# xN930 MBIM Command Functional Specification

1VV0301083 Rev.2 – 2013-12-25


Making machines talk.

APPLICABILITY TABLE

| PRODUCT |
| --- |
| LN930 |
| LN930-AP |
| HN930 |



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# 1 Introduction

The Mobile Broadband Interface Model is based on the USB communication class Network Control Model (NCM). MBIM extends the NCM specification control IP packet transfer between host and USB device. Please check MBIM specification [3].

## 1.1 Scope

This document covers all the MBIM commands required for Intel XMM62xx, XMM63xx and XMM7xxxx platforms. If any feature is specific to only one (or part of platforms), that will be outlined in this document.

## 1.2 Purpose

The purpose of this document is to specify all the MBIM commands. The document follows the USB MBIM specification [3] unless otherwise specified.

## 1.3 Architectural Overview

Please refer MBIM Inter-working Architectural specification for further details.



 

## 1.4 Related Documents

| # | Title | Source ( if provided) |
|---|---|---|
| **1** | USB Communications Class Subclass Specification for Mobile Broadband Interface Model | http://www.usb.org/developers/devclass_docs#approved |
| **2** | Microsoft Mobile Broadband API Reference | http://msdn.microsoft.com/en-us/library/dd323267(v=vs.85).aspx |



 

# 2 MBIM Commands

The MBIM commands are identified based on Command Ids (CIDs). This specification details the CIDs required for XMM platforms. This section gives detail about each CIDs

## 2.1 MBIM_CID_DEVICE_CAPS

Refer section 10.5.1 of USB MBIM Specification 3

## 2.2 MBIM_CID_SUBSCRIBER_READY_STATUS

Refer section 10.5.2 of USB MBIM Specification 3

## 2.3 MBIM_CID_RADIO_STATE

Refer section 10.5.3 of USB MBIM Specification 3

## 2.4 MBIM_CID_PIN

Refer section 10.5.4 of USB MBIM Specification 3

## 2.5 MBIM_CID_PIN_LIST

Refer section 10.5.5 of USB MBIM Specification 3

PinDescDeviceSimPin is not supported

SIM LOCK is mapped to first inserted SIM card (PinDescDeviceFirstSimPin)



 

## 2.6 MBIM_CID_HOME_PROVIDER

Refer section 10.5.6 of USB MBIM Specification 3

## 2.7 MBIM_CID_PREFERRED_PROVIDERS

Refer section 10.5.7 of USB MBIM Specification 3

## 2.8 MBIM_CID_VISIBLE_PROVIDERS

Refer section 10.5.8 of USB MBIM Specification 3

## 2.9 MBIM_CID_REGISTGER_STATE

Refer section 10.5.9 of USB MBIM Specification 3

## 2.10 MBIM_CID_PACKET_SERVICE

Refer section 10.5.10 of USB MBIM Specification 3

## 2.11 MBIM_CID_SIGNAL_STATE

Refer section 10.5.11 of USB MBIM Specification 3

## 2.12 MBIM_CID_CONNECT

Refer section 10.5.12 of USB MBIM Specification 3



 

## 2.13 MBIM_CID_SMS_CONFIGURATION

Refer section 10.5.15 of USB MBIM Specification 3

## 2.14 MBIM_CID_SMS_READ

Refer section 10.5.16 of USB MBIM Specification 3

## 2.15 MBIM_CID_SMS_SEND

Refer section 10.5.17 of USB MBIM Specification 3

## 2.16 MBIM_CID_SMS_DELETE

Refer section 10.5.18 of USB MBIM Specification 3

## 2.17 MBIM_CID_MESSAGE_STORE_STATUS

Refer section 10.5.19 of USB MBIM Specification 3

## 2.18 MBIM_CID_IP_CONFIGURATION

Refer section 10.5.20 of USB MBIM Specification 3

## 2.19 MBIM_CID_USSD

Refer section 10.5.21 of USB MBIM Specification 3



 

## 2.20 MBIM_CID_PHONEBOOK_CONFIGURATION

Refer section 10.5.22 of USB MBIM Specification 3

Unsolicited Notification is not supported

## 2.21 MBIM_CID_PHONEBOOK_READ

Refer section 10.5.23 of USB MBIM Specification 3

## 2.22 MBIM_CID_PHONEBOOK_DELETE

Refer section 10.5.4 of USB MBIM Specification 3

## 2.23 MBIM_CID_PHONEBOOK_WRITE

Refer section 10.5.25 of USB MBIM Specification 3

## 2.24 MBIM_CID_STK_PAC

Refer section 10.5.26 of USB MBIM Specification 3

## 2.25 MBIM_CID_STK_TERMINAL_RESPONSE

Refer section 10.5.27 of USB MBIM Specification 3

## 2.26 MBIM_CID_STK_ENVELOP

Refer section 10.5.28 of USB MBIM Specification 3



 

