User's Manual

OMX Media Component

User's Manual FLAC Decoder Part

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1. Overview

1.1. Overview of This Document

This document is the User's Manual for the OMX Media Component and specifications of the FLAC Decoder Media Component are described.
Please read this document with related document [1] and [2].

1.2. Overview of FLAC Decoder Media Component and Scope of This Document

Figure 1-1shows the software configuration of the FLAC Decoder Media Component and scope. The FLAC Decoder Media Component consists of the OMX Media Component Common Library which provides common functions of OpenMAX IL, the OMX Media Component Audio Common Library which provides common functions of audio processing, and the OMX Media Component FLAC Decoder Library which realizes functions of FLAC Decoder. The OMX Media Component FLAC Decoder Library controls ARM FLAC Decode Software and realizes codec processing.

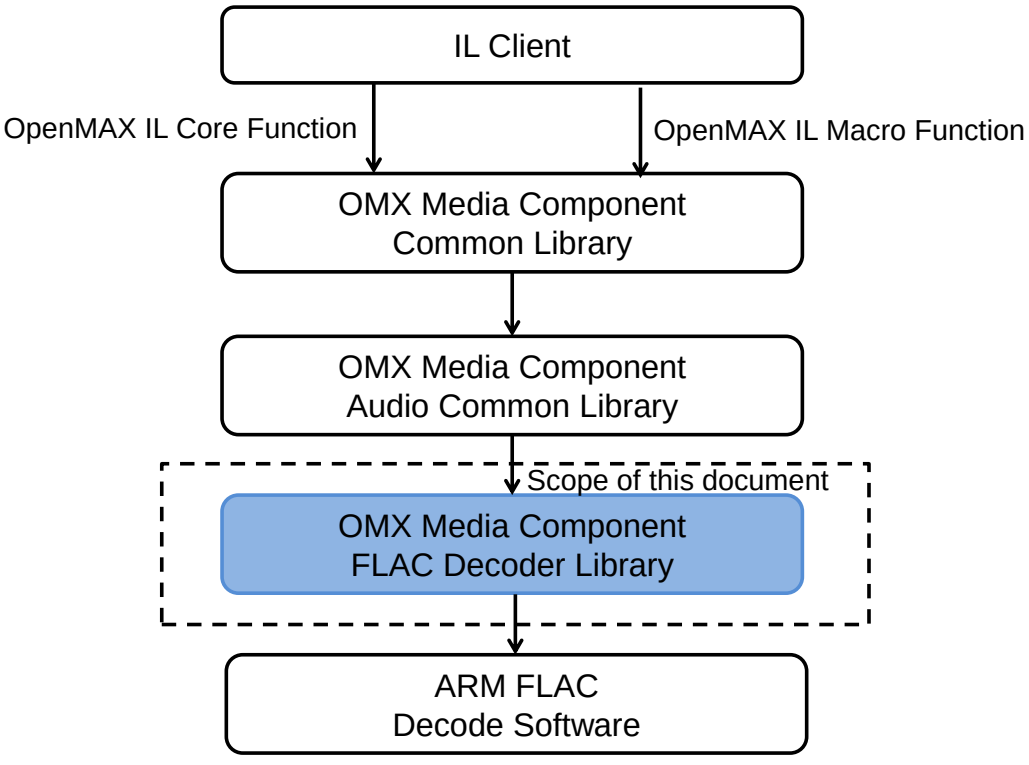

Figure 1-1 Software Configuration of FLAC Decoder Media Component and Scope

1.3. Related Documents

Table 1-1 shows the reference documents and related documents.

Table 1-1 List of Related Documents

No	Document Name	Description
[1]	OMX Media Component User's Manual Common Part	
[2]	OMX Media Component User's Manual Audio Common Part	
[3]	OpenMAX Integration Layer Application Programming Interface Specification Version 1.1.2, September 1, 2008	http://www.khronos.org/registry/omxil/specs/OpenMAX_IL_1_1_2_Specification.pdf

1.4. Terminology

Table 1-2 shows the terminology used in this document.

Table 1-2 Terminology

Term	Abbreviation	Description
Audio Port Base	APB	The base value of the port index of the Audio Media Component. The port index values of the input and output ports are obtained by adding offset values to this base value.
OpenMAX IL	-	Open API specified by the Khronos Group. It standardizes accesses to primitive media processing which is commonly used in graphics, audio, and image libraries.
Component	-	Refers to a component that is defined in OpenMAX IL Specification.
Media Component	MC	A component that performs multimedia processing. It corresponds to the Component that is defined in OpenMAX IL.
IL Client	-	Refers to software that uses functions of OpenMAX IL Core and Component.

1.5. Role Name and Component Name

Table 1-3 shows the role name and component name of FLAC Decoder Media Component.

Table 1-3 Role Name and Component Name

Role Name	Component Name
audio_decoder.flac	OMX.RENESAS.AUDIO.DECODER.FLAC

2. Functions

The FLAC Decoder Media Component is the component that provided functions to decode data compressed by FLAC standard.

