

Update Version 0.9 Jan 2017

Notes: Tx are always even length, words to fall on the even division boundary.
All data in little endian

Only blue needs to be implemented for the contract

Implemented but not part of contract and not tested!

| | b0-3 | b4 | b5 | b6 | b7 | b8-b9 | b10-b11 | b12-b13 | b14-b15 |
|-------------|---|----|------|-----|-----|-------------|-----------|-----------|------------|
| header | t1-t4 | To | From | cmd | sub | data length | packet no | Tx seq no | 16 bit CRC |
| Data packet | Data0 | d1 | | | | | | dx | 16 bit CRC |
| t1-t4 | Start of header (STRT) - sequence of 4 unique bytes | | | | | | | | 0x900DBEEF |
| To | destination of who the packet is going to | | | | | | | | |
| From | the source of the message (master is always 0) | | | | | | | | |
| Command | the action needed to be taken | | | | | | | | |
| Sub command | relates to the specific command | | | | | | | | |
| Data length | the length of the data packet in words, including the data crc | | | | | | | | |
| Packet no | if info is broken up into multiple data, the sequence of the data sent. For write commands (ie no replying data), the replying ack/nak contains the packet number that was originally send, for reads, the packet number reflects the packet number of the data | | | | | | | | |
| Tx Seq No | the Transmission sequence number - to allow the master to track the reply from the devices | | | | | | | | |
| CRC | 16 bit CRC of b4 to b13 | | | | | | | | |
| Data pack | the data followed by its CRC | | | | | | | | |

All multi byte numbers will be little endian

| | |
|--|---|
| Start of header 4 byte sequence (STRT) | 0x900DBEEF |
| ACK | 3 |
| NACK | 4 |
| ACK_HEADER (language not selected on unit) | 5 |
| CRC16 | Polynomial is: $p(x) = x^{16} + x^{12} + x^5 + 1$ |
| Initial value | 0 |

Commands

Broadcast

Broadcast channel sound

All devices will grab the packet of data if they needed it. (if channel no = to the one they are playing). The device address in the "to" byte will grab the packet and always give an ack or nak, even if it is not playing this channel no.

Send

Cmd sent 0A H Broadcast
 Sub- sent 0-11 Channel no (language no.)
 Packet no the sequence of packets. 0 being the beginning of the file.
 0 to xx

Receive

Cmd reply Ack /Nak/ AckHdr Ack if data and header received, Nak if header received, but data corrupt, AckHdr if header received but channel not selected
 Sub reply mem 0-255 In the case of a reply this is the language number

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 2 | 172 | 1 | 100 | CRC |

| Data0 | d1 | | | | | | d11 | 16 bit CRC |
|-------|----|--|--|--|--|--|-----|------------|
|-------|----|--|--|--|--|--|-----|------------|

meaning

to device 20, from master (0), command broadcast, channel 2, 172 bytes, 2nd packet, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|---------------------|----------|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak / Nak Hdr | language | 0 | 1 | mem level | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak), memory level (see below), no data

Mem level

Replies to the level of its memory buffer for that language. Obviously if device is not playing channel 2 then mem = 0, otherwise mem will equal the buffer space available in bytes. The value will be between 0 (full) and 16k (empty). This will give the master a rough indication as to its needs to speed up TX or slow it down. Obviously if the person changes language, the buffer will be reset 0

System Reset

This will reset all the slave devices to their default volume and audio channel number, as well as flush the mp3 buffer and memory

Send

Cmd sent 0A H Broadcast
 Sub- sent 255 system reset - will reset all devices to default
 Packet no 0

Receive

Cmd reply Ack if data and header received, Nak if header
 Ack /Nak received, but data corrupt
 n/a

Send

| t1-t4 | To | From | cnd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|------|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | FF H | 0 | 0 | 100 | CRC |

meaning

to device 20, from master (0), comand boradcast, sub command master reset, tx sequence no 100

Answer

| t1-t4 | To | From | cnd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak), tx sequence no 100

Reset comms counter

This command will rest all of the communication counters of packets recieved and corrupted.

