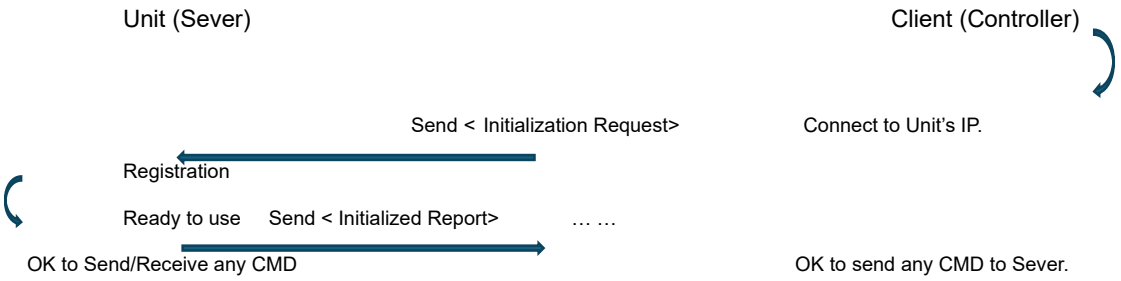
Controlling via Network

Set-up

The unit's IP control is always ready to use, through port 50000 of its IP address. To identify the connected client/server that is using this protocol, an initialization command should be sent by the client just after connection is established, and the unit will respond to this command. For more details about the commands please refer to the command description part of this document.

IP Control is disabled for minimum standby power consumption when the AVR is in "Green" mode or when the AVR is disconnected from the local network.



Conventions

All hexadecimal numbers begin 0x.

Any character in single quotes gives the ASCII equivalent of a hex value.

<n> represents an unknown or variable number.

Command and response formats

Communication between the controller and the AVR takes the form of sequences of bytes, with all commands and responses having the same basic format. The AVR shall always respond to a received command, but may also send messages at other times.

Each transmission by the Controller is the following format:

<Start><CmdID><DataLen><Data1>...<DataN><End>

- <Start> Start transmission, a fixed hex data: 0x23
- <CmdID> Command Id code
- <DataLen> the number of data items following this item, excluding the <End>.
- <Data1>...<DataN> parameters of <CmdID>, this part is empty if <DataLen> is 0.
- <End> End transmission, one fixed hex data: 0x0D

Each response by the AVR is the following format:

<Start><CmdID><RspCode><DataLen><Data1>...<DataN><End>

- <Start> Start transmission, two fixed hex data:0x02 0x23
- <CmdID> Command Id code
- <RspCode> Response code, refer the Response code table: Table-1
- <DataLen> the number of data items following this item, excluding the <End>.
- <Data1>...<DataN> parameters of <CmdID>, this part is empty if <DataLen> is 0.
- <End> End transmission, one fixed hex data: 0x0D

Response code (Table-1)

0x00	Status update.
0xC1	Command not recognized.
0xC2	Parameter not recognized.
0xC3	Command invalid at this time.
0xC4	Invalid data length.

The AVR responds to each command from the controller within three seconds. The AVR supports consecutive message control so the controller can send 2 or more commands to the AVR in one packet, the AVR will handle and respond to them one by one, the AVR may also send these consecutive response messages in one packet.

State changes

The AVR will inform the connected controller of any state change resulting from front panel buttons, IR remote control using the appropriate message.

For example, if the user changed the volume via the front panel volume knob, a command <06: Set/Request the main volume.> would be sent to the controller.

A similar action would be taken for all other state changes including decode mode changes.

Example command and response sequence

As an example, the command sent from Controller.

Start	CmdID	DataLen	Data1	Data2	End
0x23	0x02	0x02	0x05	0x21	0x0D

As an example, the AVR receives and responds to this command.

