ARCAM

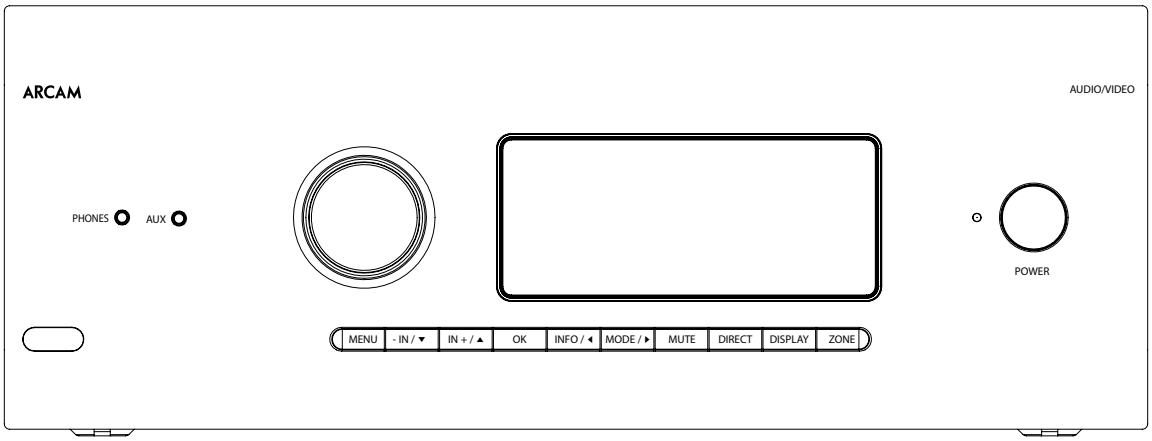
Custom Installation Notes:

Serial programming interface and

IR remote commands for

Arcam AVR5/AVR10/AVR20/AVR30/AV40

AVR11/AVR21/ARV31/AVR41



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Applicability

Changelog

Issue A.0: First draft

Issue B.0: Added C4 & DANTE to engineering menu control & correct 0x13

Issue C.0: Removed commands 0x39/0x3A as not longer used, Auro commands 0x10, 0x11 & 0x28 updated. Dolby Centre spread removed from 0x29, Leveller & Calibration Offset removed from 0x28. Added Auro Native & Auro 2D IR commands.

Issue D.0: Added Auro channel responses to 0x43 / 0x29. Correct Bass -1 IR comamnd.

Issue E.0: Added AVR5

Issue F.o: Added AVR11, AVR21, AVR31, AV41

Controlling via RS232/NET

Introduction

This document describes the remote control protocol for controlling via the RS232/NET interface. The AV implements virtual IR commands in order to simplify the protocol. Any operation that can be invoked using the IR remote control can be achieved over a control link using the Simulate RC5 IR command (0x08). See page 7 for details of this command. The RC5 IR code set is listed from page 39.

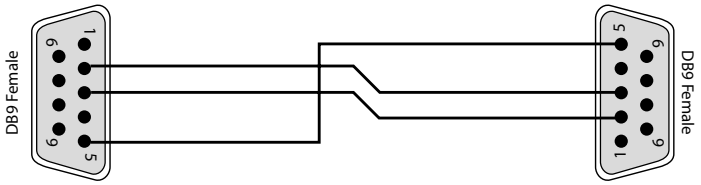
Set-up

The AV must be correctly configured for Control; by default, Control is disabled for minimum standby power consumption. RS232 control can be enabled using the front panel: press and hold the front panel **DIRECT** button for 4 seconds until "RS232 CONTROL ON" is displayed on the VFD. Alternatively, Control for RS232 or IP can be enabled using the OSD menu. Press (AMP) followed by (MENU) on the remote control in order to access the setup menu. Use the cursor keys (◄) (►) (▼) (▲) and (OK) to enter the General Setup menu and locate the option ***Control***. Press (OK), (▼) then (OK) to change this parameter to 'On'. IP control is via port 50000 of the IP address of the unit (in the Network Settings menu).

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.

Serial Cable Specification



The cable is wired as a null modem:

Connector 1 pin	Connector 2 pin	Function
2	3	Rx ← Tx
3	2	Tx → Rx
5	5	RS232 Ground

Data transfer format

- Transfer rate: 38,400bps.
- 1 start bit, 8 data bits, 1 stop bit, no parity, no flow control.

Command and response formats

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

Each transmission by the RC is the following format:

<St> <Zn> <Cc> <Dl> <Data> <Et>

- St (Start transmission): 0x21 '!'
- Zn (Zone number): see below.
- Cc (Command code): the code for the command
- Dl (Data length): the number of data items following this item,excluding the ETR
- Data: the parameters for the command
- Et (End transmission): 0x0D

Each response by the AVR is the following format::

<St> <Zn> <Cc> <Ac> <Dl> <Data> <Et>

- St (Start transmission): 0x21 '!'
- Zn (Zone number): see below.
- Cc (Command code): the code for the command
- Ac (Answer code): see below.
- Dl (Data Length): the number of data items following this item, excluding the ETR
- Data: the parameters for the response of length n. n is limited to 255.
- Et (End transmission): 0x0D

The AV responds to each command from the RC within three seconds. The RC may send further commands before a previous command response has been received.

Zone numbers

The following zone numbers are defined:

- 0x01 – Zone number 1. (Zone 1 is the master zone. Commands that appear zone-less refer to the master zone)
- 0x02 – Zone number 2.

Answer codes

The following answer codes are defined:

- 0x00 – Status update.
- 0x82 – Zone Invalid.
- 0x83 – Command not recognised.
- 0x84 – Parameter not recognised.
- 0x85 – Command invalid at this time.[1]
- 0x86 – Invalid data length.

[1]Certain commands cannot be processed when the Setup Menu is being displayed. An answer code of 0x85 will be returned in these circumstances. Also, commands for tuner control cannot be processed when the tuner input is not selected, etc.

State changes as a result of other inputs

It is possible that the state of the AV may be changed as a result of user input via the front panel buttons or via the IR remote control. Any change resulting from these inputs is relayed to the RC using the appropriate message type.

For example, if the user changed the front panel display brightness using the DISPLAY button on the front panel, a display message (defined below) would be sent to the RC. A similar action would be taken for all other state changes (including decode mode changes).

Reserved Commands

Commands 0xF0 to 0xFF (inclusive) are reserved for test functions and should never be used.

Example command and response sequence

As an example, the command to simulate the RC5 command "16-16", volume up:

STR	ZONE	CC	DL	Data 1	Data 2	ETR
0x21	0x01	0x08	0x02	0x10	0x10	0x0D

Assuming that the command was accepted by the AV Receiver and is being processed, the AV responds to this command with the following sequence:

STR	ZONE	CC	AC	DL	Data 1	Data 2	ETR
0x21	0x01	0x08	0x00	0x02	0x10	0x10	0x0D

AMX Duet™ Support

The AV shall be fully compatible with AMX Duet™ Dynamic Device Discovery Protocol (DDDP) The following description of Dynamic Device Discovery comes from the AMX website (www.amx.com). Dynamic Device Discovery is part of AMX's Duet™ platform, which combines the proven reliability and power of NetLinx with the extensive capabilities of the Java 2 Micro Edition (J2ME) platform. When integrating a serial or IP device from a manufacturer embedding the Dynamic Device Discovery Protocol (DDDP), Duet recognizes the device and loads the appropriate Duet module, which automatically installs the new device. AMX's NetLinx Master can then find and install the Duet device module either from a library on the master, from AMX's Web site, or from the manufacturer's Web site. Duet also allows for device swapping so that programming changes are not required when devices with DDDP are removed or replaced – a huge benefit for end users. The Duet platform is an extension AMX's InConcert® manufacturer partner program, which was developed to ensure seamless communication between partners' devices and the AMX control system.

Data is specified in the ASCII format. All ASCII characters between the quotes "" should be recognised/transmitted. "\r" is a carriage return (0x0D)

Command: "AMX\r"

Response:
"AMXB<Device-SDKClass=Receiver><Device-Make=ARCAM><Device-Model=modelname><Device-Revision=x.y.z>\r"

Where

x.y.z = RS232 protocol version number.

Control 4 SDDP Support

The AV shall be fully compatible with the Control 4 SDDP discovery protocol.

Crestron Connected Support

The AV shall be fully compatible with the Crestron Connected discovery protocol.

System Command Specifications

Power (0x00)

Request the stand-by state of a zone.

Example

Command/response sequence to request the power state of zone 1 where zone 1 has power on:

Command:	0x21 0x01 0x00 0x01 0xF0 0x0D
Response:	0x21 0x01 0x00 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x00
Dl	0x01
Data	0xF0 – Request power state
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x00
Ac	Answer code
Dl	0x01
Data	0x00 – Zone is in stand-by 0x01 – Zone is powered on
Et	0x0D

Display Brightness (0x01)

Request the brightness of the front panel display.

Example

Command/response sequence for requesting the brightness of the display where the display is off:

Command:	0x21 0x01 0x01 0x01 0xF0 0x0D
Response:	0x21 0x01 0x01 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x01
Dl	0x01
Data	0xF0 – Request brightness
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x01
Ac	Answer code
Dl	0x01
Data	0x00 – Front panel is off 0x01 – Front panel L1 0x02 – Front panel L2
Et	0x0D

Headphones (0x02)

Determine whether headphones are connected.

Example

Command/response sequence to request the headphone status where the headphones are not connected:

Command:	0x21 0x01 0x02 0x01 0xF0 0x0D
Response:	0x21 0x01 0x02 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x02
Dl	0x01
Data	0xF0 – Request current headphone connection status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x02
Ac	Answer code
Dl	0x01 (Data length)
Data	0x00 – Headphones are not connected. 0x01 – Headphones are connected
Et	0x0D

FM genre (0x03)

Request information on the current station programme type from FM source in a given zone. If FM is not selected on the given zone an error 0x85 is returned.

