⊖ LINN PRODUCT SOFTWARE

Klimax Pre-amplifier - RS232 ASCII Interface Specification And Commands
Version 1.03

Revision History

Revision	Description	Author	Date
1.00	First Issue	Tom Celinski	12th December 2001
1.01	Reviewed by B.W. Christie	Tom Celinski	8th January 2002
1.02	Revised command set	David Murdie	1st July 2002
1.03	Command set used by release version of software	David Murdie	10th September 2002

Note: This initial version of this document was based on *Kolektor - RS232 ASCII Interface Specification And Commands Version 1.20* by B. W. Christie

Table of Contents

Introduction

This document describes how to control the Klimax Kontrol through an RS232 interface.

There are three main sections to this document:

1: Message protocol

This section describes how commands are constructed and how they may be used.

2: System Commands

This section lists the commands which allow the Klimax Pre-amp to be used as part of a system driven through an RS232 interface.

3: Klimax pre-amp Commands

This section defines a list of commands for controlling the Klimax pre-amplifier.

1:Message Protocol

1.1: Overview

The RS232 interface on the Klimax pre-amp allows it to be controlled by a touch screen, PC or any computer with an RS232 port. The Klimax Pre-amp obeys the commands received through the RS232 interface and replies to confirm a successful or unsuccessful operation. The Klimax pre-amp is a slave device in that it does not transmit anything unless it first receives something, e.g. a task or status command.

The RS232 interface uses an initial-response-then-final-response method to acknowledge receiving the command and then completing the task. The interface also supports device and group identifiers to allow a number of units to be connected together.

1.2: Message Syntax

The general syntax is as follows: **Command NL**

where : **Command**   Syntax: **$command$**

is the command from the host for the product. Enclosed by the '$' delimiter.

NL   Syntax: 13dec and 10dec (0Dhex and 0Ahex)

are the line termination characters, carriage return and line feed.

1.4: Syntax Of Commands And Responses

1.4.1: Command Syntax

The command message has two variations:

1.4.1.1: Command Help

This allows the host to find out what type of parameters the command requires.

      Syntax: **`$? cmnd$NL`**

    where   **`$`**   = command start delimiter
                `?`   = request for help
                `cmnd` = command
                `$`   = command end delimiter
                `NL`   = Line termination characters - carriage return, line feed.

Additionally, if '**`cmnd`**' is a '**`?`**' then the command set of the product will be provided, with each command being separated from the next by a space.

Note that command help is product dependent and is implemented on the Klimax pre-amplifier.

1.4.1.2: Command

This is the method by which the host controls the product

      Syntax: **`$cmnd (param (param ……)) $NL`**   perform some operation

    where   **`$`**   = command start delimiter
                `cmnd` = command string
                `param` = parameter string
                `$`   = command end delimiter
                `NL`   = Line termination characters - carriage return, line feed.

Note that values contained within ' **(** ' and ' **)** ' may or may not be required, it is dependent on the command.

1.4.2: Response Overview

When replies are made an initial response and final response are issued. It is unwise for the host to issue further commands until the final response has been received. Section 1.3 describes the action of identifiers on these replies and specifies rules, which may also suppress the replies.

1.4.2.1: Initial Response

This will be given on receipt of a valid command and for a positive acknowledge will be of the form:

`!NL`

In this way, the host quickly knows that the destination has received and understood the command.

The host should expect an initial response to the command within 10 ms.

1.4.2.1.1: Initial Response Failure

This will be given on receipt of an invalid command and will be of the form:

`!$FAIL n$NL`

Where 'n' is a code specifying why the command was invalid, see section 2.4.1.1

Note that there is no final response.

1.4.2.2: Final Response

This will be given on completion of the task and will be of the form:

`!$Status_String$NL`

The status string will be a unique response to the originating command.

Note that the identifiers may or may not be used, see section 1.3

1.4.2.2.1: Final Response Failure

This will be given where a task could not be completed and will be of the form:

`!$FAIL n$NL`

Where 'n' is a code specifying why the task could not be completed, see section 2.4.1.1

2: System Commands

The following commands allow the Klimax Pre-amp to be part of a system driven through an RS232 interface.