Start	CmdID	RspCode	DataLen	Data1	Data2	End
0x02,0x23	0x02	0x00	0x02	0x05	0x21	0x0D

Commands ID Table

Ver1.1

Command ID	Command Specification
0x00	Set/Request the standby state of the AVR.
0x01	Set/Request the display dim status of the AVR
0x02	Request the version number of the various pieces of software on the AVR
0x04	Simulate a remote-control command via IP
0x05	Set/Request the input source.
0x06	Set/Request the main volume.
0x07	Set/Request the mute status.
0x08	Set/Request the Surround decoding mode.
0x09	Set/Request party mode status
0x0A	Set/Request party out volume
0x0B	Set/Request Treble equalization
0x0C	Set/Request Bass equalization
0x0D	Set/Request Room equalization
0x0E	Set/Request Dialog Enhanced state.
0x0F	Set/Request Dolby Audio Mode.
0x10	Set/Request Compression for Dolby / DTS audio.
0x11	Request/Report Streaming server state
0x50	Initialization Request / Initialized Report
0x51	Heartbeat
0x52	Reboot Request
0x53	Force a restore of the factory default settings

System Command Specifications:

Set/Request Standby State (0x00)

Set/Request the standby state of the AVR.

Data Specification:

Data1:

- 0xF0 Request power state
- 0x00 Set to / is in standby status.
- 0x01 Set to / is powered on.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x00	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x00	0x00	0x01	0x01	0x0D

Set/Request Display Dim (0x01)

Set/Request the display dim status of the AVR

Data Specification:

Data1:

- 0xF0 Request display dim state - 0x00 Full brightness.
- 0x01 50% brightness.
- 0x02 25% brightness.
- 0x03 Display Off.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x01	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x01	0x00	0x01	0x00	0x0D

Request Software Version (0x02)

Request the version number of the various pieces of software on the AVR.

Data Specification:

Command / Response Data1:

- 0xF0 Request implemented IP control version. (per this document) - 0xF1 Request Host version.
- 0xF2 Request DSP version.
- 0xF3 Request OSD version.
- 0xF4 Request NET version.

Response Data2~N bytes

- Ascii Codes. For example, version number 1.53 will take 4 bytes '1','.','5','3'.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x02	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	Data2	Data3	Data4	Data5	End
0x02,0x23	0x02	0x00	0x05	0xF0	0x31	0x2E	0x35	0x33	0x0D

Simulate AVR IR Command (0x04)

Simulate a remote-control command via IP. The data is a NEC encoded format, 2 customer code + 1 IR code, MSB first.

Data Specification:

Data1: Remote control code. Refer to table below

Power	0x010E03
UP	0x010E99
Down	0x010E59
Left	0x010E83
Right	0x010E43
OK	0x010E21
Menu	0x010ECA
Back	0x010EA1
Dim	0x010EC9
Vol+	0x010EE3
Vol-	0x010E13
Source+	0x010E8C
Source-	0x010E0C
Surr. +	0x010EF4
Surr. -	0x010E74
Mute	0x010EC3

Command example

Start	CmdID	DataLen	Data1	Data2	Data3	End
0x23	0x04	0x03	0x01	0x0E	0xE3	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	Data2	Data3	End
0x02,0x23	0x04	0x00	0x03	0x01	0x0E	0xE3	0x0D

Set/Request input source (0x05)

Select/Request the input source.

Data Specification:

Data1:

- 0xF0 request current source.

Source ID and name. Refer to table below

TV(ARC)	0x01	(All models)
HDMI 1	0x02	(All models)
HDMI 2	0x03	(All models)
HDMI 3	0x04	(All models)
HDMI 4	0x05	(All models)
HDMI 5	0x06	(Only available on MA710/MA7100HP/9100HP)
HDMI 6	0x07	(Only available on MA710/MA7100HP/9100HP)
Coax	0x08	(All models)
Optical	0x09	(All models)
Analog1	0x0a	(All models)
Analog2	0x0b	(All models)
Phono	0x0c	(Only available on MA710/MA7100HP/9100HP)
Bluetooth	0x0d	(All models)
Network	0x0e	(All models)

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x05	0x01	0x08	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x05	0x00	0x01	0x08	0x0D

Set/Request master volume (0x06)

Set/Request the main volume.

Data Specification:

Data1:

- 0xF0 request current master volume.
- 0x00 – 0x63, master volume (0-99).

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x06	0x01	0x28	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x06	0x00	0x01	0x28	0x0D

Set/Request mute status (0x07)

Set/Request the mute status.