The FLAC Decoder Media Component performs decode processing when compressed data is stored in the input buffer and stores resulted linear PCM data to the output buffer.

2.1. Function Details

2.1.1. Decode Function

The supported standards and functions by the FLAC Decoder Media Component are shown as below.

Table 2-1 Supported Standards and Functions

Compliant Standard	FLAC 1.3.0 (26-May-2013)
Input Format	FLAC Frame
Input Channel	1 channel (Monaural) 2 channels (Stereo) 3 channels (3/0) 4 channels (2/2) 5 channels (3/2) 5.1 channels (3/2 + LFE) (Note 1)
Input Sampling Frequency	8 / 11.025 / 12 / 16 / 22.05 / 24 / 32 / 44.1 / 48 / 64 / 88.2 / 96 / 128 / 176.4 / 192 kHz
Bits per sample of input data	4 - 24 bits / sample
Output Format	16 or 32 bit linear PCM (channel interleaved format)
Output Channel	1 channel 2 channels 6 channels (Note 2)
Output Sampling Frequency	Same as input sampling frequency

(Note 1) "/" denotes the number of channels for the front and rear speakers.
(Note 2) Data from 3 to 5.1 channels is outputted as 6 channels.

The un-supported functions for the FLAC Decoder Media Component are shown below.

Meta data is not to be decoded.

MD5 signature is not to be checked.

Down mixing. (Only a L/R channel is outputted when a down channel function is effective)

When block size is fixed, input streams other than 1 - 4608 sample (per 1 frame and 1 channel) is not to be decoded.

When block size is variable, input streams other than 16 - 4608 sample (per 1 frame and 1 channel) is not to be decoded.

2.1.2. Notification Function of Port Information Change

The FLAC Decoder Media Component sends event when the information of “Output Sampling Frequency”, “Output Channel Number”, and “Output Channel Mapping” is changed. Please refer to section 7, for details.

2.2. Port

The FLAC Decoder Media Component has one input port and one output port.

The input port has input buffers to store compressed data, and the output port has output buffers to store PCM data.

Table 2-2 Ports of FLAC Decoder Media Component

Component	Port Index	Type
FLAC decoder Media Component	APB+0	Input Port
	APB+1	Output Port

3. I/O Data Format

3.1. Buffer Payload

Figure 3-1 shows the data storage format of input buffers for FLAC Decoder Media Component. "fn" in the figure denotes the sequence number (frame number) of compressed data. Compressed data is input to FLAC Decoder Media Component in frame units. An arbitrary number of frames can be stored in a single input buffer if data is input in frame units. However, one frame data cannot be split into two or more input buffers.

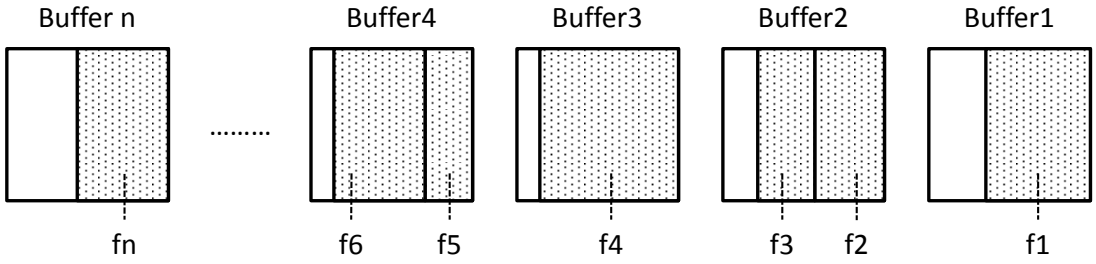

Figure 3-1 Data Storage Format of Input Buffers

Figure 3-2 and Figure 3-3 show the data storage format of output buffers for FLAC Decoder Media Component. PCM data decoded by FLAC Decoder Media Component can be stored in the output buffers in one frame unit or sequentially. However, equal-time linear PCM samples (for all channels) are stored to same buffer.

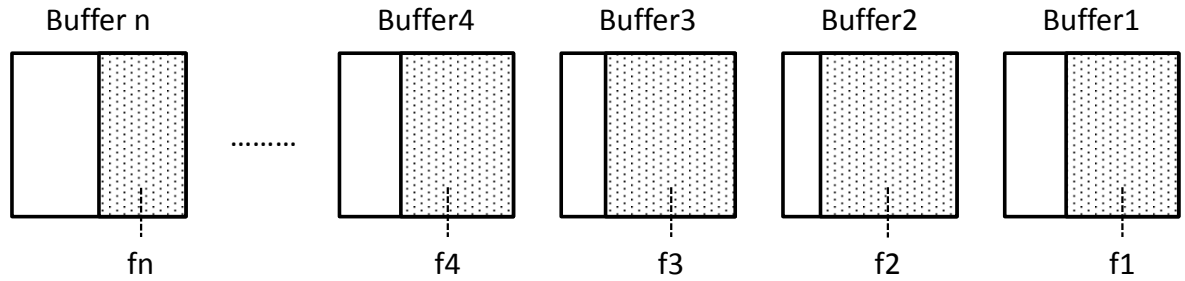

Figure 3-2 Data Storage Format of Output Buffer (1 Frame Unit)

