



# MXC

## Command Strings

Third-party command strings for Shure Microflex Complete discussion system  
Version: 1 (2019-l)

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# MXC

## Command Strings

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## Command Strings for External Controller

Set up a TCP/IP connection to control and monitor the MXC system from an external interface. Controllers such as AMX<sup>®</sup> or Crestron<sup>®</sup> connect to the DIS-CCU using a simple (raw) TCP/IP socket connection and the strings listed in this section. Use computers, room control systems, or micro controller based applications for button mimics and camera control applications.

Some examples of functionally available using the protocol:

- Setting a microphone in speak or in request
- Retrieving a list of seats available in the system.

This interface supports applications developed by customers, so the protocol is deliberately kept simple. The External Control protocol offers a means for supplementing the control functionality available through the DIS-CCU browser interface and the DIS-CCU interactive display, however some commands and settings available in the browser interface and on the DIS-CCU interactive display are not available using the 'External Control Protocol'

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## General Protocol Behavior

### TCP/IP socket connection

A TCP/IP socket connection to the DIS-CCU must be established for the External Control protocol to become available. Configuration of the DIS-CCU connection to the Ethernet must be defined from the CCU interactive front plate control/Browser interface and an IP address for the DIS-CCU must be assigned in the network.

Choose either a static IP address or an IP address assigned through DHCP. It is convenient to ensure, that the DIS-CCU ends up with the same IP address at each start up.

Knowing the IP address, the only additional information required for setting up a TCP/IP connection is the Port Number:

**Port Number = 3142**

***Example:** Test connection to CCU via Putty<sup>®</sup>: If the DIS-CCU is assigned IP address 192.168.1.100, the external application must connect the TCP/IP socket to the address 192.168.1.100:3142.*

Knowing the IP address of the DIS-CCU a connection can be set up using a simple terminal program like Putty.

1. Download at <http://www.putty.org>
2. Start Putty.
3. Insert IP address and Port Number.
4. Select 'Raw' for the Connection Type.
5. Press 'Open' to establish connection to the CCU. Control is now possible.
6. Type 'help' to see a list of commands available.

## Command Structure (from External Control to DIS-CCU)

To control the CCU an External Control sends commands to DIS-CCU included in command lines. Commands lines are build up in a very simple manner:

Space - 0x20 = 32

Carriage return - 0x0D = 13

Line Feed - 0x0A = 10

Command lines are terminated by a Carriage Return or Line Feed or both. In order to be able to communicate with Windows systems, Linux systems or other systems, the CCU understands both types of command line terminations.

Notice also, there is a space between the command and data. If a command does not carry any data, space is possible but not required.

The CCU is not sensitive to upper/lower case.

**Example:**

```
mic_on 212
```

Turn on microphone at seat 212. Command = mic\_on, data = 212. The 'mic\_on' command carries a seat number as data.

## Command Structure (from DIS-CCU to External Control)

Command lines out of the DIS-CCU are just as simple:

Space - 0x20 = 32

Carriage return - 0x0D = 13

Line Feed - 0x0A = 10

Again, to satisfy most systems, the CCU terminates command lines by including both and .

## Seat Numbering

Microphone units are identified by means of a seat numbers. Each unit is assigned a seat number. This is done automatically for all conference units, when they are connected to the DIS-CCU. The DIS-CCU Browser interface is used to change seat numbering.

Seat numbers must be in the range from 1 to 65535.

## DIS-CCU Reply to Commands

Generally, a command from an external application is replied to by the CCU. But, reply to a command is produced only if actions are taken by the CCU due to the command.

**Example:** When a 'mic\_on' command results in a microphone being turned on, the CCU replies with a 'mic\_on' command. On the other hand, if a 'mic\_on' command does not lead to turning on a microphone, the CCU does not produce any reply.

There can be several reasons for the CCU to reject turning on a microphone:

- The microphone is already on
- The microphone is no longer connected to the system
- Speak list is already full ('max\_speakers') and delegate interrupt is not 'on'

---

## Retrieving System Status

The CCU supports streaming of status. When an External Control issues a 'mic\_status' or 'audio\_status' command, the CCU responds by sending the microphone system status. The same applies to 'audio status'. Therefore, it is possible for an External Control to synchronize with the CCU status.