Data Specification:

Data1:

- 0xF0 request mute status.
- 0x00 AVR is not muted.
- 0x01 AVR is muted.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x07	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x07	0x00	0x01	0x00	0x0D

Set/Request Surround decoding mode (0x08)

Set/Request the surround decoding mode.

Data Specification:

Data1:

- 0xF0 request surround mode.

Surround mode name and id. Refer to table below

Dolby Surround	0x01	(Only available on MA710/MA7100HP/9100HP)
DTS Neural:X	0x02	(Only available on MA710/MA7100HP/9100HP)
Stereo 2.0	0x03	(All models)
Stereo 2.1	0x04	(All models)
All Stereo	0x05	(All models)
Native	0x06	(All models)
Dolby ProLogic II	0x07	(Only available on MA510)

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x08	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x08	0x00	0x01	0x06	0x0D

Set/Request party mode status (0x09)

(Only available on MA710/MA7100HP/9100HP) Set/Request the party mode status.

Data Specification:

Data1:

- 0xF0 request party mode status.
- 0x00 Party mode turned OFF.
- 0x01 Party mode set to ON.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x09	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x09	0x00	0x01	0x01	0x0D

Set/Request party out volume (0x0A)

(Only available on MA710/MA7100HP/9100HP) Set/Request the party out volume.

Data Specification:

Data1:

- 0xF0 request party volume status.
- 0x00 – 0x63, party volume (0-99).

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x0A	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x0A	0x00	0x01	0x032	0x0D

Set/Request Treble equalization (0x0B)

Set/Request the treble equalization.

Data Specification:

Data1:

- 0xF0 request
- 0x00 – 0x0C, treble regular value from 0dB to 12dB.
- 0xFF – 0xF4, treble negative value from -1dB to -12dB

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x0B	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x0B	0x00	0x01	0x05	0x0D

Set/Request Bass equalization (0x0C)

Set/Request the bass equalization.

Data Specification:

Data1:

- 0xF0 request
- 0x00 – 0x0C, Bass regular value from 0dB to 12dB.
- 0xFF – 0xF4, Bass negative value from -1dB to -12dB

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x0C	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x0C	0x00	0x01	0x00	0x0D

Set/Request Room equalization (0x0D)

Set/Request the room equalization.

Room EQ can be selected only after a room correction filter has been uploaded to the AVR. If a room correction filter has not been uploaded to the AVR then the AVR will respond with RspCode 0xC3.

Data Specification:

Data1:

- 0xF0 request
- 0x00 room eq disabled (not loaded)
- 0x01 room eq “EZ Set EQ” select/ selected.
- 0x02 room eq “Dirac Live” select/ selected. (Only available on MA7100HP/9100HP)

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x0D	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x0D	0x00	0x01	0x00	0x0D

Set/Request Dialog Enhanced state (0x0E)

Set/Request the dialog enhanced state.

Data Specification:

Data1:

- 0xF0 request
- 0x00, dialog enhanced turn/turned off. - 0x01, dialog enhanced turn/turned on.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x0E	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x0E	0x00	0x01	0x00	0x0D

Set/Request Dolby Audio Mode (0x0F)

Set/Request the Dolby Audio Mode.

Data Specification:

Data1:

- 0xF0 request
- 0x00, Dolby audio mode turn/turned to off.
- 0x01, Dolby audio mode turn/turned to Music.
- 0x02, Dolby audio mode turn/turned to Movie.
- 0x03, Dolby audio mode turn/turned to Night. (Only available on MA710/MA7100HP/9100HP)

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x0F	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x0F	0x00	0x01	0x00	0x0D

Set/Request Compression for Dolby / DTS audio (0x10)

Set/Request the compression (DRC) for Dolby / DTS audio. (Only available on MA710/MA7100HP/9100HP)

Data Specification:

Data1:

- 0xF0 request
- 0x00, DRC turn/turned to OFF.
- 0x01, DRC turn/turned to ON.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x10	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x10	0x00	0x01	0x00	0x0D

Request/Report Streaming server state (0x11)

Request/Report the name and play state of streaming server that is currently connected

Data Specification:

Data1:

- 0xF0 request
- 0x00-0x21, Refer to table below Data2:
- 0x00, Stopped
- 0x01, Playing
- 0x02, Paused
-

