SP/SR112

Serial Port for the TCG Time Code Generator option for the SR-112

1.   Serial Port Settings

Baud	=	115200
Data Bits	=	8
Stop Bits	=	1
Parity	=	none
Flow Control	=	none

2. Serial Command Message Formats

2.1. Overview

The set of commands and status responses transmitted via the device serial port (UART) is 100% ASCII text-based, and is formatted in such a way that it can be manually entered from and displayed using a terminal program, such as HyperTerminal or PuTTY.

2.2. Prompts

As is customary with terminal interfaces, the text dialog exists within a framework of prompts and end-of-line characters.

- At startup the user is presented with a prompt.

- As the user enters characters they are echoed back to the terminal program for display.

- When the user presses the <Enter> key at the end of a command or status request, an end-of-line sequence is returned to the terminal and a new line is started.

- At this point actions diverge:
    - if the user entry was a command, the system then returns a new prompt.
    - if the entry was a status request, the system returns a new status line:
        - (a) starting with a field of spaces, the same width as the prompt
        - (b) the response data, in text form
        - (c) end-of-line characters
        - (d) a new prompt.

To summarize, with user entry contained in curly braces:

```
<prompt> {user_entered_command<CR><LF>}
<prompt> {user_entered_status_request<CR><LF>}
<status_response><CR><LF>
<prompt>
```

where:
```
<CR> = Carriage return
<LF> = Line feed
```
Pressing a keyboard <Enter> key will insert the <CR><LF> sequence.

The text for <prompt> is usually project dependent.

2.3. General Command and Status Response Format

```
[<ChanChar>-]<Label>[ [<Index> ]<Argument>]
```

`<ChanChar>`

Multi-channel devices use a single ASCII character to identify the channel being addressed. For example, left and right channels are often identified as channels 'L' and 'R'.

The general system is always considered to be channel '0', and entering no channel at all implies channel '0'.

The channel character precedes the Label field, and is separated from it by a hyphen or minus sign.

`<Label>`

Each command or status response is uniquely identified by a short text label. For example, the command to set a display brightness level is typically "BRT". Labels are kept short, generally under 9 characters.

A list of commands is supplied for each product manufactured, and the exact text for the labels will be found in these lists.

Labels are case-insensitive, and are customarily displayed in uppercase. The receiving device will typically convert all text to uppercase prior to parsing.

`<Index>`

A message is optionally indexed. Typical uses for indexed messages are accessing internal tables, or accessing the register set in an externally attached I2C device.

Indices are sent as unsigned numbers, and may be either decimal or hex, the latter using the standard 0x.. terminology.

`<Argument>`

Most commands and all status responses have an argument value. For the vast majority of messages it is an unsigned integer value. Some arguments however are signed, and some are floating point.

Arguments may also be entered as hex (0x..), but this is generally only useful in the unsigned integer case.

2.4. Error Responses

An error response is a simple string describing an error condition.

An error message is typically returned following a command transmission that contains erroneous data, or following an invalid status request. In the latter case the error message is returned in lieu of the status data.

2.5. Command and Status Examples

For these examples the <Label> field is shown as "`LABEL`".

Command, no data:
```
LABEL
```

Command, Unsigned data:
```
LABEL 22
```
or
```
LABEL 0x16
```

Command, Floating point data:
```
LABEL 2.8
```

Command, Indexed, Signed data:
```
LABEL 100 -22
```

Status Request:
```
LABEL
```

Status Request, Indexed:
```
LABEL 100
```

Status Request, Indexed, Request to return all values sequentially:
```
LABEL
```

The final example will produce an individual response line for each and every value in the indexed array.

