Media control protocol description

Stationary devices of the ew 300-500 G4 and ew IEM G4 series

This document describes the Media Control Protocol for all aboved listed stationary Sennheiser devices. It allows to access a subset of attributes of the listed devices. By applying this protocol it is possible to set an attribute or to read its current status.

The IP address can be set individually at the device's display. When the connection is established, data can be exchanged between the Sennheiser device and the connected media control device.

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Change log

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Requirements

Supported devices

The following stationary devices will be supported the Media Control Protocol via ethernet at port 53212:

- EM 300-500 G4
- SR IEM G4

Notes

- The EM 100 G4 receiver will not be supported.
- The stationary devices require at least firmware version 1.7.0 for supporting the media control protocol.

Recommendation for your system planning and installation

Generally external devices (e.g. large video panels, switch boxes or media control and PC systems) may cause RF interference to wireless microphone systems.

To ensure that it works correctly, avoid RF interferences or RF transmission errors:

- Sufficient space between your wireless microphone system and all external devices is recommended.
- Always use shielded wiring.

See also

Download the needed instruction manual from www.sennheiser.com.

Network requirements

- Standard LAN IPv4 with 100 Mbit/s full duplex
- UDP/IP network protocol
- The max. amount of supporting stationary devices depends on your ethernet network setup.

Protocol basics

Introduction

The media protocol is based on UDP/IP. By applying this protocol, it is possible to set an attribute or read its current status, respectively. A simultaneously operation via the media protocol, WSM and the operating elements at the device‘s front panel is possible. So it may happen that the same commands are sent to a Sennheiser device with inconsistent values. In such a case the last received command with its values will be adopted.

Devices of ew G4 series can be set and read via Ethernet at port 53212, i. e. for sending and reception the same port number is used. The IP address can be set individually at the stationary transmitters and receivers. After a connection is established, data can be exchanged between the devices and the connected media control device.

A maximum of 1500 characters are considered by the media protocol. If more than 1500 characters are sent to a Sennheiser device all characters will be ignored and no warning message is sent.

Commands sent to ew G4 device

The commands are ASCII string based and case-sensitive. The command starts with a command keyword. The command keyword stands at the top of the description of every command.

If parameters are needed they are placed after the command keyword. Command keywords as well as parameters are separated by blanks. The complete instruction ends up with a carriage return. The format looks like this:

Command param1 ... paramN<CR>

A command can have more than one parameter.

If an attribute is set at a device, for example the AF-OUT attribute of an EM, it is called a set request. The other way around, if an attribute is read out, this is called a get request.

Some commands can only execute a set request, some commands can only execute a get request and others can execute both a set request and a get request.

The information if the command is able to execute a set request or get request or both can be found in chapter “Overview of all commands and cyclic attributes“ where a detailed description of every single command is listed.

An “X“ in column ‚Get request‘ means that this parameter is needed to execute a get request. In case this parameter is not needed for a get request there will be a “-“ instead of a “X“. These indications are similar for a “Set request“.

Response to set requests

If a set request is received by a Sennheiser device a response string will be sent back to the media control device. There are two different kinds of response strings.

- A positive response string will be sent back if the Sennheiser device can process the instruction. In such a case the complete instruction will be sent back as a positive acknowledgement. See below the examples of each single command.
- A negative response string will be sent if a Sennheiser device detects an error, e.g. too many or too little parameters, command keyword is incorrect, etc. in the list of error codes all possible error codes are listed.

A negative response string starts with its error code and a short description about which part of the instruction is wrong, followed by the whole instruction. The negative response string is also terminated by a carriage return <CR>.

Here are some examples of negative response strings:

1000: Invalid command [AfPOut 24] <CR>

=> “P“ within command is wrong

1010: Invalid parameter [AfOut q24] <CR>

=> “q“ is wrong

1020: Value out of range [AfOut 125] <CR>

=> 125 is to large

1030: Relative parameters not supported [Mute #1] <CR>

=> “#“ is wrong

1040: Invalid numbers of parameter [Mute 1 5] <CR>

=> 2nd parameter is wrong

1050: Incorrect termination [AfOut 21] <CR>

=> instruction does not end up with <CR>

If there is more than one error in a single command there will be only one error message which will be sent back. If the indicated error is cleared and the command has been sent again, the Sennheiser device will respond with the next error message. For example the instruction

AfOut q24

has got 2 errors. First the Sennheiser device replies with

1050: Incorrect termination [AfOut q24] <CR>

due to the missing carriage return. After this error is cleared the instruction

AfOut q24<CR>

is sent. Now the Sennheiser device comes back with

1010: Invalid parameter [AfOut q24] <CR>

because the “q“ is wrong. After clearing this error the command is error free.