## 2.27 MBIM_CID_DEVICE_SERVICES

Refer section 10.5.29 of USB MBIM Specification 3

## 2.28 MBIM_CID_DEVICE_SERVICE_SUBSCRIBE_LIST

Refer section 10.5.30 of USB MBIM Specification 3

## 2.29 MBIM_CID_AKA_AUTH

Refer section 10.5.31 of USB MBIM Specification 3

## 2.30 MBIM_CID_SIM_AUTH

Refer section 10.5.33 of USB MBIM Specification 3

## 2.31 MBIM_CID_NETWORK_IDLE_HINT

Refer section 10.5.35 of USB MBIM Specification 3

## 2.32 MBIM_CID_IP_PACKET_FILTERS

Refer section 10.5.37 of USB MBIM Specification Revision 1.0

## 2.33 MBIM_CID_ ATDS_SIGNAL

Refer Section 5 of AT&T Windows 8 Extended API Requirements version 1.6.1

## 2.34 MBIM_CID_ ATDS_LOCATION

Refer Section 5 of AT&T Windows 8 Extended API Requirements version 1.6.1



 

# 2.35 MBIM_CID_ ATDS_OPERATORS

Refer Section 5 of AT&T Windows 8 Extended API Requirements version 1.6.1

# 2.36 MBIM_CID_ ATDS_REGISTER_STATE

Refer Section 5 of AT&T Windows 8 Extended API Requirements version 1.6.1

# 2.37 MBIM_CID_ ATDS_RAT

Refer Section 5 of AT&T Windows 8 Extended API Requirements version 1.6.1

# 2.38 MBIM_CID_ ATDS_RAT_DISPLAY

Refer Section 7 of AT&T Windows 8 Extended API Requirements version 1.6.1

# 2.39 MBIM_CID_SAR_CONFIG

## 2.39.1 Description

The command sets or returns information about a MB device's SAR mode.

**Query:**

InformationBuffer on MBIM_COMMAND_MSG is not used. MBIM_SAR_CONFIG returned in Information Buffer of MBIM_COMMAND_DONE.

**Set:**

InformationBuffer on MBIM_COMMAND_MSG contains MBIM_SAR_CONFIG. MBIM_SAR_CONFIG is returned in InformationBuffer of MBIM_COMMAND_DONE.

**Unsolicited Event:**

Not Applicable

## 2.39.2 Parameters

**Table 1: Parameters**



 

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM _SAR_CONFIG | Empty | NA |
| **Response** | MBIM _SAR_CONFIG | MBIM_SAR_CONFIG | NA |

### 2.39.3 Data structures

**Table 2: MBIM_SAR_STATUS**

| Types | Value | Description |
|---|---|---|
| MBIM_SAR_STATUS_ENABLED | 1 | The SAR power restriction is enabled. Therefore the Modem shall take into account the SAR Setting table provided in the command. |
| MBIM_SAR_STATUS_DISABLED | 0 | The SAR power restriction is disabled Therefore the Modem shall ignore the SAR Setting table provided in the command. |

**Table 3: MBIM_SAR_CONFIG**

| Offset | Size | Fixed | Type | Description |
|---|---|---|---|---|
| 0 | 4 | SarStatus | MBIM_SAR_STATUS | The status of the SAR power restriction (enabled or disabled). This parameter is band independent |
| 4 | 4 | Level | UINT32 | Level for which the transmit power limits have to be applied. Level supported in range 1-8. Optional. Default value is Level 1 |



 

### 2.39.4 Set

The MBIM_SAR_CONFIG structure shall be used in the InformationBuffer.

### 2.39.5 Query

The InformationBuffer shall be null and InformationBufferLength shall be zero.

### 2.39.6 Response

The MBIM_SAR_CONFIG structure shall be used in the InformationBuffer.

### 2.39.7 Notification

NA.



 

### 2.39.8 Status codes

**Table 4: Status Codes**

| | |
|---|---|
| MBIM_STATUS_INVALID_PARAMETERS | Some input parameter has invalid format, e.g. a specified band is not supported or all bands of one RAT are set to disable. |

## 2.40 MBIM_CID_THERMAL_STATE

### 2.40.1 Description

The command sets or returns information about the thermal state of the WWAN device.