Send

Cmd sent 0A H Broadcast
 Sub sent 254 reset all comms counters.
 Packet no 0

Receive

Cmd reply Ack if data and header received, Nak if header
 Ack /Nak received, but data corrupt

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|------|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | FE H | 0 | 0 | 100 | CRC |

meaning

to device 20, from master (0), comand boradcast, sub command reset comms counters, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, comand (Ack / Nak), txsequence no 100

Activate channels

This command will set the following audio channels active. Those channels that are not active will be skipped over by the slave unit (when the user presses change language selection.) A bit mask is used to specify which channels are active.

Send

Cmd sent 0A H Broadcast
Sub sent 253 set the active audio channels
Packet no 0

Receive

Cmd reply Ack if data and header received, Nak if header received, but data corrupt
Ack /Nak

Sub command 0 n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 253 | 4 | 0 | 107 | CRC |

b0-3

| bit0 ch0 | bit 1 ch1 | bit 9-12 | bit 13-16 | ch 25-31 | 16 bit CRC |
|-------------|--------------|----------|-----------|----------|------------|
|-------------|--------------|----------|-----------|----------|------------|

meaning

to device 20, from master (0), command broadcast, set channel 0,1,2,xxx to active, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 107 | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak), tx sequence no 107

Set default language

This command will set the default language. Value can be from 0 to 19.

Send

Cmd sent

0A H Broadcast

Sub sent

250 set the default language

Packet no

0

Receive

Cmd reply

Ack /Nak Ack if data and header received, Nak if header received, but data corrupt

Sub command

0 n/a

]

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 250 | 2 | 0 | 108 | CRC |

byte[0] byte[1]

| | | | |
|---|---|--------|-----|
| 2 | 0 | 16 bit | CRC |
|---|---|--------|-----|

meaning

to device 20, from master (0), command broadcast, set default language to 2

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 108 | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak), tx sequence no 108

Set
Language
Text

This command will set the following audio channels text.

Send

| | | |
|-----------|------|----------------------------|
| Cmd sent | OA H | Broadcast |
| Sub sent | 249 | set the audio channel text |
| Length | 4 | |
| Packet no | 0 | |

Receive

| | | |
|-------------|----------|---|
| Cmd | reply | Ack if data and header received, Nak if header received, but data corrupt |
| Sub command | Ack /Nak | |
| | 0 | n/a |
| |] | |

| | | | | | | | | | |
|------|-------|----|------|------|-----|--------|----|-----|-----|
| Send | t1-t4 | To | From | cmd | sub | length | no | No | GRC |
| | STRT | 20 | 0 | 0A H | 249 | 4 | 0 | 107 | GRC |

| byte[0] | byte[1] | byte[2] | byte[3] | |
|------------------------|---------------------------|---------------------------|---------------------------|------------|
| which language [0..15] | 1 st character | 2 nd character | 3 rd character | 16 bit CRC |

meaning to device 20, from master (0), command broadcast, set language specified in byte[0] text to the values in byte[1..3] , tx sequence no 107

| | | | | | | | | | |
|--------|-------|----|------|--------------|-----|----------------|--------------|--------------|---------------|
| Answer | | | | | | | | | |
| | t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
| | STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 107 | CRC |

meaning to device master (0), from device 20, command (Ack / Nak), tx sequence no 107

Set default volume

This command will set the default audio volume. Volume can be a value from 0 to 19 where 0 is off.

Send

Cmd sent 0A H Broadcast
Sub sent 248 set the active audio channels
Packet no 0

Receive

Cmd reply Ack if data and header received, Nak if header
 Ack /Nak received, but data corrupt
Sub command 0 n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 248 | 2 | 0 | 108 | CRC |

| byte 0 | byte[1] |
|--------|--------------|
| 10 | 0 16 bit CRC |

meaning

to device 20, from master (0), command broadcast, set set default volume to 10

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 108 | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak), tx sequence no 108

Enter Slave

Program mode

All slaves will enter ID program mode until a master exit or hard reset

Send

Cmd sent 0A H Broadcast
Sub sent 252 ID program mode
Packet no 0

Receive

Cmd reply Ack if data and header received, Nak if header
 Ack /Nak received, but data corrupt
Sub command n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 |] | 252 | 2 | 0 | 33 | CRC |

B1-2

| | | |
|----------------|--|---------------|
| time in sec | | 16 bit CRC |
|----------------|--|---------------|

meaning

to device 20, from master (0), command broadcast, set all slaves into program mode, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|--------------|-----|----------------|--------------|--------------|---------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 33 | CRC |