Response to get requests

When receiving a positive response the requested data will be transmitted to the media control. If the command instruction is incorrect, the appropriate error message will be sent to the media control.

Relative change

Some parameters can be incremented or decremented regarding to their current values. This is indicated by adding a ‚#' before the parameter's value.

For example the instruction

Squelch #1<CR>

increments Squelch by one stepsize. If the Squelch value has been +11 before, it will be set to +13 as Squelch can only be set in multiples of 2. Following instruction decrements Squelch by 2 steps:

Squelch #-2<CR>

assuming the previous Squelch value was +11 the new value is +7.

Monitoring of UDP/IP connection

In order to detect a UDP/IP disconnection a timeout mechanism is established in this protocol. The media control has to send this timeout to Sennheiser devices to confirm that media control device is still present. This timeout is passed by using the ‚Push' command. How to use this command is described below in more detail.

Different ways to update the media control

There are different ways how Sennheiser devices can pass information to media control.

One way is that a set of attributes is sent periodically to media control. The cycle time can be adjusted by a command. All attributes are sent out in one go. These attributes are called ‚Cyclic attributes'. It is also possible to disable the transmission of the cyclic attributes (see details of “Push“ command).

Another way to pass Cyclic attributes is to send them asynchronously due to a change of any warning. This can be adjusted via the Push command.

For an EM it is also possible to send Cyclic attributes asynchronously when a change of transmitter's attributes is detected, for instance when the state of the pilot signal has changed. It can also be adjusted via the “Push“ command.

Another way of passing information to the media control is that attributes of Sennheiser devices are only sent if a change happened to this attribute. It is also possible to disable this behaviour for all attributes together. But it is not possible to disable this mechanism only for one dedicated attribute (see details of “Push“ command). The attributes which are only sent if a change happened are called “Configuration attributes“.

The attributes belonging to cyclic attributes and configuration attributes, separated for SR and EM are listed below.

Attributes of the EM device

Cycling attributes	Configuration attributes
RF 1	Name
RF 2	Frequency configuration
States	Squelch
RF	AF-Out
AF	Equalizer
Bat	Mute
Msg	-
Config index	-

Attributes of the SR device

Cycling attributes	Configuration attributes
AF	Name
States	Frequency configuration
Msg	Sensitivity
Config index	Mode: Mono/Stereo
-	Equalizer
-	Mute

The cyclic attribute “Config index“ has got a specific meaning.

Always when a configuration attribute changes and is transmitted to the client this index will be incremented. Assuming the index‘ value is 60. If frequency configuration changes the index will be incremented to 61 and when afterwards the name changes the index will be incremented to 62.

In case of a temporarily interrupt of UDP/IP connection it may happen that media control or any other clients miss the reception of a configuration attribute that has been changed.

If the UDP/IP connection is established after an interrupt the client can compare the current ‚Config index‘ value to the one the client received last. If there is a difference the client can request an update of all configuration attributes.

The “Config index“ is limited to 999. Afterwards it starts from 0 again.

Response of cyclic attributes

Due to the fact that cyclic attributes are all sent in one go here is an example how it could look like (only cyclic attributes are listed, but not the previously sent command).

For an EM device it could be

- RF1 25 65 1<CR>
- RF2 28 78 0<CR>
- States 3 2<CR>
- RF 50 1 1<CR>
- AF 40 65 3<CR>
- Bat 70<CR>
- Msg Low_RF_Signal Low_Battery<CR>
- Config 234<CR>

The order of the cycylic attributes is always the same.

Note:
The cyclic attribute before the ‚Config' attribute represents the warnings. In this example the status is “Low_RF_Signal Low_Battery“. If there is no warning there will be an “OK“ instead of the warning messages (see following example for SR below).

For a SR device it could look like

- Af 15 25 40 38 5<CR>
- States 0 2<CR>
- Msg OK<CR>
- Config 555<CR>

So each cyclic attribute is separated by a semicolon. For more information about the single attributes see the corresponding tables below.

Overview of all commands and cyclic attributes

For EM and SR

Commands

Cyclic attributes

For EM only

Commands

Cyclic attributes

For SR only

Commands

Cyclic attributes

Commands and cyclic attributes (detail)

Commands valid for EM and SR

Push [set only]

Valid for device EM and SR

Description

This command has got different meanings.

The first parameter realizes the already mentioned timeout mechanism in order to indicate that UDP/IP connection is still up.

In case timeout is elapsed and no new Push command is sent to the device neither cyclic attributes are sent anymore nor configuration attributes are updated on change nor cyclic attributes are updated on change of warning, pilot signal or battery status.