Example

Command/response sequence to request the programme type on zone 1 where the programme type is "POP MUSIC":

Command:	0x21 0x01 0x03 0x01 0xF0 0x0D
Response:	0x21 0x01 0x03 0x00 0x09 0x50 0x4F 0x50 0x20 0x4D 0x55 0x53 0x49 0x43 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x03
Dl	0x01
Data1	Request information source: 0xF0 – FM program type
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x03
Ac	Answer code
Dl	Data length <n>
Data1 – Data<n>	The radio programme type in ASCII characters
Et	0x0D

Software version (0x04)

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

Example

Command/response sequence to request the RS232 protocol version (1.4):

Command: 0x21 0x01 0x04 0x01 0xF0 0x0D

Response: 0x21 0x01 0x04 0x00 0x03 0xF0 0x01 0x04 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x04
Dl	0x01
Data	0xF0 – Request RS232 version 0xF1 – Request Host version 0xF2 – Request OSD version 0xF3 – Request DSP version 0xF4 – Request NET version 0xF5 – Request IAP version
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x04
Ac	Answer code
Dl	0x03
Data1	Echo data from command
Data2	Major version number
Data3	Minor version number
Et	0x0D

Restore factory default settings (0x05)

Force a restore of the factory default settings.

Example

Command/response sequence to restore factory defaults:

Command:	0x21 0x01 0x05 0x02 0xAA 0xAA 0x0D
Response:	0x21 0x01 0x05 0x00 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x05
Dl	0x02
Data1	0xAA (Confirmation data pattern to avoid accidental restore)
Data2	0xAA (Confirmation data pattern to avoid accidental restore)
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x05
Ac	Answer code
Dl	0x00
Et	0x0D

Save/Restore secure copy of settings (0x06)

Force a restore of the secure copy of the settings. Note: If no secure copy has been made, this command will return an answer code of 0x85.

If the system is currently doing a save and another save is requested. The second save will fail silently. If a command 0x1E is being processed this command will fail with a answer code 0x85

Example

Command/response sequence to restore secure backup:

Command: 0x21 0x01 0x06 0x07 0x01 0x55 0x55 0x01 0x02 0x03 0x040x0D

Response: 0x21 0x01 0x06 0x00 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0X06
Dl	0x07
Data1	0x00 – Save secure backup 0x01 – Restore secure backup
Data2	0x55 (Confirmation data pattern to avoid accidental save/restore)
Data3	0x55 (Confirmation data pattern to avoid accidental save/restore)
Data4	Pin digit 1
Data5	Pin Digit 2
Data5	Pin Digit 3
Data7	Pin Digit 4
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x06
Ac	Answer code
Dl	0x00
Et	0x0D

Simulate RC5 IR Command (0x08)

Simulate an RC5 command via the RS232 port. An additional status message will be sent in most cases as a result of the IR command.

Example

Command/response sequence to RC5 16-17 (AVR volume down in zone 1):

Command: 0x21 0x01 0x08 0x02 0x10 0x11 0x0D

Response: 0x21 0x01 0x08 0x00 0x02 0x10 0x11 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x08
Dl	0x02
Data1	RC5 System code
Data2	RC5 Command code
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x08
Ac	Answer code
Dl	0x02
Data1	RC5 System code
Data2	RC5 Command code
Et	0x0D

Display Information Type (0x09)

Set the VFD display information type (where applicable).

The return data echoes the data sent.

Example

Command/response sequence to set the display text to show the current FM radio text with FM playing in zone 2:

Command:	0x21 0x02 0x09 0x01 0x01 0x0D
Response:	0x21 0x02 0x09 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x09
Dl	0x01
Data	**For all sources:** 0x00 – Set the display to Processing mode 0xE0 – Cycle though all displayable information. 0xF0 – Request the current display type **If the current source is FM:** 0x01 – Set the display to Radio text 0x02 – Set the display to Programme type 0x03 – Set the display to Signal strength **If the current source is DAB:** 0x01 – Set the display to Radio text 0x02 – Set the display to Genre 0x03 – Set the display to Signal quality 0x04 – Set the display to Bit rate **If the current source is NET** 0x01 – Set the display to Track 0x02 – Set the display to Artist 0x03 - Set the display to Album 0x04 – Set the display to audio type 0x05 – Set the display to rate
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x09
Ac	Answer code
Dl	0x01
Data	The current display is returned, as for the command.
Et	0x0D

Request current source (0x1D)

Request the source currently selected for a given zone.

Example

Command/response sequence to request the current source for Zone 1 where the source is set to 'SAT':

Command:	0x21 0x01 0x1D 0x01 0xF0 0x0D
Response:	0x21 0x01 0x1D 0x00 0x01 0x04 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1D
Dl	0x01
Data	0xF0
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1D
Ac	Answer code
Dl	0x01
Data	The current source in the indicated zone: 0x00 – Follow Zone 1 0x01 – CD 0x02 – BD 0x03 – AV 0x04 – SAT 0x05 – PVR 0x06 – UHD 0x08 – AUX 0x09 – DISPLAY 0x0B – TUNER (FM) 0x0C – TUNER (DAB) 0x0E – NET 0x10 - STB 0x11 - GAME 0x12 - BT
Et	0x0D

Headphone Over-ride (0x1F)

Activate/deactivate the mute relays (does not zero the volume).

Example

Command/response sequence to activate the mute relays:

Command:	0x21 0x01 0x1F 0x01 0x01 0x0D
Response:	0x21 0x01 0x1F 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1F
Dl	0x01
Data	0x00 – Headphone/Over-ride Clear (speakers muted if headphones present) 0x01 – Headphone/Over-ride Set (speakers unmuted if headphones present)
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1F
Ac	Answer code
Dl	0x01
Data1	Relay state
Et	0x0D

Input Command Specifications

Select analogue/digital (0x0B)

Select an analogue/digital audio input for the current source. Returns invalid (0x85) if OSD is showing setup screen.

Example

Command/response sequence to change the audio input to 'digital' in zone 1:

Command:	0x21 0x01 0x0B 0x01 0x01 0x0D
Response:	0x21 0x01 0x0B 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0B
Dl	0x01
Data	0x00 – Use the analogue audio for the current source. 0x01 – Use the digital audio for the current source (if available). 0x02 – Use HDMI for the current source (if available). 0xF0 – Request the audio type in use for the current source.
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0B
Ac	Answer code
Dl	0x01
Data	Response: 0x00 – Analogue audio is in use for the current source. 0x01 – Digital audio is in use for the current source. 0x02 – HDMI audio is in use for the current source.
Et	0x0D

Output Command Specifications

Set/Request Volume (0x0D)

Set or request the volume of a zone.

This command returns the volume even if the zone requested is in mute. The "Request Mute status" command can be used to discover if the zone is muted.

Response data format:
e.g. for volume 42dB: Data1=0x2A (42)

Example

Command/response sequence for setting the volume in Zone 1 to 45dB:

Command:	0x21 0x01 0x0D 0x01 0x2D 0x0D
Response:	0x21 0x01 0x0D 0x00 0x01 0x2D 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0D
Dl	0x01
Data	0x00 (0) – 0x63 (99) – Set the volume 0xF0 – Request the current volume
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0D
Ac	Answer code
Dl	0x01
Data1	Zone volume, integer value: 0x00 (0) – 0x63 (99)
Et	0x0D

Request Mute status (0x0E)

Request the mute status of the audio in a zone.

Example

Command/response sequence to request the mute status of zone 1 where zone 1 is muted:

Command:	0x21 0x01 0x0E 0x01 0xF0 0x0D
Response:	0x21 0x01 0x0E 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0E
Dl	0x01
Data	0xF0 – Request mute status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0E
Ac	Answer code
Dl	0x01
P2	0x00 – Zone is muted 0x01 – Zone is not muted
Et	0x0D

Request direct mode status (0x0F)

Request the direct mode status on Zone 1.

Example

Command/response sequence to request the Direct mode status in zone 1 where the mode is direct:

Command:	0x21 0x01 0x0F 0x01 0xF0 0x0D
Response:	0x21 0x01 0x0F 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x0F
Dl	0x01
Data	0xF0 – Request mode setting
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x0F
Ac	Answer code
Dl	0x01
Data	0x00 – 'Direct mode' is off 0x01 – 'Direct mode' is on
Et	0x0D

Request decode mode status — 2ch (0x10)

Request the decode mode for two-channel material in zone 1.

Example

Command/response sequence to request the decode mode in zone 1 where the mode is Dolby Surround Mode:

Command:	0x21 0x01 0x10 0x01 0xF0 0x0D
Response:	0x21 0x01 0x10 0x00 0x01 0x04 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x10
Dl	0x01
Data	0xF0 – Request decode mode
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x10
Ac	Answer code
Dl	0x01
Data	0x01 – Stereo 0x04 – Dolby Surround 0x07 – Neo:6 Cinema 0x08 – Neo:6 Music 0x09 - 5/7 Ch Stereo 0x0A - DTS Neural:X 0x0B - Reserved 0x0C - DTS Virtual:X 0x0D - Dolby Virtual Height 0x0E - Auro Native (not AVR5) 0x0F - Auro-Matic 3D (not AVR5) 0x10 - Auro-2D (not AVR5)
Et	0x0D

Request Decode mode status — MCH (0x11)

Request the decode mode for multi-channel material in zone 1.

Example

Command/response sequence to request the decode mode in zone 1 where the mode is Dolby Surround Mode:

Command:	0x21 0x01 0x11 0x01 0xF0 0x0D
Response:	0x21 0x01 0x11 0x00 0x01 0x06 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x11
Dl	0x01
Data	0xF0 – Request decode mode
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x11
Ac	Answer code
Dl	0x01
Data	0x01 – Stereo down-mix 0x02 – Multi-channel 0x03 – DTS Neural:X 0x06 – Dolby Surround 0x0B - Reserved 0x0C - DTS Virtual:X 0x0D - Dolby Virtual Height 0x0E - Auro Native (not AVR5) 0x0F - Auro-Matic 3D (not AVR5) 0x10 - Auro-2D (not AVR5)
Et	0x0D

Request RDS information (0x12)

Request RDS information from the current radio station in a given zone. If FM is not selected on the given zone an error 0x85 is returned.

