Decoder firmware API description
===============================

Note: this API is part of the decoder firmware, so it's cx23415 only.

Name   CX2341X_DEC_PING_FW
Enum   0/0x00
Description
        This API call does nothing. It may be used to check if the firmware
        is responding.

Name   CX2341X_DEC_START_PLAYBACK
Enum   1/0x01
Description
        Begin or resume playback.
Param[0]
        0 based frame number in GOP to begin playback from.
Param[1]
        Specifies the number of muted audio frames to play before normal
        audio resumes. (This is not implemented in the firmware, leave at 0)

Name   CX2341X_DEC_STOP_PLAYBACK
Enum   2/0x02
Description
        Ends playback and clears all decoder buffers. If PTS is not zero,
        playback stops at specified PTS.
Param[0]
        Display 0=last frame, 1=black
        Note: this takes effect immediately, so if you want to wait for a PTS,
        then use '0', otherwise the screen goes to black at once.
        You can call this later (even if there is no playback) with a 1 value
        to set the screen to black.
Param[1]
        PTS low
Param[2]
        PTS high

Name   CX2341X_DEC_SET_PLAYBACK_SPEED
Enum   3/0x03
Description
        Playback stream at speed other than normal. There are two modes of
        operation:
            Smooth: host transfers entire stream and firmware drops unused
                    frames.
            Coarse: host drops frames based on indexing as required to achieve
                    desired speed.
Param[0]
        Bitmap:

```
              0:7   0 normal
                    1 fast only "1.5 times"
                    n nX fast, 1/nX slow
              30    Framedrop:
                         '0' during 1.5 times play, every other B frame is dropped
                         '1' during 1.5 times play, stream is unchanged (bitrate
                             must not exceed 8mbps)
              31    Speed:
                         '0' slow
                         '1' fast
        Note: n is limited to 2. Anything higher does not result in
        faster playback. Instead the host should start dropping frames.
Param[1]
        Direction: 0=forward, 1=reverse
        Note: to make reverse playback work you have to write full GOPs in
        reverse order.
Param[2]
        Picture mask:
              1=I frames
              3=I, P frames
              7=I, P, B frames
Param[3]
        B frames per GOP (for reverse play only)
        Note: for reverse playback the Picture Mask should be set to I or I, P.
        Adding B frames to the mask will result in corrupt video. This field
        has to be set to the correct value in order to keep the timing correct.
Param[4]
        Mute audio: 0=disable, 1=enable
Param[5]
        Display 0=frame, 1=field
Param[6]
        Specifies the number of muted audio frames to play before normal audio
        resumes. (Not implemented in the firmware, leave at 0)
```

```
Name    CX2341X_DEC_STEP_VIDEO
Enum    5/0x05
Description
        Each call to this API steps the playback to the next unit defined below
        in the current playback direction.
Param[0]
        0=frame, 1=top field, 2=bottom field
```

```
Name    CX2341X_DEC_SET_DMA_BLOCK_SIZE
Enum    8/0x08
Description
        Set DMA transfer block size. Counterpart to API 0xC9
Param[0]
        DMA transfer block size in bytes. A different size may be specified
        when issuing the DMA transfer command.
```

Name   CX2341X_DEC_GET_XFER_INFO
Enum   9/0x09
Description
        This API call may be used to detect an end of stream condition.
Result[0]
        Stream type
Result[1]
        Address offset
Result[2]
        Maximum bytes to transfer
Result[3]
        Buffer fullness

Name   CX2341X_DEC_GET_DMA_STATUS
Enum   10/0x0A
Description
        Status of the last DMA transfer
Result[0]
        Bit 1 set means transfer complete
        Bit 2 set means DMA error
        Bit 3 set means linked list error
Result[1]
        DMA type: 0=MPEG, 1=OSD, 2=YUV

