+QCFG="nwscanmode",1                  //SIM1 is set as GSM only.
OK
AT+QDSQ?                                //Query the signal strength of SIM1 and SIM2.
+QDSQ: 0,"LTE",-61,-91,82,-11
+QDSQ: 1,"GSM",-72

OK
```

**NOTE**

More details about **AT+QCFG="nwscanmode"**, see ***document [1]***.

### 2.3.9. AT+QDSOPS Query Operators of Dual (U)SIM Cards

This command queries the current operators and networks of dual (U)SIM cards. If no operator is selected, **<format>**, **<oper>** and **<AcT>** are omitted.

| **AT+QDSOPS Query Operators of Dual (U)SIM Cards** | |
|---|---|
| Test Command<br>**AT+QDSOPS=?** | Response<br>**OK** |
| Read Command<br>**AT+QDSOPS?** | Response<br>**AT+QDSOPS: <simID1>,<mode1>[,<format1>[,<oper1>][,<AcT1>]]**<br>**AT+QDSOPS: <simID2>,<mode2>[,<format2>[,<oper2>][,<AcT2>]]**<br><br>**OK**<br>Or<br>**ERROR**<br><br>If there is any error related to ME functionality:<br>**+CME ERROR: <err>** |
| Maximum Response Time | 180 s, determined by network |
| Characteristics | / |

### Parameter

| | |
|---|---|
| **<simID>** | Integer type. (U)SIM card ID.<br>0 SIM1<br>1 SIM2 |
| **<oper>** | Operator in format as per **<format>**. |
| **<mode>** | Integer type.<br>0 Automatic network searching<br>1 Manual network searching<br>2 Manual deregistration from network<br>4 The combination of manual and automatic network searching |
| **<format>** | Integer type. Indicates the format of **<oper>**.<br>0 Full name of the operator in alphanumeric format which can be up to 16 characters<br>1 Full name of the operator in alphanumeric format which can be up to 16 characters<br>2 Numeric format. GSM location area identification number |
| **<AcT>** | Integer type. Access technology selected.<br>0 GSM<br>7 E-UTRAN |
| **<err>** | Error code. For more details, see ***document [1]***. |

### Example

```
AT+QDSOPS?                    //Query the operators of SIM1 and SIM2.
+QDSOPS: 0,0,0,"CHN-UNICOM",7
+QDSOPS: 1,0,0,"CHINA MOBILE",7

OK
```

**NOTE**

GSM network is optional to EC200U-CN.

## 2.4. Summary of URC

SIM1 related URCs are standard URCs, see ***document [1]***; and all SIM2 related URCs are added with the suffix "DS" as shown in the table below.

**Table 4: Summary of URC**

| Type | SIM1 URC | SIM2 URC | Description |
|---|---|---|---|
| SIM | +CFUN: | +CFUNDS: | ME function mode |
| | +CPIN: | +CPINDS: | (U)SIM card state |
| | +QUSIM: | +QUSIMDS: | (U)SIM card type |
| | +QIND: PB DONE | +QINDDS: PB DONE | Phonebook initialization finished |
| | +QSIMSTAT: | +QSIMSTATDS: | (U)SIM card insertion status |
| SMS | +CDS: | +CDSDS: | New CDS is received and output directly |
| | +CMTI: | +CMTIDS: | New message is received and saved to memory |
| | +CMT: | +CMTDS: | New short message is received and output directly to TE |
| | +QIND: SMS DONE | +QINDDS: SMS DONE | SMS initialization finished |
| | +QIND: "SMSFULL","SM" | +QINDDS: "SMSFULL","SM" | SMS storage is full |
| CALL | NO CARRIER | NO CARRIER DS | The connection has been terminated or the attempt to establish a connection failed |
| | RING | RING DS | Incoming call indication |
| | +CRING: | +CRINGDS: | An incoming call is indicated to the TE with unsolicited result code instead of the normal **RING** |
| | +CCWA: | +CCWADS: | Call waiting indication |

| | | | |
|---|---|---|---|
| | +COLP: | +COLPDS: | The presentation of the COL (connected line) at the TE for a mobile originated call |
| | +CLIP: | +CLIPDS: | Mobile terminating call indication |
| **Network** | +CREG: | +CREGDS: | Indicate the CS domain network registration status of the ME |
| | +CGREG: | +CGREGDS: | Indicate the PS domain network registration status of the ME |
| | +CEREG: | +CEREGDS: | Indicate the EPS network registration status of the ME |
| | +QCSQ: | +QCSQDS: | Signal strength reporting |
| **NITZ** | +CTZV: | +CTZVDS: | Time zone reporting |
| | +CTZE: | +CTZEDS: | Extended time zone reporting |

# 3 Example

This chapter introduces how to initialize and use the dual (U)SIM cards to perform related services, such as (U)SIM card information quering, network status querying, call making and answering, SMS, context configuration and PDP activation, TCP application, PPP dailing and ECM/RNDIS application.

## 3.1. Initialization After Booting

The module automatically checks the card slots after powering on the module and initializes the two (U)SIM cards inserted in it. After the initialization completes, the module will register on network automatically. Generally, the URCs are reported after powering on the module.