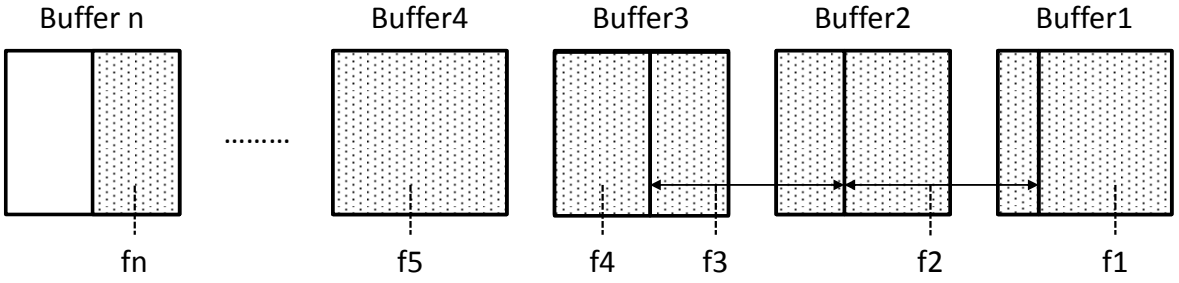

Figure 3-3 Data Storage Format of Output Buffer (Continuation)

3.2. Data Format of Input Buffer

Figure 3-4 shows input buffer format. A stream data is stored to the input buffer and the data size is set to nFilledLen in the OMX_BUFFERHEADERTYPE structure.

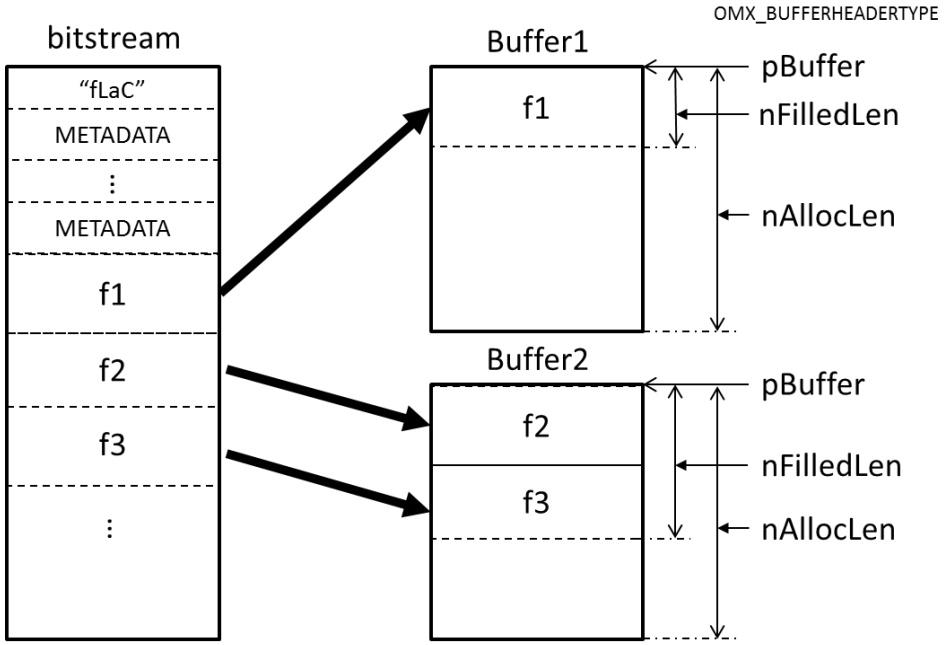

Figure 3-4 Data Format of Input Buffer

3.3. Data Format of Output Buffer

FLAC Decoder Media Component stores the volume of output data specified by nFilledLen in the OMX_BUFFERHEADERTYPE structure from the address specified by a member of that structure as shown in Figure 3-5.

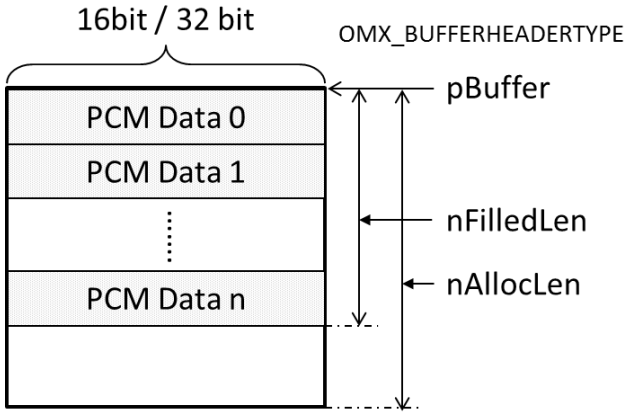

Figure 3-5 Data Format of Output Buffer

In FLAC Decoder Media Component, layout of PCM data is different for each output channel. Figure 3-6 shows formats of each output channel. When data from 3 to 5.1 channels is input, output is 6 channels and silent data is stored for void channel. And, when down channel is effective, output format is 2 channels (Stereo) and value 2 is set to nChannels in the OMX_AUDIO_PARAM_PCMMODETYPE structure.

