# BC25&BC32 OneNET Application Note

**NB-IoT Module Series**

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# About the Document

## History

| Revision | Date | Author | Description |
|---|---|---|---|
| 1.0 | 2019-08-06 | Albert ZHANG | Initial |

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# 1 Introduction

LwM2M (Lightweight Machine to Machine) is a secure, efficient and deployable client-server protocol for managing resource-constrained devices on a variety of networks. LwM2M uses a modern architectural design based on REST, defines an extensible resource and data model and reuses and builds on an efficient secure data transfer standard called the Constrained Application Protocol (CoAP). LwM2M is a profile for device services based on CoAP (RFC 7252). LwM2M offers a light and compact secure communication interface together with an efficient data model, realizing the management and service enablement of M2M devices.

This document mainly introduces how to connect devices applying Quectel BC25 and BC32 modules to OneNET IoT Open Platform of China Mobile (OneNET) and realize related functions through LwM2M.

# 2 OneNET Data Interaction Mechanism

This chapter gives the data interaction mechanism of OneNET.

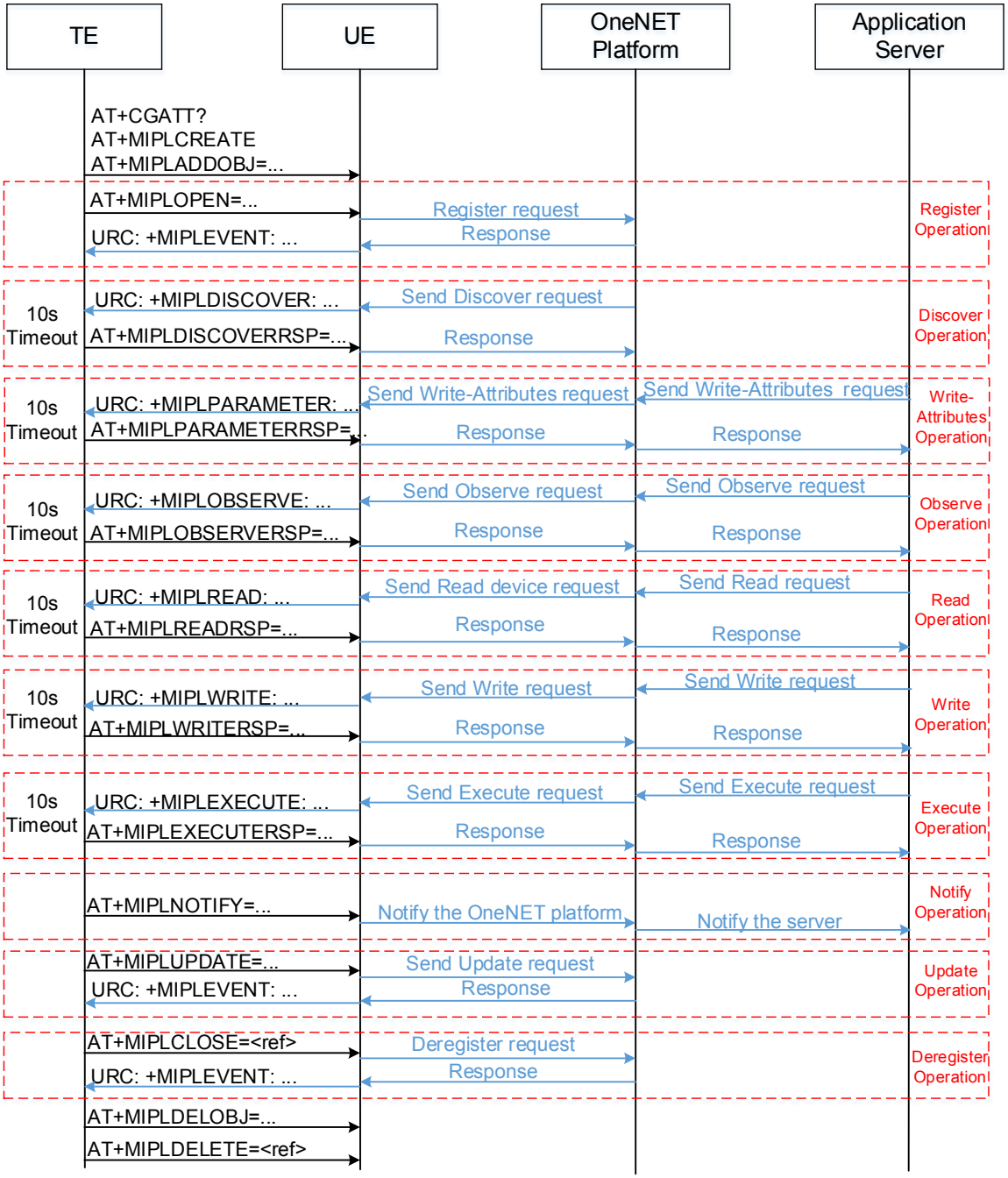


**Figure 1: OneNET Data Interaction Diagram**

# 3 OneNET Related AT Commands

This chapter presents the AT commands to operate OneNET functions.

## 3.1. AT Command Syntax

**Table 1: Types of AT Commands and Responses**

| | | |
|---|---|---|
| **Test Command** | **AT+<*x*>=?** | This command returns the list of parameters and value ranges set by the corresponding Write Command or internal processes. |
| **Read Command** | **AT+<*x*>?** | This command returns the currently set value of the parameter or parameters. |
| **Write Command** | **AT+<x>=<…>** | This command sets the user-definable parameter values. |
| **Execution Command** | **AT+<x>** | This command reads non-variable parameters affected by internal processes in the UE. |

## 3.2. Description of OneNET Related AT Commands

### 3.2.1. AT+MIPLCONFIG OneNET Access Configuration

The command is used to configure bootstrap mode and bootstrap server address or LwM2M server address. It also can be used to set the parameter ACK_TIMEOUT of CoAP protocol. The maximum transmit waiting time "MAX_TRANSMIT_WAIT" of CoAP protocol implemented by the UE equals "ACK_TIMEOUT" * ((2$^{(4+1)}$) - 1).