2.2: Communication Commands

2.2.1: BAUD

Select / Return baud rate setting

↷	**$BAUD baudrate$**
↳	!$BAUD baudrate$
📖	*Select new baudrate from the following: 2400, 4800, 9600, 19200 or 38400*

↷	**$BAUD ?$**
↳	!$BAUD baudrate$
📖	*Returns current baud rate (see above)*

- The initial response will be at the current baud rate and the final response will be at the new baud rate.
- The baud rate defaults to 9600 when the product is initialised

2.2.2: RESET

Return product to a known state

↷	**$RESET$**
↳	!$RESET$
📖	*Clear communications buffer on product*

2.2.3: ECHO

Echo text

↷	**$ECHO text$**
↳	!$ECHO <text>$
📖	*Echo's the text back enclosed in < and >*

This command is used to ease the burden of initial set-up of host/product communications, the product will echo the parameter provided back to the host.

3.3.5: TEST

This command tests various display items

☞	**$TEST [Y\|ON]$**
✍	!$TEST Y$
📖	*Switches display test mode on*

☞	**$MUTE [N\|OFF]$**
✍	!$MUTE N$
📖	*Switches display test mode off*

☞	**$MUTE PIXELS [Y\|ON]$**
✍	!$MUTE PIXELS ON$
📖	*Switches display test (All pixels on) mode on*

☞	**$MUTE PIXELS [N\|OFF]$**
✍	!$MUTE PIXELS OFF$
📖	*Switches display test (All pixels on) mode off*

2.4: Status Command

The status command has been provided as a debugging aid, i.e. the host can find out why a command was not processed.

2.4.1: STATUS

Return the last command status

⇗	**$STATUS$**
⬐	!$STATUS number$
📖	*Return the status of the last command*

Where `number` is the returned status code. Codes are allocated on a block basis for each product with the first 48 codes reserved for general use.

2.4.1.1: Status Codes

General:	**Code**	**Description**
	00 (0x00)	No error
	01 (0x01)	Unexpected termination of command line
	02 (0x02)	Unrecognised or misplaced character in command line
	03 (0x03)	Corrupted command message (within $….$)
	04 (0x04)	Start of another source identifier, identifier has already been supplied
	05 (0x05)	Start of another group identifier, identifier has already been supplied
	06 (0x06)	Start of another destination identifier, identifier has already been supplied
	07 (0x07)	Source identifier is too large, maximum of 20 characters
	08 (0x08)	Group identifier is too large, maximum of 20 characters
	09 (0x09)	Destination identifier is too large, maximum of 20 characters
	10 (0x0A)	Source identifier corrupted
	11 (0x0B)	Group identifier corrupted
	12 (0x0C)	Destination identifier corrupted
	13 (0x0D)	Unknown group identity
	14 (0x0E)	Unknown destination identity
	15 (0x0F)	Unknown command
	16 (0x10)	Unknown command parameter
	17 (0x11)	Parameter missing from **ID** command
	18 (0x12)	Unknown product identifier, cannot delete
	19 (0x13)	Parameter missing from **GID** command
	20 (0x14)	Cannot delete group identifier, unknown
	21 (0x15)	Cannot add new group identifier, already exists
	22 (0x16)	Cannot add new group identifier, list full
	23 (0x17)	Polling must be activated by the **POLL START** command
	24 (0x18)	Only **POLL ID, SLEEP** or **DONE** commands accepted during polling
	25 (0x1A) **upto** 47 (0x2F)	Reserved

3: Klimax Pre-amplifier Commands

The following pages contain the command set for the Klimax pre-amplifier.

Important: Parameters must be separated from commands and each other by at least one space character

Where a command can be enabled or disabled then

Y or **ON** will enable (turn on) the setting and **N** or **OFF** will disable (turn off) the setting

3.1: Command Help

Command help is implemented by the Klimax pre-amplifier and will give the host details for any given command.

```
for example:    $? VOL$
replies with:   !$? VOL (?|+|-|int|+int|-int|= (int|+int))$
```

3.2: System Commands

The system commands supported by the Klimax pre-amplifier are **BAUD**, **RESET**, **ECHO** and **STATUS**. These are all explained in section 2 of this document.