**Query:**

InformationBuffer on MBIM_COMMAND_MSG contains MBIM_QUERY_THERMAL_STATE. MBIM_THERMAL_STATE_INFO is returned in InformationBuffer of MBIM_COMMAND_DONE.

**Set:**

InformationBuffer on MBIM_COMMAND_MSG contains MBIM_THERMAL_CONFIG. MBIM_THERMAL_CONFIG is returned in InformationBuffer of MBIM_COMMAND_DONE.

**Unsolicited Event:**

The Event InformationBuffer contains an MBIM_THERMAL_STATE_INFO structure.



 

## 2.40.2 Parameters

**Table 5:Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_THERMAL_CONFIG | MBIM_QUERY_THERMAL_STATE | NA |
| **Response** | MBIM_THERMAL_CONFIG | MBIM_THERMAL_STATE_INFO | MBIM_THERMAL_STATE_INFO |

## 2.40.3 Data structures

**Table 6: MBIM_THERMAL_THRESHOLD_SETTING**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | Enable | UINT32 | 0 to disable / unarm the threshold. In this mode, no notification is triggered<br><br>1 to enable. |
| 4 | 4 | TemperatureSensorID | UINT32 | Unique Identifier for the thermal sensor on the module. Must be 0 for WWAN module. |
| 8 | 4 | AlarmID | UINT32 | One based index of the temperature threshold to be programmed. Typically DPTF will use indices 1 and 2 (for two programmable thresholds) |
| 12 | 4 | ThresholdValue | UINT32 | Indicates the threshold temperature value to be compared against the current temperature value to generate notifications. The unit of this value is in 1/10th of Celsius Degree. |
| 16 | 4 | HysteresisValue | UINT32 | Indicates the hysteresis that needs to be used for generating cross interrupt. in 1/10th of Celsius Degrees. |
| 20 | 4 | Sampling Period | UINT32 | Indicates the time interval that the firmware will use to monitor the thermal sensor when the modem is active. |



 

### 2.40.4 Set

Sets a trigger threshold, overrides the previous one if any.

**Table 7: MBIM_THERMAL_CONFIG**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | Threshold0 | MBIM_THERMAL_THRESHOLD_SETTING | Threshold 0 |
| 24 | 24 | Threshold1 | MBIM_THERMAL_THRESHOLD_SETTING | Threshold 1 |
| 48 | 24 | Threshold2 | MBIM_THERMAL_THRESHOLD_SETTING | Threshold 2 |
| 2 | 4 | Threshold3 | MBIM_THERMAL_THRESHOLD_SETTING | Threshold 3 |

Remark: When the MBIM_CID_THERMAL_STATE set command is sent, it will override any prior MBIM_CID_THERMAL_STATE set command for a specific thermal sensor and the new thresholds as identified by the MBIM_THERMAL_CONFIG structure passed in is used

When the MBIM extension handler passes the threshold values to the AT command handler, it assigns and maintains a unique ID for the threshold as required by the AT command.

The MBIM extension handler also stores the programmed threshold values from the host and returns the same back in the MBIM_THERMAL_CONFIG as part of the response structures during set and query operations.

At a time there can be a maximum of 4 thresholds per Thermal Sensor. During each set command, there be a maximum of 4 thresholds passed with 4 different ThermalSensorID and AlarmID combination. If more thresholds need to be set, then multiple of the set commands may be issued with different ThermalSensorID values. However, there can be only 4 AlarmIDs per ThermalSensorID.

For modules that have more than one thermal sensor, the Set command may include many MBIM_THERMAL_THRESHOLD_SETTING structure with different ThermalSensorID values. There may also be many MBIM_THERMAL_THRESHOLD_SETTING structures for the same ThermalSensorID (maximum of 4). It is the responsibility of the MBIM Extension handler to send as many AT command sequences as needed to pass all the thresholds to the modem firmware.

In general, it is advisable for the MBIM extension handler to remove all Alarms for a specific temp_sensor_id before programming the new set of trip points in response to MBIM_CID_THERMAL_STATE Set Command. The host SW will ensure all Alarms for a specific temp_sensor_id is passed in any time a specific Alarm need to be changed.

When a new alarm ID is created by the host, if the measured temperature is found to be higher than trip point (threshold), then this event has to be



reported. However, if the temperature is lower than [threshold – hysteresis] when alarm ID is created, then no event to report.