If not configured, default values of these parameters will be used. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLCONFIG OneNET Access Configuration** | |
|---|---|
| Test Command<br>**AT+MIPLCONFIG=?** | Response<br>**+MIPLCONFIG: <mode>,<parameter1>[,<parameter2>]**<br><br>**OK** |

| | |
|---|---|
| Read Command<br>**AT+MIPLCONFIG?** | Response<br>**+MIPLCONFIG: <mode>,<ip>,<port>**<br>**+MIPLCONFIG: <mode>,<rsp_timeout>**<br>**+MIPLCONFIG: <mode>,<obs_autoack>**<br><br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Write Command<br>**AT+MIPLCONFIG=<mode>,<parameter1>[,<parameter2>]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

## Parameter

| | |
|---|---|
| **<mode>** | Option mode<br>0 Disable bootstrap and configure LwM2M server IP and port<br>1 Enable bootstrap and configure bootstrap server IP and port. The default bootstrap server address is 183.230.40.39:5683<br>2 Set the parameter ACK_TIMEOUT of CoAP protocol<br>3 Set whether to enable the module to automatically respond to observe requests |
| **<ip>** | When **<mode>=0**, it is the IP address of LwM2M server.<br>When **<mode>=1**, it is the IP address of bootstrap server. |
| **<port>** | When **<mode>=0**, it is the port of LwM2M server.<br>When **<mode>=1**, it is the port of bootstrap server.<br>Range: 1000-65535. |
| **<rsp_timeout>** | Value of ACK_TIMEOUT. Range: 2-20. Unit: second. Default value: 2 seconds. |
| **<obs_autoack>** | Whether to enable the module to automatically respond to observe requests<br>0 Disable automatic responding to observe request<br>1 Enable automatic responding to observe requests and TE should not respond |

| **<mode>** | **<parameter1>** | **<parameter2>** |
|---|---|---|
| 0 | **<ip>** | **<port>** |
| 1 | **<ip>** | **<port>** |
| 2 | 1 | **<rsp_timeout>** |
| 3 | **<obs_autoack>** | |

to the request through **AT+MIPLOBSERVERSP** command.

**NOTES**

1. The command should be used before creating communication instance with **AT+MIPLCREATE** command.
2. Configured parameters of the command will not be saved in non-volatile memory and will be reset to default after rebooting.

### 3.2.2. AT+MIPLCREATE Create a OneNET Communication Suite Instance

The command is used to create an instance of OneNET communication suite. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLCREATE Create a OneNET Communication Suite Instance** | |
|---|---|
| Execution Command<br>**AT+MIPLCREATE** | Response<br>**+MIPLCREATE: <ref>**<br><br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |

### 3.2.3. AT+MIPLDELETE Delete a OneNET Communication Suite Instance

The command is used to delete an instance of OneNET communication suite. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLDELETE Delete a OneNET Communication Suite Instance** | |
|---|---|
| Test Command<br>**AT+MIPLDELETE=?** | Response<br>**+MIPLDELETE: <ref>**<br><br>**OK** |

| | |
|---|---|
| Write Command<br>**AT+MIPLDELETE=<ref>** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 3s |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |

### 3.2.4. AT+MIPLVER Query Current OneNET Communication Suite Version

The command is used to query the current version of OneNET communication suite.

| **AT+MIPLVER Query Current OneNET Communication Suite Version** | |
|---|---|
| Read Command<br>**AT+MIPLVER?** | Response<br>**+MIPLVER: <version>**<br><br>**OK** |
| Maximum Response Time | 300ms |

**Parameter**

| | |
|---|---|
| **<version>** | The current version of OneNET communication suite. |

### 3.2.5. AT+MIPLADDOBJ Add a LwM2M Object

The command is used to add a LwM2M object. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLADDOBJ Add a LwM2M Object** | |
|---|---|
| Test Command<br>**AT+MIPLADDOBJ=?** | Response<br>**+MIPLADDOBJ: <ref>,<objId>,<insCount>,<insBitmap>, <attrCount>,<actCount>**<br><br>**OK** |
| Write Command | Response |

| | |
|---|---|
| **AT+MIPLADDOBJ=<ref>,<objId>,<insCount>,<insBitmap>,<attrCount>,<actCount>** | **OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<objId>** | Object ID (identifier). If object ID does not exist, an error will be returned. |
| **<insCount>** | Instance count. |
| **<insBitmap>** | Instance bitmap. A string marked with double quotation marks. For example, if there are 4 instances whose IDs are 0, 1, 2, 3, the value of **<insCount>** will be 4, and the **<insBitmap>="1101"** means the instance ID 0, 1, 3 will be registered, and the instance ID 2 will not be registered. |
| **<attrCount>** | Attribute count, which indicates the count of readable and/or writeable resources. |
| **<actCount>** | Action count, which indicates the count of executable resources. |

### 3.2.6. AT+MIPLDELOBJ Delete a LwM2M Object

The command is used to delete a LwM2M object. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLDELOBJ Delete a LwM2M Object** | |
|---|---|
| Test Command<br>**AT+MIPLDELOBJ=?** | Response<br>**+MIPLDELOBJ: <ref>,<objId>**<br><br>**OK** |
| Write Command<br>**AT+MIPLDELOBJ=<ref>,<objId>** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<objId>** | Object ID. If object ID does not exist, an error will be returned. |

### 3.2.7. AT+MIPLOPEN Send Register Request

The command is used to send register request to OneNET. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLOPEN Send Register Request** | |
|---|---|
| Test Command<br>**AT+MIPLOPEN=?** | Response<br>**+MIPLOPEN: <ref>,<lifetime>[,<timeout>]**<br><br>**OK** |
| Write Command<br>**AT+MIPLOPEN=<ref>,<lifetime>[,<timeout>]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<lifetime>** | Device lifetime. Range: 16-268435454. Unit: second. |
| **<timeout>** | Timeout of registration. Range: 30-65535. Unit: second. |

### 3.2.8. AT+MIPLCLOSE Send Deregister Request

The command is used to send deregister request to OneNET. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLCLOSE Send Deregister Request** | |
|---|---|
| Test Command<br>**AT+MIPLCLOSE=?** | Response<br>**+MIPLCLOSE: <ref>**<br><br>**OK** |
| Write Command<br>**AT+MIPLCLOSE=<ref>** | Response<br>**OK** |

| | |
|---|---|
| | If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 3s |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |

### 3.2.9. AT+MIPLDISCOVERRSP Respond to Discover Request

The command is used to respond to the discover request from OneNET. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLDISCOVERRSP Respond to Discover Request** | |
|---|---|
| Test Command<br>**AT+MIPLDISCOVERRSP=?** | Response<br>**+MIPLDISCOVERRSP: <ref>,<msgId>,<result>[,<length>,<valuestring>[,<raiMode>]]**<br><br>**OK** |
| Write Command<br>**AT+MIPLDISCOVERRSP=<ref>,<msgId>,<result>[,<length>,<valuestring>[,<raiMode>]]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | | | |
|---|---|---|---|
| **<ref>** | Instance ID of OneNET communication suite. | | |
| **<msgId>** | Message ID, which comes from the URC "**+ MIPLDISCOVER:**". | | |
| **<result>** | The result of discover. The result codes are as follows: | | |
| | Result code | CoAP response code | Description |
| | 1 | 2.05 | Content, indicate the correct result |
| | 11 | 4.00 | Bad Request |
| | 12 | 4.01 | Unauthorized |

| | | | |
|---|---|---|---|
| | 13 | 4.04 | Not Found |
| | 14 | 4.05 | Method Not Allowed |
| | 15 | 4.06 | Not Acceptable |
| **<length>** | The length of **<valuestring>**. | | |
| **<valuestring>** | A string which includes the attributes of the object and should be marked with double quotation marks. Each attribute should be separated with semicolon, such as "1101;1102;1103". The count of attributes should not exceed the sum of **<attrCount>** and **<actCount>** in command **AT+MIPLADDOBJ**. | | |
| **<raiMode>** | Integer type. It specifies the flag of RAI (Release Assistant Indication) of message transmission. Range: 0-2.<br>0 Do not release indication<br>1 Release indication after the message<br>2 Release indication after the message has been replied | | |

### 3.2.10. AT+MIPLOBSERVERSP Respond to Observe Request

The command is used to respond to the observe request from OneNET or application servers when automatic responding to observe request is disabled. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLOBSERVERSP Respond to Observe Request** | |
|---|---|
| Test Command<br>**AT+MIPLOBSERVERSP=?** | Response<br>**+MIPLOBSERVERSP: <ref>,<msgId>,<result>[,<raiMode>]**<br><br>**OK** |
| Write Command<br>**AT+MIPLOBSERVERSP=<ref>,<msgId>,<result>[,<raiMode>]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

### Parameter

| | | | |
|---|---|---|---|
| **<ref>** | Instance ID of OneNET communication suite. | | |
| **<msgId>** | Message ID, which comes from the URC "**+ MIPLOBSERVE:**". | | |
| **<result>** | The result of observe. The result codes are as follows: | | |
| | Result code | CoAP response code | Description |
| | 1 | 2.05 | Content, indicate the correct result |
| | 11 | 4.00 | Bad Request |
| | 12 | 4.01 | Unauthorized |

| | | | |
|---|---|---|---|
| | 13 | 4.04 | Not Found |
| | 14 | 4.05 | Method Not Allowed |
| | 15 | 4.06 | Not Acceptable |
| **<raiMode>** | Integer type. It specifies the flag of RAI of message transmission. Range: 0-2. | | |
| | 0 | Do not release indication | |
| | 1 | Release indication after the message | |
| | 2 | Release indication after the message has been replied | |

### 3.2.11. AT+MIPLREADRSP Respond to Read Request

The command is used to respond to the read request from OneNET or application servers. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLREADRSP Respond to Read Request** | |
|---|---|
| Test Command<br>**AT+MIPLREADRSP=?** | Response<br>**+MIPLREADRSP: <ref>,<msgId>,<result>[,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<index>,<flag>[,<raiMode>]]**<br><br>**OK** |
| Write Command<br>**AT+MIPLREADRSP=<ref>,<msgId>,<result>[,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<index>,<flag>[,<raiMode>]]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | | | |
|---|---|---|---|
| **<ref>** | Instance ID of OneNET communication suite. | | |
| **<msgId>** | Message ID, which comes from the URC "**+MIPLREAD:**". | | |
| **<result>** | The result of read. The result codes are as follows: | | |
| | Result code | CoAP response code | Description |
| | 1 | 2.05 | Content, indicate the correct result |
| | 11 | 4.00 | Bad Request |
| | 12 | 4.01 | Unauthorized |
| | 13 | 4.04 | Not Found |
| | 14 | 4.05 | Method Not Allowed |
| | 15 | 4.06 | Not Acceptable |
| **<objId>** | Object ID, which comes from the URC "**+MIPLREAD:**". | | |

| | |
|---|---|
| **<insId>** | Instance ID, which comes from the URC "**+MIPLREAD:**". |
| **<resId>** | Resource ID, which comes from the URC "**+MIPLREAD:**". |
| **<valueType>** | Type of the value<br>1 String<br>2 Opaque<br>3 Integer<br>4 Float<br>5 Boolean |
| **<len>** | Length of the value. Unit: byte.<br>When **<valueType>=1**, it is the length of the string value of **<value>**.<br>When **<valueType>=2**, it is the length of the hex value of **<value>**.<br>When **<valueType>=3**, it is not the exact length of integer value of **<value>** and should be 2, 4, or 8.<br>When **<valueType>=4**, it is not the exact length of float value of **<value>** and should be 4.<br>When **<valueType>=5**, it is 1. |
| **<value>** | The value<br>When **<valueType>=1**, it is in string format, and should be marked with double quotation marks.<br>When **<valueType>=2**, it is in hex format.<br>When **<valueType>=3**, it is in integer format.<br>When **<valueType>=4**, it is in float format.<br>When **<valueType>=5**, it is in Boolean format. |
| **<index>** | The index number of the data. If the data is a combination of several messages, it should be separated into several parts. If it is separated into N parts, the order number of **<index>** is N-1 to 0 in descending order, and the AT command will be called in the order from the largest to the smallest number. **<index>=0** means that this is the last message of the data. |
| **<flag>** | The message indication. The range is 0-2.<br>0 Indicates the last message of the **<value>**<br>1 Indicates the first message of the **<value>**<br>2 Indicates the middle message of the **<value>**<br>Only **<flag>=0** is supported in this version now. |
| **<raiMode>** | Integer type. It specifies the flag of RAI of message transmission. Range: 0-2.<br>0 Do not release indication<br>1 Release indication after the message<br>2 Release indication after the message has been replied. |

**NOTES**

1. The command is used as response to read request. If **<valueType>=2**, character of the hex value is counted as 2***<len>**.
2. If **<valueType>=4**, length of the float value is recommended to be 4 bytes and **<len>** should be 4.