Name   CX2341X_DEC_SCHED_DMA_FROM_HOST
Enum   11/0x0B
Description
        Setup DMA from host operation. Counterpart to API 0xCC
Param[0]
        Memory address of link list
Param[1]
        Total # of bytes to transfer
Param[2]
        DMA type (0=MPEG, 1=OSD, 2=YUV)

Name   CX2341X_DEC_PAUSE_PLAYBACK
Enum   13/0x0D
Description
        Freeze playback immediately. In this mode, when internal buffers are
        full, no more data will be accepted and data request IRQs will be
        masked.
Param[0]
        Display: 0=last frame, 1=black

Name   CX2341X_DEC_HALT_FW
Enum   14/0x0E
Description
        The firmware is halted and no further API calls are serviced until

        the firmware is uploaded again.

Name   CX2341X_DEC_SET_STANDARD
Enum   16/0x10
Description
        Selects display standard
Param[0]
        0=NTSC, 1=PAL

Name   CX2341X_DEC_GET_VERSION
Enum   17/0x11
Description
        Returns decoder firmware version information
Result[0]
        Version bitmask:
            Bits 0:15 build
            Bits 16:23 minor
            Bits 24:31 major

Name   CX2341X_DEC_SET_STREAM_INPUT
Enum   20/0x14
Description
        Select decoder stream input port
Param[0]
        0=memory (default), 1=streaming

Name   CX2341X_DEC_GET_TIMING_INFO
Enum   21/0x15
Description
        Returns timing information from start of playback
Result[0]
        Frame count by decode order
Result[1]
        Video PTS bits 0:31 by display order
Result[2]
        Video PTS bit 32 by display order
Result[3]
        SCR bits 0:31 by display order
Result[4]
        SCR bit 32 by display order

Name   CX2341X_DEC_SET_AUDIO_MODE
Enum   22/0x16
Description
        Select audio mode
Param[0]

```
        Dual mono mode action
            0=Stereo, 1=Left, 2=Right, 3=Mono, 4=Swap, -1=Unchanged
Param[1]
        Stereo mode action:
            0=Stereo, 1=Left, 2=Right, 3=Mono, 4=Swap, -1=Unchanged
```

```
Name    CX2341X_DEC_SET_EVENT_NOTIFICATION
Enum    23/0x17
Description
        Setup firmware to notify the host about a particular event.
        Counterpart to API 0xD5
Param[0]
        Event: 0=Audio mode change between mono, (joint) stereo and dual
channel.
        Event: 3=Decoder started
        Event: 4=Unknown: goes off 10-15 times per second while decoding.
        Event: 5=Some sync event: goes off once per frame.
Param[1]
        Notification 0=disabled, 1=enabled
Param[2]
        Interrupt bit
Param[3]
        Mailbox slot, -1 if no mailbox required.
```

```
Name    CX2341X_DEC_SET_DISPLAY_BUFFERS
Enum    24/0x18
Description
        Number of display buffers. To decode all frames in reverse playback you
        must use nine buffers.
Param[0]
        0=six buffers, 1=nine buffers
```

```
Name    CX2341X_DEC_EXTRACT_VBI
Enum    25/0x19
Description
        Extracts VBI data
Param[0]
        0=extract from extension & user data, 1=extract from private packets
Result[0]
        VBI table location
Result[1]
        VBI table size
```

```
Name    CX2341X_DEC_SET_DECODER_SOURCE
Enum    26/0x1A
Description
        Selects decoder source. Ensure that the parameters passed to this
        API match the encoder settings.
```

Param[0]

       Mode: 0=MPEG from host, 1=YUV from encoder, 2=YUV from host

Param[1]

       YUV picture width

Param[2]

       YUV picture height

Param[3]

       Bitmap: see Param[0] of API 0xBD

Name   CX2341X_DEC_SET_PREBUFFERING
Enum   30/0x1E
Description

       Decoder prebuffering, when enabled up to 128KB are buffered for
       streams <8mpbs or 640KB for streams >8mbps

Param[0]

       0=off, 1=on