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## Voting Control

The external control interface features control of voting sessions and attendance check sessions in the Central Unit. And only if the feature license 'Voting' is uploaded in the DIS-CCU.

## Voting configurations

Two different configurations must be considered:

- DIS-CCU controlled by SW6000
- DIS-CCU not controlled by SW6000 (standalone)

## Retrieve voting sessions

No matter which configuration applies, it is possible for an external controller to request a list of voting sessions - using the command 'voting\_status'. The CCU will reply by returning the list of voting sessions currently applicable (either SW6000 defined voting sessions or build-in voting sessions).

## SW6000 controlled

SW6000 supports a number of voting sessions. Via the external control protocol, it is possible to make two requests:

- Start one of the SW6000 defined voting sessions
- Start SW6000 default voting session

## Standalone The CCU features

4 build-in voting sessions in standalone mode:

- 3-button voting
- 3-button secret voting
- 5-button voting
- 5-button secret voting

---

## Voting Results

At completion of a voting session, the CCU delivers final voting results. Also at completion of an attendance check the CCU delivers final attendance check result.

The DIS-CCU supports 2-, 3-, and 5-button voting in standalone systems.

In 2-button voting sessions, the following alternatives apply:

1. Yes
2. No

In 3-button voting sessions, the following alternatives apply:

1. 'Yes'
2. 'Abstain'
3. 'No'

In 5-button voting sessions, the following alternatives apply:

1. '++'
2. '+'
3. '0'
4. '.'
5. '--'

Up to 9 voting results can be defined when connected to SW6000.

## Example: Voting

Assume that the CCU is not controlled by the SW6000

ExtCtrl

CU

----->

voting\_status

----->

<-----

voting\_configuration 1 3-button voting voting\_configuration 2 3-button secret voting

voting\_configuration 3 5-button voting voting\_configuration 4 5-button secret voting

voting\_status\_done

<-----

----->

start\_voting 1

----->

<----- voting\_started 1

<-----

<----- interim\_voting\_result 1 0 Yes interim\_voting\_result 2 0 Abstain

interim\_voting\_result 3 0 No

<-----

<-----

vote (Yes)

<-----

<----- interim\_voting\_result 1 1 Yes interim\_voting\_result 2 0 Abstain

interim\_voting\_result 3 0 No

<-----

----->

stop\_voting

----->

<-----

voting\_stopped

<-----

<----- final\_voting\_result 1 1 Yes final\_voting\_result 2 0 Abstain

final\_voting\_result 3 0 No

<-----

---

# Audio Control

## Commands from External Control to DIS-CCU

### Set Loudspeaker Volume

loudspeaker\_volume

Sets the volume of the loudspeakers for all microphone units.

The volume of the loudspeakers ranges from -41 to 0. The value -41 indicates the speaker is Off. Values from -40 to 0 indicates the attenuation in dB.

The CCU responds to this command by issuing the loudspeaker\_volume command.

### Set Line Input 1 Level

line\_input\_level\_1

Adjusts the level of the line input 1 signal.

The level of line input 1 ranges from -41 to 0. The value -41 indicates the signal level is zero. Values from -40 to 0 indicate the attenuation in dB.

The CCU responds to this command by issuing the line\_input\_level\_1 command.

### Set Line Input 1 gain

line\_input\_gain\_1

Adjusts the input gain of the line input 1.

0 or 10.

Gain can be set to 0 dB or 10 dB. 0 dB will not add any gain to the line input whereas 10 dB will add 10 dB gain to the line input. The CCU responds to this command by a line\_input\_gain\_1 message.

### Set Line Input 2 Level

line\_input\_level\_2

Adjusts the level of the line input 2 signal.

The level of line input 2 ranges from -41 to 0. The value -41 indicates the signal level is zero. Values from -40 to 0 indicate the attenuation in dB.

The CCU responds to this command by issuing the line\_input\_level\_2 command.

### Set Line Input 2 gain

line\_input\_gain\_2

Adjusts the input gain of the line input 2 .

0 or 10.

Gain can be set to 0 dB or 10 dB. 0 dB will not add any gain to the line input whereas 10 dB will add 10 dB gain to the line input. The CCU responds to this command by a line\_input\_gain\_2 message.