### 3.2.12. AT+MIPLWRITERSP Respond to Write Request

The command is used to respond to the write request from OneNET or application servers. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLWRITERSP Respond to Write Request** | |
|---|---|
| Test Command<br>**AT+MIPLWRITERSP=?** | Response<br>**+MIPLWRITERSP: <ref>,<msgId>,<result>[,<raiMode>]**<br><br>**OK** |
| Write Command<br>**AT+MIPLWRITERSP=<ref>,<msgId>,<result>[,<raiMode>]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

**<ref>** Instance ID of OneNET communication suite.

**<msgId>** Message ID, which comes from the URC "**+MIPLWRITE:**".

**<result>** The result of write. The result codes are as follows:

| Result code | CoAP response code | Description |
|---|---|---|
| 2 | 2.04 | Changed, indicate the correct result |
| 11 | 4.00 | Bad Request |
| 12 | 4.01 | Unauthorized |
| 13 | 4.04 | Not Found |
| 14 | 4.05 | Method Not Allowed |

**<raiMode>** Integer type. It specifies the flag of RAI of message transmission. Range: 0-2.

0 Do not release indication
1 Release indication after the message
2 Release indication after the message has been replied

### 3.2.13. AT+MIPLEXECUTERSP Respond to Execute Request

The command is used to respond to the execute request from OneNET or application servers. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLEXECUTERSP Respond to Execute Request** | |
|---|---|
| Test Command<br>**AT+MIPLEXECUTERSP=?** | Response<br>**+MIPLEXECUTERSP: <ref>,<msgId>,<result>[,<raiMode>]**<br><br>**OK** |
| Write Command<br>**AT+MIPLEXECUTERSP=<ref>,<msgId>,<result>[,<raiMode>]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | | | |
|---|---|---|---|
| **<ref>** | Instance ID of OneNET communication suite. | | |
| **<msgId>** | Message ID, which comes from the URC "**+MIPLEXECUTE:**". | | |
| **<result>** | The result of execute. The result codes are as follows: | | |
| | Result code | CoAP response code | Description |
| | 2 | 2.04 | Changed, indicate the correct result |
| | 11 | 4.00 | Bad Request |
| | 12 | 4.01 | Unauthorized |
| | 13 | 4.04 | Not Found |
| | 14 | 4.05 | Method Not Allowed |
| **<raiMode>** | Integer type. It specifies the flag of RAI of message transmission. Range: 0-2. | | |
| | 0 | Do not release indication | |
| | 1 | Release indication after the message | |
| | 2 | Release indication after the message has been replied. | |

### 3.2.14. AT+MIPLPARAMETERRSP Respond to Write-Attributes Request

The command is used to respond to the write-attributes request from OneNET or application server. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLPARAMETERRSP Respond to Write-Attributes Request** | |
|---|---|
| Test Command<br>**AT+MIPLPARAMETERRSP=?** | Response<br>**+MIPLPARAMETERRSP: <ref>,<msgId>,<result>[,<raiMode>]**<br><br>**OK** |
| Write Command<br>**AT+MIPLPARAMETERRSP=<ref>,<msgId>,<result>[,<raiMode>]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<msgId>** | Message ID, which comes from the URC "**+MIPLPARAMETER:**". |
| **<result>** | The result of write-attributes operation. The result codes are as follows: |

| Result code | CoAP response code | Description |
|---|---|---|
| 2 | 2.04 | Changed, indicate the correct result |
| 11 | 4.00 | Bad Request |
| 12 | 4.01 | Unauthorized |
| 13 | 4.04 | Not Found |
| 14 | 4.05 | Method Not Allowed |

| | |
|---|---|
| **<raiMode>** | Integer type. It specifies the flag of RAI of message transmission. Range: 0-2.<br>0 Do not release indication<br>1 Release indication after the message<br>2 Release indication after the message has been replied. |

### 3.2.15. AT+MIPLNOTIFY Send Data to OneNET or Application Servers

The command is used to send data to OneNET or application servers. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLNOTIFY Send Data to OneNET or Application Servers** | |
|---|---|
| Test Command<br>**AT+MIPLNOTIFY=?** | Response<br>**+MIPLNOTIFY: <ref>,<msgId>,<objId>,<insId>,<resId><valueType>,<len>,<value>,<index>,<flag>[,<ackid>[,<raiMode>]]**<br><br>**OK** |
| Write Command<br>**AT+MIPLNOTIFY=<ref>,<msgId>,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<index>,<flag>[,<ackid>[,<raiMode>]]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

**Parameter**

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<msgId>** | Message ID, which comes from the URC "**+MIPLOBSERVE:**". |
| **<objId>** | Object ID. If object ID does not exist, an error will be returned. |
| **<insId>** | Instance ID, which comes from the URC **"+MIPLOBSERVE:**". |
| **<resId>** | Resource ID, which comes from the URC **"+MIPLOBSERVE:**". |
| **<valueType>** | Type of the value<br>1 String<br>2 Opaque<br>3 Integer<br>4 Float<br>5 Boolean |
| **<len>** | Length of the value. Unit: byte.<br>When **<valueType>=1**, it is the length of the string value of **<value>**.<br>When **<valueType>=2**, it is the length of the hex value of **<value>**.<br>When **<valueType>=3**, it is not the exact length of integer value of **<value>** and should be 2, 4, or 8.<br>When **<valueType>=4**, it is not the exact length of float value of **<value>** and should be 4.<br>When **<valueType>=5**, it is 1. |

| | |
|---|---|
| **<value>** | The value.<br>When **<valueType>=1**, it is in string format, and the string should be marked with double quotation marks.<br>When **<valueType>=2**, it is in hex format.<br>When **<valueType>=3**, it is in integer format.<br>When **<valueType>=4**, it is in float format.<br>When **<valueType>=5**, it is in Boolean format. |
| **<index>** | The index number of the data. If the data is a combination of several messages, it should be separated into several parts. If it is separated into N parts, the order number of **<index>** is N-1 to 0 in descending order, and the AT command will be called in the order from the largest to the smallest number. **<index>=0** means that this is the last message of the data. |
| **<flag>** | The message indication. The range is 0-2.<br>0 Indicates the last message of the **<value>**<br>1 Indicates the first message of the **<value>**<br>2 Indicates the middle message of the **<value>**<br>Only **<flag>=0** is supported in this version now. |
| **<ackid>** | Integer type, range: 0-65535.<br>0 The data will be sent in Non-confirmable (NON) message.<br>1~65535 The data will be sent in Confirmable (CON) message and the result of message sent will be indicated by URC "**+MIPLEVENT**" URC. |
| **<raiMode>** | Integer type. It specifies the flag of RAI of message transmission. Range: 0-2.<br>0 Do not release indication<br>1 Release indication after the message<br>2 Release indication after the message has been replied. |

**NOTES**

1. If **<valueType>=2**, character of the hex value is counted as 2***<len>**.
2. If **<valueType>=4**, length of the float value is recommended to be 4 bytes and **<len>** should be 4.
3. For data composed of several messages, if one of the messages returns an error, the previous message will still be sent out.