Example

Command/response sequence to request the RDS information on FM in zone 1, where the response is "Playing your favourite music".

Command:	0x21 0x01 0x12 0x01 0xF0 0x0D
Response:	0x21 0x01 0x12 0x00 0x1C 0x00 0x50 0x6C 0x61 0x79 0x69 0x6E 0x67 0x20 0x79 0x6F 0x75 0x72 0x20 0x66 0x61 0x76 0x6F 0x75 0x72 0x69 0x74 0x65 0x20 0x6D 0x75 0x73 0x69 0x63 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x12
Dl	0x01
Data1	Request information source: 0xF0 – FM
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x12
Ac	Answer code
Dl	Data length <n>
Data1 – Data<n>	The radio programme type in ASCII characters
Et	0x0D

Request Video Output Resolution (0x13)

Request the Video Output Resolution of zone 1.

Example

Command/response sequence to request the video output in zone 1 where the resolution is bypass - will always be bypass (command for legacy control support):

Command:	0x21 0x01 0x13 0x01 0xF0 0x0D
Response:	0x21 0x01 0x13 0x00 0x01 0x07 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x13
Dl	0x01
Data	0xF0 – Request the video output.
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x13
Ac	Answer code
Dl	0x01
Data	0x07 - bypass
Et	0x0D

Menu Command Specifications

Request menu status (0x14)

Request which (if any) menu is open in the unit.

Example

Command/response sequence to request which menu is open where the 'Trim' menu is open on the front panel:

Command: 0x21 0x01 0x14 0x01 0xF0 0x0D

Response: 0x21 0x01 0x14 0x00 0x01 0x03 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x14
Dl	0x01
Data	0xF0 – Request the open menu state
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x14
Ac	Answer code
Dl	0x01
Data	0x00 – No menu is open 0x02 – Set-up Menu Open 0x03 – Trim Menu Open 0x04 – Bass Menu Open 0x05 – Treble Menu Open 0x06 – Sync Menu Open 0x07 – Sub Menu Open 0x08 – Tuner Menu Open 0x09 – Network menu Open 0x0A – USB Menu Open
Et	0x0D

Request tuner preset (0x15)

Request the current tuner preset number. If the tuner is not selected on the given zone an error 0x85 is returned.

Example

Command/response sequence to request the preset number where the present number is 10 on zone 1:

Command: 0x21 0x01 0x15 0x01 0xF0 0x0D

Response: 0x21 0x01 0x15 0x00 0x01 0x0A 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x15
Dl	0x01
Data	0x01 – 0x32 (1-50) number of required preset. 0xF0 – Request the current preset number.
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x15
Ac	Answer code
Dl	0x01
Data	0xFF – Currently no preset selected 0x01- 0x32: (1-50) the current preset number.
Et	0x0D

Tune (0x16)

Increment/Decrement the tuner frequency in 0.05MHz steps (FM).

The returned frequency is calculated as follows:

FM freq. (MHz) = reported freq. (MHz)

FM freq. (kHz) = reported freq. (kHz)

For these reasons, this command may return values that cannot be translated into ASCII characters.

If the tuner is not selected on the given zone an error 0x85 is returned.

Example

Command/response sequence to increment the FM tuning from 85.0MHz to 85.05MHz in zone 1:

Command: 0x21 0x01 0x16 0x01 0x01 0x0D

Response: 0x21 0x01 0x16 0x00 0x02 0x55 0x05 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x16
Dl	0x01
Data1	0x00 – Decrement tuner frequency by 1 step. 0x01 – Increment tuner frequency by 1 step. 0xF0 – Request the current tuner frequency.
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x16
Ac	Answer code
Dl	0x02 (Data length)
Data1	FM: New frequency (MHz)
Data2	FM: New frequency (10's kHz)
Et	0x0D

Request DAB station (0x18)

Request the current DAB station selected. If DAB is not selected on the given zone, an error 0x85 is returned.

Example

Command/response sequence to request the DAB station selection where the station is called “DAB STATION 2” in zone 1:

Command: 0x21 0x01 0x18 0x01 0xF0 0x0D

Response: 0x21 0x01 0x18 0x00 0x10 0x44 0x41 0x42 0x20 0x53 0x54 0x41 0x54 0x49 0x4F 0x4E 0x20 0x32 0x20 0x20 0x20 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x18
Dl	0x01
Data	0xF0 – Request the current DAB station
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x18
Ac	Answer code
Dl	Data length, fixed to 16 bytes (ASCII characters)
Data1 – Data128	The service label of the DAB station in ASCII characters. The data is padded to 16 bytes with the space character (0x20)
Et	0x0D

Prog. Type/Category (0x19)

Request information on the current station programme type from DAB source in a given zone. If DAB is not selected on the given zone an error 0x85 is returned.

Example

Command/response sequence to request the programme type on zone 1 where the programme type is “POP MUSIC”:

Command: 0x21 0x01 0x19 0x01 0xF0 0x0D

Response: 0x21 0x01 0x19 0x00 0x10 0x50 0x4F 0x50 0x20 0x4D 0x55 0x53 0x49 0x43 0x20 0x20 0x20 0x20 0x20 0x20 0x20 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x19
Dl	0x01
Data1	Request information source: 0xF0 – DAB program type
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x19
Ac	Answer code
Dl	Data length, fixed to 16 bytes (ASCII characters)
Data1 – Data128	The radio programme type in ASCII characters. The data is padded to 16 bytes with the space character (0x20)
Et	0x0D

DLS/PDT info. (0x1A)

Request DLS/PDT information (digital radio text) from the current radio station in a given zone. If DAB is not selected on the given zone an error 0x85 is returned.

Example

Command/response sequence to request the DLS information on DAB in zone 1, where the response is “Playing your favourite music”.

Command: 0x21 0x01 0x1A 0xF0 0x0D

Response: 0x21 0x01 0x1A 0x00 0x80 0x00 0x50 0x6C 0x61 0x79 0x69 0x6E 0x67 0x20 0x79 0x6F 0x75 0x72 0x20 0x66 0x61 0x76 0x6F 0x75 0x72 0x69 0x74 0x65 0x20 0x6D 0x20 0x20 0x20 0x20 0x20 0x20 0x20

Request preset details (0x1B)

Request details of tuner presets.

Example

Command/response sequence to request preset 1 where the response is a preset on DAB called "DAB STATION 2":

Command: 0x21 0x01 0x1B 0x01 0x01 0x0D

Response: 0x21 0x01 0x1B 0x00 0x0F 0x01 0x02 0x44 0x41 0x42 0x20 0x53 0x54 0x41 0x54 0x49 0x4F 0x4E 0x20 0x32 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1B
Dl	0x01
Data	0x01- 0x32: (1-50) The number of the required preset
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1B
Ac	Answer code
Dl	Data length <n>
Data1	0x01- 0x32: (1-50) The number of the requested preset
Data2	0x01 : FM frequency 0x02 : FM RDS name 0x03 : DAB (AVR450/750 only)
Data3	FM: New frequency (MHz)
Data4	FM: New frequency (10'skHz)
Data<n>	The name (DAB, FM if RDS) in ASCII characters
Et	0x0D

Network playback status (0x1C)

Network message format.

If the network is not selected on the given zone an error 0x85 is returned.

Example

Command/response sequence where the network module is playing.

Command: 0x21 0x01 0x1C 0x01 0xF0 0x0D

Response: 0x21 0x01 0x1C 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1C
Dl	0x01
Data	0xF0 – Request Network playback status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1C
Ac	Answer code
Dl	Data length <n>
Data1	0x00 – Stopped 0x01 – Transitioning 0x02 – Playing 0x03 – Paused
Et	0x0D

IMAX Enhanced (0x0C) (not AVR5)

Controls IMAX Enhanced.

Example

Command/response sequence to set IMAX Enhanced to Auto:

Command: 0x21 0x01 0x0C 0x01 0xF1 0x0D

Response: 0x21 0x01 0x0C 0x00 0x01 0x02 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0C
Dl	0x01
Data	0xF0 – Request current IMAX Enhanced state 0xF1 – IMAX Enhaned Auto 0xF2 – IMAX Enhanced On 0xF3 - IMAX Enhanced Off
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0C
Ac	Answer code
Dl	0x01
Data1	0x00 – IMAX Enhanced Off 0x01 – IMAX Enhanced On 0x02 – IMAX Enhanced Auto
Et	0x0D

Setup Adjustment Command Specifications

Treble Equalisation (0x35)

Adjust the amount of treble equalisation.

Example

Command/response sequence to set the treble to -2dB:

Command: 0x21 0x01 0x35 0x01 0x82 0x0D

Response: 0x21 0x01 0x35 0x00 0x01 0x82 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x35
Dl	0x01
Data	0x00 — 0x0C – Set treble to 0dB — +12dB 0x81 — 0x8C – Set treble to -1dB — -12dB 0xF0 – Request current treble value 0xF1 – Increment treble by 1dB 0xF2 – Decrement treble by 1dB
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x35
Ac	Answer code
Dl	0x01
Data1	0x00 — 0x0C – Treble is 0dB — +12dB 0x81 — 0x8C – Treble is -1dB — -12dB
Et	0x0D

Bass Equalisation (0x36)

Adjust the amount of bass equalisation.

