

Technical Committee

# mioty® Base Station Service Center Interface (BSSCI) attachment – Sub-channel for Variable MAC Support V1.0.0

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# mioty® Base Station Service Center Interface (BSSCI) attachment – Sub-channel for Variable MAC Support

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## Version History

Version	Date	Changes	Status
1.0.0	2023-07-20	Initial Version	Approved



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## 2 Scope

This document is an attachment to the Base Station Service Center Interface specification (BSSCI) version 1.0.1 [2] and specifies the additional sub-channel functionalities to support “Variable MAC” features of ETSI TS 103357 [1].

## 3 Sub-channel Variable MAC (VM)

### 3.1 General

The VM Sub-channel provides functionality to manage Variable MAC messages as specified in [ETSI TS 103 357 (2018-06)] clause 6.3.3 on the physical layer with the uplink and downlink data operations. The VM operations can be initiated by the Service Center to manage the handling of variable MAC messages at the Base Station for End Points using a variable MAC. The intended variable MAC-Types can be activated or deactivated which results in forwarding or filtering of messages using the respective MAC-Types.

### 3.2 VM Activate operation

#### 3.2.1 VM Activate

Name	Type	Description
command	String	"vm.activate"
opId	Numeric	ID of the operation
macType	Numeric	MAC-Type of the intended Variable MAC

#### 3.2.2 VM Activate response

Name	Type	Description
command	String	"vm.activateRsp"
opId	Numeric	ID of the operation

#### 3.2.3 VM Activate complete

Name	Type	Description
command	String	"vm.activateCmp"
opId	Numeric	ID of the operation

### 3.3 VM Deactivate operation

#### 3.3.1 VM Deactivate

Name	Type	Description
command	String	"vm.deactivate"
opId	Numeric	ID of the operation
macType	Numeric	MAC-Type of the intended Variable MAC

#### 3.3.2 VM Deactivate response

Name	Type	Description
command	String	"vm.deactivateRsp"
opId	Numeric	ID of the operation

#### 3.3.3 VM Deactivate complete

Name	Type	Description
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command	String	“vm.deactivateCmp”
opId	Numeric	ID of the operation

### 3.4 VM Status operation

The VM Status operation delivers a list of the activated MAC-Types.

#### 3.4.1 VM Status

Name	Type	Description
command	String	“vm.status”
opId	Numeric	ID of the operation

#### 3.4.2 VM Status response

Name	Type	Description
command	String	“vm.statusRsp”
opId	Numeric	ID of the operation
macTypes	Numeric[]	List of activated macTypes

#### 3.4.3 VM Status complete

Name	Type	Description
command	String	“vm.statusCmp”
opId	Numeric	ID of the operation

### 3.5 VM Uplink data operation

The VM UL data operation is initiated by the Base Station after receiving uplink data from an End Point using a variable MAC (VM).

#### 3.5.1 VM UL data

Name	Type	Description
command	String	“vm.ulData”
opId	Numeric	ID of the operation
macType	Numeric	MAC-Type of Variable MAC
userData	Numeric[n]	n Byte End Point user data U-MPDU; starting with first byte after MAC-Type
trxTime	Numeric	Transceiver time of reception, center of last subpacket, 64 bit, ns resolution
sysTime	Numeric	Unix UTC time of reception, center of last subpacket, 64 bit, ns resolution
freqOff	Numeric	Frequency offset from center between primary and secondary channel in Hz
snr	Numeric	Reception signal to noise ratio in dB
rssi	Numeric	Reception signal strength in dBm
eqSnr	Numeric	AWGN equivalent reception SNR in dB, optional
subpackets	Object	Subpackets object with reception info for every subpacket, optional

carrSpace	Numeric	Carrier spacing step size Bc, 0 = narrow, 1 = standard, 2 = wide
pattGrp	Numeric	Uplink TSMA Pattern group, 0 = normal, 1 = repetition, 2 = low delay
pattNum	Numeric	Uplink TSMA Pattern number p
crc	Numeric[2]	Header and payload CRC, crc[0] = header CRC, crc[1] = payload CRC

#### Subpackets object

Name	Type	Description
snr	Numeric[m]	Subpacket signal to noise ratio in dB
rsi	Numeric[m]	Subpacket signal strength in dBm
frequency	Numeric[m]	Subpacket frequencies in Hz
phase	Numeric[m]	Subpacket phases in degree +-180, optional

### 3.5.2 VM UL data response

Name	Type	Description
command	String	"vm.ulDataRsp"
opId	Numeric	ID of the operation

### 3.5.3 VM UL data complete

Name	Type	Description
command	String	"vm.ulDataCmp"
opId	Numeric	ID of the operation

## 3.6 VM Downlink data operation

The VM DL data operation is initiated by the Service Center to send downlink data via the Base Station to an End Point using a variable MAC.

### 3.6.1 VM DL data

Name	Type	Description
command	String	"vm.dlData"
opId	Numeric	ID of the operation
macType	Numeric	MAC-Type of Variable MAC
userData	Numeric[n]	n Byte End Point user data U-MPDU; starting with first byte after MAC-Type
trxTime	Numeric	Transceiver time of transmission, center of first subpacket, 64 bit, ns resolution
sysTime	Numeric	Unix UTC time of transmission, center of first subpacket, 64 bit, ns resolution
freqOff	Numeric	Frequency offset from center between primary and secondary channel in Hz
ulSnr	Numeric	Uplink reception signal to noise ratio in dB
ulRssi	Numeric	Uplink reception signal strength in dBm
carrOffRange	Numeric	Carrier offset range, 5 or 1
carrSpace	Numeric	Carrier spacing, 0 = narrow, 1 = standard, 2 = wide
ulCrc	Numeric[2]	Uplink header and payload CRC to extract downlink parameter, ulCrc[0] = header CRC, ulCrc[1] = payload CRC
tsi	Numeric	Transmission start time indicator, 21 to 16383, optional, default 128
syncBurst	Boolean	True to enable sync burst

dualChan	Boolean	True to enable dual channel
repetition	Boolean	True to enable core frame repetition
longBlkDist	Boolean	True to enable long block distance

### 3.6.2 VM DL data response

Name	Type	Description
command	String	"vm.dlDataRsp"
opId	Numeric	ID of the operation

### 3.6.3 VM DL data complete

Name	Type	Description
command	String	"vm.dlDataCmp"
opId	Numeric	ID of the operation

## 4 References

- [1] ETSI TS 103 357 V1.1.1 (2018-06): "Short Range Devices; Low Throughput Networks (LTN); Protocols for radio interface A"
- [2] mioty® BSSCI – Base Station Service Center Interface v1.0.0, mioty-alliance 2024