But it is still possible to send single commands for example Frequency, RfConfig and so on. In other words the timeout is only needed if cyclic or configuration attributes shall be sent to media device.

Second parameter determines the cycle time for the cyclic attributes. By passing a 0 as second parameter no cyclic attributes are updated at all.

The third parameter is responsible for sending out attributes in dependency of their status and their warnings, see following table (“–“ means “inactive“, “X“ means “active“).

3rd parameter value	Send configuration attributes on change of attributes	Send cyclic attributes on change of warnings	Send cyclic attributes on change of pilot signal or status of battery (EM only)
0	-	-	-
1	X	-	-
2	-	X	-
3	X	X	-
4	-	-	X
5	X	-	X
6	-	X	X
7	X	X	X

Column „**send configuration attributes on change of attributes**“ means that a configuration attribute is sent when a change to this configuration attribute occurred. For instance when the name changed via WSM or the front panel Sennheiser device sends out Name Madonna<CR>.

Column „**send cyclic attributes on change of warnings**“ means that all cyclic attributes are updated when any change of warning is detected. For instance when warning ‚Low Battery‘ is active all cyclic attributes are sent by Sennheiser device.

Column „**send cyclic attributes on change of pilot signal or status of battery**“ means that all cyclic attributes are transmitted on any change of pilot signal or status of battery. For instance when status of battery changes from 100% to 70% all cyclic attributes are sent to media control. **This column is only valid for EM devices.**

The ‚Push' command can only be sent with all 3 parameters.

By using all three parameters an immediate update can be executed, if required. This could be used during initialisation. In order to execute the immediate update timeout value has to be set to ‚0'. If cyclic attributes shall be updated the second parameter has to be greater than 0. For the configuration attributes the third parameter has to be set to 1. At least one of the second and third parameter has to be unequal to 0. If all three parameters are 0 Sennheiser device stops sending out any information.

It might happen that cyclic/configuration attributes are sent first to media control before the Push instruction is sent as acknowledgement. So the order of responses might vary.

Parameters

Name	Value Range	Get request	Set request	Relative change
Timeout	0..300 sec. Resolution: 1 sec.	-	X	No
Cyclic attributes	0..60000 msec. Resolution: 100 msec.	-	X	No
Settings of configuration and cyclic attributes	See table on page 11: Meaning of 3rd Push parameter only available for EM	-	X	No

Examples

Push 0 0 1<CR>

All configuration attributes are sent once immediately. Sennheiser device replies with Push 0 0 1<CR>.

Push 0 0 2<CR>

All configuration attributes are sent once immediately. Sennheiser device replies with Push 0 0 2<CR>. Whenever the third parameter is greater than 0 all configuration attributes are sent once immediately.

Push 0 100 0<CR>

All cyclic attributes are sent once immediately. Sennheiser device replies with Push 0 100 0<CR>.

Push 5 400 1<CR>

The timeout value determines how long the settings for cyclic and configuration attributes are valid. Cyclic attributes are updated every 400 ms for a period of 5 sec.

Configuration attributes are updated on change for a period of 5 sec. If the cyclic and configuration attributes should be updated permanently the whole instruction has to be sent again and again. Sennheiser device replies with Push 5 400 1<CR>.

Push 5<CR>

Sennheiser device replies with 1040: Invalid numbers of parameter [Push 5]<CR>.

Push 0<CR>

Sennheiser device replies with 1040: Invalid numbers of parameter [Push 0]<CR>.

Push 0 0 0<CR>

Sennheiser device will stop sending out all attributes and reply with Push 0 0 0<CR>.

Push 250 200 2<CR>

Cyclic attributes are updated every 200 ms for a duration of 250 seconds. Beside of this cyclic attributes will be updated every time when any warning changes its state. No configuration attributes will be updated on change. Sennheiser device replies with Push 250 200 2<CR>.

Push 250 200 3<CR>

Cyclic attributes are updated every 200 ms for a duration of 250 seconds. Beside of this cyclic attributes will be updated every time when any warning changes its state. Configuration attributes will be updated on change. Sennheiser device replies with Push 250 200 3<CR>.

Push 250 200 4<CR>

Cyclic attributes are updated every 200 ms for a duration of 250 seconds. Beside of this cyclic attributes will be updated every time when either transmitter‘s pilot signal or transmitter‘s battery status changes. No configuration attributes will be updated on change. Sennheiser device replies with Push 250 200 4<CR>.

Push 250 200 5<CR>

Cyclic attributes are updated every 200 ms for a duration of 250 seconds. Beside of this cyclic attributes will be updated every time when either transmitter‘s pilot signal or transmitter‘s battery status changes. Configuration attributes will be updated on change. Sennheiser device replies with Push 250 200 5<CR>.