Example

Command/response sequence to increase the bass EQ by 1dB when it was 0dB:

Command: 0x21 0x01 0x36 0x01 0xF1 0x0D

Response: 0x21 0x01 0x36 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x36
Dl	0x01
Data	0x00 — 0x0C – Set bass to 0dB — +12dB 0x81 — 0x8C – Set bass to -1dB — -12dB 0xF0 – Request current bass value 0xF1 – Increment bass by 1dB 0xF2 – Decrement bass by 1dB
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x36
Ac	Answer code
Dl	0x01
Data1	0x00 — 0x0C – Bass is 0dB — +12dB 0x81 — 0x8C – Bass is -1dB — -12dB
Et	0x0D

Room Equalisation (0x37)

Turn the room equalisation system on/off.

Example

Command/response sequence to turn the room equalisation system on (EQ1):

Command: 0x21 0x01 0x37 0x01 0x01 0x0D

Response: 0x21 0x01 0x37 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x37
Dl	0x01
Data	0xF0 – Request current Room EQ state 0x00 - Room EQ off 0x01 – Room EQ 1 on 0x02 – Room EQ 2 on 0x03 - Room EQ 3 on
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x37
Ac	Answer code
Dl	0x01
Data1	0x00 – Room EQ is off 0x01 – Room EQ 1 is on 0x02 - Room EQ 2 is on 0x03 - Room EQ 3 is on 0x04 – Room EQ has not been calculated and is therefore off
Et	0x0D

Dolby Audio (0x38)

Control the status of the Dolby Audio system.

Example

Command/response sequence to turn the Dolby Audio system is in movie mode:

Command:	0x21 0x01 0x38 0x01 0x01 0x0D
Response:	0x21 0x01 0x38 0x00 0x01 0x02 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x38
Dl	0x01
Data	0x00 – Dolby Audio off 0x01 – Dolby Audio movie mode 0x02 - Dolby Audio music mode 0x03 - Dolby Audio night mode 0xF0 – Request current Dolby Audio mode
Et	0x0D

RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x38
Ac	Answer code
Dl	0x01
Data1	0x00 – Dolby Audio is off 0x01 – Dolby Audio movie mode 0x02 - Dolby Audio Music mode 0x03 - Dolby Audio night mode
Et	0x0D

Balance (0x3B)

Adjust the balance control.

Example

Command/response sequence to set the balance to -3:

Command:	0x21 0x01 0x3B 0x01 0x83 0x0D
Response:	0x21 0x01 0x3B 0x00 0x01 0x83 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x3B
Dl	0x01
Data	0x00 — 0x06 – Set the balance to 0 — 6 0x81 — 0x86 – Set the balance to -1 — -6 0xF0 – Request current balance 0xF1 – Increment the balance by 1dB 0xF2 – Decrement the balance by 1dB
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x3B
Ac	Answer code
Dl	0x01
Data1	0x00 — 0x06 – Balance is 0 — 6 0x81 — 0x86 – Balance is -1 — -6
Et	0x0D

Subwoofer Trim (0x3F)

Adjust the value of subwoofer trim.

Example

Command/response sequence to set the subwoofer trim to -1.5dB:

Command:	0x21 0x01 0x3F 0x01 0x85 0x0D
Response:	0x21 0x01 0x3F 0x00 0x01 0x85 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x3F
Dl	0x01
Data	0x00 — 0x14 – Set positive subwoofer trim in 0.5dB steps (e.g. 0x02 = +1.0dB) 0x81 — 0x94 – Set negative sub. trim in 0.5dB steps (e.g. 0x82 = -1.0dB) 0xF0 – Request current subwoofer trim value 0xF1 – Increment the subwoofer trim by 0.5dB 0xF2 – Decrement the subwoofer trim by 0.5dB
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x3F
Ac	Answer code
Dl	0x01
Data1	0x00 — 0x14 – Positive subwoofer trim in 0.5dB steps (e.g. 0x02 = +1.0dB) 0x81 — 0x94 – Negative subwoofer trim in 0.5dB steps (e.g. 0x82 = -1.0dB)
Et	0x0D

Lipsync Delay (0x40)

Adjust the lipsync delay value.

Example

Command/response sequence to set the lipsync delay to 50ms:

Command:	0x21 0x01 0x40 0x01 0x0A 0x0D
Response:	0x21 0x01 0x40 0x00 0x01 0x0A 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x40
Dl	0x01
Data	0x00 — 0x32 – set the lipsync delay in 5ms steps (e.g. 0x08 = 40ms) 0xF0 – Request current lipsync delay value 0xF1 – Increment the lipsync delay by 5ms 0xF2 – Decrement the lipsync delay by 5ms
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x40
Ac	Answer code
Dl	0x01
Data1	0x00 — 0x32 – the lipsync delay in 5ms steps (e.g. 0x10 = 80ms)
Et	0x0D

Compression (0x41)

Adjust the dynamic range compression setting.

Example

Command/response sequence to set compression to medium:

Command: 0x21 0x01 0x41 0x01 0x01 0x0D

Response: 0x21 0x01 0x41 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x41
Dl	0x01
Data	0x00 – Compression off 0x01 – Set compression to medium 0x02 – Set compression to high 0xF0 – Request current compression setting
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x41
Ac	Answer code
Dl	0x01
Data1	0x00 – Compression off 0x01 – medium 0x02 – high
Et	0x0D

Request incoming video parameters (0x42)

Request the incoming video resolution, refresh rate and aspect ratio.

Example

Command/response sequence to request video parameters, where the video is 1280x720 (720p) 50Hz 16:9, normal colourspace:

Command: 0x21 0x01 0x42 0x01 0xF0 0x0D

Response: 0x21 0x01 0x42 0x00 0x08 0x05 0x00 0x02 0xD0 0x32 0x00 0x02 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x42
Dl	0x01
Data	0xF0 – Request incoming video parameters
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x42
Ac	Answer code
Dl	0x08
Data1	Horizontal resolution MSB (e.g. for 720p: 0x05 since 1280 = 0x0500)
Data2	Horizontal resolution LSB (e.g. for 720p: 0x00 since 1280 = 0x0500)
Data3	Vertical resolution MSB (e.g. for 720p: 0x02 since 720 = 0x02D0)
Data4	Vertical resolution LSB (e.g. for 720p: 0xD0 since 720 = 0x02D0)
Data5	Refresh rate for full image update (half the field rate for interlaced signals) (e.g. for 50Hz progressive: 0x32)
Data6	Interlaced flag: 0x00 – Progressive 0x01 – Interlaced
Data7	Aspect ratio: 0x00 – Undefined 0x01 – 4:3 0x02 – 16:9
Data 8	Colour space 0x00 - normal 0x01 - HDR10 0x02 - Dolby Vision 0x03 - HLG 0x04 - HDR10+ (not HDMI2.0)
Et	0x0D

Request incoming audio format (0x43)

Request the incoming audio format.

Example

Command/response sequence to request the incoming audio format, where the format is Dolby Digital 5.1:

Command:	0x21 0x01 0x43 0x01 0xF0 0x0D
Response:	0x21 0x01 0x43 0x00 0x02 0x02 0x1A 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x43
Dl	0x01
Data	0xF0 – Request incoming audio format
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x43
Ac	Answer code
Dl	0x02
Data1	Audio stream format: 0x00 – PCM 0x01 – Analogue Direct 0x02 – Dolby Digital 0x03 – Dolby Digital EX 0x04 – Dolby Digital Surround 0x05 – Dolby Digital Plus 0x06 – Dolby Digital True HD 0x07 – DTS 0x08 – DTS 96/24 0x09 – DTS ES Matrix 0x0A – DTS ES Discrete 0x0B – DTS ES Matrix 96/24 0x0C – DTS ES Discrete 96/24 0x0D – DTS HD Master Audio 0x0E – DTS HD High Res Audio 0x0F – DTS Low Bit Rate 0x10 – DTS Core 0x13 – PCM Zero 0x14 – Unsupported 0x15 – Undetected 0x16 - Dolby Atmos 0x17 - DTS:X 0x18 - IMAX ENHANCED (not AVR5) 0x19 - Auro 3D (not AVR5)
Data2	Audio channel configuration: 0x00 – Dual Mono 0x01 – Centre only 0x02 – Stereo only 0x03 – Stereo + mono surround 0x04 – Stereo + Surround L & R 0x05 – Stereo + Surround L & R + mono Surround Back 0x06 – Stereo + Surround L & R + Surround Back L & R 0x07 – Stereo + Surround L & R containing matrix info for surr. back L&R 0x08 – Stereo + Centre 0x09 – Stereo + Centre + mono surround 0x0A – Stereo + Centre + Surround L & R 0x0B – Stereo + Centre + Surround L & R + mono Surround Back 0x0C – Stereo + Centre + Surround L & R + Surround Back L & R 0x0D – Stereo + Centre + Surr. L&R plus matrix info for surr. back L&R 0x0E – Stereo Downmix Lt Rt 0x0F – Stereo Only (Lo Ro) 0x10 – Dual Mono + LFE 0x11 – Centre + LFE 0x12 – Stereo + LFE 0x13 – Stereo + single surround + LFE 0x14 – Stereo + Surround L & R + LFE 0x15 – Stereo + Surround L & R + mono Surround Back + LFE 0x16 – Stereo + Surround L & R + Surround Back L & R + LFE 0x17 – Stereo + Surround L & R + LFE 0x18 – Stereo + Centre + LFE plus matrix information for surr. back L&R 0x19 – Stereo + Centre + single surround + LFE 0x1A – Stereo + Centre + Surround L & R + LFE (Standard 5.1) 0x1B – Stereo + Centre + Surr. L & R + mono Surr. Back + LFE (6.1) 0x1C – Stereo + Centre + Surround L & R + Surround Back L & R + LFE (7.1) 0x1D – Stereo + Centre + Surround L & R + LFE, plus matrix for surr. back 0x1E – Stereo Downmix (Lt Rt) + LFE 0x1F – Stereo Only (Lo Ro) + LFE 0x20 – Unknown 0x21 – Undetected 0x30 - Auro Quad (not AVR5) 0x31 - Auro 5.0 (not AVR5) 0x32 - Auro 5.1 (not AVR5) 0x33 - Auro 2.2.2 (not AVR5) 0x34 - Auro 8.0 (not AVR5) 0x35 - Auro 9.1 (not AVR5) 0x36 - Auro 10.1 (not AVR5) 0x37 - Auro 11.1 (not AVR5) 0x38 - Auro 13.1 (not AVR5)
Et	0x0D

Request incoming audio sample rate (0x44)

Request the incoming audio sample rate.