The graph below explains the event reporting behavior in typical scenario:

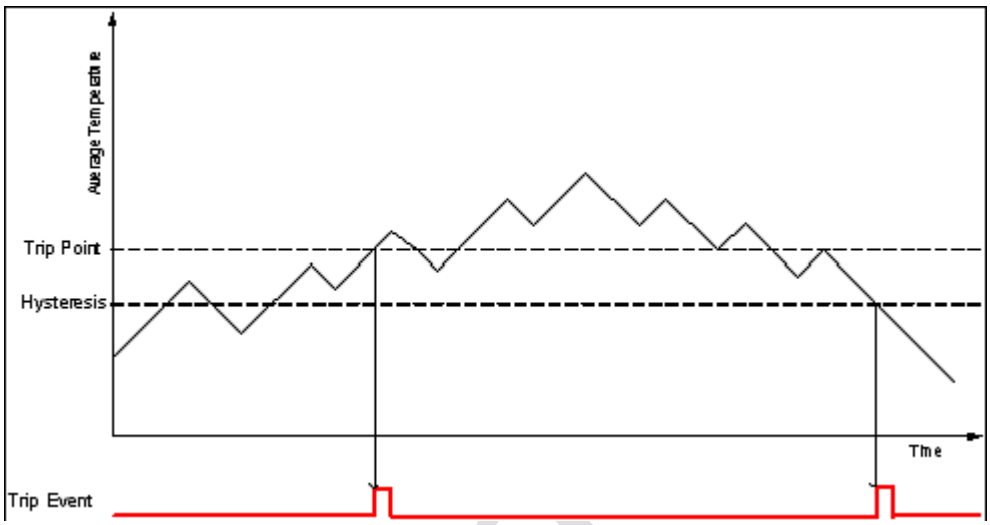


**Figure 1: Thermal State**

### 2.40.5 Query

The following structure shall be used in the InformationBuffer.

**Table 8: MBIM_QUERY_THERMAL_STATE**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | TemperatureSensorID | UINT32 | Unique Identifier for the thermal sensor on the module.<br>Must be 0 for WWAN module. |



### 2.40.6 Response

The following structure shall be used in the InformationBuffer for MBIM_CID_THERMAL_STATE Query command and for the Unsolicited Notification Event.

For the MBIM_CID_THERMAL_STATE Query command, the MBIM Extension handler uses the AT+XTAMR AT command to query the thermal sensor and return the temperature value.

**Table 9: MBIM_THERMAL_STATE_INFO**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | CurrentTemperature Value | INT32 | The current value of the temperature measures by the device, in 1/10th of Celsius Degrees. |
| 4 | sizeof(MBIM_THERMAL_THRESHOLD_SETTING) | Threshold | MBIM_THERMAL_THRESHOLD_SETTING | The specific threshold that was crossed. When this structure is returned in response to a Query, this structure shall be ignored. |

### 2.40.7 Notification

Notifications are raised when the current temperature crosses one of the thresholds programmed with the MBIM_THERMAL_CONFIG command. No notification is raised if the threshold was programmed with Enabled = 0.

See MBIM_THERMAL_STATE_INFO.

### 2.40.8 Status codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).



 

# 2.41 MBIM_CID_MODEM_REBOOT

## 2.41.1 Description

The firmware update application needs to trigger a reboot of the device in firmware update mode. Therefore a specific MBIM command is defined which shuts down normal operation and restarts the device in firmware update mode.

This command reboots the device into firmware update mode. After the command is sent the device shuts down and reboots in firmware update mode.

## 2.41.2 Parameters

**Table 10: Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | Empty | N/A | N/A |
| **Response** | Empty | N/A | N/A |

## 2.41.3 Data Structures

Not Applicable

## 2.41.4 Set

The InformationBuffer shall be null and InformationBufferLength shall be zero.

## 2.41.5 Query

Not Applicable



 

### 2.41.6 Response

Empty

### 2.41.7 Notification

Not Applicable

### 2.41.8 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).

## 2.42 MBIM_CID_INTC_ADPCLK_MODE

### 2.42.1 Description

The command returns information about a MB device's frequency information for adaptive clocking purpose.