### Set Line Output Volume (A-H)

line\_output\_volume

Adjusts the level of the line output signal.

Indicates which output is being controlled. Possible values are: 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H'.

The volume of the line output ranges from -41 to 0. The value -41 indicates the volume is Off. Values from -40 to 0 indicate attenuation in dB.

The CCU responds to this command by issuing the `line_output_volume` command.

## Define Audio Path

`audio_path`

This command defines audio connections in the system.

Indicates which connection is being controlled. Possible values are: 'mic\_to\_speaker', 'mic\_to\_floor', 'linein\_1\_to\_speaker', 'linein\_1\_to\_lineout\_A' or 'linein\_1\_to\_floor'.

Indicates whether the audio is being routed from microphones/lineinput\_1 to speakers/lineoutput/floor.

The CCU responds to this command by issuing the `audio_path` command.

## Set Individual Speaker Attenuation

`mic_speaker_attenuation`

This command sets the speaker attenuation of a microphone.

: The desired microphone

: The desired speaker attenuation. Possible values: 0 to 7. (0 to 6 will attenuate 0 to 6 dB. 7 is speaker off.)

The CCU responds to this command by returning a 'mic\_speaker\_attenuation' message.

## Set Individual Microphone Attenuation

`mic_attenuation`

This command sets the attenuation of a microphone.

: The desired microphone

: The desired microphone attenuation. Possible values: 0 to 6. (0 is the lowest attenuation and 6 is most attenuation.)

The CCU responds to this command by returning a 'mic\_attenuation' message.

## Request Audio Status

`audio_status`

Provides system audio status.

The CCU responds to this command by issuing a list of commands for the Audio settings:

`line_output_volume` (for all outputs A-D)

`audio_path` (for all paths)

`line_input_level` (for all inputs)

`line_input_gain` (for all inputs)

`mic_speaker_attenuation` (for all units)

`mic_attenuation` (for all units)

`loudspeaker_volume`

`audio_status_done`

## Commands from DIS-CCU to External Control

### Loudspeaker Volume

`loudspeaker_volume`

Indicates the volume of loudspeakers for all microphone units.

The volume of the loudspeakers ranges from -41 to 0. The value -41 indicates the volume is Off. Values from -40 to 0 indicate attenuation in dB.

## Line Input 1 Level

line\_input\_level\_1

Indicates the level of the line input 1 signal.

The level of line input 1 ranges from -41 to 0. The value -41 indicates the level is zero. Values from -40 to 0 indicate attenuation in dB.

## Line Input 2 Level

line\_input\_level\_2

Indicates the level of the line input 2 signal.

The level of line input 2 ranges from -41 to 0. The value -41 indicates the level is zero. Values from -40 to 0 indicate attenuation in dB.

## Line Input 1 Gain

line\_input\_gain\_1

Indicates the input gain of the line in 1 input.

: 0 or 10.

Gain can be set to 0 dB or 10 dB. 0 dB will not add any gain to the line input whereas 10 dB will add 10 dB gain to the line input.

## Line Input 2 Gain

line\_input\_gain\_2

Indicates the input gain of the line in 2 input.

: 0 or 10.

Gain can be set to 0 dB or 10 dB. 0 dB will not add any gain to the line input whereas 10 dB will add 10 dB gain to the line input.

## Line Output Level (A-D)

line\_output\_level

Adjusts the level of the line output signal.

Indicates which output is being controlled. Possible values: 'A', 'B', 'C', 'D', 'E', 'F', 'G', 'H'. On DIS-CCU 'A' to 'D' are possible. DIS-CCU may deliver 'A' to 'H'.

The level of the line output ranges from -41 to 0. The value -41 indicates the output is zero. Values from -40 to 0 indicate attenuation in dB.

## Define Audio Path

audio\_path

This command defines audio connections in the system.

Indicates which connection is being controlled. Possible values are: 'mic\_to\_speaker', 'mic\_to\_floor', 'linein\_1\_to\_speaker', 'linein\_1\_to\_lineout\_A' or 'linein\_1\_to\_floor'.

Indicates whether the audio is being routed from microphones/lineinput\_1 to speakers/lineoutput\_A/floor.

## Individual Speaker Attenuation

mic\_speaker\_attenuation

Indicates the speaker attenuation of a microphone.