3.3: Other Commands

3.3.1: VOLUME

☞	**$VOL ?$**
✎	`!$VOL value$`
📖	*Return current volume setting*

☞	**$VOL +$**
✎	`!$VOL value$`
📖	*Increase current volume setting by 1*

☞	**$VOL -$**
✎	`!$VOL value$`
📖	*Decrease current volume setting by 1*

☞	**$VOL [+]number$**
✎	`!$VOL value$`
📖	*Increase current volume setting by supplied value*

☞	**$VOL -number$**
✎	`!$VOL value$`
📖	*Decrease current volume setting by supplied value*

☞	**$VOL = [+]number$**
✎	`!$VOL value$`
📖	*Set current volume setting to absolute value supplied*

3.3.2: BALANCE

↷	**`$BAL ?$`**
↺	`!$BAL value$`
📖	*Return current balance setting*

↷	**`$BAL +$`**
↺	`!$BAL value$`
📖	*Increase current balance setting by 1*

↷	**`$BAL -$`**
↺	`!$BAL value$`
📖	*Decrease current balance setting by 1*

↷	**`$BAL [+]number$`**
↺	`!$BAL value$`
📖	*Increase current balance setting by supplied value*

↷	**`$BAL -number$`**
↺	`!$BAL value$`
📖	*Decrease current balance setting by supplied value*

↷	**`$BAL = [+|-]number$`**
↺	`!$BAL value$`
📖	*Set current balance setting to value supplied*

3.3.5: MUTE

☞ **$MUTE ?$**
↳ !$MUTE ON$
↳ !$MUTE OFF$
📖 *Return current mute status*

☞ **$MUTE [Y|ON]$**
↳ !$MUTE ON$
📖 *Enable mute*

☞ **$MUTE [N|OFF]$**
↳ !$MUTE OFF$
📖 *Disable mute*

3.3.6: LISTEN (indirect commands)

☞ **$LISTEN ?$**
↳ !$LISTEN value$
📖 *Return current source number ('value' is between 1 and 5)*

☞ **$LISTEN +$**
↳ !$LISTEN value$
📖 *Select the next logical source*

☞ **$LISTEN -$**
↳ !$LISTEN value$
📖 *Select the previous logical source*

☞ **$LISTEN number$**
↳ !$LISTEN value$
📖 *Select absolute source 'number'*

Note: If a source is unavailable for any reason, then the number returned specifies the currently selected source.

3.3.7: LISTEN (direct commands)

☞ **$LISTEN CD$**
↳ !$LISTEN value$
📖 *Select the next CD source*

☞ **$LISTEN LASER$**
↳ !$LISTEN value$
📖 *Select the next Laser source*

☞ **$LISTEN [AUX|AUX1]$**
↳ !$LISTEN value$
📖 *Select the next AUX source*

☞ **$LISTEN AUX2$**
↳ !$LISTEN value$
📖 *Select the next Phono source*

☞ **$LISTEN [TUN|TUNER]$**
↳ !$LISTEN value$
📖 *Select the next tuner source*

☞ **$LISTEN [TAP|TAPE]$**
↳ !$LISTEN value$
📖 *Select the Tape source*

☞ **$LISTEN VCR$**
↳ !$LISTEN value$
📖 *Select the Video source*

☞ **$LISTEN NAME value$**
↳ !$LISTEN NAME value$
📖 *Select the source with name given by value or return value=UNKNOWN*

3.3.8: STEREO

☞ **$STEREO ?$**
↳ !$STEREO ON$
↳ !$STEREO OFF$
📖 *Indicates if the pre-amplifier is in stereo mode (ON) or in mono mode (OFF)*

☞ **$STEREO [Y|ON]$**
↳ !$STEREO ON$
📖 *Enter stereo mode*

☞ **$STEREO [N|OFF]$**
↳ !$STEREO OFF$
📖 *Leave stereo mode (switch to mono)*

3.3.9: STANDBY

☞ **$STANDBY ?$**
↳ !$STANDBY ON$
↳ !$STANDBY OFF$

📖 *Indicates whether the pre-amplifier is in standby mode (ON) or not in standby mode (OFF)*

🗗	**$STANDBY [Y|ON]$**
↪	!$STANDBY ON$
📖	*Enter standby*

🗗	**$STANDBY [N|OFF]$**
↪	!$STANDBY OFF$
📖	*Leave standby*

3.3.10: USER

For details of user options (and valid settings of the *value* fields below) refer to *Klimax Pre-amplifier Software Functional Specification*. Note that the possible settings in the current protocol are upper case stings.