```
RDY

+CFUN: 1                          //Report SIM1 function mode.

+CPIN: READY                      //Report SIM1 status.

+QUSIM: 1

+CFUNDS: 1                        //Report SIM2 function mode.

+CPINDS: READY                    //Report SIM2 status.

+QUSIMDS: 1

+QINDDS: SMS DONE                 //SMS initialization of SIM2 has completed.

+QINDDS: PB DONE                  //Phonebook initialization of SIM2 has completed.

+QIND: SMS DONE                   //SMS initialization of SIM1 has completed.

+QIND: PB DONE                    //Phonebook initialization of SIM1 has completed.
AT+QDSREG?                        //Query the CS domain network registration status of SIM1
                                  and SIM2
+QDSREG: 0,0,1
+QDSREG: 1,0,1                    //SIM1 and SIM2 have registered on network.
```

```
OK
AT+QDSGREG?                    //Query the PS domain network registration status of SIM1 and SIM2
+QDSGREG: 0,0,1
+QDSGREG: 1,0,1                //SIM1 and SIM2 have registered on network.

OK
AT+QDSEREG?                    //Query the EPS network registration status of SIM1 and SIM2
+QDSEREG: 0,0,1
+QDSEREG: 1,0,1                //SIM1 and SIM2 have registered on network.

OK
```

## 3.2. (U)SIM Card Application

### 3.2.1. Query IMSI

```
AT+QDSIM=0                     //Select SIM1.
OK
AT+CIMI                        //Query the IMSI of SIM1.
460027156528504

OK
AT+QDSIM=1                     //Select SIM2.
OK
AT+CIMI                        //Query the IMSI of SIM2.
460016085318106

OK
AT+QDSIMI?                     //Query the IMSI of SIM1 and SIM2.
+QDSIMI: 0,460027156528504
+QDSIMI: 1,460016085318106

OK
```

**NOTE**

More details about **AT+CIMI**, see ***document [1]***.

### 3.2.2. Query ICCID

```
AT+QDSIM=0                          //Select SIM1.
OK
AT+QCCID                            //Query the ICCID of SIM1.
+QCCID: 898600E1122115658504

OK
AT+QDSIM=1                          //Select SIM2.
OK
AT+QCCID                            //Query the ICCID of SIM2.
+QCCID: 89860118830003741022

OK
AT+QDSCCID?                         //Query the ICCID of SIM1 and SIM2.
+QDSCCID: 0,898600E1122115658504
+QDSCCID: 1,89860118830003741022

OK
```

**NOTE**

More details about **AT+QCCID**, see ***document [1]***.

### 3.2.3. Query Status of (U)SIM Card

```
AT+QDSPIN?                  //Query status of SIM 1 and SIM2.
+QDSPIN: 0,SIM PIN          //SIM1 is locked and (U)SIM PIN is required.
+QDSPIN: 1,READY            //SIM2 is ready and no password is required.

OK
AT+QDSIM=0                  //Select SIM1.
OK
AT+CPIN="1234"              //enter PIN code.
OK

+CPIN: READY

+QUSIM: 1

+QIND: SMS DONE
```

```
+QIND: PB DONE
AT+QDSPIN?                  //Query status of SIM 1 and SIM2.
+QDSPIN: 0,READY
+QDSPIN: 1,READY            //The status of SIM1 and SIM2 is Ready.

