

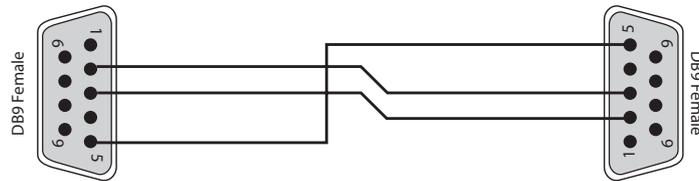
RS232 Control

Introduction

This document describes the remote control protocol for controlling the MZ8/12 via the RS232 interface.

The document relates to MZ RS232 control protocol version 1.0. Any updates to this protocol will be posted on the Arcam Extranet website at <http://www.arcam.co.uk/extranet>.

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.

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 remote controller (RC) and the MZ8/MZ12 takes the form of sequences of bytes, with all commands and responses having the same basic format. The MZ8/MZ12 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> <DI> <Data> <Et>
St (Start transmission): 0x21 '!'
Zn (Zone number): see below.
Cc (Command code): the code for the command
DI (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 MZ8/MZ12 is the following format:

<St> <Zn> <Cc> <Ac> <DI> <Data> <Et>
St (Start transmission): 0x21 '!'
Zn (Zone number): see below.
Cc (Command code): the code for the command
Ac (Answer code): see below.
DI (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 MZ8/MZ12 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 are global are addressed to Zone 1)
- 0x02 - Zone number 2.
- 0x03 - Zone number 3.
- 0x04 - Zone number 4.
- 0x05 - Zone number 5.
- 0x06 - Zone number 6.

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.
- 0x86 - Invalid data length.

Example command and response sequence

As an example, the command 0x00, change power state – enter standby:

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

Assuming that the command was accepted by the amplifier and is being processed, the MZ8/MZ12 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 MZ8 & MZ12 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=ARCAM><Device-Model=MZ><Device-Revision=x.y>\r"

Where x.y = RS232 protocol version number.

System Command Specifications

Software version (0x04)

Request the version number of the main software or the control protocol of the MZ8/MZ12.

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 version RS232 protocol 0xF1 - Request version main software
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

Power (0x00)

Request or change the standby state.

Example

Command/response sequence to request the power state where the power is on:

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

COMMAND:	
Byte:	Description:
St	0x21
Zn	0x01 (command affects all zones)
Cc	0x00
Dl	0x01
Data	0x00 – Enter standby state 0x01 – Power-on 0x02 – Toggle power state 0xF0 – Request power state
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	0x01
Cc	0x00
Ac	Answer code
Dl	0x01
Data	0x00 – System is in standby 0x01 – System is powered on
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
Data	0x00 – Zone is muted 0x01 – Zone is not muted
Et	0x0D

Activate/deactivate the mute lines (0x1F)

Activate/deactivate the mute lines on the designated zone.

Example

Command/response sequence to activate the mute relays:

Command: 0x21 0x01 0x1F 0x01 0x0D

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

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1F
Data1	0x00 – Deactivate mute line 0x01 – Activate mute line
Dl	0x01
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x1F
Ac	Answer code
Dl	Data length <n>
Data1	Relay state
Et	0x0D

Report Amplifier temperature status (0x27)

Report the temperature status of the various zones amplifiers.

Example

Command/response sequence to request the temperature of zone 1 where temperature is too high:

Command: 0x21 0x01 0x27 0x01 0xF0 0x0D

Response: 0x21 0x01 0x27 0x00 0x01 0x01 0x0D

Note: As each amplifier powers a pair of zones (1&2, 3&4, 5&6) the temperature status of zones 1 and 2 is the same value.

COMMAND:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x27
Dl	0x01
Data	0xF0 – Request temperature status
Et	0x0D
RESPONSE:	
Byte:	Description:
St	0x21
Zn	Zone number
Cc	0x27
Ac	Answer code
Dl	0x01
P2	0x00 – Temperature OK 0x01 – Over temperature
Et	0x0D

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