### 2.42.2 Parameters

**Table 11 Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_ADPCLK_ACTIVATE | Empty | NA |
| **Response** | Empty | MBIM_ADPCLK_FREQ_INFO | MBIM_ADPCLK_FREQ_INFO |

### 2.42.3 Data Structures

**Table 12 MBIM_ADPCLK_ACTIVATE**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | State | MBIM_ADP_CLK_STATE | This enables or disables adaptive clocking in the modem. On receiving this command to activate, the modem should start sending unsolicited events. On de-activating, the modem should stop sending unsolicited events |

**Table 13 MBIM_ADP_CLK_STATE**

| Types | Value |
|---|---|
| MBIMAdpClkDeActivate | 0 |
| MBIMAdpClkActivate | 1 |

**Table 14 MBIM_ADPCLK_FREQ_VALUE**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 8 | CenterFrequency | UINT64 | The center frequency of the channel number in Hz, should be zero when the radio is off. This is host receiver channel frequency. |
| 4 | 4 | FrequencySpread | UINT32 | The frequency spread of the channel number in Hz, should be zero when the radio is off. This is host receiver channel frequency spread. |
| 8 | 4 | NoisePower | UINT32 | Optional.<br>The noise power referred at antenna in dBm, at the reported center frequency, and integrated over a bandwidth equal to reported frequency spread. This value shall be zeroed if not used. |
| 12 | 4 | RelativeSignalStrengthIndication | UINT32 | Optional.<br>The Relative Signal Strength Indication in dBm |
| 16 | 4 | ConnectStatus | UINT32 | Optional<br>The radio connect state – 1 when connected to the Base Station,<br>The radio connect state – 0, when disconnected from the Base Station |

**Table 15 MBIM_ADPCLK_FREQ_INFO**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | ElementCount (EC) | UINT32 | Number of elements in array.<br>In case of LTE or any other technology that requires multiple bands (consecutive or not) will report the frequency in many array elements.<br>If the technology only requires one band, this array will contain one element only. |
| 4 | 8*EC | ElementOffset LengthPair | OL_PAIR_LIST | First element of the pair is a 4 byte Offset in bytes, calculated from the beginning (offset 0) of this MBIM_ADPCLK_FREQ_INFO structure, to a MBIM_ADPCLK_FREQ_VALUE structure. Second element of the pair is a 4 byte size of the record element |



| | | | | |
|---|---|---|---|---|
| 4+8*EC | | DataBuffer | DATABUFFER | Array of MBIM_ADPCLK_FREQ_VALUE structures |

### 2.42.4 Set

Set command will be called to enable/disable Adaptive Clocking.

### 2.42.5 Query

Query is called with information buffer as NULL and InformationBufferLength shall be zero.
MBIM_ADPCLK_FREQ_INFO returned in InformationBuffer of MBIM_COMMAND_DONE

### 2.42.6 Response

MBIM_ADPCLK_FREQ_INFO returned in InformationBuffer of MBIM_COMMAND_DONE

### 2.42.7 Notification

The Event InformationBuffer contains an MBIM_ADPCLK_FREQ_INFO structure.

### 2.42.8 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).

## 2.43 MBIM_CID_INTC_TRACE

### 2.43.1 Description

The CID is used to set the trace config.



 

### 2.43.2 Parameters

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_CID_TRACE_CONFIG | Empty | NA |
| **Response** | MBIM_CID_TRACE_CONFIG | MBIM_CID_TRACE_CONFIG | NA |

### 2.43.3 Data Structures

**Table 16 MBIM_CID_TRACE_CONFIG**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | Configuration | UINT32 | Configuration value for trace configuration<br>0 - tracing disabled<br>1 – default configuration for tracing<br>2 – n other trace configurations (currently not supported) |

### 2.43.4 Set

Set operation is used to enable/disable the trace based on configuration value provided in MBIM_CID_TRACE_CONFIG structure

### 2.43.5 Query

Returns MBIM_CID_TRACE_CONFIG structure as response.

### 2.43.6 Response

MBIM_CID_TRACE_CONFIG structure is returned as response to Set and Query operation.

### 2.43.7 Notification

Not Applicable for MBIM_CID_INTC_TRACE, but enables notification MBIM_CID_INTC_TRACE_DATA and will be sent to host when tracing is enabled.



 

### 2.43.8 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).

## 2.44 MBIM_CID_INTC_TRACE_DATA

### 2.44.1 Description

The CID presents the trace data to host.