OK
```

### 3.2.4. Detect (U)SIM Card

```
AT+QSIMDET=1,0              //Enable (U)SIM card hot-plug function.
OK
//Pull out SIM1
+CPIN: NOT READY

//Insert SIM1
+CPIN: READY

//Pull out SIM2
+CPINDS: NOT READY

//Insert SIM2
+CPINDS: READY
```

**NOTE**

More details about **AT+QSIMDET**, see ***document [1]***.

## 3.3. Network Service Application

### 3.3.1. Query Network Registration Status

```
AT+QDSIM=0                  //Select SIM1.
OK
AT+CREG?                    //Query the CS domain network registration status of SIM1.
+CREG: 0,1

OK
AT+CGREG?                   //Query the PS domain network registration status of SIM1.
+CGREG: 0,1
```

```
OK
AT+CEREG?                  //Query the EPS network registration status of SIM1.
+CEREG: 0,1

OK
AT+QDSREG?                 //Query the CS domain network registration status of SIM1 and SIM2.
+QDSREG: 0,0,1
+QDSREG: 1,0,1

OK
AT+QDSGREG?                //Query the PS domain network registration status of SIM1 and SIM2.
+QDSGREG: 0,0,1
+QDSGREG: 1,0,1

OK
AT+QDSEREG?                //Query the EPS network registration status of SIM1 and SIM2.
+QDSEREG: 0,0,1
+QDSEREG: 1,0,1

OK
```

### 3.3.2. Report Network Registration Status

```
AT+QDSIM=0                 //Select SIM1.
OK
AT+CEREG=1                 //Enable the EPS network registration URC of SIM1.
OK
AT+QDSIM=1                 //Select SIM2.
OK
AT+CEREG=1                 //Enable the EPS network registration URC of SIM2.
OK

+CEREG: 0

+CEREG: 1

+CEREGDS: 0

+CEREGDS: 1
```

### 3.3.3. Query Signal Strength

```
AT+QDSQ?                          //Query the signal strength of SIM1 and SIM2.
+QDSQ: 0,"LTE",-56,-81,85,-6
+QDSQ: 1,"LTE",-57,-83,83,-7

OK
AT+QDSIM=0                        //Select SIM1.
OK
AT+QCSQ                           //Query the signal strength of SIM1.
+QCSQ: "LTE",-56,-81,85,-6

OK
AT+QDSIM=1                        //Select SIM2.
OK
AT+QCSQ                           //Query th signal strength of SIM2.
+QCSQ: "LTE",-57,-81,86,-5

OK
```

**NOTE**

More details about **AT+QCSQ**, see ***document [1]***.

### 3.3.4. Select Network and Query Operator

```
AT+QDSIM=0                        //Select SIM1.
OK
AT+QCFG="nwscanmode",1            //SIM1 is set as GSM only.
OK
AT+COPS?                          //Query the operator of SIM1.
+COPS: 0,0,"CHINA MOBILE",0

OK
AT+QDSOPS?                        //Query the operators of SIM1 and SIM2.
+QDSOPS: 0,0,0,"CHINA MOBILE",0
+QDSOPS: 1,0,0,"CHN-UNICOM",7

OK
```

**NOTE**

More details about **AT+COPS**, see ***document [1]***.

## 3.4. Call

### 3.4.1. Make a Call

```
AT+QDSIM=0                          //Select SIM1.
OK
AT+CREG?                            //Query the CS domain network registration status of SIM1.
+CREG: 0,1

OK
ATD10086;                           //Make a call via SIM1.
OK
AT+CLCC                             //List current calls of ME.
+CLCC: 1,0,0,0,0,"10086",129

OK
ATH                                 //Hang up the call.
OK
AT+QDSIM=1                          //Select SIM2.
OK
AT+CREG?                            //Query the CS domain network registration status of SIM2.
+CREG: 0,1

OK
ATD10086;                           //Make a call via SIM2.
OK
AT+CLCC                             //List current calls of ME.
+CLCC: 1,0,0,0,0,"10086",129

OK
ATH                                 //Hang up the call.
OK
```

**NOTE**

More details about **ATD**, **AT+CLCC** and **ATH**, see ***document [1]***.

### 3.4.2. Answer a Call

```
AT+QDSIM?                                   //Query the (U)SIM card being used.
+QDSIM: 0                                   //Currently SIM1 is being used.