### 3.2.16. AT+MIPLUPDATE Send Update Request

The command is used to send an update request to update lifetime and objects. Please refer to ***Chapter 6*** for possible **<err>** values.

| **AT+MIPLUPDATE Send Update Request** | |
|---|---|
| Test Command<br>**AT+MIPLUPDATE=?** | Response<br>**+MIPLUPDATE: <ref>,<lifetime>,<withObjectFlag>[,<raiMode>]** |

| | |
|---|---|
| | **OK** |
| Write Command<br>**AT+MIPLUPDATE=<ref>,<lifetime>,<withObjectFlag>[,<raiMode>]** | Response<br>**OK**<br><br>If there is any error:<br>**ERROR**<br>Or<br>**+CME ERROR: <err>** |
| Maximum Response Time | 300ms |

## Parameter

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<lifetime>** | Updated lifetime value. The range is 0 or 16-268435454. Unit: second. “0” means that the lifetime is 86400 seconds. |
| **<withObjectFlag>** | Whether to update with object list.<br>0 Update without object list.<br>1 Update with object list. |
| **<raiMode>** | Integer type. It specifies the flag of RAI of message transmission. Range: 0-2.<br>0 Do not release indication<br>1 Release indication after the message<br>2 Release indication after the message has been replied. |

# 4 OneNET Related URCs

This chapter exhibits URCs related to OneNET with descriptions.

**Table 2: OneNET Related URCs**

| SN | URC | Description |
|---|---|---|
| [1] | **+MIPLDISCOVER: <ref>,<msgId>,<objId>** | When OneNET sends a discover request, the module will report the URC when it receives the request. |
| [2] | **+MIPLOBSERVE: <ref>,<msgId>,<flag>,<objId>,<insId>,<resId>** | When OneNET or application servers send an observe request, the module will report the URC once it receives such a request. |
| [3] | **+MIPLREAD: <ref>,<msgId>,<objId>,<insId>,<resId>** | When OneNET or application servers send a read request, the module will report the URC when it receives the request. |
| [4] | **+MIPLWRITE: <ref>,<msgId>,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<flag>,<index>** | When OneNET or application servers send a write request, the module will report the URC once it receives such a request. |
| [5] | **+MIPLEXECUTE: <ref>,<msgId>,<objId>,<insId>,<resId>[,<len>,<arguments>]** | When OneNET or application servers send an execute request, the module will report the URC once it receives such a request. |
| [6] | **+MIPLPARAMETER: <ref>,<msgId>,<objId>,<insId>,<resId>,<len>,<parameter>** | When OneNET or application servers send a write-attributes request, the module will report the URC once it receives such a request. |
| [7] | **+MIPLEVENT: <ref>,<evtid>[,<extend>][,<ackid>]** | Report the URC when there is an event to be notified to TE. |

## 4.1. “+MIPLDISCOVER” URC to Inform the TE to Respond to Discover Request

The URC is mainly used to inform the TE to respond to the discover request from OneNET. The TE should respond to the request with **AT+MIPLDISCOVERRSP** command within 10 seconds after this URC is completely exported.

| “+MIPLDISCOVER” URC to Inform the TE to Respond to Discover Request | |
|---|---|
| URC Format:<br>**+MIPLDISCOVER: <ref>,<msgId>,<objId>** | Inform the TE to respond to the discover request from OneNET. |

### Parameter

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<msgId>** | Message ID of packet. |
| **<objId>** | Object ID that is received from OneNET. |

## 4.2. “+MIPLOBSERVE” URC to Inform the TE to Respond to Observe Request

The URC is mainly used to inform the TE to respond to the observe request from OneNET or application servers. If automatic responding to observe request is disabled, the TE should respond to the request with **AT+MIPLOBSERVERSP** command within 10 seconds after this URC is completely exported.

| “+MIPLOBSERVE” URC to Inform the TE to Respond to Observe Request | |
|---|---|
| URC Format:<br>**+MIPLOBSERVE: <ref>,<msgId>,<flag>,<objId>,<insId>,<resId>** | Inform the TE that there is an observe request from OneNET or application servers. |

### Parameter

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<msgId>** | Message ID of packet. |
| **<flag>** | Indicates whether to observe.<br>0 Cancel observe<br>1 Observe |
| **<objId>** | Object ID that is received from OneNET or application servers. |
| **<insId>** | Instance ID that is received from OneNET or application servers. “-1” indicates |

| | |
|---|---|
| | observe or cancel observe all resources under all instances. |
| **<resId>** | Resource ID that is received from OneNET or application servers. "-1" indicates observe or cancel observe all resources under the instance. |

## 4.3. "+MIPLREAD" URC to Inform the TE to Respond to Read Request

The URC is mainly used to inform the TE to respond to the read request from OneNET or application servers. The TE should respond to the request with **AT+MIPLREADRSP** command within 10 seconds after this URC is completely exported.

| **"+MIPLREAD" URC to Inform the TE to Respond to Read Request** | |
|---|---|
| URC Format:<br>**+MIPLREAD: <ref>,<msgId>,<objId>,<insId>,<resId>** | Inform the TE to respond to the read request from OneNET or application servers. |

### Parameter

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<msgId>** | Message ID of packet. |
| **<objId>** | Object ID that is received from OneNET or application servers. |
| **<insId>** | Instance ID that is received from OneNET or application servers. "-1" indicates read all resources under the object. |
| **<resId>** | Resource ID that is received from OneNET or application servers. "-1" indicates read all resources under the instance. |

## 4.4. "+MIPLWRITE" URC to Inform the TE to Respond to Write Request

The URC is mainly used to inform the TE to respond to the write request from OneNET or application servers. The TE should respond to the request with **AT+MIPLWRITERSP** command within 10 seconds after this URC is completely exported.

| **"+MIPLWRITE" URC to Inform the TE to Respond to Write Request** | |
|---|---|
| URC Format:<br>**+MIPLWRITE: <ref>,<msgId>,<objId>,<insId>,<resId>,<valueType>,<len>,<value>,<flag>,<index>** | Inform the TE to respond to the write request from OneNET or application servers. |

### Parameter

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<msgId>** | Message ID of packet. |
| **<objId>** | Object ID that is received from OneNET or application servers. |
| **<insId>** | Instance ID that is received from OneNET or application servers. |
| **<resId>** | Resource ID received from OneNET or application servers. |
| **<valueType>** | Type of the value (only shows in opaque currently).<br>1 String<br>2 Opaque<br>3 Integer<br>4 Float<br>5 Boolean |
| **<len>** | Length of the value. Unit: byte.<br>When **<valueType>=3**, it is 2, 4, or 8.<br>When **<valueType>=4**, it is 4.<br>When **<valueType>=5**, it is 1. |
| **<value>** | The value in hex format that is received from OneNET or application servers. |
| **<flag>** | The message indication. The range is 0-2.<br>**<flag>=0** Indicates the last message of the **<value>**<br>**<flag>=1** Indicates the first message of the **<value>**<br>**<flag>=2** Indicates the middle message of the **<value>**<br>Only **<flag>=0** is supported in this version now. |
| **<index>** | The index number of the write request. If the write request is a combination of several messages, it should be separated into several parts. If it is separated into N parts, the order number of **<index>** is N-1 to 0 in descending order, and the URC is sorted from the largest to the smallest number. **<index>=0** means this is the last message of the write request. |

**NOTE**

The data length of write request from application servers should be less than 1000 bytes, otherwise there may be a failure.

