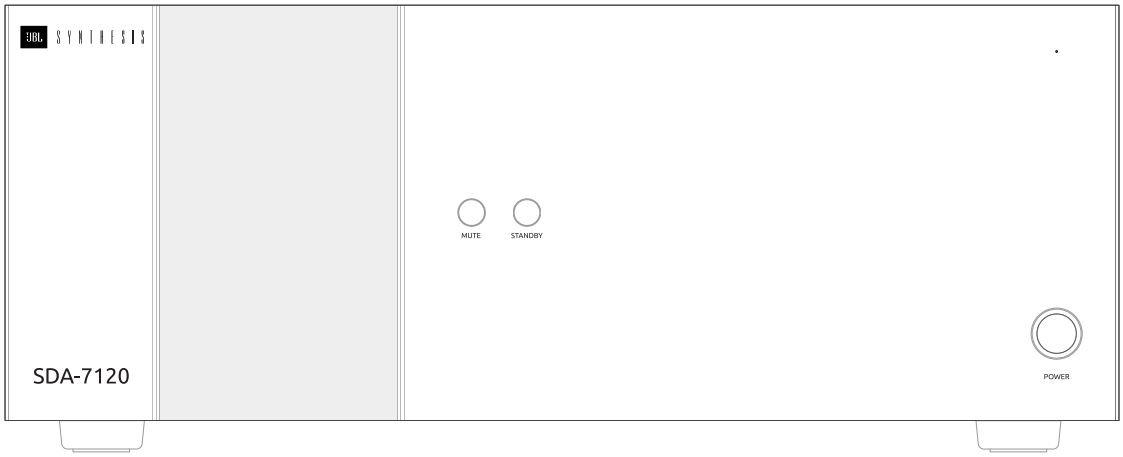
JBL SYNTHESIS®

Custom Installation Notes:

IP/Serial programming interface for the JBL Synthesis SDA-7120 & SDA-2220 power amplifiers



Contents

Applicability

This document applies to the JBL Synthesis SDA-7120 & SDA-2220 power amplifiers.

Revision history

Issue 1.0	Initial Release
Issue 2.0	Corrected temperature query and response

Controlling via RS232/NET

Introduction

This document describes the remote control protocol for controlling via the RS232/NET interface.

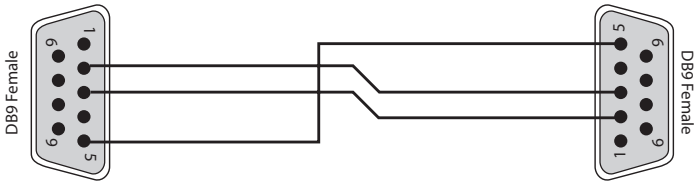
Set-up

IP control is via port 50000 of the IP address of the unit.

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:

2	3	Rx ← Tx
3	2	Tx → Rx
5	5	RS232 Ground

Data transfer format

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

Command and response formats

Communication between the remote controller (RC) and the SDA-7120 or SDA-2220 takes the form of sequences of bytes, with all commands and responses having the same basic format. The SDA-7120 or SDA-2220 will always respond to a received command, but may also send messages at other times.

Each transmission by the RC hs 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 SDA-7120 or SDA-2220 has 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 (note that n is limited to 255).
- Et (End transmission): 0x0D

The SDA-7120 or SDA-2220 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.
- 0x86 – Invalid data length.

State changes as a result of other inputs

It is possible that the state of the SDA-7120 or SDA-2220 may be changed as a result of user input via the rear panel switches or by external events (i.e. a fault). Any change resulting from these inputs is relayed to the RC using the appropriate message type.

Reserved Commands

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

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=Amplifier><Device-Make=JBL Synthesis><Device-Model=SDA-7120 or SDA-2220><Device-Revision=x.y.z>\r"

Where,

x.y.z = RS232 protocol version number.

System Command Specifications

Power (0x00)

Set/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	0x00 – Power Off 0x01 – Power On 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 standby 0x01 – Zone is powered on
Et	0x0D

Software version (0x04)

Request the firmware version

Example

Command/response sequence, where the repsonse is version 1.2:

Command: 0x21 0x01 0x04 0x01 0xF0 0x0D
Response: 0x21 0x01 0x04 0x00 0x02 0x01 0x02 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x04
Dl	0x01
Data	0xF0 - request software version
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x04
Ac	Answer code
Dl	0x02
Data1	0x?? - major version number
Data2	0x?? - minor version number
Et	0x0D

Factory reset (0x05)

This command resets the unit to factory defaults.