OK

RING DS                                     //Incoming calls on SIM2.
ATA                                         //Answer the call
+CME ERROR: 3                               //Fail to answer the call on SIM1.

RING DS
AT+QDSIM=1                                  //Select SIM2.
OK
ATA                                         //Answer the call.
OK
AT+CLCC                                     //List current calls of ME.
+CLCC: 1,1,0,0,0,"18924012349",129

OK

NO CARRIER DS                               //The call is hung up by the originator.
```

**NOTE**

More details about **ATA** and **+CME ERROR**, see ***document [1]***.

## 3.5. SMS

### 3.5.1. Send SMS

```
AT+QDSIM=0                                  //Select SIM1.
OK
AT+CREG?                                    //Query the CS domain network registration
```

```
                                        status of SIM1.
+CREG: 0,1

OK
AT+CSCS="GSM"                           //Set the character used by the TE as GSM format.

OK
AT+CMGF=1                               //Select text mode.
OK
AT+CMGS="15212786473"                   //Send SMS to SIM2.
>Hello SIM1                             //Input SMS content. Tap CTRL+Z to send, and tap ESC to cancel the operation.

+CMGS: 11

OK

+CMTIDS: "ME",7                         //SIM2 has received the SMS and stored in ME.
AT+QDSIM=1                              //Select SIM2.
OK
AT+CREG?                                //Query the CS domain network registration status of SIM2.

+CREG: 0,1

OK
AT+CMGF=1                               //Select text mode.
OK
AT+CMGS="18225658934"                   //Send SMS to SIM1.
>Hello SIM2                             //Input SMS content. Tap CTRL+Z to send, and tap ESC to cancel the operation.


+CMGS: 54

OK

+CMTI: "ME",9                           //SIM1 has received the SMS and stored in ME.
```

**NOTE**

More details about **AT+CSCS**, **AT+CMGF** and **AT+CMGS**, see ***document [1]***.

### 3.5.2. Read SMS

```
+CMTIDS: "ME",0                                   //SIM2 has received the SMS.
AT+QDSIM?                                         //Query the (U)SIM card being used
+QDSIM: 0                                         //Currently SIM1 is being used.

OK
AT+CMGR=0                                         //Read SMS
OK                                                //SIM1 has not received the SMS.
AT+QDSIM=1                                        //Select SIM2.
OK
AT+CPMS?                                          //Query SMS storage.
+CPMS: "ME",1,100,"ME",1,100,"ME",1,100

OK
AT+CMGF?                                          //Query the SMS mode.
+CMGF: 1

OK
AT+CMGR=0                                         //Read SMS.
+CMGR: "REC UNREAD","13929101640",,"2021/04/08,14:15:39+32"
Hello SIM2

OK
```

**NOTE**

More details about **AT+CMGR**, **AT+CPMS** and **AT+CMGF**, see ***document [1]***.

## 3.6. Context Configuration and PDP Activation/Deactivate

```
AT+QDSIM=0                                        //Select SIM1.
OK
AT+QICSGP=1,1,"CMNET","","",1                     //Configure the IP type and APN of the first PDP of
                                                  SIM1.
OK
AT+QIACT=1                                        //Activate the first PDP of SIM1.
OK
AT+QIACT?                                         //Query all the activated PDPs and IP addresses of
                                                  SIM1.
+QIACT: 1,1,1,"10.33.194.2"
```

```
OK
AT+QIDEACT=1                          //Deactivate the first PDP of SIM1.
OK
AT+QDSIM=1                            //Select SIM2.
OK
AT+QICSGP=1,1,"UNINET","","",1        //Configure the IP type and APN of the first PDP of
                                      SIM2.
OK
AT+QIACT=1                            //Activate the first PDP of SIM2, and it can coexist with
                                      the first PDP of SIM1.
OK
AT+QIACT?                             //Query all the activated PDPs and IP addresses of
                                      SIM2.
+QIACT: 1,1,1,"10.201.2.70"