: The desired microphone

: The desired speaker attenuation. Possible values: 0 to 7. (0 to 6 will attenuate 0 to 6 dB. 7 is speaker off.)

## Individual Microphone Attenuation

mic\_attenuation

Indicates the attenuation of a microphone.

: The desired microphone

: The desired attenuation. 0 to 6 dB, where 0 is the lowest attenuation and 6 is most attenuation.

## Audio Status Complete

audio\_status\_done

This command terminates audio status streaming.

---

# Voting Commands

## Commands from External Control to the DIS-CCU

### Start a voting session

start\_voting

Starts a voting session in the CCU

: Identification of the voting configuration to start.

The CCU replies with 'voting\_started', if a voting session is started.

### SW6000 controlled

The voting\_session\_id defines which voting configuration to run. A list of configurations can be requested by command 'voting\_status'.

If no voting\_session\_id is specified, the 'default SW6000 voting configuration' is requested.

### Standalone

voting\_session\_id defines the build-in voting configurations:

'1' 3-button voting

'2' 3-button secret voting

'3' 5-button voting

'4' 5-button secret voting

If no voting\_session\_id is specified, the configuration '1' is requested.

### Stop a voting session

stop\_voting

Used to stop an ongoing voting session in the CCU. If the voting session is stopped, the CCU replies with `voting_stopped`.

## Cancel a voting session

`cancel_voting`

Used to cancel an ongoing voting session in the CCU. If the voting session is cancelled, the CCU replies with `voting_cancelled`.

## Start attendance check session

`start_attendance_check`

Used to start an attendance check session in the CCU. If an attendance check session is started, the CCU replies with `attendance_check_started`.

## Stop an attendance check session

`stop_attendance_check`

This command is used to stop an ongoing attendance check session in the CCU. If the attendance check session is stopped, the CCU replies with `attendance_check_stopped`.

## Cancel an Attendance Check

`cancel_attendance_check`

Used to cancel an ongoing attendance check session in the CCU. If the attendance check session is cancelled, the CCU replies with `attendance_check_cancelled`.

## Request Voting Status

`voting_status`

Used to request voting status. The result is a list of available voting configurations. The CCU replies to this command by returning the commands:

`voting_configuration 1`

...

`voting_configuration`

`voting_status_done`

## Commands from DIS-CCU to External Control

### A voting session is started

`voting_started`

### A voting session is stopped

`voting_stopped`

### A voting session is cancelled

`voting_cancelled`

### Interim voting results

`interim_voting_result`

During a voting session the CCU informs about interim voting results. When new votes are cast, the CCU distributes interim voting results. This command informs about one of the interim voting results.

---

With SW6000 connected values [1 to 9] corresponding to the 9 result columns in the SW6000 'Voting Configurations'. For a standalone DIS-CCU this is the button numbers [1 to 5].  
interim voting result. With SW6000 this is the result for the 9 result columns. For a standalone CCU this is the number of votes given on the specified button.  
Text related to the result. With SW6000 this is the labels for the 9 result columns. For a standalone CCU this voting button labels.

## Final voting results

final\_voting\_result

At completion of a voting session the CCU distributes final voting results. This command informs about final voting result for one of the voting alternatives.

With SW6000 connected values [1 to 9] corresponding to the 9 result columns in the SW6000 'Voting Configurations'. For a standalone DIS-CCU this is the button numbers [1 to 5].

With SW6000 this is the result for the 9 result columns. For a standalone CCU 61cc this is the number of votes given on the specified button.

Text related to the result.

## An attendance check session is started

attendance\_check\_started

## An attendance check session is stopped

attendance\_check\_stopped

## An attendance check session is cancelled

attendance\_check\_cancelled

## Interim Attendance check result

interim\_attendance\_check\_result

Used by the CCU to inform about the interim attendance check result. contains the interim attendance check result.

## Final Attendance check result

final\_attendance\_check\_result

Used by the CCU to inform about the final attendance check result.

contains the interim attendance check result. For a standalone system it indicates how many delegates have pressed the 'attendance' button.

## Voting Configuration

voting\_configuration

Identifies a voting configuration.

is an integer identifying the voting configuration.

is a name for the configuration.