## 4.5. "+MIPLEXECUTE" URC to Inform the TE to Respond to Execute Request

The URC is mainly used to inform the TE to respond to the execute request from OneNET or application servers. The TE should respond to the request with **AT+MIPLEXECUTERSP** command within 10 seconds after this URC is completely exported.

| "+MIPLEXECUTE" URC to Inform the TE to Respond to Execute Request | |
|---|---|
| URC Format:<br>**+MIPLEXECUTE: <ref>,<msgId>,<objId>,<insId>,<resId>[,<len>,<arguments>]** | Inform the TE to respond to the execute request from OneNET or application servers. |

### Parameter

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |
| **<msgId>** | Message ID of packet. |
| **<objId>** | Object ID that is received from OneNET or application servers. |
| **<insId>** | Instance ID that is received from OneNET or application servers. |
| **<resId>** | Resource ID that is received from OneNET or application servers. |
| **<len>** | The length of **<arguments>**. Unit: character. |
| **<arguments>** | The arguments of execute operation in string type. |

## 4.6. "+MIPLPARAMETER" URC to Inform the TE to Respond to Write-Attributes Request

The URC is mainly used to inform the TE to respond to the write-attributes request from OneNET or application servers. The TE should respond to the request with **AT+MIPLPARAMETERRSP** command within 10 seconds after this URC is completely exported.

| "+MIPLPARAMETER" URC to Inform the TE to Respond to Write-Attributes Request | |
|---|---|
| URC Format:<br>**+MIPLPARAMETER: <ref>,<msgid>,<objId>,<insId>,<resId>,<len>,<parameter>** | Inform the TE to respond to the Write-Attributes request from OneNET or application servers. |

### Parameter

| | |
|---|---|
| **<ref>** | Instance ID of OneNET communication suite. |

| | |
|---|---|
| **<msgId>** | Message ID of packet. |
| **<objId>** | Object ID that is received from OneNET or application servers. |
| **<insId>** | Instance ID that is received from OneNET or application servers. “-1” indicates that the **<parameter>** is applied to all resources under the object. |
| **<resId>** | Resource ID that is received from OneNET or application servers. “-1” indicates that the **<parameter>** is applied to all resources under the instance. |
| **<len>** | The length of **<parameter>**. Unit: character. |
| **<parameter>** | The parameter of write-attributes operation in string type. |

## 4.7. “+MIPLEVENT” URC to Notify the TE of Events

The URC is mainly used to notify the TE of events.

| **“+MIPLEVENT” URC to Notify the TE of Events** | |
|---|---|
| URC Format:<br>**+MIPLEVENT: <ref>,<evtid>[,<extend>][,<ackid>]** | Notify the TE of events. |

### Parameter

| | | |
|---|---|---|
| **<ref>** | Instance ID of OneNET communication suite. | |
| **<evtid>** | Event identifier. | |
| | 1 | EVENT_BOOTSTRAP_START |
| | 2 | EVENT_BOOTSTRAP_SUCCESS |
| | 3 | EVENT_BOOTSTRAP_FAILED |
| | 4 | EVENT_CONNECT_SUCCESS |
| | 5 | EVENT_CONNECT_FAILED |
| | 6 | EVENT_REG_SUCCESS |
| | 7 | EVENT_REG_FAILED |
| | 8 | EVENT_REG_TIMEOUT |
| | 9 | EVENT_LIFETIME_TIMEOUT |
| | 10 | EVENT_STATUS_HALT |
| | 11 | EVENT_UPDATE_SUCCESS |
| | 12 | EVENT_UPDATE_FAILED |
| | 13 | EVENT_UPDATE_TIMEOUT |
| | 14 | EVENT_UPDATE_NEED |
| | 15 | EVENT_DEREG_DONE |
| | 20 | EVENT_RESPONSE_FAILED |
| | 21 | EVENT_RESPONSE_SUCCESS |
| | 25 | EVENT_NOTIFY_FAILED |
| | 26 | EVENT_NOTIFY_SUCCESS |

| | | |
|---|---|---|
| | 40 | EVENT_FIRMWARE_DOWNLOADING |
| | 41 | EVENT_FIRMWARE_DOWNLOAD_FAILED |
| | 42 | EVENT_FIRMWARE_DOWNLOADED |
| | 43 | EVENT_FIRMWARE_UPDATING |
| | 44 | EVENT_FIRMWARE_UPDATE_SUCCESS |
| | 45 | EVENT_FIRMWARE_UPDATE_FAILED |
| | 46 | EVENT_FIRMWARE_UPDATE_OVER |
| | 47 | EVENT_FIRMWARE_DOWNLOAD_DISCONNECT |
| | 48 | EVENT_FIRMWARE_ERASE_SUCCESS |
| | 49 | EVENT_FIRMWARE_ERASE_FAIL |
| **<extend>** | Extended parameter. | |
| | **<evtid>=20** | Message ID of the response command. |
| | **<evtid>=14** | The remaining time of lifetime in seconds. |
| **<ackid>** | Integer type. Range: 1-65535. Acknowledgement identifier of the CON message notified through **AT+MIPLNOTIFY**. | |

# 5 Examples

This chapter gives the examples to explain how to use OneNET related AT commands.

## 5.1. Access Configuration

This example shows how to configure bootstrap mode and bootstrap server address or access server and how to set the parameter ACK_TIMEOUT of CoAP protocol.

```
AT+MIPLCONFIG=?
+MIPLCONFIG: <mode>,<parameter1>[,<parameter2>]

OK

AT+MIPLCONFIG=1,183.230.40.39,5683          //Enable bootstrap and configure bootstrap server IP and port.

OK

AT+MIPLCONFIG?
+MIPLCONFIG: 1,183.230.40.39,5683
+MIPLCONFIG: 2,2
+MIPLCONFIG: 3,1

OK

AT+MIPLCONFIG=0,183.230.40.40,5683          //Disable bootstrap and configure access server IP and port.

OK

AT+MIPLCONFIG?
+MIPLCONFIG: 0,183.230.40.40,5683
+MIPLCONFIG: 2,2
+MIPLCONFIG: 3,1

OK

//Set ACK_TIMEOUT value to 9 seconds.
```

```
AT+MIPLCONFIG=2,1,9
OK

AT+MIPLCONFIG?
+MIPLCONFIG: 0,183.230.40.40,5683
+MIPLCONFIG: 2,9
+MIPLCONFIG: 3,1

OK
```