Push 250 200 6<CR>

Cyclic attributes are updated every 200 ms for a duration of 250 seconds. Beside of this cyclic attributes will be updated every time when either transmitter‘s pilot signal or transmitter‘s battery status changes or when warning status changes on side of stationary devices (EM and SR). No configuration attributes will be updated on change. Sennheiser device replies with Push 250 200 6<CR>.

Push 250 200 7<CR>

Cyclic attributes are updated every 200 ms for a duration of 250 seconds. Beside of this cyclic attributes will be updated every time when either transmitter‘s pilot signal or transmitter‘s battery status or when warning status changes on side of stationary devices (EM and SR). Configuration attributes will be updated on change. Sennheiser device replies with Push 250 200 7<CR>.

Push 5 450 1<CR>

1020: Value out of range [Push 5 450 1] <CR>. 450 does not meet required resolution.

BankList [get only]

Valid for device EM and SR

Description

By using this command with its parameter a list of frequencies in kHz is sent to media control. The order of the sent frequencies are conform to the channels which means that first frequency f1 correspond to channel 1, second frequency f2 correspond to channel 2 and so on.

Bank number 21 until 26 correspond to user bank 1 to user bank 6.

It may happen that less channels of a user bank are used as possible. For example there are 32 channels in a user bank but only channels 2 and 4 are used. The command BankList returns in such a case only 4 frequencies, for instance „BankList 0 822000 0 819375<CR>“ . The remaining channels from 5 to 32 are left out because all of them would be 0‘s anyway.

Parameters

Name	Value range	Get request	Set request	Relative change
Number of banks	1..20: Presets 21..26: User banks	X	-	No

Examples

BankList 10<CR>

List of frequencies of bank 10 is sent to media control.

BankList 21<CR>

List of frequencies of user bank 1 is sent to media control.

Frequency [set and get]

Valid for device EM and SR

Description

The frequency can be adjusted by this command. By using the BankList command the user gets the information about which frequency belongs to which combination of bank and channel.

In order to use a preset frequency of a dedicated bank and channel parameter frequency has to match to the parameters bank and channel. In case the frequency does not match to bank and channel the frequency is stored in user bank U1.0. This is also true if parameters bank and channel are out of range. Thus frequency has got highest priority.

If the value of frequency is out of range an error message will be sent.

In case the command is sent as a get request the values sent back correspond to the order frequency, bank, channel.

In case user bank U1.0 is the selected bank Sennheiser‘s device returns a 0 for bank and channel.

If the frequency shall be changed it is enough to send only one parameter. Parameter for Bank and Channel are then obsolete.

Parameters

Name	Value range	Get request	Set request	Relative change
Frequency	depends on frequency range unit is in kHz	-	X	Yes
Bank	0: indicator for U1.0 1..20: presets 21..26: user banks U1..U6	-	X	No
Channel	0: indicator for U1.0 1..64: number of channels depends on device	-	X	No

Examples

Frequency 822000 2 10<CR>

If frequency corresponds to bank and channel bank will be set to 2 and channel to 10. Sennheiser device replies with Frequency 822000 2 10<CR> If frequency does not correspond to bank and channel frequency will be stored in user bank U1.0 Sennheiser device replies with Frequency 822000 0 0<CR>.

Frequency 822000 150 10<CR>

Frequency is stored in user bank U1.0 although parameter bank is out of range. Sennheiser device replies with Frequency 822000 2 10<CR>.

Frequency 56 2 9<CR>

1020: Value out of range [Frequency 56 2 9]<CR> Due to wrong frequency error message is sent to media control.

Frequency #1 5 7<CR>

1040: Invalid numbers of parameter [Frequency #1 5 7]<CR> as it is not reasonable to pass bank and channel parameters although the frequency is intended to be incremented.

Frequency 821000<CR>

Frequency is stored in user bank U1.0. Sennheiser device replies with Frequency 821000 0 0<CR>.

Frequency #1<CR>

Frequency is increased by one step size. If previous frequency was 821000 Sennheiser device replies with 821025 0 0<CR>.

Frequency<CR>

This is a get request. A possible return could be ‚Frequency 822000 2 10<CR>‘, which means frequency is set to 822.000 MHz, bank preset 2 and channel 10 is selected. Another possible return could be ‚Frequency 822000 0 0<CR>‘. This means the frequency is set to 822.000 MHz and is stored in user bank U1.0.

RfConfig [get only]

Valid for device EM and SR

Description

This command provides the media control with information about frequency range and the step size. The order of the values which are sent back correspond to frequency minimum, frequency maximum and frequency step size. All values are in kHz. It may happen that a device has got some frequency gaps within its range. In such a case the parameters are sent out more than once.