### 2.44.2 Parameters

**Table 17 Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_CID_TRACE_CONFIG | Empty | NA |
| **Response** | MBIM_CID_TRACE_CONFIG | MBIM_CID_TRACE_CONFIG | NA |

### 2.44.3 Data Structures

**Table 18 MBIM_CID_TRACE_CONFIG**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | Configuration | UINT32 | Configuration value for trace configuration<br>0 - tracing disabled<br>1 – default configuration for tracing<br>2 – n other trace configurations (currently not supported) |

### 2.44.4 Set

Set operation is used to enable/disable the trace based on configuration value provided in MBIM_CID_TRACE_CONFIG structure

### 2.44.5 Query

Returns MBIM_CID_TRACE_CONFIG structure as response.



 

### 2.44.6 Response

MBIM_CID_TRACE_CONFIG structure is returned as response to Set and Query operation.

### 2.44.7 Notification

Not Applicable for MBIM_CID_INTC_TRACE, but enables notification MBIM_CID_INTC_TRACE_DATA and will be sent to host when tracing is enabled.

### 2.44.8 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).

## 2.45 MBIM_CID_INTC_NRTAPP

### 2.45.1 Description

This command is used to set and get the application related information in/from UE.

***Note:*** NRTC is available in REL9 and above only.

### 2.45.2 Parameters

**Table 19 Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_NRTC_APP_INFO | Empty | NA |
| **Response** | Empty | MBIM_NRTC_APP_INFO | NA |

### 2.45.3 Data Structures



 

**Table 20 MBIM_NRTC_APP_INFO**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 2 | Period | UINT16 | Required application service period ms. Overrides any previous use |
| 2 | 2 | Duration | UINT16 | Required application service duration ms. Overrides any previous use. |

### 2.45.4 Set

MBIM_ NRTC_APP_INFO returned in InformationBuffer of MBIM_COMMAND_DONE.

### 2.45.5 Query

InformationBuffer in command_msg is not used, MBIM_ NRTC_APP_INFO returned in InformationBuffer of MBIM_COMMAND_DONE

### 2.45.6 Response

MBIM_ NRTC_APP_INFO returned in InformationBuffer of MBIM_COMMAND_DONE.

### 2.45.7 Notification

NA

### 2.45.8 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).

## 2.46 MBIM_CID_INTC_NRTCWS

### 2.46.1 Description

Coexisting LTE and CWS (WLAN and BT) are likely to generate harmonics and spur issues in several bands, contiguous or not. This



 

command is used to exchange the state and frequency information of these devices.

***Note:*** NRTC is available in REL9 and above only.

## 2.46.2 Parameters

**Table 21 Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_NRTCWS_CFG | Empty | NA |
| **Response** | Empty | MBIM_NRTCWS_CFG | MBIM_NRTCWS_INFO |

## 2.46.3 Data Structures

**Table 22 MBIM_NRTCWS_CFG**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 2 | Mode | UINT16 | Enable/Disable/set unsolicited notification or pass the configuration to modem. If Mode is 0 or 1 rest of the parameters need not be provided. |
| 2 | 2 | WLAN_Active | UINT16 | Indicates WLAN is active or not. |
| 4 | 2 | WLAN_Safe_Rx | UINT16 | Indicates WLAN is in safe frequency range or not. |
| 6 | 2 | WLAN_Bandwidth | UINT16 | WLAN bandwidth. |
| 8 | 2 | BT_Active | UINT16 | Indicates BT is active or not. |
| 10 | 2 | BT_Safe_Rx | UINT16 | Indicates BT is in safe frequency range or not. |

**Table 23 MBIM_NRTCWS_INFO**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 2 | LTE_Active | UINT16 | Indicates LTE is active or not. |
| 2 | 2 | WLAN_Safe_Rx_Min | UINT16 | Lower limit of frequency(in Mhz) where WLAN can receive when LTE is Transmitting. |
| 4 | 2 | WLAN_Safe_Rx_Max | UINT16 | Upper limit of frequency(in Mhz) where WLAN can receive when LTE is Transmitting. |
| 6 | 2 | BT_ Safe_Rx_Min | UINT16 | Lower limit of frequency(in Mhz) where BT can receive when LTE is Transmitting |



| | | | | |
|---|---|---|---|---|
| 8 | 2 | BT_ Safe_Rx_Max | UINT16 | Upper limit of frequency(in Mhz) where BT can receive when LTE is Transmitting. |
| 10 | 2 | LTE_SPS_Periodicity | UINT16 | Semi-Persistent scheduling periodicity. |
| 12 | 2 | LTE_SPS_Duration | UINT16 | SPS duration. |
| 14 | 2 | LTE_SPS_Initial_Offset | UINT16 | SPS Initial offset. |

***Note:*** In cases of Query and Notification, to represent a value that is not known (or invalid) we have to use 0XFFFF to distinguish it from '0' which is a valid value.