## 5.2. Register and Discover Operations

### 5.2.1. Register and Discover Operations (without Auto Subscription)

The following example illustrates register and discover operations under the scenario that the auto subscription function of OneNET has been disabled.

```
//Create a communication suite instance with a single command, with bootstrap mode enabled.
AT+MIPLCREATE
+MIPLCREATE: 0                          //Created the communication suite instance successfully.

OK

//Add a LWM2M object.
AT+MIPLADDOBJ=0,3311,2,"11",4,2
OK                                      //Added the object successfully. And the instance ID 0 and 1
                                          will be registered.

AT+MIPLOPEN=0,600,60                    //Send register request to OneNET.
OK

+MIPLEVENT: 0,1

+MIPLEVENT: 0,2

+MIPLEVENT: 0,4

+MIPLEVENT: 0,6                         //Registered successfully.

+MIPLDISCOVER: 0,26384,3311              //Received resource discover request.

//Respond the resource discover request with resource ID list.
AT+MIPLDISCOVERRSP=0,26384,1,19,"5850;5851;5706;5805"
```

```
OK

AT+MIPLDELOBJ=0,3311                    //Delete a LWM2M object.
OK

//Send deregister request to OneNET platform.
AT+MIPLCLOSE=0
OK

+MIPLEVENT: 0,15                        //Deregistered successfully.

//Delete the communication suite instance.
AT+MIPLDELETE=0
OK                                      //Deleted the communication suite instance successfully.
```

### 5.2.2. Register and Discover Operations (with Auto Subscription)

The following example illustrates register and discover operations under the scenario that the auto subscription function of OneNET has been enabled.

```
//Create a communication suite instance with a single command, with default setting.
AT+MIPLCONFIG?
+MIPLCONFIG: 1,183.230.40.39,5683
+MIPLCONFIG: 2,2
+MIPLCONFIG: 3,1                        //Enable response observe request by module automatically.

OK

AT+MIPLCREATE
+MIPLCREATE: 0                          //Created the communication suite instance successfully.

OK

//Add a LWM2M object.
AT+MIPLADDOBJ=0,3311,2,"11",4,2
OK                                      //Added the object successfully. And the instance ID 0 and 1
                                          will be registered.

//Send register request to OneNET.
AT+MIPLOPEN=0,600,60
OK

+MIPLEVENT: 0,1
```

```
+MIPLEVENT: 0,2

+MIPLEVENT: 0,4

+MIPLEVENT: 0,6                                  //Registered successfully.

+MIPLOBSERVE: 0,78025,1,3311,0,-1                //Received observe(3311/0) request.

+MIPLOBSERVE: 0,143562,1,3311,1,-1               //Received observe(3311/1) request.

+MIPLDISCOVER: 0,12491,3311                      //Received resource discover request.

//Respond the resource discover request with resource ID list.
AT+MIPLDISCOVERRSP=0,12491,1,19,"5850;5851;5706;5805"
OK

AT+MIPLDELOBJ=0,3311                            //Delete a LWM2M object.
OK

//Send deregister request to OneNET platform.
AT+MIPLCLOSE=0
OK

+MIPLEVENT: 0,15                                 //Deregistered successfully.

//Delete the communication suite instance.
AT+MIPLDELETE=0
OK                                               //Deleted the communication suite instance successfully.
```

## 5.3. Read Operation

### 5.3.1. Read Resource

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent a read request to the UE to read the resource (3311/0/5805).

```
+MIPLREAD: 0,3123,3311,0,5805                          //Received a read resource request

AT+MIPLREADRSP=0,3123,1,3311,0,5805,4,4,1.88,0,0       //Respond to the read request.
OK                                                     //Data 1.88 sent to application servers successfully.
```

### 5.3.2. Read Instance

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent a read request to the UE to read the instance (3311/0).

```
+MIPLREAD: 0,25466,3311,0,-1                          //Received a read instance request

AT+MIPLREADRSP=0,25466,1,3311,0,5851,5,1,1,3,0        //Respond to the read request with four
                                                        messages.
OK
AT+MIPLREADRSP=0,25466,1,3311,0,5852,3,2,123,2,0
OK
AT+MIPLREADRSP=0,25466,1,3311,0,5706,1,10,"1234567890",1,0
OK
AT+MIPLREADRSP=0,25466,1,3311,0,5805,4,4,1.88,0,0
OK
```

### 5.3.3. Read Object

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent a read request to the UE to read the object (3311).

```
+MIPLREAD: 0,39299,3311,-1,-1                         //Received a read object request

AT+MIPLREADRSP=0,39299,1,3311,0,5851,5,1,1,5,0 //Respond to the read request with six messages.
OK
AT+MIPLREADRSP=0,39299,1,3311,0,5852,3,2,123,4,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5851,5,1,1,3,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5852,3,2,123,2,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5706,1,10,"1234567890",1,0
OK
AT+MIPLREADRSP=0,39299,1,3311,1,5805,4,4,1.88,0,0
OK
```

## 5.4. Write Operation

### 5.4.1. Write Resource

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent a write request to the UE to write the resource (3311/0/5706) with value in string (hello).

```
+MIPLWRITE: 0,38017,3311,0,5706,2,5,68656C6C6F,0,0      //Received a write resource request.

AT+MIPLWRITERSP=0,38017,2                    //Respond to the write request with result code (2).
OK
```

### 5.4.2. Write Instance

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent a write request to the UE to write the instance (3311/0).

```
+MIPLWRITE: 0,46584,3311,0,5706,2,5,68656C6C6F,0,2      //Received a write instance request.

+MIPLWRITE: 0,46584,3311,0,5850,2,1,01,0,1

+MIPLWRITE: 0,46584,3311,0,5851,2,8,00000002DFDC1C3E,0,0

AT+MIPLWRITERSP=0,46584,2                    //Respond to the write request with result code (2).
OK
```

## 5.5. Execute Operation

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent an execute request to the UE with argument “reset”.

```
+MIPLEXECUTE: 0,36476,3303,0,5605,5,"reset"      //Received a execute request.

AT+MIPLEXECUTERSP=0,36476,2                  //Respond to the execute request with result code (2).
```

```
OK
```

## 5.6. Write-Attributes Operation

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent a write-attributes request to the UE.

```
+MIPLPARAMETER: 0,56642,3303,0,5700,38,"pmin=2;pmax=190;gt=100.0;lt=1.0;st=0.2"
                                          //Received a write-attributes request.

AT+MIPLPARAMETERRSP=0,56642,2             //Respond to the execute request with result code (2).
OK
```