Parameters

Name	Value range	Get request	Set request	Relative change
Frequency minimum	depends on frequency range unit is in kHz	-	-	No
Frequency maximum	depends on frequency range unit is in kHz	-	-	No
Frequency step size	25 or 125 unit is in kHz	-	-	No

Examples

RfConfig<CR>

A possible return could be ‚RfConfig 566000 608000 25<CR>‘, which means frequency minimum is at 566.000 MHz, frequency maximum is at 608.000 MHz and frequency step size is 25 kHz. Another possible return could be ‚RfConfig 779125 787875 125 797125 805875 125 806125 809750 125<CR>‘. This means that first block goes from 779.125 MHz to 787.875 MHz with a frequency step size of 125 kHz, the second block starts from 797.125 and ends up at 805.875 MHz with a frequency step size of 125 kHz and the third block starts from 806.125 and terminates at 809.750 MHz also with frequency step size of 125 kHz.

Name [set and get]

Valid for device EM and SR

Description

By using this command the name of Sennheiser‘s device can be set or be read.

Parameters

Name	Value range	Get request	Set request	Relative change
Name	ASCII Code (32..126 decimal)	-	X	No

Examples

Name Vocal 1<CR>

Name of Sennheiser‘s device is set to ‚Vocal 1‘.

Sennheiser device replies with Name Vocal 1<CR>.

Name<CR>

Sennheiser‘s device sends back Name Vocal 1<CR>.

Mute [set and get]

Valid for device EM and SR

Description

On an EM device this command mutes the output. It is called a Rx-Mute. If this command is applied on a SR device it will not send the carrier frequency anymore. This is called Rf-Mute. For both devices, SR and EM, the status of Rf-Mute respectively Rx-Mute can be read.

Parameters

Name	Value range	Get request	Set request	Relative change
Mute	0: (Rx–/Rf–) Mute disabled 1: (Rx–/Rf–) Mute enabled	-	X	No

Examples

Mute 1<CR>

Mute is enabled. Sennheiser device replies with Mute 1<CR>.

Mute<CR>

Sennheiser‘s device replies with Mute 1<CR>.

FirmwareRevision [get only]

Valid for device EM and SR

Description

This command is used to read out the current firmware revision. This command has got no parameter.

Parameters

Name	Value range	Get request	Set request	Relative change
Firmware Revision Number	Format #.#.#	-	-	No

Examples

FirmwareRevision<CR>

Sends back the current revision number e.g. FirmwareRevision 1.20.1<CR>.

Cyclic attributes valid for EM and SR

Msg [get only by cyclic attributes]

Valid for device EM and SR

Description

This attribute is sent to media control together with other cyclic attributes. The current status of warnings is sent as a string to media control.

For the EM following warnings exist:

- RX-Mute
- Low Battery
- AF Peak
- Low RF Signal
- RF-Mute
- TX-Mute

For the SR following warnings exist:

- AF Peak
- RF-Mute

In case no warning is active an ‚OK' is sent to media control.

Parameters

Name	Value range	Get request	Set request	Relative change
Warning strings	AF_Peak Low_Battery TX_Mute Low_RF_Signal RF_Mute RX_Mute OK	-	-	No

Examples

Msg OK<CR>

Everything is ok.

Msg AF_Peak Low_Battery

EM detected AF peak and low battery.

See chapter „Response of cyclic attributes“ on page 9.

Config [get only by cyclic attributes]

Valid for device EM and SR

Description

This attribute is sent to media control together with other cyclic attributes.The configuration index is sent as a string to media control. It represents a counter that is incremented whenever a change in the configuration is executed, for instance when frequency changes. The configuration index counts to 999 and starts then from 0 again.

Parameters

Name	Value range	Get request	Set request	Relative change
Configuration index	0..999	-	-	No

See chapter „Response of cyclic attributes“ on page 9.

Commands valid for EM only

Squelch [set and get]

Valid for device EM only

Description

This command sets the squelch of an EM device. It also can be used to read the squelch status. In order to deactivate squelch function the parameter has to be set to 0 (see examples). Switching off squelch function can not be achieved by using relative parameters.

Parameters

Name	Value range	Get request	Set request	Relative change
Squelch value	(0) 5..25: Squelch value in dB in 2 dB step size	-	X	Yes

Examples

Squelch 0<CR>

Squelch is switched off. Sennheiser device replies with Squelch 0<CR>.

Squelch 7<CR>

Squelch is set to 7 dB. Sennheiser device replies with Squelch 7<CR>.

Squelch #1<CR>

Squelch is incremented by one step size e.g. previous value 7 dB => new value 9 dB. Sennheiser device replies with Squelch 9<CR>.