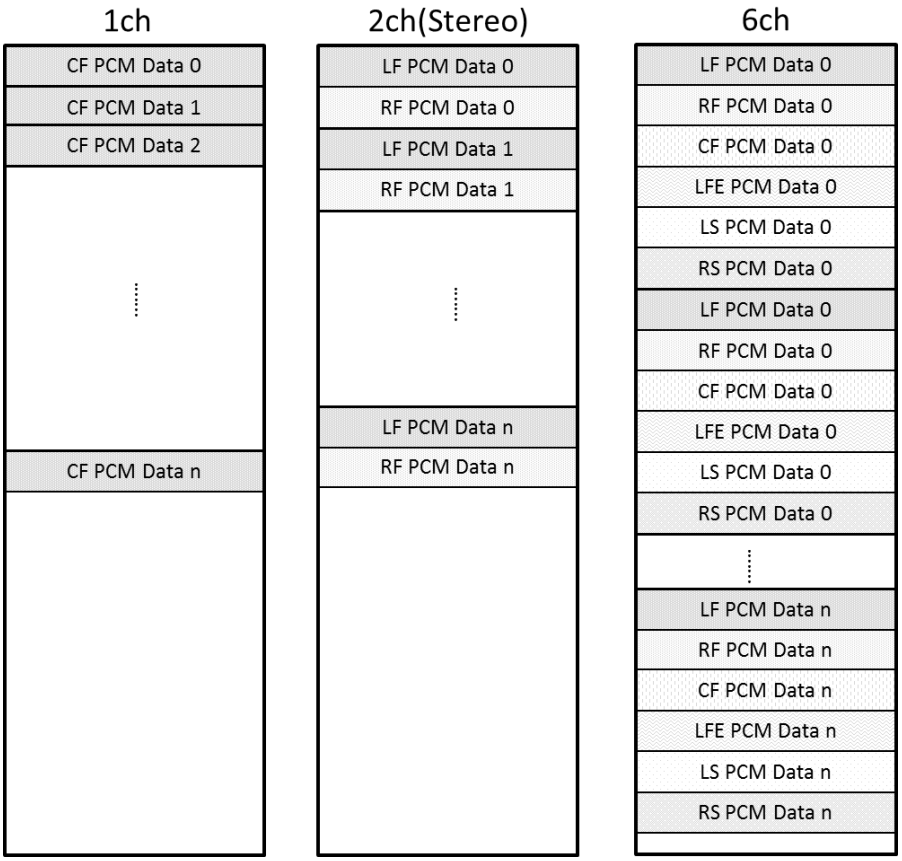

Figure 3-6 Data Format of each Output Channel

4. API Reference

Please refer to the related document [2].

5. Indexes

5.1. Standard Indexes of FLAC Decoder Media Component

Table 5-1 shows the list of standard indexes that are available for FLAC Decoder Media Component.

Table 5-1 List of Indexes available for FLAC Decoder Media Component

Index	Corresponding Strucure Name
Description	
OMX_IndexParamAudioInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamVideoInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamImageInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamOtherInit	OMX_PORT_PARAM_TYPE Structure
Please refer to the related document [1].	
OMX_IndexParamStandardComponentRole	OMX_PARAM_COMPONENTROLETYPE Structure
Please refer to the related document [1].	
OMX_IndexParamCompBufferSupplier	OMX_PARAM_BUFFERSUPPLIERTYPE Structure
Please refer to the related document [1].	
OMX_IndexParamPortDefinition	OMX_PORTDEFINITIONTYPE Structure
Please refer to the related document [1] and [2].	
OMX_IndexParamAudioPortFormat	OMX_AUDIO_PARAM_PORTFORMATTYPE Structure
Please refer to the related document [2].	
OMX_IndexParamAudioPcm	OMX_AUDIO_PARAM_PCMMODETYPE Structure
To set or get information regarding PCM.	

5.2. Expanded Indexes of FLAC Decoder Media Component

Table 5-2 shows the list of expanded indexes that are available for FLAC Decoder Media Component.