## 5.7. Observe Operation

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has sent an observe request to the UE.
3. Automatic responding to observe request by the module is disabled.

```
+MIPLOBSERVE: 0,29620,1,3311,0,-1          //Received an observe request.

AT+MIPLOBSERVERSP=0,29620,1                //Confirm the observe request.
OK
```

## 5.8. Notify Operation

### 5.8.1. Notify Resource Data

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has observed the resource (3303/0/5700) successfully and **<msgId>** of the observe request is 122179.

```
AT+MIPLNOTIFY=0,122179,3303,0,5700,4,4,25.6,0,0          //Notify resource data.
OK
```

### 5.8.2. Notify Instance Data

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has observed the instance (3303/0) successfully and **<msgId>** of the observe request is 653687.

```
AT+MIPLNOTIFY=0,653687,3303,0,5700,4,4,10.24,3,0         //Notify instance data.
OK

AT+MIPLNOTIFY=0,653687,3303,0,5701,1,3,"Cel",2,0
OK

AT+MIPLNOTIFY=0,653687,3303,0,5601,4,4,0.16,1,0
OK

AT+MIPLNOTIFY=0,653687,3303,0,5602,4,4,100.86,0,0
OK
```

### 5.8.3. Notify Object Data

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has observed the object (3303) successfully and **<msgId>** of the observe request is 196301.

```
AT+MIPLNOTIFY=0,196301,3303,0,5700,4,4,9.8,3,0           //Notify instance (0) data.
OK

AT+MIPLNOTIFY=0,196301,3303,0,5701,1,3,"Cel",2,0
OK

AT+MIPLNOTIFY=0,196301,3303,0,5601,4,4,0.16,1,0
OK

AT+MIPLNOTIFY=0,196301,3303,0,5602,4,4,99.8,0,0
OK
```

```
AT+MIPLNOTIFY=0,196301,3303,1,5700,4,4,0.2,3,0          //Notify instance (1) data.
OK

AT+MIPLNOTIFY=0,196301,3303,1,5701,1,3,"Cel",2,0
OK

AT+MIPLNOTIFY=0,196301,3303,1,5601,4,4,3.2,1,0
OK

AT+MIPLNOTIFY=0,196301,3303,1,5602,4,4,100.1,0,0
OK
```

### 5.8.4. Notify Resource Data with <ackid>

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has observed the resource (3303/0/5701) successfully and **<msgId>** of the observe request is 307353.

```
AT+MIPLNOTIFY=0,307353,3303,0,5701,1,3,"Cel",0,0,255    //Notify resource data with <ackid> (255).
OK

+MIPLEVENT: 0,26,255                                    //Return notification results.
```

### 5.8.5. Notify Instance Data with <ackid>

Prerequisites:

1. The UE has registered to OneNET successfully.
2. The application server has observed the resource (3303/0) successfully and **<msgId>** of the observe request is 487674.

```
AT+MIPLNOTIFY=0,487674,3303,0,5700,4,4,170.1,3,0,258    //Notify resource data with <ackid> (258).
OK

AT+MIPLNOTIFY=0,487674,3303,0,5701,1,3,"Cel",2,0,258
OK

AT+MIPLNOTIFY=0,487674,3303,0,5601,4,4,106.1,1,0,258
OK

AT+MIPLNOTIFY=0,487674,3303,0,5602,4,4,660.9,0,0,258
```

```
OK

+MIPLEVENT: 0,26,258                    //Return notification results
```

## 5.9. Update Operation

### 5.9.1. Update Operation

Prerequisite:

The UE has registered to OneNET successfully.

```
AT+MIPLUPDATE=0,86400,0                 //Update lifetime to 86400 seconds.
OK

+MIPLEVENT: 0,11                        //Return update result.
```

# 6 Summary of <err> Values

This chapter introduces the **<err>** values related to BC25 and BC32 modules.

The error values listed in the following two tables are compliant with the 3GPP specifications. Customers can refer to *3GPP TS 27.007 V13.5.0, sub-clause 9.2* for all possible **<err>** values.

**Table 3: General Errors (27.007)**

| <err> Values | Description |
|---|---|
| 3 | Operation not allowed |
| 4 | Operation not supported |
| 23 | Memory failure |
| 30 | No network service |
| 50 | Execute fail |
| 52 | Option not support |
| 53 | Param invalid |
| 159 | Uplink busy/flow control |

**Table 4: General Errors (27.005)**

| <err> Values | Description |
|---|---|
| 300 | ME failure |
| 301 | SMS service of ME reserved |
| 302 | Operation not allowed |
| 303 | Operation not supported |
| 304 | Invalid PDU mode parameter |

| | |
|---|---|
| 305 | Invalid text mode parameter |
| 310 | USIM not inserted |
| 311 | USIM PIN required |
| 312 | PH-USIM PIN required |
| 313 | USIM failure |
| 314 | USIM busy |
| 315 | USIM wrong |
| 316 | USIM PUK required |
| 317 | USIM PIN2 required |
| 318 | USIM PUK2 required |
| 320 | Memory failure |
| 321 | Invalid memory index |
| 322 | Memory full |
| 330 | SMSC address unknown |
| 331 | No network service |
| 332 | Network timeout |
| 340 | No +CNMA acknowledgement expected |
| 500 | Unknown error |

**NOTE**

**AT+CMEE=<n>** command disables (**<n>=0**) or enables (**<n>=1**, **<n>=2**) the use of final result code **+CME ERROR:<err>**.

# 7 Appendix A References

**Table 5: Related Documents**

| SN | Document Name | Remark |
|---|---|---|
| [1] | IPSO-Smart-Objects-Starter-Pack | Internet Protocol for Smart Objects (IPSO) Alliance |
| [2] | OMA-TS-LightweightM2M-V1_0 | Open Mobile Alliance LwM2M Specification |
| [3] | Quectel_BC25_AT_Commands_Manual_V1.0 | The AT command manual of BC25 module |
| [4] | Quectel_BC32_AT_Commands_Manual_V1.0 | The AT command manual of BC32 module |

**Table 6: Terms and Abbreviations**

| Abbreviation | Description |
|---|---|
| CoAP | Constrained Application Protocol |
| ID | Identifier |
| LwM2M | Lightweight Machine to Machine |
| LPWA | Low-Power Wide-Area |
| ME | Mobile Equipment |
| NB-IoT | Narrow Band Internet of Things |
| REST | Representational state transfer |
| TE | Terminal Equipment (Typically the MCU) |
| UE | User Equipment (Typically the Module) |
| URC | Unsolicited Result Code |