~~Exit Slave
Program mode~~

~~Exit the slave ID program mode~~

Send

Cmd sent

0A H Broadcast

Sub sent

242 ID program mode

Packet no

0

Receive

Cmd reply

Ack /Nak Ack if data and header received, Nak if header received, but data corrupt

Sub command

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----|-----|----------------|--------------|--------------|---------------|
| STRT | 20 | 0] | | 242 | 2 | 0 | 33 | CRC |

meaning

to device 20, from master (0), command broadcast, set all slaves exit program mode, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|--------------|-----|----------------|--------------|--------------|---------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 33 | CRC |

Save comms
stat
counters

This command will save all of the communication counters of packets received and corrupted. The counters will be loaded with these values on startup.

Send

Cmd sent

0A H Broadcast
251 save all comms counters.
0

Receive

Cmd reply

Ack if data and header received, Nak if header
Ack /Nak received, but data corrupt

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 251 | 0 | 0 | 100 | CRC |

meaning

to device 20, from master (0), comand boradcast, sub command store comms counters, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, comand (Ack / Nak), txsequence no 100

Music
buffer

This is the number of bytes that should be in the music buffer before playing will resume. This will ensure that there is a reasonable amount of music buffered to allow jitter in the data rate

Send

Cmd sent

0A H Broadcast
247 Set buffer threshold
0

Receive

Cmd reply

Ack if data and header received, Nak if header
Ack /Nak received, but data corrupt

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 247 | 4 | 0 | 100 | CRC |

meaning

to device 20, from master (0), command broadcast, sub command store comms counters, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, comand (Ack / Nak), txsequence no 100

Live threshold buffer

Only expreximental

Send

Cmd sent

0A H Broadcast

Sub sent

246 clear all comms counters.

Packet no

0

Receive

Cmd reply

Ack if data and header received, Nak if header received, but data corrupt

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|---------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H ?? | | 4 | 0 | 100 | CRC |

meaning

to device 20, from master (0), comand boradcast, sub command store comms counters, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, comand (Ack / Nak), txsequence no 100

Headpone unpug

Send

Set the timeout in seconds for switching back to the dfault language and volume after the headpone has been unpugged

Cmd sent

0A H Broadcast

Sub sent

245

Packet no

0

Receive

Cmd reply

Ack if data and header received, Nak if header received, but data corrupt

Ack /Nak

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 245 | 4 | 0 | 100 | CRC |

meaning

to device 20, from master (0), comand Broadcast, set commands store comms counters, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, comand (Ack / Nak), txsequence no 100

Clear the language

Send

Clear the timers used for keeping track of how long each language was listened to

Cmd sent

0A H Broadcast

Sub sent

244

Packet no

0

Receive

Cmd reply Ack /Nak
 n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|----------------|--------------|--------------|---------------|
| STRT | 20 | 0 | 0A H | 244 | 0 | 0 | 100 | CRC |

meaning

to device 20, from master (0), comand boradcast, sub command
clear language play timers, tx sequance no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|--------------|-----|----------------|--------------|--------------|---------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, comand (Ack / Nak),
txsequence no 100

Save

etc. These values will be loaded on startup.

Send

Cmd sent 0A H Broadcast
Sub sent 240 Save the parameters configured
Packet no 0

Receive

Cmd reply Ack if data and header received, Nak if header
 Ack /Nak received, but data corrupt
 n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|----------------|--------------|--------------|---------------|
| STRT | 20 | 0 | 0A H | 240 | 0 | 0 | 100 | CRC |

meaning to device 20, from master (0), comand boradcast, sub command
store comms counters, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|--------------|-----|----------------|--------------|--------------|---------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning to device master (0), from device 20, comand (Ack / Nak),
txsequence no 100

Load

This command will load the default configuration

Send

Cmd sent

0A H Broadcast

Sub sent

241

Packet no

0

Receive

Cmd reply

Ack if data and header received, Nak if header received, but data corrupt

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|------|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 241' | 0 | 0 | 100 | CRC |

meaning

to device 20, from master (0), comand boradcast, sub command store comms counters, tx sequence no 100

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-----|-------------|-----------|-----------|------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, comand (Ack / Nak), txsequence no 100

Set time

Set time which is the number of seconds since 1 Jan 1970. But any reference can be used since the unit does not interpret the time, it just increases the number each second.