Table 5-2 List of Expanded Indexes available for FLAC Decoder Media Component

Index (Expanded Index Name)	Corresponding Strucure Name
Description	
OMXR_MC_IndexParamAudioOutputUnit (OMX.RENESAS.INDEX.PARAM.AUDIO.OUTPUTUNIT)	OMXR_MC_AUDIO_PARAM_OUTPUTUNITTYPE Structure
Please refer to the related document [2].	
OMXR_MC_IndexParamAudioPortSettingMask (OMX.RENESAS.INDEX.PARAM.AUDIO. PORTSETTINGSEVENTMASK)	OMXR_MC_AUDIO_PARAM_PORTSETTINGSEVENTMASK TYPE Structure
Please refer to the related document [2].	
OMXR_MC_IndexParamAudioFlac (OMX.RENESAS.INDEX.PARAM.AUDIO.FLAC)	OMXR_MC_AUDIO_PARAM_FLACTYPE Structure
To set or get information regarding FLAC.	
OMXR_MC_IndexParamFlacDownChannel (OMX.RENESAS.INDEX.PARAM.FLAC.DOWNCHANNEL)	OMXR_MC_AUDIO_PARAM_FLACDOWNCHANNELTYPE Structure
To set or get information regarding Down Channel of FLAC.	

5.3. Indexes Specified by OpenMAX IL Macro Functions

Table 5-3 shows indexes which can be specified by OpenMAX IL Macro functions and available port index for FLAC Decoder Media Component.

Table 5-3 Indexes Specified by OpenMAX IL Macro Functions

Index	Get/SetParameter		Get/SetConfig		Port Index	
	Get	Set	Get	Set	APB+0	APB+1
OMX_IndexParamAudioInit	x	x	-	-	-	-
OMX_IndexParamVideoInit	x	x	-	-	-	-
OMX_IndexParamImageInit	x	x	-	-	-	-
OMX_IndexParamOtherInit	x	x	-	-	-	-
OMX_IndexParamStandardComponentRole	x	x	-	-	-	-
OMX_IndexParamCompBufferSupplier	x	x	-	-	x	x
OMX_IndexParamPortDefinition	x	x	-	-	x	x
OMX_IndexParamAudioPortFormat	x	x	-	-	x	x
OMXR_MC_IndexParamAudioFlac	x	x	-	-	x	-
OMX_IndexParamAudioPcm	x	x	-	-	-	x
OMXR_MC_IndexParamAudioOutputUnit	x	x	-	-	-	x
OMXR_MC_IndexParamAudioPortSettingMask	x	x	-	-	-	x
OMXR_MC_IndexParamFlacDownChannel	x	x	-	-	-	x

x : Effective
- : Ineffective

6. Structures

Table 6-1 shows the list of structures of FLAC Decoder Media Component.

Table 6-1 Structures of FLAC Decoder Media Component

Structure Name	Reference
OMX_AUDIO_PORTDEFINITIONTYPE	Section 6.1
OMX_PARAM_COMPONENTROLETYPE	Related Document [1]
OMX_PARAM_BUFFERSUPPLIERTYPE	Related Document [1]
OMX_AUDIO_PARAM_PORTFORMATTYPE	Section 6.2
OMXR_MC_AUDIO_PARAM_FLACTYPE	Section 6.3
OMX_AUDIO_PARAM_PCMMODETYPE	Section 6.4
OMXR_MC_AUDIO_PARAM_OUTPUT_UNITTYPE	Related Document [2]
OMXR_MC_AUDIO_PARAM_PORTSETTINGSEVENTMASKTYPE	Related Document [2]
OMXR_MC_AUDIO_PARAM_DOWNCHANNELTYPE	Section 6.5

Given below is an explanation of how to interpret the member of the structures described in this section.

- ✓ Description of a member of a structure corresponded to index

[Member]

Member Name	Get	Set
Indicates the member name	Indicates the attribute of the member specified in the OMX_GetParameter () or OMX_GetConfig () function. If "R" is written, the value of this member can be obtained. If "W" is written, please specify a value in this member.	Indicates the attributes of the member specified in the OMX_SetParameter () or OMX_SetConfig () function. If "W" is written, please specify a value in this member. If “-” is written, the value of this member is ignored. Any value specified in this member is not reflected.

6.1. OMX_AUDIO_PORTDEFINITIONTYPE

[Structure] Please refer to section 4.1.5 in the related document [3].

[Function] Please refer to section 4.1.5 in the related document [3].

[Members]

Member Name	Get	Set
cMIMEType	R	-
pNativeRender	R	-
bFlagErrorConcealment	R	-
eEncoding	R	-

[Details]

cMIMEType

Configurable value	-
Acquirable value	NULL
Initial value	NULL
Remarks	Not supported.

pNativeRender

Configurable value	-
Acquirable value	NULL
Initial value	NULL
Remarks	Not supported.

bFlagErrorConcealment

Configurable value	-
Acquirable value	OMX_FLASE
Initial value	OMX_FLASE
Remarks	Not supported.

eEncoding

Configurable value	-	
Acquirable value	**nPortIndex**	**Value**
	APB+0	OMXR_MC_AUDIO_CodingFLAC
	APB+1	OMX_AUDIO_CodingPCM
Initial value	**nPortIndex**	**Value**
	APB+0	OMXR_MC_AUDIO_CodingFLAC
	APB+1	OMX_AUDIO_CodingPCM
Remarks	-	

6.2. OMX_AUDIO_PARAM_PORTFORMATTYPE

[Structure] Please refer to section 4.1.6 in the related document [3].