Example

Command/response sequence to request the incoming audio sample rate, where the rate is 48kHz:

Command:	0x21 0x01 0x44 0x01 0xF0 0x0D
Response:	0x21 0x01 0x44 0x00 0x01 0x02 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x44
Dl	0x01
Data	0xF0 – Request incoming audio sample rate
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x44
Ac	Answer code
Dl	0x01
Data1	Incoming audio sample rate: 0x00 – 32 KHz 0x01 – 44.1 KHz 0x02 – 48 KHz 0x03 – 88.2 KHz 0x04 – 96 KHz 0x05 – 176.4 KHz 0x06 – 192 KHz 0x07 – Unknown 0x08 – Undetected
Et	0x0D

Set/Request Sub Stereo Trim (0x45)

Set/Request the subwoofer trim value for stereo mode.

Example

Command/response sequence to set the sub stereo trim to -1.5dB:

Command:	0x21 0x01 0x45 0x01 0x83 0x0D
Response:	0x21 0x01 0x45 0x00 0x01 0x83 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x45
Dl	0x01
Data	0x00 – set the Sub Stereo Trim value to 0dB 0x81 — 0x94 – set the Sub Stereo Trim value to -0.5dB — -10.00dB 0xF0 – Request Sub Stereo Trim value 0xF1 – Increment Sub Stereo Trim value by 0.5dB 0xF2 – Decrement Sub Stereo Trim value by 0.5dB
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x45
Ac	Answer code
Dl	0x01
Data1	0x00, 0x81 — 0x94 – Sub Stereo Trim value in -0.5dB steps
Et	0x0D

Set/Request Zone 1 OSD on/off (0x4E)

Set/Request whether the Zone 1 OSD is shown.

Example

Command/response sequence to set the Zone 1 OSD to 'Off':

Command:	0x21 0x01 0x4A 0x01 0xF2 0x0D
Response:	0x21 0x01 0x4A 0x00 0x00 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x4E
Dl	0x01
Data	0xF0 – Request current Zone 1 OSD on/off state. 0xF1 – Set Zone 1 OSD to On. 0xF2 – Set Zone 1 OSD to Off.
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x4E
Ac	Answer code
Dl	0x01
Data1	0x00 – Zone 1 OSD is On. 0x01 – Zone 1 OSD is Off.
Et	0x0D

Set/Request Video Output Switching (0x4F)

Set/Request the HDMI video output selection.

Example

Command/response sequence to set the video output to HDMI output 1:

Command:	0x21 0x01 0x4F 0x01 0x02 0x0D
Response:	0x21 0x01 0x4F 0x00 0x01 0x02 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x4F
Dl	0x01
Data	0x02 – Set HDMI Output 1. 0x03 – Set HDMI Output 2. 0x04 – Set HDMI Output 1 & 2. 0xF0 – Request current video output switching setting.
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x4F
Ac	Answer code
Dl	0x01
Data1	0x02 – HDMI Output 1. 0x03 – HDMI Output 2. 0x04 – HDMI Output 1 & 2.
Et	0x0D

Set/request input name (0x20)

This command returns the name of an input if renamed by the user. It can also be used to set the input name.

Example

Command/response sequence for setting the current input to "BDP300":

Command:	0x21 0x01 0x20 0x06 0x42 0x44 0x50 0x33 0x30 0x30 0x0D
Response:	0x20 0x01 0x20 0x00 0x06 0x42 0x44 0x50 0x33 0x30 0x30 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x20
Dl	0x01 (query) or <n> (limited to 10 characters) for setting name
Data	F0 - query 1-<n>
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x20
Ac	Answer code
Dl	Data length - <n> if setting, 0x0A if requesting the name
Data1 - Data <n>	Input name in ASCII characters
Et	0x0D

FM Scan up/down (0x23)

Initiates a FM scan up or down. Note: only valid if on FM input

Example

Command/response to starting a FM scan up:

Command:	0x21 0x01 0x23 0x01 0x01 0x0D
Response:	0x21 0x01 0x23 0x00 0x01 0xFF 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x23
Dl	0x01
Data	0x01 - Scan up 0x02 - Scan down
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x23
Ac	Answer code
Dl	0x01
Data1	0xFF - scanning
Et	0x0D

DAB Scan (0x24)

Initiates a DAB scan. Note: only valid if on DAB input

Example

Command/response to starting a DAB scan:

Command:	0x21 0x01 0x24 0x01 0xF0 0x0D
Response:	0x21 0x01 0x24 0x00 0x01 0xFF 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x24
Dl	0x01
Data	0xF0 - Start DAB scan
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x24
Ac	Answer code
Dl	0x01
Data1	0xFF - scanning 0x00 - Scan finished
Et	0x0D

Heartbeat (0x25)

Heartbeat command to check unit is still connected and communication - also resets the EuP standby timer.

Example

Command/response to sending a heartbeat command:

Command:	0x21 0x01 0x25 0x01 0xF0 0x0D
Response:	0x21 0x01 0x25 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x25
Dl	0x01
Data	0xF0 - Heartbeat
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x25
Ac	Answer code
Dl	0x01
Data1	0x00 - response
Et	0x0D

Reboot (0x26)

Forces a reboot of the unit.

Example

Command/response to sending a reboot command:

Command:	0x21 0x01 0x26 0x06 0x52 0x45 0x42 0x4F 0x4F 0x54 0x0D
Response:	0x21 0x01 0x26 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x26
Dl	0x06
Data1	0x52
Data2	0x45
Data3	0x42
Data4	0x4F
Data5	0x4F
Data6	0x54
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x26
Ac	Answer code
Dl	0x01
Data1	0x00 - response
Et	0x0D

Bluetooth status (0x50)

Bluetooth status. Note: only valid if on BT input

Example

Command/response to starting a BT status request, where the response is paired, audio paused:

Command:	0x21 0x01 0x50 0x01 0xF0 0x0D
Response:	0x21 0x01 0x50 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x50
Dl	0x01
Data	0xF0 - BT status request
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x50
Ac	Answer code
Dl	Dat a length <n>
Data1	0x00 - No connection 0x01 - Connected, audio paused 0x02 - Connected, audio playing SBC 0x03 - Connected, audio playing AAC 0x04 - Connected, audio playing aptX 0x05 - Connected, audio playing aptX-HD
Data2 – Data<n>	name of track in ASCII if playing or paused
Et	0x0D

Setup (0x27)

Starts remote setup of the unit.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x27
Dl	0x01
Data1	0xF0
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x27
Ac	Answer code
Dl	0x01
Data1	0xnn - setup mode active, nn = version of menu 0xFF - setup mode from front panel, remote setup not possible
Et	0x0D

Room EQ name(s) (0x34)

Request Room EQ name(s).

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x34
Dl	0x01
Data1	0xF0 - request EQ names
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x34
Ac	Answer code
Dl	0xn - dependant on number of EQ slots filled, 20, 40, 60
Data1-20	EQ1 name (read only / 20 characters) name in ASCII characters
Data21-40	EQ2 name (read only / 20 characters) name in ASCII characters
Data41-60	EQ3 name (read only / 20 characters) name in ASCII characters
Et	0x0D

Now Playing Information (0x64)

Request the various now playing track details

Example

Command/response sequence to request the currently playing artist where the response is A

Command:	0x21 0x01 0x64 0x01 0xF1 0x0D
Response:	0x21 0x01 0x64 0x00 0x02 0x41 0x0D

Note

Response length is limited to 100 characters

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x64
Dl	0x01
Data	0xF0 – Request the currently playing track title 0xF1 - Request the currently playing artist 0xF2 - Request the currently playing album 0xF3 - Request the currently playing application (GoogleCast only) 0xF4 - Request the currently playing sample rate 0xF5 - Request the currently playing track encoder
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x64
Ac	Answer code
Dl	<n>
Data	Track: Track title in ASCII characters Album: Album name in ASCII characters Artist: Artist name in ASCII characters Application: GoogleCast source application in ASCII characters Sample rate: 0x00 – 32 kHz 0x01 – 44.1 kHz 0x02 – 48 kHz 0x03 – 88.2 kHz 0x04 – 96 kHz 0x05 – 176.4 kHz 0x06 – 192 kHz 0x07 – Unknown 0x08 – Undetected Audio encoder: 0x00 – MP3 0x01 – WAV 0x02 – WMA 0x03 – FLAC 0x04 - ALAC 0x05 – MQA 0x0A – Unknown
Et	0x0D

Input config (0x28)