Send

Cmd sent

0A H Broadcast

Sub sent

239 Set the internal time

Packet no

0

Receive

Cmd reply

Ack if data and header received, Nak if header received, but data corrupt

Ack /Nak

n/a

Send

| t1-t4 | To | From | cmd | sub | length | no | No | CRC |
|-------|----|------|------|-----|--------|----|-----|-----|
| STRT | 20 | 0 | 0A H | 239 | 4 | 0 | 100 | CRC |

meaning

to device 20, from master (0), command broadcast, sub command set time

Answer

| t1-t4 | To | From | cmd | sub | length | no | No | CRC |
|-------|----|------|-----------|-----|--------|----|-----|-----|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak), txsequence no 100

Set default language channels individually

Send

Cmd sent

0A H Broadcast

Sub sent

238

Set the default language on each channel individually

Packet no

0

Receive

Cmd reply

Ack if data and header received, Nak if header received, but data corrupt

Ack /Nak

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 238 | 2 | 0 | 100 | CRC |

meaning

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|--------------|-----|----------------|--------------|--------------|---------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 100 | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak),
txsequence no 100

Clear language

Send

Delete all language mp3 audio data

Cmd sent

0A H Broadcast

Sub sent

231 Delete mp3s

Packet no

0

Receive

Cmd reply

Ack /Nak Ack if data and header received, Nak if header
received, but data corrupt

n/a

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|----------------|--------------|--------------|---------------|
| STRT | 20 | 0 | 0A H | 231 | 0 | 0 | 105 | CRC |

meaning

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|--------------|-----|----------------|--------------|--------------|---------------|
| STRT | 0 | 20 | Ack / Nak | 0 | 0 | 0 | 106 | CRC |

meaning

to device master (0), from device 20, command (Ack / Nak),
txsequence no 100

Sent Language mp3 Audio file

This command will sent text and mp3 file that is used to identify the audio channels. The text must match the display audio file and the mp3 file must contain the audio to identify the language. The audio will be played when a new language selection is made to identify the new language selected.

A pause of 50 ms must be added between packets to allow the processor to write to FLASH.

Important note: The clear audio mp3 command (CMD=231) must be send before the files are uploaded. Mp3 language files must be send in sequence. If one file is changed all files must be resend. The total size is limited to 256k bytes.

Send

| | | |
|-----------------|--------------|---|
| Cmd sent | 0A H | Broadcast |
| Sub-cmd sent | 100+n | Set the audio channel text and audio mp3 for language channel n |
| Length | 10 or 256 | Length is fixed. 5 if it is a header (packet number =0) or 256 if it is a data packet. If it is the last packet the unused bytes should be zero filled. |
| Packet no | 0 | Packet number 0 indicates a header and length should be 10 |
| MP3 crc | 2 bytes | The crc for the mp3 file |
| Language abbrev | 3 characters | The abbreviation for the language - must correspond to the abbreviation on the display |
| Mp3 data length | 4 byteLEN | Length of the datmp3 data. Must be a multiple of 256 and must be less than 32k ! |

Send

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|-------------|-----------|-----------|------------|
| STRT | 20 | 0 | 0A H | 103 | 10 | 0 | 107 | CRC |

| byt[0] | byt[1:2] | byte[3:5] | byte[6:9] | |
|---------------|------------|-----------------------|------------|------------|
| Fixed version | CRC of mp3 | language abbreviation | mp3 length | |
| 3 | 0x1234 | "ENG" | 4092 | 16 bit CRC |

meaning

to device 20, from master (0), command broadcast, language mp3 header , tx sequence no 107, mp3 CRC is 0x1234, Language abbreviation "ENG" and total length is 4092

| | | | | | | | | | |
|--|----|------|------|-----|--------|----|-----|--------|-----|
| | | | | | | | | | |
| STRT | 21 | 0 | 15 H | 1 | 0 | 0 | 101 | CRC | |
| meaning | | | | | | | | | |
| to device 21, from master (0), read, device status, 0 data, n/a packet, tx sequence no 101 | | | | | | | | | |
| Answer | | | | | | | | | |
| t1-t4 | To | From | cmd | sub | length | no | No | CRC | |
| STRT | 0 | 21 | 16H | 1 | yy | 0 | 101 | CRC | |
| | | | | | | | | | |
| Data0 | d1 | | | | | | dyy | 16 bit | CRC |

meaning

to device master (0), from device 21, comand (Ack(16H) / Nak), read sub comand xx, data length yy, first packet,reply to tx sequence no 101