3. Generator Command List

3.1.Time Code Generator related commands

Channel	Label	Description	Command /Status	Indexed	Auto-save	Value Limit (0=no limit)
0	GDELAY	Generator Delay (unit=milliseconds)	C,S	-	Y	60
0	GFLY	Generator Flywheel (Repair mode): 0=5 frames 1=15 frames 2=Infinite				
0	GJAMMODE	Generator Repair Mode: 0=Copy 1=Jam 2=Show	C,S	-	Y	1
0	GJAMWIN	Generator Repair Window (percentage of video frame)	C,S	-	Y	99
0	GMODE	Generator Mode: 0=Off 1=Repair 2=Generate	C,S	-	Y	2
0	GPERSIST	Generator Input Persistence (Repair mode), unit=frames	C,S	-	Y	99
0	GRAMP	Generator Ramp Up time, unit=0.5 sec	C,S	-	Y	19
0	GRATEID	Generator Rate Identifier request: 0x00000003=30 NDF 0x01000003=30 DF 0x02000004=25 0x03000005=24 0x00000013=29.97 NDF 0x01000013=29.97 DF 0x03000015=23.976	C,S	-	Y	0
0	GRATEUSED	Generator Rate Identifier currently in use (same values as GRATEID)	S	-	-	0
0	GRUNTOG	Generator Start/Stop toggle - if currently stopped, start running from time in GSTART - if currently running then stop	C	-	-	0
0	GSTART	Generator Start Time - 4 values, indexed: index=0: hours index=1: minutes index=2: seconds index=3: frames	C,S	Y	Y	0
0	GUBITS	Generator User Bits (Binary Groups) - 4 values, indexed as if for a time code value: index=0: 8th,7th binary groups index=1: 6th,5th binary groups index=2: 4th,3rd binary groups index=3: 2nd,1st binary groups	C,S	Y	Y	0
0	GVIDREF	Generator Video Reference: 0=Off 1=On	C,S	-	Y	1
0	RISETIME	Output Time Code Waveform Rise Time: 0=1usec 1=20usec 2=40usec (SMPTE)	C,S	-	Y	2

3.2. Additional commands, for simplified generator control

Channel	Label	Description	Command /Status	Indexed	Auto-save	Value Limit (0=no limit)
0	GRATE	Generator Rate: 0=30 NDF 1=30 DF 2=25 3=24 4=29.97 NDF 5=29.97 DF 6=23.976	C,S	-	- (auto save removed)	6
0	GRUN	Generator Run/Stop: 0=Stop 1=Run	C,S	-	-	1

0	GTEXN	Transmit Generator Time Code over Serial Port:
		0=Off
		1=Transmit while running only
		2=Transmit while running and at intervals when stopped
		    (see GTXSTINT)
		
		Transmitted format is: `Grxhhmmssff`
		followed by a new prompt, and where:
		    'G' = fixed prefix
		    'r' = Generator Rate, same values as GRATE, decimal.
		    'x' = ':' (colon) while running, '.' (period) while stopped
		    'hhmmssff' = BCD hours, minutes, seconds, frames
		A new time code value will be transmitted once per frame when the Generator is running.
		Default = 0 (Off).
			C,S	-	-	2

0	GTXSTINT	Interval, in frames, between Generator Time Code transmissions over Serial Port when the Generator is stopped and when GTXEN = 2. Values 0 and 1 are equivalent, and will produce transmissions at the current frame rate (i.e. once per frame). Power up default = 30.	C,S	-	- (auto save removed)	255
0	GSTARTNS	Generator Start Time, Not Saved to Flash - 4 values, indexed: index=0: hours index=1: minutes index=2: seconds index=3: frames	C,S	Y	-	0

3.3. Additional commands, for simplified reader control

Channel	Label	Description	Command /Status	Indexed	Auto-save	Value Limit (0=no limit)

0	RTXEN	Transmit Reader Time Code over Serial Port:
		0=Off
		1=Transmit while receiving time code only
		2=Transmit while receiving time code and at intervals when input time code has stopped (see RTXSTMS)
		
		Transmitted format is: `Rrxhhmmssff`
		followed by a new prompt, and where:
		  'R' = fixed prefix
		  'r' = Reader Rate, same values as GRATE, decimal, plus:
		     7=rate unknown
		  'x' = ':' (colon) while at playspeed, '.' (period) while non-play
		  'hhmmssff' = BCD hours, minutes, seconds, frames
		A new time code value will be transmitted once per frame when input time code is running.
		Default = 0 (Off).
			C,S	-	-	2

0	RTXSTMS	Interval, in milliseconds, between Reader Time Code transmissions over Serial Port when the input time code is stopped and when RTXEN = 2. Minimum: 30 Maximum: 3600000 (1 hour) Power up default = 1000	C,S	-	-	3600000

3.4. Additional System Commands

Channel	Label	Description	Command /Status	Indexed	Auto-save	Value Limit (0=no limit)
0	ECHOOFF	Option to disable serial echo function, whereby serial characters received by the SR-112 are echo'd back to the serial host for user display. Recommended for CPU to CPU applications. 0=echo on 1=echo off	C,S	-	-	1