## Voting Status complete

voting\_status\_done

Informs that voting status streaming is complete.

---

# Microphone Control

## Commands from External Control to DIS-CCU

### Turn on microphone

mic\_on

Instruct the CCU to turn on the microphone at seat\_no.

If the CCU turns on the microphone, it replies with the '**mic\_on**' command. If the microphone also appeared in the request list, it is taken out of the request list and the CCU issues the '**mic\_request\_off**' command.

### Turn off microphone

mic\_off

Instruct the CCU to turn off the microphone at seat\_no.

If the CCU turns off the microphone, it issues a '**mic\_off**' command.

### Turn off all the delegate microphones

mic\_all\_delegates\_off>

Instruct the CCU to turn off all delegate microphones.

A Chairman is not turned off.

The CCU responds to the command by issuing the '**mic\_off**' command for each microphone that is turned off.

### Put a microphone in the reply list

mic\_reply\_on

Insert a microphone into the reply list.

If the CCU inserts the unit into the reply list and it issues the '**mic\_reply\_on**' command.

### Remove a microphone from the reply list

mic\_reply\_off

Remove a microphone from the reply list.

If the CCU removes the unit from the reply list and it issues the '**mic\_reply\_off**' command.

### Clear the reply list

mic\_all\_requests\_off>

Clear the reply list.

The CCU responds by issuing the '**mic\_reply\_off**' command for each microphone that is removed from the reply list.

### Put a microphone in the request list

mic\_request\_on

Insert a microphone into the request list.

If the CCU inserts the unit into the request list and it issues the '**mic\_request\_on**' command.

---

## Remove a microphone from the request list

mic\_request\_off

Remove a microphone from the request list.

If the CCU removes the unit from the request list and it issues the '**mic\_request\_off**' command.

## Clear the request list

mic\_all\_requests\_off>

Clear the request list.

The CCU responds by issuing the '**mic\_request\_off**' command for each microphone that is removed from the request list.

## Set the next microphone on

mic\_next\_on>

Turns off the first microphone in the speak list and turns on the first microphone from the request list.

If a microphone is turned off, the CCU issues the '**mic\_off**' command.

If a microphone is turned on, the CCU issues the '**mic\_on**' command and the '**mic\_request\_off**' command.

## Set the maximum number of total speakers

max\_total\_speakers

Maximum number of speakers allowed to speak.

Can be set from "1" to "8"

The CCU issues the '**max\_total\_speakers**' command.

## Set the maximum number of delegate speakers

max\_speakers

Maximum number of delegates allowed to speak.

Can be set from "1" to "8"

The CCU issues the '**max\_speakers**' command.

## Set the maximum number of replies

max\_replies

Maximum number of delegates allowed in the reply list.

Can be set from "0" to "250".

The CCU issues the '**max\_replies**' command.

## Set the maximum number of requests

max\_requests

Maximum number of delegates allowed in the request list.

Can be set from "0" to "250".

The CCU issues the '**max\_requests**' command.

## Set the Operation Mode

mic\_mode

Set the system operation mode.

Can be set to "auto" (Automatic), "fifo" (First-in-first-out), "manual" (Manual) or "vox" (Voice Active)

Can be set to "auto" (Automatic), "fifo" (First-in-first-out), "manual" (Manual), "vox" (Voice Active), "auto+reply" (Automatic+Reply), "manual+reply" (Manual+Reply) and "vox+reply" (Voice Activate + Reply)

The CCU issues the '**mic\_mode**' command.

## Set the Interrupt Mode

mic\_interrupt

Set the ability to interrupt. Defines, whether microphones should interrupt or not.

Can be "Same", "Lower" (microphones interrupt) or "off" (microphones do not interrupt)

The CCU issues the '**mic\_interrupt**' command

## Set the microphone priority

mic\_priority priority>

Set the microphone priority.

: microphone to adjust.

: desired priority. Possible values: 0 to 5, where 0 is the lowest priority and 5 is the highest priority.

The CCU responds to this command by returning a **mic\_priority** message.

## Retrieve the Microphone Status

mic\_status

Ask the CCU to deliver status of the system (microphones in speak, and microphones in request list).