Sends input config menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x28
Dl	0x01 / 0x19
Data1 Data 1-25	0xF0 - request Input config set input config as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x28
Ac	Answer code
Dl	0x19
Data1-10	Input name 0xnn - Input name in ASCII characters
Data11	Lip Sync 0x00 - 0x32 Lip sync in 5mS steps
Data12	Mode 0x00 - Last mode 0x01 - Stereo 0x02 - Stereo Direct 0x03 - Dolby Surround 0x04 - DTS Neural:X 0x05 - Virtual Height 0x06 - 16 Ch Stereo Mode 0x07 - Auro 2D Surround (not AVR5) 0x08 - Reserved 0x09 - Auro 3D (not AVR5) 0x0A - Auro Native (not AVR5)
Data13	MCH mode 0x00 - Last mode 0x01 - Native 0x02 - Stereo Downmix 0x03 - Virtual Height 0x04 - Native Upmixer (Dolby Surround, DTS Virtual:X) 0x05 - Reserved 0x06 - Auro 2D Surround (not AVR5) 0x07 - Auro 3D (not AVR5) 0x08 - Auro Native (not AVR5)
Data14	Bass 0x00 - 0x0C – Bass is 0dB — +12dB 0x81 - 0x8C – Bass is -1dB — -12dB
Data15	Treble 0x00 - 0x0C – Treble is 0dB — +12dB 0x81 - 0x8C – Treble is -1dB — -12dB
Data16	Room EQ 0x00 - Room EQ off 0x01 - Room EQ1, 0x02 - Room EQ2, 0x03 - Room EQ3 0x04 - Not calculated
Data17	Input Trim 0x00 - 1V 0x01 - 2V 0x02 - 4V
Data18	Dolby Audio 0x00 - Dolby Audio off 0x01 - Dolby Audio movie, 0x02 - music, 0x03 - night
Data19	Stereo mode 0x00 - Left/Right 0x01 - Left/Right+Sub 0x02 - Sub+Sat 0x03 - As speaker types
Data20	Sub Stereo 0x00 - 0dB 0x81 — 0x94 – Sub Stereo is -0.5 — -10dB
Data21	IMAX Enhanced mode (not AVR5) 0x00 - Auto 0x01 - On 0x02 - Off
Data22	Auro-Matic 3D (not AVR5) 0x00 - Small, 0x01 - Medium, 0x02 - Large, 0x03 - Movie, 0x04 - Speech
Data23	Auro-Matic Strength (not AVR5) 0x00 - 0x10 - 0-16
Data24	Audio Source 0x00 – Analogue audio is in use for the current source. 0x01 – Digital audio is in use for the current source. 0x02 – HDMI audio is in use for the current source.
Data25	CD Direct 0x00 - CD Direct off, 0x01 - CD Direct on
Et	0x0D

General Setup (0x29)

Sends general setup menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x29
Dl	0x01 / 0x20
Data1 Data 1-32	0xF0 - request Input config set input config as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x29
Ac	Answer code
Dl	0x20
Data1-10	0xnn - Input name in ASCII characters
Data11	Audio stream format: 0x00 – PCM 0x01 – Analogue Direct 0x02 – Dolby Digital 0x03 – Dolby Digital EX 0x04 – Dolby Digital Surround 0x05 – Dolby Digital Plus 0x06 – Dolby Digital True HD 0x07 – DTS 0x08 – DTS 96/24 0x09 – DTS ES Matrix 0x0A – DTS ES Discrete 0x0B – DTS ES Matrix 96/24 0x0C – DTS ES Discrete 96/24 0x0D – DTS HD Master Audio 0x0E – DTS HD High Res Audio 0x0F – DTS Low Bit Rate 0x10 – DTS Core 0x13 – PCM Zero 0x14 – Unsupported 0x15 – Undetected 0x16 - Dolby Atmos 0x17 - DTS:X 0x18 - IMAX ENHANCED (not AVR5) 0x19 - Auro 3D (not AVR5)
Data12	Audio channel configuration: 0x00 – Dual Mono 0x01 – Centre only 0x02 – Stereo only 0x03 – Stereo + mono surround 0x04 – Stereo + Surround L & R 0x05 – Stereo + Surround L & R + mono Surround Back 0x06 – Stereo + Surround L & R + Surround Back L & R 0x07 – Stereo + Surround L & R containing matrix information for surround back L&R 0x08 – Stereo + Centre 0x09 – Stereo + Centre + mono surround 0x0A – Stereo + Centre + Surround L & R 0x0B – Stereo + Centre + Surround L & R + mono Surround Back 0x0C – Stereo + Centre + Surround L & R + Surround Back L & R 0x0D – Stereo + Centre + Surround L & R containing matrix information for surround back L&R 0x0E – Stereo Downmix Lt Rt 0x0F – Stereo Only (Lo Ro) 0x10 – Dual Mono + LFE 0x11 – Centre + LFE 0x12 – Stereo + LFE 0x13 – Stereo + single surround + LFE 0x14 – Stereo + Surround L & R + LFE 0x15 – Stereo + Surround L & R + mono Surround Back + LFE 0x16 – Stereo + Surround L & R + Surround Back L & R + LFE 0x17 – Stereo + Surround L & R + LFE 0x18 – Stereo + Centre + LFE containing matrix information for surround back L&R 0x19 – Stereo + Centre + single surround + LFE 0x1A – Stereo + Centre + Surround L & R + LFE (Standard 5.1) 0x1B – Stereo + Centre + Surround L & R + mono Surround Back + LFE (6.1, e.g. DTS ES Discrete) 0x1C – Stereo + Centre + Surround L & R + Surround Back L & R + LFE (7.1) 0x1D – Stereo + Centre + Surround L & R + LFE, containing matrix information for surround back L&R (6.1 e.g. Dolby Digital EX) 0x1E – Stereo Downmix (Lt Rt) + LFE 0x1F – Stereo Only (Lo Ro) + LFE 0x20 – Unknown 0x21 – Undetected

	0x30 - Auro Quad
	0x31 - Auro 5.0
	0x32 - Auro 5.1
	0x33 - Auro 2.2.2
	0x34 - Auro 8.0
	0x35 - Auro 9.1
	0x36 - Auro 10.1
	0x37 - Auro 11.1
	0x38 - Auro 13.1
Data13	Incoming audio sample rate:
	0x00 – 32 KHz
	0x01 – 44.1 KHz
	0x02 – 48 KHz
	0x03 – 88.2 KHz
	0x04 – 96 KHz
	0x05 – 176.4 KHz
	0x06 – 192 KHz
	0x07 – Unknown
	0x08 – Undetected
Data14	Incoming bitrate
	0x00 - 32kbps
	0x01 - 56kbps
	0x02 - 64kbps
	0x03 - 96kbps
	0x04 - 112kbps
	0x05 - 128kbps
	0x06 - 192kbps
	0x07 - 224kbps
	0x08 - 256kbps
	0x09 - 320kbps
	0x0A - 384kbps
	0x0B - 448kbps
	0x0C - 512kbps
	0x0D - 576kbps
	0x0E - 640kbps
	0x0F - 768kbps
	0x10 - 960kbps
	0x11 - 1024kbps
	0x12 - 1152kbps
	0x13 - 1280kbps
	0x14 - 1344kbps
	0x15 - 1408kbps
	0x16 - 1411.2kbps
	0x17 - 1472kbps
	0x18 - 1536kbps
	0x19 - 1920kbps
	0x1A - 2048kbps
	0x1B - 3072kbps
	0x1C - 3840kbps
	0x1D - Open
	0x1E - Variable
	0x1F - Lossless
Data15	Dialnorm
	0x00 (0dB) - 0x1F (31dB)
Data16-20	Incoming video resolution (returns 0x00 x 5 if no input)
	Horizontal resolution MSB (e.g. for 720p: 0x05 since 1280 = 0x0500)
	Horizontal resolution LSB (e.g. for 720p: 0x00 since 1280 = 0x0500)
	Vertical resolution MSB (e.g. for 720p: 0x02 since 720 = 0x02D0)
	Vertical resolution LSB (e.g. for 720p: 0xD0 since 720 = 0x02D0)
	Refresh rate for full image update (half the field rate for interlaced signals) (e.g. for 50Hz progressive: 0x32)

Data21	Interlaced flag:
	0x00 – Progressive
	0x01 – Interlaced
Data22	Aspect ratio:
	0x00 – Undefined
	0x01 – 4:3
	0x02 – 16:9
Data23	Colour space
	0x00 - normal
	0x01 - HDR10
	0x02 - Dolby Vision
	0x03 - HLG
	0x04 - HDR10+
Data24	Audio compression
	0x00 - Off
	0x01 - Medium
	0x02 - High
Data25	Balance
	0x00 — 0x06 – Balance is 0 — 6
	0x81 — 0x86 – Balance is -1 — -6
Data26	DTS Dialogue Control
	0x00 — 0x06 – DTS Dialog Control is 0 — 6
Data27	Maximum volume
	0x00 (0) – 0x63 (99)
Data28	Maximum on volume
	0x00 (0) – 0x63 (99) – Set the volume
Data29	Display on time
	0x00 - 5 seconds
	0x01 - 10 seconds
	0x02 - 30 seconds
	0x03 - 1 minute
	0x04 - Always on
Data30	Control option
	0x00 - Off
	0x01 - RS232
	0x02 - IP
Data31	Power on option
	0x00 - Last state
	0x01 - Standby
	0x02 - On
Data32	Language
	0x00 - English
	0x01 - Francsis
	0x02 - Deutsch
	0x03 - Espanol
	0x04 - Nederlands
	0x05 - Русский
	0x06 - 中文

Speaker Types (0x2A)