[Function] Please refer to section 4.1.6 in the related document [3].

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	W	W
nIndex	W	-
eEncoding	R	-

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMX_AUDIO_PARAM_PORTFORMATTYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+0 APB+1
Acquirable value	-
Initial value	-
Remarks	-

nIndex

Configurable value	**nPortIndex**	**Value**
	APB+0	0
	APB+1	0
Acquirable value	-	
Initial value	-	
Remarks	-	

eEncoding

Configurable value	-		
Acquirable value	**nPortIndex**	**nIndex**	**Value**
	APB+0	0	OMXR_MC_AUDIO_CodingFLAC
	APB+1	0	OMX_AUDIO_CodingPCM
Initial value	**nPortIndex**	**nIndex**	**Value**
	APB+0	0	OMXR_MC_AUDIO_CodingFLAC
	APB+1	0	OMX_AUDIO_CodingPCM
Remarks	-		

6.3. OMXR_MC_AUDIO_PARAM_FLACTYPE

[Structure]
```
typedef struct OMXR_MC_AUDIO_PARAM_FLACTYPE {
    OMX_U32         nSize;
    OMX_VERSIONTYPE nVersion;
    OMX_U32         nPortIndex;
    OMX_U32         nMinBlockSize;
    OMX_U32         nMaxBlockSize;
    OMX_U32         nMinFrameSize;
    OMX_U32         nMaxFrameSize;
    OMX_U32         nSampleRate;
    OMX_U32         nChannels;
    OMX_U32         nBitsPerSample;
} OMXR_MC_AUDIO_PARAM_FLACYPE;
```

[Function] FLAC information structure.

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	W	W
nMinBlockSize	R	W
nMaxBlockSize	R	W
nMinFrameSize	R	W
nMaxFrameSize	R	W
nSampleRate	R	W
nChannels	R	W
nBitsPerSample	R	W

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMXR_MC_AUDIO_PARAM_FLACTYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+0
Acquirable value	-
Initial value	-
Remarks	-

nMinBlockSize

Configurable value	0 - 4608
Acquirable value	Setting value.
Initial value	4096
Remarks	Analyze the FLAC stream and specify the minimum block size. The minimum block size can be obtained from METADATA_BLOCK_STREAMINFO of the FLAC stream.

nMaxBlockSize

Configurable value	0 - 4608
Acquirable value	Setting value.
Initial value	4096
Remarks	Analyze the FLAC stream and specify the maximum block size. The maximum block size can be obtained from METADATA_BLOCK_STREAMINFO of the FLAC stream.

nMinFrameSize

Configurable value	0 - 83968
Acquirable value	Setting value.
Initial value	0
Remarks	Analyze the FLAC stream and specify the minimum frame size. The minimum frame size can be obtained from METADATA_BLOCK_STREAMINFO of the FLAC stream.

nMaxFrameSize

Configurable value	0 - 83968
Acquirable value	Setting value.
Initial value	0
Remarks	Analyze the FLAC stream and specify the maximum frame size. The maximum frame size can be obtained from METADATA_BLOCK_STREAMINFO of the FLAC stream.

nSampleRate

Configurable value	8000, 11025, 12000, 16000, 22050, 24000, 32000, 44100, 48000, 64000, 88200, 96000, 128000, 176400, 192000
Acquirable value	Setting value or decoded result.
Initial value	48000
Remarks	Analyze the FLAC stream and specify the sample rate. The sample rate can be obtained from METADATA_BLOCK_STREAMINFO of the FLAC stream. After decoding, decoded result is stored.

nChannels

Configurable value	1 - 6	
Acquirable value	Setting value or decoded result.	
Initial value	2	
Remarks	**Value**	**Description**
	1	1 channel (monaural)
	2	2 channels (stereo)
	3	3 channels (3/0)
	4	4 channels (2/2)
	5	5 channels (3/2)
	6	6 channels (3/2+LFE)
	Analyze the FLAC stream and specify the number of channels. The number of channels can be obtained from METADATA_BLOCK_STREAMINFO of the FLAC stream. After decoding, decoded result is stored.	

nBitsPerSample

Configurable value	4 - 24
Acquirable value	Setting value or decoded result.
Initial value	16
Remarks	Analyze the FLAC stream and specify the bits per sample. The bits per sample can be obtained from METADATA_BLOCK_STREAMINFO of the FLAC stream. After decoding, decoded result is stored.

6.4. OMX_AUDIO_PARAM_PCMMODETYPE

[Structure] Please refer to section 4.1.7 in the related document [3].