Squelch #-2<CR>

Squelch is decremented by 2 step sizes e.g. previous value 9 dB => new value 5 dB. Sennheiser device replies with Squelch 5<CR>.

Squelch 2<CR>

Sennheiser device replies with 1020: Value out of range [Squelch 2]<CR>.

Squelch<CR>

current value is sent to media control, e.g. Squelch 7<CR>.

AfOut [set and get]

Valid for device EM only

Description

The output can be controlled by applying this command. It is also possible to get the current status of the output. By using relative parameters it is only possible to reach +18 dB. Values greater than +18 dB can only be reached directly, for instance by using AfOut 24<CR>. By decrementing from +24 dB down jumps directly to +21 dB and then directly to +18 dB.

Parameters

Name	Value range	Get request	Set request	Relative change
AfOut value	-24..+18(+24): AfOut value in dB. Step size 3 dB.	-	X	Yes

Examples

AfOut –18<CR>

AfOut is set to –18 dB. Sennheiser device replies with AfOut -18<CR>.

AfOut 24<CR>

AfOut is set to 24 dB. Sennheiser device replies with AfOut 24<CR>.

AfOut #1<CR>

AfOut is incremented by 1 step size (3 dB) e.g. previous value –18 dB => new value –15 dB. Sennheiser device replies with AfOut -15<CR>.

AfOut 25<CR>

1020: Value out of range [AfOut 25]<CR>.

AfOut<CR>

current value is sent to media control, e.g. AfOut 3<CR>.

Equalizer [set and get]

Valid for device EM only

Description

This command adjusts the equalizer on an EM device. The status of the equalizer can also be read.

Parameters

Name	Value range	Get request	Set request	Relative change
Equalizer setting	0: flat 1: low cut 2: low cut and high boost 3: high boost	-	X	No

Examples

Equalizer 1<CR>

Equalizer is set to flat. Sennheiser device replies with Equalizer 1<CR>.

Equalizer 5<CR>

1020: Value out of range [Equalizer 5]<CR>.

Equalizer<CR>

current status is sent to media control, e.g. Equalizer 2<CR> => low cut and high boost.

Cyclic attributes valid for EM only

RF1 [get only by cyclic attributes]

Valid for device EM only

Description

This attribute is sent to media control together with other cyclic attributes.

The first parameter contains the minimum RF value of antenna 1 since last cycle. The second parameter contains the maximum RF value of antenna 1since last cycle.

0% is consistent to 0 dBµV.

100% is consistent to 40 dBµV.

Values greater than 100% are possible.

The third parameter contains information if antenna 1 was active since last cycle. Whenever antenna 1 was active since last cycle Sennheiser device will set this parameter to 1 even then if most of the time antenna 2 was active since last cycle.

Parameters

Name	Value range	Get request	Set request	Relative change
Rf min	0.. greater 100% possible	-	-	No
Rf max	0.. greater 100% possible	-	-	No
Antenna 1	0: Antenna 1 was not active since last cycle 1: Antenna 1 was at least once active since last cycle	-	-	No

Examples

See chapter „Response of cyclic attributes“ on page 9.

RF2 [get only by cyclic attributes]

Valid for device EM only

Description

This attribute is sent to media control together with other cyclic attributes.

The first parameter contains the minimum RF value of antenna 2 since last cycle. The second parameter contains the maximum RF value of antenna 2 since last cycle.

0% is consistent to 0 dBµV.

100% is consistent to 40 dBµV.

Values greater than 100% are possible.

The third parameter contains information if antenna 2 was active since last cycle. Whenever antenna 2 was active since last cycle Sennheiser device will set this parameter to 1 even then if most of the time antenna 1 was active since last cycle.

Parameters

Name	Value range	Get request	Set request	Relative change
Rf min	0.. greater 100% possible	-	-	No
Rf max	0.. greater 100% possible	-	-	No
Antenna 2	0: Antenna 2 was not active since last cycle 1: Antenna 2 was at least once active since last cycle	-	-	No

Examples

See chapter „Response of cyclic attributes“ on page 9.

States [get only by cyclic attributes]

Valid for device EM only

Description

This attribute is sent to media control together with other cyclic attributes. The first parameter shows Mute flags since last cycle. „Since last cycle“ means that this parameter does not represent the current mute status but what happened during last cycle. For instance at the beginning of a cycle there is no RF-Mute. Thus bit 2 is set to ‚0‘. If a RF-Mute occurs this bit is set to ‚1‘. This bit stays ‚1‘ even then when RF-Mute does not exist anymore when the cyclic attributes are sent out next. This bit 2 is set to ‚0‘ if RF-Mute is not detected for more than a complete cycle. In other words these bits are set to ‚1‘ whenever within a cycle the appropriate mute was active.