### 2.46.4 Set

MBIM_NRTCWS_CFG is used in InformationBuffer on MBIM_COMMAND_MSG. Result in form of Status codes is retruned in InformationBuffer of MBIM_COMMAND_DONE.

### 2.46.5 Query

For query, InformationBuffer is empty. MBIM_NRTCWS_CFG is returned in InformationBuffer of MBIM_COMMAND_DONE

### 2.46.6 Response

MBIM_NRTCWS_CFG returned in InformationBuffer of MBIM_COMMAND_DONE.

### 2.46.7 Notification

The Event InformationBuffer contains an MBIM_NRTCWS_INFO structure

### 2.46.8 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).



 

# 2.47 MBIM_CID_INTC_USBPROFILE

## 2.47.1 Description

The CID is used to send AT@ command to set or get the NVM Configuration.

## 2.47.2 Parameters

**Table 24 Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_USBPROFILE_CMD | NA | NA |
| **Response** | MBIM_USBPROFILE_RSP | NA | NA |

## 2.47.3 Data Structures

**Table 25 MBIM_USBPROFILE_CMD**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | CmdLength | UINT32 | Length of the AT@ Command String |
| 4 | | CmdBuffer | DATABUFFER | AT@ Command string used in normal AT commands |

**Table 26 MBIM_USBPROFILE_RSP**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | RspLength | UINT32 | Length of response string |
| 4 | | RspBuffer | DATABUFFER | Response string for AT@ Command |

## 2.47.4 Set

Informationbuffer of MBIM_COMMAND_MSG contains

MBIM_USB_PROFILE_CMD. MBIM_USB_PROFILE_RSP is returned

in InformationBuffer of MBIM_COMMAND_DONE



 

### 2.47.5 Query

NA.

### 2.47.6 Response

MBIM_USBPROFILE_RSP structure is returned for set CID.

### 2.47.7 Notification

NA.

### 2.47.8 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).

***Note:***

1. Any other command shall not be supported, although the MBIM command structure is generic.
2. Also the coding of the string will not be 16 bit UTF, but default coding used for AT commands.

## 2.48 MBIM_CID_INTC_CIQ

### 2.48.1 Description

This command is used to Enable/Disable CIQ.



 

## 2.48.2 Parameters

**Table 27 Parameters**

| | Set | Query | Notification |
|---|---|---|---|
| **Command** | MBIM_CIQ_SET | Empty | NA |
| **Response** | Empty | MBIM_CIQ_INFO | NA |

## 2.48.3 Data Structures

**Table 28 MBIM_CIQ_SET**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | Mode | UINT32 | 0 or 1 for Enable/Disable of CIQ.<br>2 indicates force enable regardless of Metrics Client registrations |
| 4 | 4 | Debug_Info_Size | UINT32 | Size of debug string excluding null character (see section 10.4 from MBIM spec) |
| 8 | | Debug_Info | DATABUFFER | String containing debug info |

**Table 29 MBIM_CIQ_INFO**

| Offset | Size | Field | Type | Description |
|---|---|---|---|---|
| 0 | 4 | Mode | UINT32 | 0 or 1 for Enable/Disable of CIQ.<br>2 indicates force enable regardless of Metrics Client registrations |

## 2.48.4 Set

MBIM_CIQ_SET is sent as InformationBuffer on MBIM_COMMAND_MSG. Return status is obtained in InformationBuffer of MBIM_COMMAND_DONE

## 2.48.5 Response

MBIM_CIQ_INFO structure is returned for Query CID.

## 2.48.6 Notification

NA.



### 2.48.7 Status Codes

This CID only uses Generic Status Codes (see section 9.4.5 from MBIM spec).



 