Set / request speaker type menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x2A
Dl	0x01 / 0x0D
Data1	0xF0 - request Speaker Types
Data 1-10	set Speaker Types as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x2A
Ac	Answer code
Dl	0x0D
Data1-6	Speaker type
1=L/R	0x00 - Large
2=Centre	0x01 - Small, 40Hz
3=Surr.	0x02 - Small, 50Hz
4=Back	0x03 - Small, 60Hz
5=Height1	0x04 - Small, 70Hz
6=Height2	0x05 - Small, 80Hz
	0x06 - Small, 90Hz
	0x07 - Small, 100Hz
	0x08 - Small, 110Hz
	0x09 - Small, 120Hz
	0x0A - Small, 150Hz
	0x0B - Small, 160Hz
	0x0C - Small, 170Hz
	0x0D - Small, 180Hz
	0x0E - Small, 180Hz
	0x0F - Small, 200Hz
	0x10 - None
Data7	Subwoofer
	0x00 - Subwoofer
	0x01 - None
Data8	Channel 13 & 14 (not AVR5, AVR10 - report 0x11)
	0x00 - Front wides, large
	0x01 - Front wide, small, 40Hz
	0x02 - Front wide, small, 50Hz
	0x03 - Front wide, small, 60Hz
	0x04 - Front wide, small, 70Hz
	0x05 - Front wide, small, 80Hz
	0x06 - Front wide, small, 90Hz
	0x07 - Front wide, small, 100Hz
	0x08 - Front wide, small, 110Hz
	0x09 - Front wide, small, 120Hz
	0x0A - Front wide, small, 150Hz
	0x0B - Front wide, small, 160Hz
	0x0C - Front wide, small, 170Hz
	0x0D - Front wide, small, 180Hz
	0x0E - Front wide, small, 190Hz
	0x0F - Front wide, small, 200Hz
	0x10 - Front subs
	0x11 - None
Data9	Channel 15 & 16 (not AVR5, AVR10, report 0x21)
	0x00 - Middle heights, large, 0x10 - CH & TS large
	0x01 - Middle heights, small, 40Hz, 0x10 - CH & TS, small, 40Hz
	0x02 - Middle heights, small, 50Hz, 0x12 - CH & TS, small, 50Hz
	0x03 - Middle heights, small, 60Hz, 0x13 - CH & TS, small, 60Hz
	0x04 - Middle heights, small, 70Hz, 0x14 - CH & TS, small, 70Hz
	0x05 - Middle heights, small, 80Hz, 0x15 - CH & TS, small, 80Hz
	0x06 - Middle heights, small, 90Hz, 0x16 - CH & TS, small, 90Hz
	0x07 - Middle heights, small, 100Hz, 0x17 - CH & TS, small, 100Hz
	0x08 - Middle heights, small, 110Hz, 0x18 - CH & TS, small, 110Hz
	0x09 - Middle heights, small, 120Hz, 0x19 - CH & TS, small, 120Hz
	0x0A - Middle heights, small, 150Hz, 0x1A - CH & TS, small, 150Hz
	0x0B - Middle heights, small, 160Hz, 0x1B - CH & TS, small, 160Hz
	0x0C - Middle heights, small, 170Hz, 0x1C - CH & TS, small, 170Hz
	0x0D - Middle heights, small, 180Hz, 0x1D - CH & TS, small, 180Hz
	0x0E - Middle heights, small, 190Hz, 0x1E - CH & TS, small, 190Hz
	0x0F - Middle heights, small, 200Hz, 0x1F - CH & TS, small, 200Hz
	0x20 - Rear subs
	0x21 - None
Data10	Height type
	0x00 - Top
	0x01 - Dolby Enabled
Data11	Use channel 6&7
	0x00 - Surround back
	0x01 - Bi-Amp L+R
	0x02 - Zone2 (not AVR5, AVR10)
	0x03 - Height1

Data12	Filter slope 0x00 - 12dB 0x01 - 24dB 0x02 - 36dB 0x03 - 48dB
Data13	Sub gain 0x00 - 0dB 0x01 - -6dB 0x02 - -12dB 0x03 - -18dB 0x04 - -24dB 0x05 - -30dB
Et	0x0D

Speaker Distances (0x2B)

Set / request speaker distance menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x2B
Dl	0x01 / 0x21
Data1 Data 1-33	0xF0 - request Speaker Distance set Speaker Distance as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x2B
Ac	Answer code
Dl	0x21
Data1	Units 0x00 - metres 0x01 - feet 0x02 - mS
Data2-33	Distance in 2 bytes per speaker (m:cm / ft:in) Front Left Centre Front Right Surr. Right Surr. Back Right Surr. Back Left Surr. Left Left Top Front Right Top Front Left Top Back Right Top Back Subwoofer Channel13 (not AVR5, AVR10, reports 0x00, 0x00) Channel14 (not AVR5, AVR10, reports 0x00, 0x00) Channel15 (not AVR5, AVR10, reports 0x00, 0x00) Channel 16 (not AVR5, AVR10, reports 0x00, 0x00)
Et	0x0D

Speaker Levels (0x2C)

Set / request speaker level menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x2C
Dl	0x01 / 0x12
Data1 Data 1-16	0xF0 - request Speaker Levels set Speaker Levels as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x2C
Ac	Answer code
Dl	0x12
Data1	Test tone 0x00 - Internal 0x01 - External
Data2-17	Speaker level 0x00 — 0x14 –0dB — +10dB 0x81 — 0x94 –0.5dB — -10dB Front Left, Centre Front Right Surr. Right Surr. Back Right Surr. Back Left Surr. Left Left Top Front Right Top Front Left Top Back Right Top Back Subwoofer Channel13 (not AVR5, AVR10, reports 0x14) Channel14 (not AVR5, AVR10, reports 0x14) Channel15 (not AVR5, AVR10, reports 0x14) Channel 16 (not AVR5, AVR10, reports 0x14)
Data18	Noise output 0x00 - None (switch off audio noise output) 0x01 - Front Left 0x02 - Centre 0x03 - Front Right 0x04 - Surr. Right 0x05 - Surr. Back Right 0x06 - Surr. Back Left 0x07 - Surr. Left 0x08 - Left Top Front 0x09 - Right Top Front 0x0A - Left Top Back 0x0B - Right Top Back 0x0C - Subwoofer 0x0D - Channel 13 (not AVR5, AVR10) 0x0E - Channel 14 (not AVR5, AVR10) 0x0F - Channel 15 (not AVR5, AVR10) 0x10 - Channel 16 (not AVR5, AVR10)
Et	0x0D

Video Inputs (0x2D)

Set / request speaker level menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x2D
Dl	0x01 / 0x06
Data1 Data 1-16	0xF0 - request Video Inputs config set Video Inputs as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x2D
Ac	Answer code
Dl	0x06
Data1-6	Video input in order for: Data1-CD, Data2-Aux, Data3-FM, Data4-DAB, Data5-NET, Data6-BT 0x00 - STB 0x01 - GAME 0x02 - AV 0x03 - SAT 0x04 - BD 0x05 - VCR 0x06 - PVR 0x07 - None
Et	0x0D

HDMI settings (0x2E)

Set / request HDMI settings menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x2
Dl	0x01 / 0x0A
Data1 Data 1-09	0xF0 - request HDMI config set HDMI config as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x2E
Ac	Answer code
Dl	0x0A
Data1	Zone 1 OSD 0x00 - Off 0x01 - On
Data2	Zone 1 Out 0x00 - Out 1 & 2 0x01 - Out 1 0x02 - Out 2
Data3	Zone 1 lip sync (information only) 0x00 - 0xFA lipsync in 1mS steps
Data4	HDMI Audio to TV 0x00 - Off 0x01 - On
Data5	HDMI Bypass & IP 0x00 - Off 0x01 - HDMI & IP On
Data6	HDMI Bypass source 0x00 - Last 0x01 - STB 0x02 - Game 0x03 - AV 0x04 - SAT 0x05 - BD 0x06 - VCR 0x07 - PVR
Data7	CEC Control 0x00 - Off 0x01 - Output1
Data8	ARC Control 0x00 - Off 0x01 - Auto
Data9	TV Audio 0x00 - Off 0x01 - Auto
Data10	Power Off Control 0x00 - Off 0x01 - Auto
Et	0x0D

Zone settings (0x2F) (not AVR5, AVR10)

Set / request Zone settings menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x2F
Dl	0x01 / 0x06
Data1 Data 1-10	0xF0 - request Zone settings set Zone settings as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x2F
Ac	Answer code
Dl	0x06
Data1	Zone 2 Input (not AVR5, AVR10) 0x00 - Follow Zone1 0x01 - CD 0x02 - BD 0x03 - AV 0x04 - SAT 0x05 - PVR 0x06 - VCR 0x07 - STB 0x08 - Game 0x09 - FM 0x0A - DAB 0x0B - NET 0x0C - BT 0x0D - Aux 0x0E - Display
Data2	Zone 2 Status 0x00 - Standby 0x01 - On
Data3	Zone 2 Volume 0x14 (20) – 0x53 (83)
Data4	Zone 2 Max. Volume 0x14 (20) – 0x53 (83)
Data5	Zone 2 fixed volume 0x00 - No 0x01 - Yes
Data6	Zone 2 Maximum On Volume 0x14 (20) – 0x53 (83)
Et	0x0D

Network (0x30)

Set / request Network menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x30
Dl	0x01 / 0x45
Data1 Data 1-69	0xF0 - request Network settings set Network settings as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x30
Ac	Answer code
Dl	0x45
Data1	Net source 0x00 - Follow Zone1 0x01 - Follow Zone2
Data2-21	SSID name (20 character limit)
Data22-41	Network key (20 character limit - set only)
Data42-45	IP address 0x00-0xFF
Data46-49	MAC address 0x00 -0xFF
Data50-69	Friendly name (20 characters) name in ASCII characters
Et	0x0D

Bluetooth (0x32)

Set / request Bluetooth menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x32
Dl	0x01 / 0x02 / 0xnn
Data1 Data 1-2	0xF0 - request Bluetooth settings set Bluetooth settings as below (only pair & clear can be set)
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x32
Ac	Answer code
Dl	0xn - dependant on number of paired devices
Data1 Data2 Data3-22 Data23-42 Data43-<n>	Pair Device (set only) 0x00 - no effect 0x01 - Start Pair Device Clear Paired Devices (set only) 0x00 - no effect 0x01 - Clear Paired Devices Paired device1 name (read only / 20 characters) name in ASCII characters Paired device2 name (read only / 20 characters) name in ASCII characters Paired device3-8 name (read only / 20 characters) name in ASCII characters
Et	0x0D

Engineering menu (0x33)

Set / request Engineering menu info.