OK
AT+QIDEACT=1                          //Deactivate the first PDP of SIM2.
OK
```

**NOTE**

More details about **AT+QICSGP**, **AT+QIACT** and **AT+QIDEACT**, see ***document [2]***.

## 3.7. TCP Application

### 3.7.1. Establish TCP Connection

```
AT+QDSIM=0                                          //Select SIM1.
OK
AT+QIOPEN=1,0,"TCP","220.180.239.212",8024,0,0      //After the first PDP of SIM1 is activated
                                                    by AT+QIACT, use Socket 0 to create
                                                    TCP client and enter buffer mode.
OK

+QIOPEN: 0,0                                        //TCP client is connected sucessfully.
AT+QISTATE=1,0                                      //Get the connection status of Socket 0.
+QISTATE: 0,"TCP","220.180.239.212",8024,0,2,1,0,0,"uart1"

OK
AT+QDSIM=1                                          //Select SIM2.
```

```
OK
AT+QIOPEN=1,1,"TCP","220.180.239.212",8024,0,0          //After the first PDP of SIM2 is activated by AT+QIACT, use Socket 1 to create a TCP client and enter buffer mode.

OK

+QIOPEN: 1,0                                            //TCP client is connected sucessfully.
AT+QISTATE=1,1                                          //Get the connection status of Socket 1.
+QISTATE: 1,"TCP","220.180.239.212",8024,0,2,1,1,0,"uart1"

OK
```

**NOTE**

More details about **AT+QIOPEN** and **AT+QISTATE**, see ***document [2]***.

### 3.7.2. Send Data

```
AT+QDSIM=0                                              //Select SIM1.
OK
AT+QISEND=0                                             //Socket 0 sends variable-length data.
> SIM1 TEST                                             //Input the data to be sent. Tap CTRL+Z to send, and tap ESC to cancel the operation.

SEND OK
AT+QISEND=0,10                                          //Socket 0 sends 10 bytes fixed-length data.
> SIM1 TEST1
SEND OK
AT+QISEND=0,0                                           //Query the length of data sent from Socket 0.
+QISEND: 19,19,0

OK
AT+QDSIM=1                                              //Select SIM2.
OK
AT+QISEND=1,9                                           //Socket 1 sends 9 bytes fixed-length data.
> SIM2 TEST                                             //Input the data to be sent. Tap CTRL+Z to send, and tap ESC to cancel the operation.

SEND OK
AT+QISEND=1,0                                           //Query the length of data sent from Socket 1
+QISEND: 9,9,0

OK
```

**NOTE**

More details about **AT+QISEND**, see ***document [2]***.

### 3.7.3. Receive Data

```
+QIURC: "recv",0                    //Socket 0 of SIM1 has received data and reports an URC.
AT+QIRD=0,1500                      //Read the data of Socket 0 and the length is 1500 bytes.
+QIRD: 17                           //The actual received data is 17 bytes.
SIM1 SCOKET0 TEST

OK

+QIURC: "recv",1                    //Socket 1 of SIM2 has received data and reports an URC.
AT+QIRD=1,1500                      //Read the data of Socket 1 and the length is 1500 bytes.
+QIRD: 17
SIM2 SCOKET1 TEST

OK
AT+QIRD=1,1500                      //Read the data of Socket 1 and the length is 1500 bytes.
+QIRD: 0                            //There is no data in the buffer.

OK
AT+QIRD=0,0                         //Query the total length of Socket 0 received data, including the read
                                    data and unread data.
+QIRD: 17,17,0

OK
AT+QIRD=1,0                         //Query the total length of Socket 1 received data, including the read
                                    data and unread data.
+QIRD: 17,17,0

OK
```

**NOTE**

More details about **AT+QIRD**, see ***document [2]***.

### 3.7.4. Disconnect Connections

```
AT+QDSIM=0                                                  //Select SIM1
OK
AT+QISTATE?                                                 //Query the connection status of all Sockets of SIM1
+QISTATE: 0,"TCP","220.180.239.212",8024,0,2,1,0,0,"uart1"  //The status of Socket 0 is that TCP client is connected.