[Function] Please refer to section 4.1.7 in the related document [3].

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	W	W
nChannels	R	W
eNumData	R	-
eEndian	R	-
bInterleaved	R	-
nBitPerSample	R	-
nSamplingRate	R	W
ePCMMode	R	-
eChannelMapping	R	W

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMX_AUDIO_PARAM_PCMMODETYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+1
Acquirable value	-
Initial value	-
Remarks	-

nChannels

Configurable value	1, 2, 6
Acquirable value	Setting value or decoded result.
Initial value	2
Remarks	This value does not affect decoding process. When data from 3 to 5.1 channels is input, this value is set 6.

eNumData

Configurable value	-
Acquirable value	OMX_NumericalDataSigned
Initial value	OMX_NumericalDataSigned
Remarks	Not supported.

eEndian

Configurable value	-
Acquirable value	OMX_EndianLittle
Initial value	OMX_EndianLittle
Remarks	Not supported.

bInterleaved

Configurable value	-
Acquirable value	OMX_TRUE
Initial value	OMX_TRUE
Remarks	Not supported.

nBitPerSample

Configurable value	16, 32
Acquirable value	Setting value.
Initial value	16
Remarks	Specify the number of bits per sample.

nSamplingRate

Configurable value	8000, 11025, 12000, 16000, 22050, 24000, 32000, 44100, 48000, 64000, 88200, 96000, 128000, 176400, 192000
Acquirable value	Setting value or decoded result.
Initial value	48000
Remarks	This value does not affect decoding process.

ePCMMode

Configurable value	-
Acquirable value	OMX_AUDIO_PCMModeLinear
Initial value	OMX_AUDIO_PCMModeLinear
Remarks	Not supported.

eChannelMapping

Configurable value	OMX_AUDIO_ChannelNone OMX_AUDIO_ChannelLF OMX_AUDIO_ChannelRF OMX_AUDIO_ChannelCF OMX_AUDIO_ChannelLFE OMX_AUDIO_ChannelLS OMX_AUDIO_ChannelRS
Acquirable value	Setting value or decoded result.
Initial value	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF
Remarks	This value does not affect decoding process. The relation among channel of input data, nChannels and eChannelMapping is shown as below. If the Down channel is ON, output channel is 2(stereo).

Channel of input data	**nChannles**	**eChannelMapping**
1(monaural)	1	eChannelMapping[0]= OMX_AUDIO_ChannelCF
2(stereo)	2	eChannelMapping[0]= OMX_AUDIO_ChannelLF

			eChannelMapping[1]= OMX_AUDIO_ChannelRF
	3(3/0)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelCF eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelNone eChannelMapping[5]= OMX_AUDIO_ChannelNone
	4(2/2)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelNone eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelRS
	5(3/2)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelCF eChannelMapping[3]= OMX_AUDIO_ChannelNone eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelRS
	5.1(3/2+LFE)	6	eChannelMapping[0]= OMX_AUDIO_ChannelLF eChannelMapping[1]= OMX_AUDIO_ChannelRF eChannelMapping[2]= OMX_AUDIO_ChannelCF eChannelMapping[3]= OMX_AUDIO_ChannelLFE eChannelMapping[4]= OMX_AUDIO_ChannelLS eChannelMapping[5]= OMX_AUDIO_ChannelRS

6.5. OMXR_MC_AUDIO_PARAM_FLACDOWNCHANNELTYPE

[Structure]
```
typedef struct OMXR_MC_AUDIO_PARAM_FLACDOWNCHANNELTYPE {
    OMX_U32                 nSize;
    OMX_VERSIONTYPE         nVersion;
    OMX_U32                 nPortIndex;
    OMX_BOOL                bDownChannel;
} OMXR_MC_AUDIO_PARAM_FLACDOWNCHANNELTYPE;
```

[Function] Down channel information structure.

[Members]

Member Name	Get	Set
nSize	W	W
nVersion	R	-
nPortIndex	W	W
bDownChannel	R	W

[Details]

nSize

Configurable value	Specify the size (in bytes) of the OMXR_MC_AUDIO_PARAM_FLACDOWNCHANNELTYPE structure.
Acquirable value	-
Initial value	-
Remarks	-

nVersion

Configurable value	-
Acquirable value	Specification version of OpenMAX IL (1.1.2).
Initial value	Specification version of OpenMAX IL (1.1.2).
Remarks	-

nPortIndex

Configurable value	APB+1
Acquirable value	-
Initial value	-
Remarks	-

bDownChannel

Configurable value	OMX_TRUE OMX_FALSE
Acquirable value	Setting value.
Initial value	OMX_TRUE
Remarks	If this value is OMX_TRUE, output is 2 channels (stereo). When the input stream is 3 - 5.1 channels, the L/R PCM data is outputted. When the input stream is 1ch, the same PCM data is copied to L/R.