# 3 MBIM Services

**Table 30: Services defined by MBIM**

| Service Name | UUID | UUID Value |
|---|---|---|
| Basic IP Connectivity | UUID_BASIC_CONNECT | a289cc33-bcbb-8b4f-b6b0-133ec2aae6df |
| SMS | UUID_SMS | 533fbeeb-14fe-4467-9f90-33a223e56c3f |
| USSD | UUID_USSD | e550a0c8-5e82-479e-82f7-10abf4c3351f |
| Phonebook | UUID_PHONEBOOK | 4bf38476-1e6a-41db-b1d8-bed289c25bdb |
| STK (SIM Toolkit) | UUID_STK | d8f20131-fcb5-4e17-8602-d6ed3816164c |
| Authentication | UUID_AUTH | 1d2b5ff7-0aa1-48b2-aa52-50f15767174e |
| Device Service Stream | UUID_DSS | c08a26dd-7718-4382-8482-6e0d583c4d0e |
| Intel firmware update service | UUID_INTEL_FWUSVC | 0ed374cb-f835-4474-bc11-3b3fd76f5641 |
| INTEL_DPTF | UUID_INTEL_DPTF | fdc22af2-f441-4d46-af8d-259fcdde4635 |
| INTEL_SAR | UUID_INTEL_SAR | 10e40d69-375a-42ce-a297-906164f2754c |
| Microsoft Host Shutdown | UUID_MS_HOSTSHUTDOWN | 883b7c26-985f-43fa-9804-27d7fb80959c |
| INTEL_ADAPTIVE_CLOCKING | UUID_INTEL_ACT | ed19555d-a6ac-4327-8eb1-fc022e5e2388 |
| Intel Trace service | UUID_INTEL_TRCSVC | 59a7f323-fe5a-4301-b185-b8ea9e6167b7 |
| AT&T Extensions | UUID_ATDS | 5967bdcc-7fd2-49a2-9f5c-b2e70e527db3 |
| INTEL NRTC | UUID_INTEL_NRTC | 2b6d8c5a-0ca9-418f-8aac-1a9dc8e32866 |
| INTEL USB PROFILE | UUID_INTEL_USB_PROFILE | fa142322-166b-4fd9-89f0-99be90ae8e3d |
| INTEL CIQ | UUID_INTEL_CIQ | 6A2A8150-ABCA-4b11-A4E2-F2FC879F5481 |



# 4 MBIM Defined CID's

## 4.1 MBIM USB Defined CID's

Refer Table 10-4 of USB MBIM Specification 3

## 4.2 MBIM IMC Extension CID's

**Table 31: MBIM IMC Extension CID's**

| CID | UUID_ | Command Code | Set | Query | Notification |
|---|---|---|---|---|---|
| MBIM_CID_INTC_SAR_CONFIG | INTEL_SAR | 1 | Y | Y | N |
| MBIM_CID_INTC_THERMAL_STATE | INTEL_DPTF | 0x02000100 | Y | Y | Y |
| MBIM_CID_INTC_MODEM_REBOOT | INTEL_FWUSVC | 1 | Y | N | N |
| MBIM_CID_MS_HOSTSHUTDOWN | MS_HOSTSHUTDOWN | 1 | Y | N | N |
| MBIM_CID_INTC_ADPCLK_MODE | INTEL_ACT | 0x02000010 | Y | Y | Y |
| MBIM_CID_INTC_TRACE | INTEL_TRCSVC | 1 | Y | Y | N |
| MBIM_CID_INTC_TRACE_DATA | INTEL_TRCSVC | 2 | N | N | Y |
| MBIM_CID_INTC_NRTAPP | INTEL_NRTC | 1 | Y | Y | N |
| MBIM_CID_INTC_NRTCWS | INTEL_NRTC | 2 | Y | Y | Y |
| MBIM_CID_INTC_USBPROFILE | INTEL_ USBPROFILE | 1 | Y | N | N |
| MBIM_CID_INTC_CIQ | INTEL_CIQ | 1 | Y | Y | N |

## 4.3 MBIM AT&T Extension CID's

**Table 32: MBIM AT&T Extension CID's**

| CID | UUID_ | Command Code | Set | Query | Notification |
|---|---|---|---|---|---|
| MBIM_CID_ ATDS_SIGNAL | ATDS | 1 | N | Y | N |
| MBIM_CID_ ATDS_LOCATION | ATDS | 2 | N | Y | N |
| MBIM_CID_ ATDS_OPERATORS | ATDS | 3 | Y | Y | N |
| MBIM_CID_ ATDS_REGISTER_STATE | ATDS | 9 | N | Y | N |
| MBIM_CID_ ATDS_RAT | ATDS | 4 | Y | Y | N |
| MBIM_CID_ ATDS_RAT_DISPLAY | ATDS | 11 | Y | Y | N |



# 5 Document History

| Revision | Date | Changes |
|---|---|---|
| 0 | 2013-07-09 | First issue |
| 1 | 2013-09-09 | HN930-DC was removed from portfolio |
| 2 | 2013-12-25 | • INTEL CIQ added and Intel specific CID names changed<br>• MBIM CID BODY SAR , Level parameter added |