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x33
Dl	0x01 / 0x33
Data1 Data 1-	0xF0 - request Engineering menu settings set Engineering menu settings as below
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x33
Ac	Answer code
Dl	0x2B
Data1	Reset Factory Defaults (set only) 0x00 - no effect 0x01 - Reset factory defaults
Data2	Check for update (set only) 0x00 - no effect 0x01 - Check for Update
Data3	Restore Secure backup 0x00 - no effect 0x01 - Restore secure backup
Data4	Store Secure Backup 0x00 - no effect 0x01 - Store secure backup
Data5	Restore USB backup 0x00 - no effect 0x01 - Restore USB backup
Data6	Store USB Backup 0x00 - no effect 0x01 - Store USB
Data7-10	Pin in hex 1-4
Data11	Region 0x00 - Europe 0x01 - US 0x02 - Canada 0x03 - Australia 0x04 - China
Data12	Remote Code 0x00 - 16 0x01 - 19
Data13	Standby Mode 0x00 - Auto 0x01 - Manual
Data14	Protection sensitivity 0x00 - High (default) 0x01 - Medium 0x02 - Low
Data15	Use Display HDMI 0x00 - Yes 0x01 - No
Data16	Display type 0x00 - 16:9 0x01 - 21:9
Data17	DANTE enable 0x00 - Off 0x01 - On
Data18	C4 SDDP 0x00 - Off 0x01 - On
Data19	Send C4 Identify 0x00 - No effect 0x01 - Send C4 Identify
Data20	Shut down code (info only) 0x00 - 00 (normal) 0x01 - 01 (amp DC offset) 0x02 - 02 (amp overtemp) 0x03 - 03 (amp overcurrent)
Data21-29	Host/IAP version (info only) Version in ASCII e.g. “2.01/0.03”
Data30-33	DSP version (info only) Version in ASCII e.g. “1.03”
Data34-37	OSD version (info only) Version in ASCII e.g. “0.11”
Data38-51	NET version (info only) Version in ASCII e.g. “2.5.13.50017-6”
Et	0x0D

AV RC5 command codes

These codes are recognised as infra-red signals received by the front panel, RC5 electrical signals received by the remote in jacks and as control data using the 'Simulate RC5 IR Command' (0x 08).

Basic Functions

These RC5 codes are present on the supplied IR remote control and provide control over basic amplifier and video processing functions.

Function	RC5 code [system-command]	RC5 code (Data1 - Data2)
	Decimal	Hexadecimal
Standby	16-12	0x10 - 0x0C
Eject (Speaker trim)	16-45	0x10 - 0x2D
1	16-1	0x10 - 0x01
2	16-2	0x10 - 0x02
3	16-3	0x10 - 0x03
4	16-4	0x10 - 0x04
5	16-5	0x10 - 0x05
6	16-6	0x10 - 0x06
7	16-7	0x10 - 0x07
8	16-8	0x10 - 0x08
9	16-9	0x10 - 0x09
SYNC - Access Lipsync Delay control	16-50	0x10 - 0x32
0	16-0	0x10 - 0x00
INFO - Cycle between VFD information panels	16-55	0x10 - 0x37
Rewind	16-121	0x10 - 0x79
Fast Forward	16-52	0x10 - 0x34
Skip Back	16-33	0x10 - 0x21
Skip Forward	16-11	0x10 - 0x0B
Stop	16-54	0x10 - 0x36
Play	16-53	0x10 - 0x35
Pause	16-48	0x10 - 0x30
Disc (Record) (DTS dialogue control)	16-90	0x10 - 0x5A
MENU (Enter system menu)	16-82	0x10 - 0x52
Navigate Up	16-86	0x10 - 0x56
Pop Up (Dolby Volume on/off)	16-70	0x10 - 0x46
Navigate Left	16-81	0x10 - 0x51
OK	16-87	0x10 - 0x57
Navigate Right	16-80	0x10 - 0x50
Audio (Room EQ on/off)	16-30	0x10 - 0x1E
Navigate Down	16-85	0x10 - 0x55
RTN (Access Subwoofer Trim control)	16-51	0x10 - 0x33
HOME	16-43	0x10 - 0x2B
Mute	16-13	0x10 - 0x0D
Increase volume (+)	16-16	0x10 - 0x10
MODE (Cycle between decoding modes)	16-32	0x10 - 0x20
DISP (Change VFD brightness)	16-59	0x10 - 0x3B
Activate DIRECT mode	16-10	0x10 - 0x0A
Decrease volume (-)	16-17	0x10 - 0x11
Red	16-41	0x10 - 0x29
Green	16-42	0x10 - 0x2A
Yellow	16-43	0x10 - 0x2B
Blue	16-55	0x10 - 0x37
Radio	16-91	0x10 - 0x5B
Aux	16-99	0x10 - 0x63
Net	16-92	0x10 - 0x5C
AV	16-94	0x10 - 0x5E
Sat	16-27	0x10 - 0x1B
PVR	16-96	0x10 - 0x60
Game	16-97	0x10 - 0x61

Function	RC5 Code [system-command]	RC5 Code (Data1 - Data2)
	Decimal	Hexadecimal
BD	16-98	0x10 - 0x62
CD	16-118	0x10 - 0x76
STB	16-100	0x10 - 0x64
UHD	16-125	0x10 - 0x7D
BT	16-122	0x10 - 0x7A
Display	16-58	0x10 - 0x3A
Power On	16-123	0x10 - 0x7B
Power Off	16-124	0x10 - 0x7C

Advanced Functions

These RC5 codes are not present on the supplied remote control but have been created for custom install use. In order for the AVR to respond to these codes they must be transmitted from a programmable IR remote control or over the control link using the 'Simulate RC5 IR Command' (0x08).

Function	RC5 Code [system-command]	RC5 Code (Data1 - Data2)
	Decimal	Hexadecimal
Change control to next zone	16-95	0x10 - 0x5F
Access Bass control	16-39	0x10 - 0x27
Access Speaker Trim controls	16-37	0x10 - 0x25
Access Treble control	16-14	0x10 - 0x0E
Random	16-76	0x10 - 0x4C
Repeat	16-49	0x10 - 0x31
Direct mode On	16-78	0x10 - 0x4E
Direct mode Off	16-79	0x10 - 0x4F
Multi Channel	16-106	0x10 - 0x6A
Stereo	16-107	0x10 - 0x6B
Dolby Surround	16-110	0x10 - 0x6E
DTS Neo:6 Cinema	16-111	0x10 - 0x6F
DTS Neo:6 Music	16-112	0x10 - 0x70
DTS Neural:X	16-113	0x10 - 0x71
Reserved	16-114	0x10 - 0x72
Virtual Height	16-115	0x10 - 0x73
5/7 Ch Stereo	16-69	0x10 - 0x45
Dolby D EX	16-23	0x10 - 0x17
Auro Matic-3D	16-71	0x10 - 0x47
Auro Native	16-103	0x10 - 0x67
Auro 2D	16-104	0x10 - 0x68
Mute On	16-26	0x10 - 0x1A
Mute Off	16-120	0x10 - 0x78
FM	16-28	0x10 - 0x1C
DAB	16-72	0x10 - 0x48
Lip Sync +5ms	16-15	0x10 - 0x0F
Lip sync -5ms	16-101	0x10 - 0x65
Sub trim +0.5dB	16-105	0x10 - 0x69
Sub trim -0.5dB	16-108	0x10 - 0x6C
Display Off	16-31	0x10 - 0x1F
Display L1	16-34	0x10 - 0x22
Display L2	16-35	0x10 - 0x23
Balance left	16-38	0x10 - 0x26
Balance right	16-40	0x10 - 0x28
Bass +1	16-44	0x10 - 0x2C
Bass -1	16-56	0x10 - 0x38
Treble +1	16-46	0x10 - 0x2E
Treble -1	16-102	0x10 - 0x66
Set Zone 2 to Follow Zone 1	16-20	0x10 - 0x14
Zone 2 Power On (not AVR5, AVR10)	23-123	0X17 - 0x7B

Function	RC5 Code [system-command]	RC5 Code (Data1 - Data2)
	Decimal	Hexadecimal
Zone 2 Power Off (not AVR5, AVR10)	23-124	0x17 - 0x7C
Zone 2 Vol+ (not AVR5, AVR10)	23-1	0x17 - 0x01
Zone 2 Vol-(not AVR5, AVR10)	23-2	0x17 - 0x02
Zone 2 Mute (not AVR5, AVR10)	23-3	0x17 - 0x03
Zone 2 Mute On (not AVR5, AVR10)	23-4	0x17 - 0x04
Zone 2 Mute Off (not AVR5, AVR10)	23-5	0x17 - 0x05
Zone 2 CD (not AVR5, AVR10)	23-6	0x17 - 0x06
Zone 2 BD (not AVR5, AVR10)	23-7	0x17 - 0x07
Zone 2 STB (not AVR5, AVR10)	23-8	0x17 - 0x08
Zone 2 AV (not AVR5, AVR10)	23-9	0x17 - 0x09
Zone 2 Game (not AVR5, AVR10)	23-11	0x17 - 0x0B
Zone 2 Aux (not AVR5, AVR10)	23-13	0x17 - 0x0D
Zone 2 PVR (not AVR5, AVR10)	23-15	0x17 - 0x0F
Zone 2 FM (not AVR5, AVR10)	23-14	0x17 - 0x0E
Zone 2 DAB (not AVR5, AVR10)	23-16	0x17 - 0x10
Zone 2 USB (not AVR5, AVR10)	23-18	0x17 - 0x12
Zone 2 NET (not AVR5, AVR10)	23-19	0x17 - 0x13
Zone 2 SAT (not AVR5, AVR10)	23-20	0x17 - 0x14
Zone 2 UHD (not AVR5, AVR10)	23-23	0x17 - 0x17
Zone 2 BT (not AVR5, AVR10)	23-22	0x17 - 0x16
Select HDMI Out 1	16-73	0x10 - 0x49
Select HDMI Out 2	16-74	0x10 - 0x4A
Select HDMI Out 1 & 2	16-75	0x10 - 0x4B

ARCAM