6.6. Structure Members Used in a Unique Manner

Table 6-2 shows structure members used in a unique manner for FLAC Decoder Media Component.

Table 6-2 Structure Members Used in a Unique Manner

Structure Name	Member	Usage
OMX_BUFFERHEADERTYPE (refer to section 5.1.1 in the related document [1])	nOffset	Not supported. Specify 0.
	nTickCount	Any value can be specified to the OMX_BUFFERHEADERTYPE structure which is input by the OMX_EmptyThisbuffer( ) function. The value specified in this member is copied into a member of the OMX_BUFFERHEADERTYPE structure which is returned by the (*FillBufferDone)( ) callback function.
	nTimeStamp	Any value can be specified to the OMX_BUFFERHEADERTYPE structure which is input by the OMX_EmptyThisbuffer( ) function. The value specified in this member is used for calculating the output value of corresponding member of the OMX_BUFFERHEADERTYPE structure which is returned by the (*FillBufferDone)( ) callback function.
	nFlags	Please refer to section 6.6.1.

6.6.1. Buffer Flag (nFlags)

The buffer flag (nFlags in the OMX_BUFFERHEADERTYPE structure) for FLAC Decoder Media Component is shown as below.

Table 6-3 Buffer Flag for I/O Port

Flag Name (nFlags)	Description for support
OMX_BUFFERFLAG_EOS	This flag can be used as described in the related document [2].
OMX_BUFFERFLAG_STARTTIME	These flags do not affect the processing of Media Component but the flag set to input buffer is transferred to related output buffer.
OMX_BUFFERFLAG_DECODEONLY	
OMX_BUFFERFLAG_DATACORRUPT	This flag is set to output buffer if input stream has an error. If this flag is set, silent data may be stored to output buffer.
OMX_BUFFERFLAG_ENDOFFRAME	These flags do not affect the processing of Media Component but the flag set to input buffer is transferred to related output buffer.
OMX_BUFFERFLAG_SYNCFRAME	
OMX_BUFFERFLAG_EXTRADATA	
OMX_BUFFERFLAG_CODECCONFIG	

7. Events

Table 7-1 shows events having a unique condition for FLAC Decoder Media Component.

Table 7-1 Events Generation Conditions

Event Type	Port	Condition
OMX_EventPortSettingsChanged	APB+0	Event is not generated.
	APB+1	Event is generated when the member nChannels, nSamplingRate, eChannelMapping in the OMX_AUDIO_PARAM_PCMMODETYPE structure are changed internally by decoding.

If OMXR_MC_AUDIO_UnitFull is set in the OMXR_MC_IndexParamAudioOutputUnit index and nChannels, nSamplingRate, eChannelMapping in the OMX_AUDIO_PARAM_PCMMODETYPE structure is changed in FLAC Decoder Media Component, a buffer whose size is less than the size of the buffer may be returned.

For the OMX_EventPortSettingChenged event, it is possible to suppress event generation by masking event.Table 7-2 shows maskable information for FLAC Decoder Media Component.

Table 7-2List of Maskable Information

Information	Masking Value
nSamplingRate	OMXR_MC_AUDIO_EVENTMASK_SAMPLINGRATE
nChannels	OMXR_MC_AUDIO_EVENTMASK_CHANNELS
eChannelMapping	OMXR_MC_AUDIO_EVENTMASK_CHANNELMAPPING

8. Memory Size

Table 8-1 shows size and purpose of main memory areas used in FLAC Decoder Media Component and the value of nBufferSize, nBufferCountAcutal, nBufferCountMin in the OMX_PARAM_PORTDEFINITONTYPE structure.

Table 8-1 Main Memory Areas used in FLAC Decoder Media Component

Memory Area Name	Memory Size (byte)			Description
Input Buffer (APB + 0)	**OMX_PARAM_PORTDEFINITIONTYPE**		**Value**	Buffer to store input stream data. This is the size of memory area allocated by the OMX_AllocateBuffer() function.
	nBufferSize	Minimum Size	83968	
		Default Size	83968	
		Maximum Size	83968	
	nBufferCountActual	Minimum Count (= nBufferCountMin)	1	
		Default Count	4	
		Maximum Count	4	
Output Buffer (APB + 1)	**OMX_PARAM_PORTDEFINITIONTYPE**		**Value**	Buffer to store output PCM data. This is the size of memory area allocated by the OMX_AllocateBuffer() function.
	nBufferSize	Minimum Size	110592	
		Default Size	110592	
		Maximum Size	110592	
	nBufferCountActual	Minimum Count (= nBufferCountMin)	1	
		Default Count	8	
		Maximum Count	8	

- Additionally, areas for such as context task communication and internal work are need.

Revision History	OMX Media Component User's Manual FLAC Decoder Part

Rev.	Date	Description	
		Page	Summary
0.01	May. 30, 2014	-	Newly created.
0.02	Jul. 8, 2014	P3	The name of FLAC Decode Middleware is changed to FLAC Decode Software.
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