Example

Command/response sequence for resetting the unit to factory defaults:

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

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
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	Zone number
Cc	0x05
Ac	Answer code
Dl	0x00
Et	0x0D

Mute/Unmute (0x0E)

Set/Request the mute status of the amplifier.

Example

Command/response sequence for requesting the mute status of the amplifier where the result is unmuted:

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

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

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0E
Dl	0x01
Data	0x00 - Mute 0x01 - Unmute1 0xF0 – Request mute status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x0E
Ac	Answer code
Dl	0x01
Data	0x00 - Muted 0x01 - Unmuted
Et	0x0D

Heartbeat (0x25)

Heartbeat command to check unit is still connected and communicating - 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	Zone number
Cc	0x25
Dl	0x01
Data	0xF0 – Heartbeat
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x25
Ac	Answer code
Dl	0x01
Data	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	Zone number
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
Data	0x00 – Response
Et	0x0D

DC offset (0x51)

Request the output DC offset status.

Example

Command/response sequence for requesting the DC offset status where the result is no DC offset:

Command:	0x21 0x01 0x51 0x01 0xF0 0x0D
Response:	0x21 0x01 0x51 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x51
Dl	0x01
Data	0xF0 – Request DC offset status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x51
Ac	Answer code
Dl	0x01
Data	0x00 - OK 0x01 - DC offset detected
Et	0x0D

Short circuit status (0x52)

Request the output short circuit status.

Example

Command/response sequence for requesting the short circuit status, where the result is no short circuit:

Command:	0x21 0x01 0x52 0x01 0xF0 0x0D
Response:	0x21 0x01 0x52 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x52
Dl	0x01
Data	0xF0 – Request short circuit status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x52
Ac	Answer code
Dl	0x01
Data	0x00 - No short circuit detected 0x01 - Short circuit detected
Et	0x0D

Friendly name (0x53)

This command returns the friendly name of the unit. It can also be used to set the unit name.

Example

Command/response sequence for setting the unit name to "AMP 1":

Command:	0x21 0x01 0x53 0x05 0x41 0x52 0x43 0x41 0x4D 0x0D
Response:	0x21 0x01 0x53 0x00 0x05 0x41 0x4D 0x50 0x20 0x31 0x0D

Note

Only upper case characters [A...Z], numbers [0...9] and space are allowed

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x53
Dl	0x01 (query) or <n> (limited to 10 characters) for setting name
Data	0xF0 – query 1–<n>
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone Number
Cc	0x53
Ac	Answer code
Dl	Data length – <n> if setting (10 characters maximum) 0x0A if requesting the name
Data1 - Data <n>	Input name in ASCII characters
Et	0x0D

Set/request IP address (0x54)

This command sets or requests the IP address of the unit.

Example

Command/response sequence for setting an IP address of 192.168.1.4:

Command:	0x21 0x01 0x54 0x04 0xC0 0xA8 0x01 0x04 0x0D
Response:	0x21 0x01 0x54 0x00 0x04 0xC0 0xA8 0x01 0x04 0x0D

Command/response for requesting the IP address of the unit, where the IP address is 192.168.1.4:

Command:	0x21 0x01 0x54 0x01 0xF0 0x0D
Response:	0x21 0x01 0x54 0x00 0x04 0xC0 0xA8 0x01 0x04 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x54
Dl	0x01 (Query) or 0x04 (Set)
Data1	0xF0 (Query) or 0x?? (Set first byte of the IP address)
Data2	0x?? (Set second byte of the IP address)
Data3	0x?? (Set third byte of the IP address)
Data4	0x?? (Set fouth byte of the IP address)
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x54
Ac	Answer code
Dl	0x04
Data1	0x?? (First byte of the IP address)
Data2	0x?? (Second byte of the IP address)
Data3	0x?? (Third byte of the IP address)
Data4	0x?? (Fourth byte of the IP address)
Et	0x0D

Request timeout counter (0x55)

This command requests the time left (in seconds) until unit enters auto standby.

Example

Command/response sequence for requesting the time left until timeout:

Command:	0x21 0x01 0x55 0x01 0xF0 0x0D
Response:	0x21 0x01 0x55 0x00 0x02 0x38 0x40 0x0D

In this example, the timeout value is 0x3840, which translates to 14,400 seconds. The range of the value returned is from 0x0000 - 0x3840 (0 - 14,400seconds)

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x55
Dl	0x01
Data	0xF0
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x55
Ac	Answer code
Dl	0x02
Data1	0x?? (First byte of timeout counter)
Data2	0x?? (Second byte timeout counter)
Et	0x0D

Lifter temperature (0x56)

Request the temperature of the lifter circuitry:

Example

Command/response sequence for requesting the temperature of lifter temperature sensor 1 where the result is 75degC:

Command:	0x21 0x01 0x56 0x01 0xF0 0x0D
Response:	0x21 0x01 0x56 0x00 0x02 0xF0 0x4B 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x56
Dl	0x01
Data	0xF0 – Request lifter temperature 1 0xF1 – Request lifter temperature 2
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x56
Ac	Answer code
Dl	0x02
Data1	0xF0 - Lifter temperature 1 0xF1 - Lifter temperature 2
Data2	0x?? – Temperature in deg C in hex, e.g. 75degC = 4B
Et	0x0D

Output temperature (0x57)

Request the temperature of the amplifier output stages

Example

Command/response sequence for requesting the temperature of output stage temperature sensor 1 where the result is 75degC:

Command: 0x21 0x01 0x57 0x01 0xF0 0x0D

Response: 0x21 0x01 0x57 0x00 0x02 0xF0 0x4B 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x57
Dl	0x01
Data	0xF0 – Request output stage temperature 1 0xF1 – Request output stage temperature 2
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x57
Ac	Answer code
Dl	0x02
Data1	0xF0 - Output temperature 1 0xF1 - Output temperature 2
Data2	0x?? – Temperature in deg C in hex, e.g. 75degC = 0x4B
Et	0x0D

Auto shutdown control (0x58)

Enable or disable the signal sense auto shutdown feature

Example 1

Command/response sequence, the signal sense auto shutdown timeout has been set to 60 minutes:

Command: 0x21 0x01 0x58 0x01 0x02 0x0D

Response: 0x21 0x01 0x58 0x00 0x01 0x02 0x0D

Example 2

Command/response sequence, the signal sense auto shutdown has been disabled:

Command: 0x21 0x01 0x58 0x01 0x00 0x0D

Response: 0x21 0x01 0x58 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x58
Dl	0x01
Data	0x00 – Disable 0x01 – 20 min (default) 0x02 – 30 min 0x03 – 1 hour 0x04 – 2 hours 0x05 – 4 hours 0xF0 – Request timeout status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x58
Ac	Answer code
Dl	0x01
Data	0x00 – Disabled 0x01 – 20 min 0x02 – 30 min 0x03 – 1 hour 0x04 – 2 hours 0x05 – 4 hours
Et	0x0D

Input detect (0x5A)

Request the status of the active input.

Example

Command/response sequence where audio input is present.

Command: 0x21 0x01 0x5A 0x01 0xF0 0x0D

Response: 0x21 0x01 0x5A 0x00 0x01 0x01 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x5A
Dl	0x01
Data	0xF0 - Request input status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x5A
Ac	Answer code
Dl	0x01
Data	0x00 - Input not present 0x01 - Input present
Et	0x0D

System status (0x5D)

Request the system status.

Example

Command/response sequence to request the system status.

Command: 0x21 0x01 0x5D 0x01 0xF0 0x0D
Response: 0x21 0x01 0x5D 0x00 0x01 0xF0 0x0D

Note:

This command will return the following information about the system:

- Power state
- Software version
- Mute status
- Network name
- Static IP address
- Timeout counter value
- Lifter temperature
- Output temperature
- Auto shutdown status
- Input detect status
- System model
- Amplifier mode (SDA-2200 only)

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x5D
Dl	0x01
Data	0xF0 – Request the system status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x5D
Ac	Answer code
Dl	0x01
Data	0xF0 - System status sent
Et	0x0D

System model (0x5E)

Request the system model.

Example

Command/response sequence to request the system model, where the model is SDA-7120

Command: 0x21 0x01 0x5E 0x01 0xF0 0x0D
Response: 0x21 0x01 0x5E 0x00 0x07 0x53 0x44 0x41 0x2D 0x37 0x31 0x32 0x30 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x5E
Dl	0x01
Data	0xF0 – Request the system model
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x5E
Ac	Answer code
Dl	<n>, maximum 10 characters
Data1 – Data<n>	System model in ASCII characters
Et	0x0D

Amplifier mode (SDA-2200 only) (0x61)

Request the amplifier mode - normal, bridged, dual mono

Example

Command/response sequence where amp mode is set to normal:

Command: 0x21 0x01 0x61 0x01 0xF0 0x0D
Response: 0x21 0x01 0x61 0x00 0x01 0x00 0x0D

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x61
Dl	0x01
Data	0xF0 - Request amplifier mode
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x61
Ac	Answer code
Dl	0x01
Data	0x00 - Normal (stereo) 0x01 - Bridged 0x02 - Dual mono
Et	0x0D

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