Bit 0 is set to ‚1‘ if for more than one complete cycle any kind of mute (TX, RF or RX) was active. For instance when bit 0 is set to ‚0‘ and bit 2 is set to ‚1‘ it means that RF-Mute was detected once since last cycle but it was not permanently active. When bit 0 is set to ‚1‘ and bit 2 is set to ‚1‘ it means that RF-Mute was active for the complete cycle. If the pilot tone is deactivated, the pilot flag will be processed.

The second parameter shows the Pilot flag since last cycle.

Parameters

Name	Value range	Get request	Set request	Relative change
Mute flags	Bit 0: Mute Bit 1: TX-Mute Bit 2: RF-Mute Bit 3: RX-Mute	-	-	No
Pilot flags	0: since last cycle no pilot signal was detected 1: since last cycle a pilot signal was permanently received 2: since last cycle a pilot signal was not permanently received, i. e a change in reception of pilot signal occurred within last period	-	-	No

Examples

States 3 0<CR>

RF-Mute occurred during last cycle, no pilot signal detected for complete cycle.

States 9 1<CR>

TX-Mute and RX-Mute detected during last cycle, pilot signal detected for complete cycle.

States 0 2<CR>

No Mute occurred during last cycle, pilot signal changed within last cycle.

See chapter „Response of cyclic attributes“ on page 9.

RF [get only by cyclic attributes]

Valid for device EM only

This attribute is sent to media control together with other cyclic attributes. The first parameter shows the current RF level in % (100% => 40 dBµV). Values greater than 100% are possible. The second parameter indicates the current antenna state.

The third parameter represents the current pilot state. If the pilot tone is deactivated, the pilot flag will be processed.

Parameters

Name	Value range	Get request	Set request	Relative change
Current RF level	0.. greater 100% possible	-	-	No
Current antenna state	1: antenna 1 is active 2: antenna 2 is active	-	-	No
Current pilot state	0: no pilot signal detected 1: pilot signal detected	-	-	No

Examples

See chapter „Response of cyclic attributes“ on page 9.

AF [get only by cyclic attributes]

Valid for device EM only

Description

This attribute is sent to media control together with other cyclic attributes. The first parameter shows current audio level. The second parameter shows the current Peak-Hold-Level.

0% is consistent to -50 dB. 100% is consistent to Peak. Values greater 100% are possible.

The third parameter represents the current mute state. Bit 0 is set to ‚1' if at least one of the other bits is set to ‚1'.

Parameters

Name	Value range	Get request	Set request	Relative change
Current Peak	0.. greater 100% possible	-	-	No
Current Peakhold	0.. greater 100% possible	-	-	No
Mute state	Bit 0: Mute Bit 1: TX-Mute Bit 2: RF-Mute Bit 3: RX-Mute	-	-	No

Examples

AF 37 42 0<CR>

Current peak is at 37%, current peak hold is at 42%, no mute detected.

AF 37 42 3<CR>

Current peak is at 37%, current peak hold is at 42%, EM indicates TX-Mute.

AF 37 42 13<CR>

Current peak is at 37%, current peak hold is at 42%, EM indicates RX-Mute and RF-Mute.

See chapter „Response of cyclic attributes“ on page 9.

Bat [get only by cyclic attributes]

Valid for device EM only

Description

This attribute is sent to media control together with other cyclic attributes. The current status of battery is indicated. If the EM device replies with ‚?' it means that no battery signal could be detected.

Parameters

Name	Value range	Get request	Set request	Relative change
Battery status	values in % [0, 30, 70,100,?]	-	-	No

Examples

Bat 0<CR>

Battery status is low, a warning is generated.

Bat 30<CR>

Battery status is 30%.

Bat ?<CR>

No battery status available (battery telegram is not received).

Commands valid for SR only

Sensitivity [set and get]

Valid for device SR only

Description

On a SR device the sensitvitiy can be adjusted by using this command. It is also possible to read the current sensitivity value.

Parameters

Name	Value range	Get request	Set request	Relative change
Sensitivity value	-42..0: Sensitivity value in dB with a step size of 3 dB	-	X	Yes

Examples

Sensitivity -21<CR>

Sensitivity is set to -21 dB. Sennheiser device replies with Sensitivity -21<CR>.

Sensitivity #3<CR>

Sensitivity is incremented by 3 times the step size in reference to its current value e.g. previous value -21 dB => new value -12 dB. Sennheiser device replies with Sensitivity -12<CR>.

Sensitivity -20<CR>

1020: Value out of range [Sensitivity -20]<CR>.

Sensitivity<CR>

Current status is sent, e.g. Sensitivity -21<CR>.