🗗	**$USER SLEEP DISPLAY ?$**
↪	!$USER SLEEP DISPLAY value$
📖	*Return the value of the Sleep Display option (NONE, LOGO, SOURCE or VOLUME).*

🗗	**$USER SLEEP DISPLAY value$**
↪	!$USER SLEEP DISPLAY value$
📖	*Set Sleep Display to the specified value (NONE, LOGO, SOURCE or VOLUME).*

🗗	**$USER SLEEP TIME ?$**
↪	!$USER SLEEP TIME value$
📖	*Return the value of the Sleep time option (2S, 5S, 10S, 20S or NEVER).*

🗗	**$USER SLEEP TIME value$**
↪	!$USER SLEEP TIME value$
📖	*Set Sleep Time to the specified value (2S, 5S, 10S, 20S or NEVER).*

🗗	**$USER INPUT1 ?$**
↪	!$USER INPUT1 value$
📖	*Return the value of the Input 1 option (BALANCED or UNBALANCED).*

🗗	**$USER INPUT1 value$**
↪	!$USER INPUT1 value$
📖	*Set Input 1 to specified value (BALANCED or UNBALANCED)*

🗗	**$USER SOURCE STARTUP ?$**
↪	!$USER SOURCE STARTUP VALUE$
📖	*Return the value of the Startup Source option (INPUT1-INPUT5 or LAST)*

🗗	**$USER SOURCE STARTUP value$**
↪	!$USER SOURCE STARTUP value$
📖	*Set Startup Source to the specified value (INPUT1-INPUT5 or LAST)*

🗗	**$USER VOLUME STARTUP ?$**
↪	!$USER VOLUME STARTUP VALUE$
📖	*Return the value of the Startup Volume option (DEFAULT OR LAST)*

🗗	**$USER VOLUME STARTUP value$**
↪	!$USER STARTUP VOLUME value$
📖	*Set Startup Volume to the specified value (DEFAULT OR LAST)*

🗗	**$USER VOLUME DEFAULT ?$**

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✋	!$USER VOLUME DEFAULT VALUE$
📖	*Return the value of the Default Volume option (0.0 to 100.0 with increments of 0.5)*

☞	**$USER DEFAULT VOLUME value$**
✋	!$USER DEFAULT VOLUME value$
📖	*Set Default Volume to the specified value (0.0 to 100.0 with increments of 0.5)*

☞	**$USER IR PRODUCT ?$**
✋	!$USER IR PRODUCT value$
📖	*Return the value of the Front Panel IR option (ON or OFF)*

☞	**$USER IR PRODUCT ON$**
✋	!$USER IR FRONT value$
📖	*Enable the front panel IR device*

☞	**$USER IR PRODUCT OFF$**
✋	!$USER IR FRONT value$
📖	*Disable the front panel IR device*

☞	**$USER IR REMOTE ?$**
✋	!$USER IR REMOTE value$
📖	*Return the value of the Remote IR option (None, RCU, or MOGEYE)*

☞	**$USER IR REMOTE value$**
✋	!$USER IR REMOTE value$
📖	*Set the value of the Remote IR option (None, RCU, or MOGEYE)*

☞	**$USER VOLUME UNITS ?$**
✋	!$USER VOLUME UNITS value$
📖	*Return the value of the Display Units option (DECIMAL or DECIBEL)*

☞	**$USER VOLUME UNITS value$**
✋	!$USER VOLUME UNITS value$
📖	*Set the value of the Display Units option (DECIMAL or DECIBEL)*

☞	**$USER LOGO ?$**
✋	!$USER LOGO value$
📖	*Return the value of the Logo option (LINN or NOTES)*

☞	**$USER LOGO value$**
✋	!$USER LOGO value$
📖	*Set the value of the Logo option (LINN or NOTES)*

3.3.11: INPUT

For details of source setup options (and valid settings of the *value* fields below) refer to *Klimax Pre-amplifier Software Functional Specification.* Note that the possible settings in the current protocol are upper case stings.

