G.711 Speech Encoder

API

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Revision History

Version	Date	Changes
1.0	22 August 2007	Original

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1. Introduction

1.1 Motivation

G.711 is a narrowband speech codec operating with speech sampled at 8000 Hz. It uses ADPCM as the base algorithm to compress speech. The input to the speech encoder can be 16-bit linear PCM speech or A-law/U-law compressed speech at 64 kbps with 8-bit per sample. The coder operates on a sample by sample basis and it supports four bit rates that is 40, 32, 24 and16 kbps.

This document describes the **A**pplication **P**rogram **I**nterface for the ITU-T G.711 Encoder. The version of XDM used is v1.0.

1.2 Scope

The document assumes that the reader is familiar with XDAIS and XDMI APIs as defined by TI. Here only the specific detail about the interface structures (standard and extended) being used by this speech encoder has been mentioned.

Glossary

API	Application Program Interface (Interface through which an application talks to functional blocks)
ITU	International Telecommunications Union

2. Interface Data Structures

2.1 API of G.711 Encoder

2.1.1 Functional Interface

Same as the standard ISPHENC_Fxns. Please refer to references [2] and [3].

2.1.2 Input/Output Format

2.1.2.1 Input Format

It is stream of 16 bits PCM samples for a single channel. There is no support for stereo speech.

2.1.2.2 Output Format

1. The encoded bitstream format is as defined by ITU-T reference software. The same format is also followed by RFC-3551. It is A-law or U-law compressed 8-bit per sample stream.
2. The encoded stream is octet aligned. There is no header associated with the stream. As each sample is individually encoded, decoding can start with any octet-aligned point.

2.1.3 Default Parameters

ITTIAM_G711ENC_PARAMS		
Description	This contains the default initialization parameters for the component.	
Syntax	Same as ITTIAM_G711ENC_Params	
Parameters	Names	Values
	Standard ISPHENC_Params: base	
	`size`	sizeof(ITTIAM_G711ENC_Params)
	`frameSize`	320

	compandingLaw	ISPEECH_G711_COMPAND_LINEAR
	packingType	0 (Not applicable)
	vadSelection	0 (Not applicable)
	No extensions available for config paramaters	
Usage	Application gets a set of suitable set of configuration parameters and may need to update only few of them. See the detail of parameters below.	

2.1.4 Data structures

2.1.4.1 ITTIAM_G711ENC_Params

2.1.4.1.1 Specific usage of ISPHENC_Params

All the parameters is used same as the standard ones. Specfic detail is as below.

Parameters	Used	Description
size	Yes	Must be sizeof (ITTIAM_G711ENC_Params)
frameSize	Yes	Size of frame for input in bytes.
compandingLaw	Yes	Companding law for input as per ISPEECH_CompandingLaw in ispeech.h
PackingType	No	Not applicable
vadSelection	No	Not applicable

2.1.4.1.2 Ittiam extentions of ISPHENC_Params

This interface structure is not extended.

2.1.4.2 ITTIAM_G711ENC_DynamicParams

2.1.4.2.1 Specific usage of ISPHENC_DynamicParams

All the parameters is used same as the standard ones.

Parameters	Used	Description
size	Yes	Contains size of the structure
frameSize	Yes	Size of frame in bytes
bitRate	No	Bitrate fixed at 64000
mode	No	Not applicable
noiseSuppressionMode	No	Not applicable
ttyTddMode	No	Not applicable
dtmfMode	No	Not applicable
dataTransmit	No	Not applicable

homingMode	No	Not applicable

2.1.4.2.2 Ittiam extentions of ISPHENC_DynamicParams

This interface structure is not extended.

2.1.4.3 ITTIAM_G711ENC_Status

2.1.4.3.1 Specific usage of ISPHENC_Status

All the parameters is used same as the standard ones. Details follow.

Parameters	Used	Description
size	Yes	Contains size of the structure
extendedError	Yes	Error info returned
frameSize	Yes	Size of frame in bytes
bitRate	No	Bitrate fixed at 64000
mode	No	Not applicable
vadFlag	No	Not applicable
noiseSuppressionMode	No	Not applicable
ttyTddMode	No	Not applicable
dtmfmode	No	Not applicable
dataTransmit	No	Not applicable
homingMode	No	Not applicable
bufInfo	Yes	Buffer info is given out to application with GETBUFINFO command

2.1.4.3.2 Ittiam extentions of ISPHENC_Status

This interface structure is not extended.

2.1.4.4 ITTIAM_G711ENC_InArgs

2.1.4.4.1 Specific usage of ISPHENC_InArgs

All the parameters is used same as the standard ones. Specific detail follow.

Parameters	Used	Description
size	Yes	Size of the structure
nullTrafficChannel	No	Not applicable here

2.1.4.4.2 Ittiam extentions of ISPHENC_InArgs

This interface structure is not extended.

2.1.4.5 ITTIAM_G711ENC_OutArgs

2.1.4.5.1 Specific usage of ISPHENC_OutArgs

All the parameters is used same as the standard ones. Specific detail follow.

Parameters	Usage	Description
size	Yes	Size of the structure
rate	No	Bitrate does not change, fixed at 64 kbps.
frameType	No	Not applicable. All frames are speech frames.
outBufferSize	Yes	Half of current frame size

2.1.4.5.2 Ittiam extentions of ISPHENC_OutArgs

This interface structure is not extended.

2.1.4.6 Control commands

Commands	Support	Description
XDM_GETSTATUS	No	frameSize and bufInfo is available. bufInfo is given out for XDM_GETBUFINFO command.
XDM_SETPARAMS	No	Only frameSize can be set.
XDM_RESET	Yes	Nothing particular to be done here, sample based codec.
XDM_SETDEFAULT	No	Default frame size of 320 is set
XDM_FLUSH	No	Sample based codec, nothing buffered
XDM_GETBUFINFO	Yes	Buffer Info is given out
XDM_GETVERSION	No	Not supported

3. Reference

[1]	spru360e.pdf	TMS320 DSP Algorithm Standard API Reference.
[2]	RFC 3551	http://www.faqs.org/rfcs/rfc3551.html