Data	Server name
0	Unknown (no connection)
1	Airable
2-3	Reserved
4	USB Storage
5	Reserved
6	VTuner
7-8	Reserved
9	TuneIn
10	UPnP
11	QPlay
12	Bluetooth
13	AirPlay
14	Reserved
15	Spotify
16	Google Cast
17	AirableRadios
18	AirablePodcasts
19	Napster
20	Qobuz
21	Deezer
22	Tidal
23	Roon
24-25	Reserved
26	AmazonMusic
27-32	Reserved
33	Pandora

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x11	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	Data2	End
0x02,0x23	0x11	0x00	0x02	0x0D	0x01	0x0D

Initialization Request / Initialized Report (0x50)

Initialization Request / Initialized Report. To identify the connected client/server that is using this protocol,

this command should be sent by the controller to the AVR just after connection is established, and the AVR will respond to this

command with the product model as an initialized report.

Once the AVR receives this command, it isn't necessary to send the command again if connection is lost temporarily and reconnected unless the AVR is power cycled, or if the reboot command is sent to the AVR.

Also, sending this command to the AVR is fine at any time, and can be used like a heartbeat command.

Data Specification:

Data1:

- 0xF0 request
- 0x01, MA510 - 0x02, MA710.
- 0x03, MA7100HP.
- 0x04, MA9100HP.

Command example

Start	CmdID	DataLen	Data1	End
0x23	0x50	0x01	0xF0	0x0D

Response

Start	CmdID	RspCode	DataLen	Data1	End
0x02,0x23	0x50	0x00	0x01	0x04	0x0D

Heartbeat (0x51)

Heartbeat command to check unit is still connected and communicating, sending this command to AVR will also reset the auto standby timer count. (Sending command <50> is also fine and will not reset the timer count).

Data Specification:

Command with 2 fixed data.

Data1: 0xAA

Data2: 0xAA

Command example

Start	CmdID	DataLen	End
0x23	0x51	0x00	0x0D

Response

Start	CmdID	RspCode	DataLen	End
0x02,0x23	0x51	0x00	0x00	0x0D

Reboot Request (0x52)

Force a reboot of the unit.

Data Specification:

Command with 2 fixed data.

Data1: 0xAA

Data2: 0xAA

Command example

Start	CmdID	DataLen	Data1	Data2	End
0x23	0x52	0x02	0xAA	0xAA	0x0D

Response

Start	CmdID	RspCode	DataLen	End
0x02,0x23	0x52	0x00	0x00	0x0D

Restore factory default settings (0x53)

Force a restore of the factory default settings.

Data Specification:

Command with 2 fixed data.

Data1: 0xAA

Data2: 0xAA

Command example

Start	CmdID	DataLen	Data1	Data2	End
0x23	0x53	0x02	0xAA	0xAA	0x0D

Response

Start	CmdID	RspCode	DataLen	End
0x02,0x23	0x53	0x00	0x00	0x0D

Release Notes

V1.0

Draft release.

V1.1

(1) Change <Start> code from 2 bytes to 1byte.

(2) Add more detail description for “Set-up” and “Command and response formats”.

(3) Add section “State changes”.

(4) Update Command <04: Simulate AVR IR Command >

(5) Add new command <50: Initialization >, <51: Heartbeat >, <52: Reboot>, <53: Factory Reset>, <11: Streaming Status>

(6) Remove duplicate command <03: Factory Reset>.

V1.2

(1) Power Response CmdID corrected to 0x00.

(2) Set/Request Room equalization CmdID corrected to 0x0D.

(3) Reboot Request DataLen value corrected to 0x02.

(4) Restore factory default settings DataLen value corrected to 0x02.

V1.3

(1) Responses from AVR begin "0x02 0x23...”

(2) Fix documentation issues: general formatting, spelling and grammar mistake.

V1.4

(1) Increase the size of the box to allow start bytes to appear on a single line.

(2) Fix documentation issues: general formatting, spelling and grammar mistake.

V1.5

(1) Automatically adjust table size based on content.

(2) Fix documentation issues: general formatting, spelling and grammar mistake.