Read sub commands

| | | | | | | | | |
|---|--------------------|-----------------|----------------------|------------|-----|------|------|--|
| Device Status | | | | | | | | |
| 01 | Audio 1 chan no | A 1 vol | Audio 2 Chanel no | A 2 Vol | CRC | | | |
| if earheadset is unplugged the Volume will be = 0 | | | | | | | | |
| version no | | | | | | | | |
| 02 | Firmware ver | Hardware ver | crc | | | | | |
| | | | | | | | | |
| Defaults | b0 | b1 | b2 | b3 | b4 | b5 | b6-7 | |
| | chan no | Vol | sec | no | Vol | time | CRC | |
| these are the default setting for each channel | | | | | | | | |

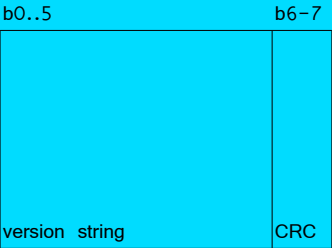
04

| | | | | | | | | |
|---------------|---------------------|----------------------|----------|---------------------|----------------------|--------|----------|-----|
| Network | | | | | | | | |
| | b0-3 | b4..7 | b8-9 | b10-11 | b12-13 | b14-15 | | |
| | with no errors | no errors | error | error | invalid | flow | | |
| Communication | | | | | | | | |
| | b16-17 | b18-19 | b20-2b22 | b24 | b26 | b28 | b30-31 | |
| | Audio1 over-flow | Audio1 under-flow | res | Audio2 over-flow | Audio2 under-flow | res | reserved | CRC |

Audio channels

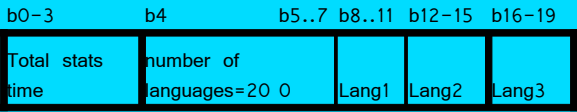
05

Read version
05



06

Language
selection stats
06

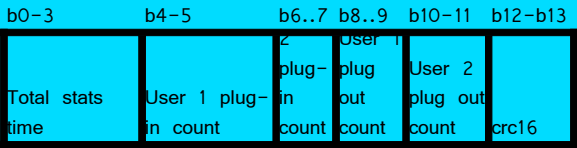


Audio channels

Note The counters can be cleared on sending the Language clear command (244)

07

Hop-on hop-off
stats
07

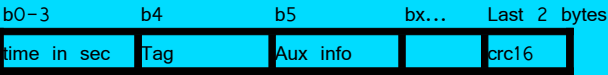


Note The counters can be cleared on sending the Language clear command (244)

The event log consists of 0 to 5 events. Each event is stored in 6 bytes. The first 4 bytes is the time stamp (Unix time format), The next byte is the tag indicating the type of the event. The last byte is an auxiliary byte that is used for other information such as the new channel number. The packet length will normally be 30 except if the end of the log is reached.

08

Get oldest 5

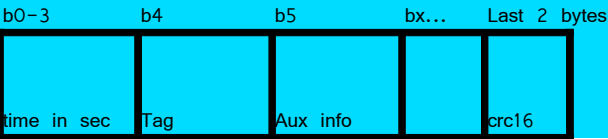


| Event | Tag value | Tag chan1 | Aux chan2 |
|----------------|-----------|-----------|---------------|
| Reserved | 2 | 130 | 0 |
| Question reply | 3 | 131 | 1=yes 2=no |
| Volume | 4 | 132 | new vol |
| Language | 5 | 133 | new lang |
| Plug in | 6 | 134 | 0 |
| Plug out | 7 | 135 | 0 |

This command is the same as 08 but in addition it will first delete the 5 oldest events. A down load of the event log will therefore start with an 08 command and if the data was successfully received it will send an 09 command to delete the older events and get the next 5 events. If the end of the event list is reached the packet length will be less than 30. A maximum of 100 events will be stored.