The CCU issues the microphone system status. The status is a list of commands from the CCU:

seat\_state (for all units in the system)

mic\_priority (for all units in the system)

mic\_mode

mic\_interrupt

max\_total\_speakers

max\_speakers

max\_requests

max\_replies

mic\_on (for all units in speakers list)

mic\_request\_on (for all units in request list)

mic\_reply\_on (for all units in reply list)

mic\_status\_done

## Retrieve the reply Status

reply\_status

Ask the CCU to deliver status of the reply configuration.

The CCU responds by sending reply system status. The status is a list of commands from the CCU:

reply\_status

reply\_configuration

reply\_status\_done

## Help

help

### help

Help is available for all commands supported by the CCU. If a command is included after the help command, details on that command is issued by the CCU.

The help command results in a brief description of the command being issued by the CCU. This command is intended for use on a simple console.

## Commands from DIS-CCU to External Control

### Microphone On

mic\_on

A microphone is turned on.

### Microphone Off

mic\_off

A microphone is turned off.

### Microphone into Reply List

mic\_reply\_on

A microphone is inserted into the reply list.

: the seat number  
: the position in the reply list  
: the reply number in the reply configuration  
: the seat name or delegate name

- The seat name is name that can be edited by the web interface when the CCU is standalone.
- The delegate name is the name of the person logged in at this seat when SW6000 is connected.

### Microphone out of reply list

mic\_reply\_off

A microphone is removed from reply list.

### Microphone into Request List

mic\_request\_on

A microphone is inserted into the request list.

: the seat number  
: provides information about the position in the request list.  
: the seat name or delegate name

### Microphone out of Request List

mic\_request\_off

A microphone is removed from request list.

## Max Total Speakers

max\_total\_speakers

Maximum number of speakers allowed to speak.

"1" to "8"

## Max Delegate Speakers

max\_speakers

Maximum number of delegates allowed to speak.

"1" to "8"

## Max Replies

max\_replies

Maximum number of delegates allowed in the reply list.

"0" to "250".

## Max Requests

max\_requests

Maximum number of delegates allowed in the request list.

"0" to "250".

## Operation Mode

mic\_mode

Provides system operation mode.

"auto" (Automatic), "fifo" (First-in-first-out), "manual" (Manual), "vox" (Voice Active), "auto+reply" (Automatic+Reply), "manual+reply" (Manual+Reply) and "vox+reply" (Voice Active + Reply)

## Interrupt Mode

mic\_interrupt

Ability for microphones to interrupt.

"Same" (microphones interrupt other microphones with same or lower priority), "Lower"(microphones interrupt other microphones with lower priority) and "off" (microphones do not interrupt other microphones)

## Mic priority

mic\_priority

This message indicates the priority of a microphone.

: the selected microphone

: The priority. Possible values: 0 to 5, where 0 is the lowest priority and 5 is the highest priority

## Seat State

seat\_state

Provides seat information.

This information is sent from the CCU to an external control application in the following situations:

- When a participant logs in or out

- When the seat name is modified
- When the external control application requests microphone status (mic\_status)
- When a microphone unit becomes lost or found

The seat number identification of a microphone unit. An number from 1 to 65535.

The current state of the seat. This is either "active" or "passive"

The seat name or delegate name. If a delegate name is available for the seat number then the delegate name is provided. Otherwise the seat name is provided.

**Example:**

```
seat_state 12 active John Jones
```

This command informs about seat number 12, which is active and has the name 'John Jones' attached.

## Microphone Status Complete

```
mic_status_done
```

Provides notification that complete system status has been sent.

## Command error

```
command_error
```

The CCU has received an unknown command.

is a text explaining the error.

**Examples:**

```
command_error unknown command
```

```
command_error syntax error
```

---

# Interpretation Commands

## Commands from DIS-CCU to External Control

### Interpreter Channel On

```
ch_on
```

Response when an interpreter channel is set active (interpretation is taking place).

: The channel number (currently 1-31)

: The language assigned to the channel. (Language name in English)

### Interpreter Channel Off

```
ch_off
```

Response when an interpreter channel is set not active (interpretation is not taking place). The message is also send if the language assigned to the channel is send.

: The channel number (currently 1-31)

: The language assigned to the channel. (Language name in English)

Status of all channels are included in the response to the mic\_status command. If the number of channels are increased, the status of the channels are informed.