☞ **`$INPUT k TYPE ?$`**

✍ `!$INPUT k TYPE value$`

📖 *Return the value of the Type option for input k (NONE, CD, PH1, PH2, TUN, TAPE1, TAPE2, AUX, KNEKT).*

☞ **`$INPUT k TYPE value$`**

✍ `!$INPUT k TYPE value$`

📖 *Set the value of the Type option of input k (NONE, CD, PH1, PH2, TUN, TAPE1, TAPE2, AUX, KNEKT).*

☞ **`$INPUT k VOLUME ?$`**

✍ `!$INPUT k VOLUME value$`

📖 *Return the value of the Volume Offset option for input k (0.0 to +/-15.0 with increments of 0.5).*

☞ **`$INPUT k VOLUME value$`**

✍ `!$INPUT k VOLUME value$`

📖 *Set the value of the Volume Offset option for input k (0.0 to +/-15.0 with increments of 0.5).*

☞ **`$INPUT k BALANCE ?$`**

✍ `!$INPUT k BALANCE value$`

📖 *Return the value of the Balance Offset option for input k (0.0 to +/-15.0 with increments of 0.5).*

☞ **`$INPUT k BALANCE value$`**

✍ `!$INPUT k BALANCE value$`

📖 *Set the value of the Balance Offset option for input k (0.0 to +/-15.0 with increments of 0.5).*

☞ **`$INPUT k NAME ?$`**

✍ `!$INPUT k NAME value$`

📖 *Return the value of the Source Name option for input k (Maximum 8 uppercase characters, numbers and spaces).*

☞ **`$INPUT k NAME value$`**

✍ `!$INPUT k NAME value$`

📖 *Set the value of the Source Name option for input k (Maximum 8 uppercase characters, numbers and spaces).*

3.3.12: INIT

⇯	**$INIT$**
⇳	!$INIT$
📖	*Resets product back to factory defaults*

3.3.13: VERSION

⇯	**$VERSION SOFTWARE$**
⇳	!$VERSION SOFTWARE SpppMMmm$
📖	*Return current software version.*
📖	*Where: 'ppp' is product number, 'MM' is major version number and ' mm' is minor version number*

⇯	**$VERSION HARDWARE$**
⇳	!$VERSION HARDWARE PCAShhhLr$
📖	*Return current hardware version (audio board)*
📖	*Where: 'hhh' is board number and 'r' is revision number*

3.3.14: CHECKSUM

⇯	**$CHECKSUM$**
⇳	!$CHECKSUM hhhh$
📖	*Return current software checksum*
📖	*Where:' hhhh' is a four digit hexidecimal value*

3.3.15: COUNTER

⇯	**$COUNTER POWER ?$**
⇳	!$COUNTER POWER days:hours:minutes:seconds$
📖	*Return total powered time*
📖	*Where: 'days' is 1 to 5 digits, 'hours' is 2 digits, 'minutes' is 2 digits and 'seconds' is 2 digits*

⇯	**$COUNTER POWER 31051972$**
⇳	!$COUNTER POWER days:hours:minutes:seconds$
📖	*31051972 is a Klimax Pre-amplifier specific password. This number has no significance other than being available only to Linn staff.*
📖	*Reset counter to zero*
📖	*Return total powered time (should be zero)*

Appendix A: Command format and description

Commands are described using the following format:

☞	**`$COMMAND parameters$`**
↳	`!$COMMAND response 1$`
↳	....
↳	`!$COMMAND response n$`
📖	*Brief command description*

Each table describes one variation of the command, therefore, for a command with five variations there will be five tables.

In cases of a command where there may be more than one form of response, all forms of the response will be listed

The following conventions apply:

- **`$COMMAND parameters$`** is the command variation

- `!$COMMAND response$` is the response to a command

- `!$FAIL number$` is the response to a failed command

- All uppercase words are keywords all commands must be supplied in uppercase

- All lowercase words represent a parameter ie. `'number'` means supply a numeric value

- Parameter's shown as, `'[p1|p2|p3]'` means use one of these values

- Parameter's shown as, `'p1 [p2 […]]'` means supply one or more values