Equalizer [set and get]

Valid for device SR only

Description

This command adjusts the equalizer on a SR device. The status of the equalizer can also be read. This command can be used either with 6 parameters or just with one. If only the Equalizer function is wanted to be changed only one parameter has to be sent.

Parameters

Name	Value range	Get request	Set request	Relative change
Equalizer	0: Equalizer off 1: Equalizer on	-	X	No
Low	-5..+5 in step size 1	-	X	No
Low Mid	-5..+5 in step size 1	-	X	No
Mid	-5..+5 in step size 1	-	X	No
Mid High	-5..+5 in step size 1	-	X	No
High	-5..+5 in step size 1	-	X	No

Examples

Equalizer 0 -5 3 0 -3 5<CR>

Equalizer is off. The values for the different ranges are still taken over. In this example it means that Low is set to -5, Low Mid is set to 3, Mid is set to 0, Mid High is set to -3 and High is set to 5. Sennheiser device replies with Equalizer 0 -5 3 0 -3 5<CR>.

Equalizer 1<CR>

Equalizer is on. The previously stored settings are then used. Sennheiser device replies with Equalizer 1 -5 3 0 -3 5<CR>.

Equalizer 0 -5 3 6 -3 5<CR>

1020: Value out of range [Equalizer 0 -5 3 6 -3 5]<CR> Mid parameter is out of range. Therefore no parameter is taken over.

Equalizer<CR>

A possible return could be Equalizer 1 -5 3 0 -3 5<CR>.

Mode [set and get]

Valid for device SR only

Description

This command determines if the SR device is set to mono or stereo mode. The status can be requested by media control.

Parameters

Name	Value range	Get request	Set request	Relative change
Mode setting	0: Mono 1: Stereo	-	X	No

Examples

Mode 1<CR>

SR is set to stereo mode. Sennheiser device replies with Mode 1<CR>.

Mode<CR>

Mode 0<CR> means SR is in mono mode.

Cyclic attributes valid for SR only

AF [get only by cyclic attributes]

Valid for device SR only

Description

This attribute is sent to media control together with other cyclic attributes. The first and second parameter define the current AF level for both RX paths. The third and fourth parameter represent AF peak-hold values.

Parameters

Name	Value range	Get request	Set request	Relative change
Af-Peak 1	0..100% at 0 dB	-	-	No
Af-Peak 2	-0..100% at 0 dB	-	-	No
Af-Peak Hold 1	0..100% at 0 dB	-	-	No
Af-Peak Hold 2	0..100% at 0 dB	-	-	No

Examples

See chapter „Response of cyclic attributes“ on page 9.

States [get only by cyclic attributes]

Valid for device SR only

Description

This attribute is sent to media control together with other cyclic attributes. The first parameter shows current RF-Mute state, which means it shows the RF-Mute state at that point of time. The second parameter shows the RF-Mute flag since last cycle.

„Since last cycle“ means that this parameter does not represent the current RF-Mute status but what happened during last cycle. For instance at the beginning of a cycle there is no RF-Mute. Thus parameter RF-Mute flag is set to ‚0‘. If a RF-Mute occurs this parameter is set to ‚2‘ even then when RF-Mute switched back to Off-state when the cyclic attributes are sent out next. In other words whenever there is a change on RF-Mute state within a cycle the second parameter returns a ‚2‘. If there is no change during the complete cycle the second parameter returns a ‚0‘ if RF-Mute was permanently off. Otherwise it returns a ‚1‘.

Parameters

Name	Value range	Get request	Set request	Relative change
RF-Mute state	0 => RF is currently on 1 => RF is currently off	-	-	No
RF-Mute flags	0: since last cycle RF is continuously on (=> RF-Mute is off) 1: since last cycle RF is continuously off (=> RF-Mute is on) 2: since last cycle RF was not permanently on, i. e. RF-Mute was active during last cycle	-	-	No

Examples

States 0 0<CR>

RF-Mute is currently off, during last cycle no RF Mute was detected.

States 0 2<CR>

RF-Mute is currently off, during last cycle RF Mute was at least once detected.

States 1 2<CR>

RF-Mute is currently detected, during last cycle RF-Mute was at least once off.

See chapter „Response of cyclic attributes“ on page 9.

List of error codes

Error code	Error text	Error description
1000	Invalid command	The given command is not known by Sennheiser's device
1010	Invalid parameter	At least one parameter is invalid for this command
1020	Value out of range	At least one parameter is out of range for this command
1030	Relative parameter not supported	At least one parameter tried an unsupported relative change
1040	Invalid numbers of parameter	Invalid number of parameters for this command
1050	Incorrect termination	The carriage return <CR> is missed