09

Delete oldest 5 and get next 5 events from log



Debug CMD 100



Master Write

This will information that will be written to a single device

Send

This will information that will be written to a single device

Cmd sent

29 H Write data to device

Sub- sent xx data set to be written- see below for options

Receive

Cmd reply If Ack the send 30 H if successful, a Nak if invalid
30H /Nak command

Sub received xx mirror of the sub comand sent

Send

| t1-t4 | To | From | cnd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|------|-----|----------------|--------------|--------------|---------------|
| STRT | 21 | 0 | 29 H | 3 | 4 | 0 | 102 | CRC |

| Data0 | d1 | | | | | | d5 | 16 bit CRC |
|-------|----|--|--|--|--|--|----|---------------|
| | | | | | | | | |

meaning , data length 4 words (8 bytes), first packet,tx sequence no 102

Answer

| t1-t4 | To | From | cnd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-------------|-----|----------------|--------------|--------------|---------------|
| STRT | 0 | 21 | 30H/ Nak | 3 | 0 | 0 | 102 | CRC |

meaning to device master (0), from device 21, command (Ack(31H) /
Nak), read sub command 3, no data, no packets,reply to tx
sequence no 102

Write Commands

Device Status

01 Read only comand

version no

02 Read only comand

Defaults

03

| b0 | b1 | b2-b3 | b4 | b5 | b6-7 | b8-9 |
|--------------------|------------|----------------------------------|----------------|------------|-----------------|------|
| Audio 1 chan no | A 1 Vol | A 1 chan Reset time in sec | A 2 Chan no | A 2 Vol | A 2 Rst time | CRC |

these are the default setting for each channel

Network

| b0-1 | b2-3 | | | | b23-24 | b25-26 |
|-----------|------|--|--|--|---------|--------|
| channel 0 | ch1 | | | | E ch 11 | CRC |

if headset is unplugged the Volume will be = 0

b0-1

Slave Write

Future - Not implemented for now

These are the only commands that the slave will initiate

Send

This will be information that will be written to a single device

Cmd sent

3D H

Write data to device

Sub- sent

xx

data set to be written- see below for options

Receive

Cmd reply

30H /Nak
xx

If Ack the send 30 H if successful, a Nak if invalid command

Sub received

mirror of the sub command sent

Send

| t1-t4 | To | From | cmd | sub | length | no | No | CRC |
|-------|----|------|------|-----|--------|----|-----|-----|
| STRT | 0 | 21 | 3D H | 5 | 1 | 0 | 102 | CRC |

b1

b2

| old seat no | New seat no | | | | | | | 16 bit CRC |
|-------------|-------------|--|--|--|--|--|--|------------|
| | | | | | | | | |

meaning

data length 1 words , first packet, tx sequence no 102

Answer

| t1-t4 | To | From | cmd | sub | data length | packet no | Tx Seq No | 16 bit CRC |
|-------|----|------|-----------|-------------|-------------|-----------|-----------|------------|
| STRT | 21 | 0 | 3DH / Nak | new seat no | 0 | 0 | 102 | CRC |

meaning

to device 21 from master, command (Ack(3DH) / Nak), confirm new seat no, reply to tx sequence no 102

Only on the ACK from the master will the slave change its address to the new seat number

Debug cmds

These are debug commands and does not form part of the contract.

They are single headers with no data after the packet and no ACKs are send

The packet nr field is used to send some data with the packet

| | | |
|---------------|---|---|
| <u>Send</u> | This will information that will be written to a single device | |
| Cmd sent | 1A H | Write to device |
| Sub- sent | xx | data set to be written- see below for options |
| Packet number | value | The packet number field is used for carrying the data |
| Cmd reply | No reply send | |

Send

| t1-t4 | To | From | cmd | sub | data length | data | Tx Seq No | 16 bit CRC |
|-------|------|------|--------|-----|-------------|------|-----------|------------|
| STRT | dest | | 0 1A H | xx | | 0 ?? | | 0 CRC |

xx

| | | |
|----------------------|---|----------------------------------|
| Set person1 language | 1 | any valid language in data field |
| Set person2 language | 2 | any valid language |
| Set all to defaults | 3 | |
| Set person 1 volume | 5 | value from 0 to 255 |
| Set person 2 volume | 6 | value from 0 to 255 |

Set buffer start
play position

11 value from 0 to 16k (5k by default)

Clear stat
counters

12 clear the statistical counters

Person1 test beep on

31

Person1 test beep off

32

Person2 test beep on

33

Person2 test beep off

34

Get version

50 return 4 characters containing the version e.g. "3.52" in data