OK
AT+QICLOSE=0                                                //Disconnect from Socket 0
OK
AT+QDSIM=1                                                  //Select SIM2

OK
AT+QISTATE?                                                 //Query the connection status of all Sockets of SIM2
+QISTATE: 1,"TCP","220.180.239.212",8024,0,2,1,1,0,"uart1"  //The status of Socket 1 is that TCP client is connected.

OK
AT+QICLOSE=1                                                //Disconnect from Socket 1.
OK
```

**NOTE**

More details about **AT+QICLOSE**, see ***document [2]***.

## 3.8. PPP Dialing

```
AT+QDSIM=1                          //Select SIM2.
OK
AT+CGREG?                           //Query the PS domain network registration status of SIM2.
+CGREG: 0,1

OK
AT+CGDCONT=1,"IP","CMNET"           //Configure PDP context.
OK
ATD*99#                             //Dial a number to establish a connection and start PPP.
CONNECT                             //Enter data mode and start the PPP frame interaction process.
7E FF 7D 23 C0 21 7D 21 7D 21 7D 20 7D 2A 7D 22 .....
```

**NOTE**

More details about **AT+CGDCONT**, see ***document [2]***.

## 3.9. ECM/RNDIS NIC Application

```
AT+QCFG="usbnet",3                  //Switch to RNDIS NIC mode which takes effect after rebooting.
OK

//Reboot
AT+QDSIM=1                          //Select SIM2.
OK
AT+CGREG?                           //Query the PS domain network registration status of SIM2.
+CGREG: 0,1

OK
AT+QNETDEVCTL=3,1,1                 //Enable automatical NIC dialing, use the first PDP of SIM2 and
                                    enable URC reporting.
OK

+QNETDEVSTATUS: 1                   //The NIC is successfully bound to PDP.
AT+QNETDEVCTL=0                     //Unbind and close the NIC.
OK
```

**NOTE**

More details about **AT+QNETDEVCTL**, see ***document [1]***.

# 4 Appendix References

**Table 5: Related Documents**

| Document Name |
|---|
| [1] Quectel_EC200U&EG915U_Series_AT_Commands_Manual |
| [2] Quectel_EC200U&EG915U_Series_TCP(IP)_Application_Note |
| [3] Quectel_EC200U&EG915U_Series_PPP_Application_Note |

**Table 6: Terms and Abbreviations**

| Abbreviation | Description |
|---|---|
| APN | Access Point Name |
| CS | Circuit Switched |
| ECM | Ethernet Networking Control Model |
| EDGE | Enhanced Data Rates for GSM Evolution |
| EPS | Evolved Packet System |
| E-UTRAN | Evolved Universal Terrestrial Radio Access Network |
| GPRS | General Packet Radio Service |
| GSM | Global System for Mobile Communications |
| ICCID | Integrated Circuit Card Identifier |
| ID | Identifier |
| IMSI | International Mobile Subscriber Identity |
| IP | Internet Protocol |
| LTE | Long-Term Evolution |

| | |
|---|---|
| ME | Mobile Equipment |
| MT | Mobile Terminal |
| NITZ | Network Identity and Time Zone / Network Informed Time Zone |
| PDP | Packet Data Protocol |
| PIN | Personal Identification Number |
| PLMN | Public Land Mobile Network |
| PPP | Point-to-Point Protocol |
| PS | Packet Switch |
| PUK | PIN Unlock Key |
| RF | Radio Frequency |
| RNDIS | Remote Network Driver Interface Specification |
| RSRP | Reference Signal Received Power |
| RSRQ | Reference Signal Received Quality |
| RSSI | Received Signal Strength Indication |
| SIM | Subscriber Identity Module |
| SINR | Signal to Interference plus Noise Ratio |
| SMS | Short Message Service |
| TA | Terminal Adapter |
| TCP | Transmission Control Protocol |
| TE | Terminal Equipment |
| UART | Universal Asynchronous Receiver& Transmitter |
| UE | User Equipment |
| UICC | Universal Integrated Circuit Card |
| URC | Unsolicited Result Code |
| USB | Universal Serial Bus |

| | |
|---|---|
| (U)SIM | (Universal) Subscriber Identity Module |