



SIGNALS+SOFTWARE

Data Sheet

ITU G.711 Speech Coder



Processor

Motorola StarCore™ MSC8101 DSP.

Background

SIGNALS+SOFTWARE are developing a complete suite of communication software for the Motorola MSC8100 family of DSPs. The initial development platform, the MSC8101, utilizes the StarCore™ 140 four ALU (Algorithmic Logic Unit) DSP core. This device also has 512kb memory and a Communications Processor Module (CPM) making it a versatile device for communication applications.

The algorithm implemented is the ITU-T recommendation G.711 audio coder. The encoder compresses linear narrowband audio input data, at a sample rate of 8kHz, to a data rate of 64 000 bps, using non-linear quantisation. G.711 is a simple algorithm, using two selectable logarithmic coding laws, A-law (European standard) and μ -law (US standard).

G.711 is the mandatory minimum standard for all ISDN terminal equipment.

Features and Performance

- Various Table Lookup and Full-Calculation implementations available.

G.711	Program Memory (Kbytes)	Tables (Kbytes)	Stack Memory (Kbytes)	Static Memory (Kbytes)	Processing Load (MHz)
Encoder	0.12	0	0	n * 0	n * 0.06
Decoder	0.07	0.5	0	n * 0	n * 0.02
Encoder + Decoder	0.19	0.5	0	n * 0	n * 0.08

Table 1 : DSP Requirements for G.711 – A-law

G.711	Program Memory (Kbytes)	Tables (Kbytes)	Stack Memory (Kbytes)	Static Memory (Kbytes)	Processing Load (MHz)
Encoder	0.10	0	0	n * 0	n * 0.06
Decoder	0.07	0.5	0	n * 0	n * 0.02
Encoder + Decoder	0.17	0.5	0	n * 0	n * 0.08

Table 2 : DSP Requirements for G.711 – μ -law

Note: Processing loads quote worst-case scenarios and n represents the number of channels.
Program memory table values are initialisation values. Kbytes equals 1024 bytes.

Technical Notes

G.711 is often used at rates less than 64 000 bps, namely 56 000 and 48 000 bps, with a slight reduction in speech quality. This allows an 8 000 bps or 16 000 bps auxiliary data channel.

Interface Details

For convenience the individual software functions are supplied as a single library module. The library contains all the object code that is required to link in to a user's top-level application code. The audio functions are either callable as C functions or as assembly functions.

Unlike most speech coders there is no need to call an initialisation routine before calling a G.711 function for the first time. For compatibility with other coders it may be convenient to call a dummy initialisation routine. Such functions are not included in the package. It is up to the user to implement this type of function.

Availability

Fully optimised code is available now, for a one-off payment and/or royalties depending on the commercial application.

Also available for StarCore™ are a full range of vocoders including G.722, G.723.1, G.726, G.728, G.729, G.729A, G.729B, G.729AB and other communication algorithms.

SIGNALS+SOFTWARE

SIGNALS+SOFTWARE was founded in 1992 as a developer of high quality Digital Signal Processing application software for the communications industry. Supplying to a whole range of customers, including large blue chip corporations, **SIGNALS+SOFTWARE** has quickly established itself as the world leader in DSP software design and production.

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