



**SIGNALS+SOFTWARE**

## Data Sheet

# ITU G.728 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 to be implemented is the ITU-T recommendation G.728 fixed rate speech coder. The encoder compresses linear narrowband speech data, at a sample rate of 8kHz, to a data rate of 16 000 bps. The decoder also incorporates an adaptive post-filter to enhance performance for multiple transcodings. The post-filter function can be omitted for single coder-decoder operation to reduce the processing power required on the DSP.

G.728 is an essential addition to all video conferencing systems and is increasingly being used in Voice and DSL applications.

### Features and Performance

G.728	Program Memory (Kbytes)	Tables (Kbytes)	Stack (Kbytes)	Data Memory (Kbytes)	Processing Load (MHz)
Encoder	14.6	2.1	0.6	n * 1.8	n * 10.97
Decoder	17.5	2.0	0.6	n * 2.4	n * 8.27
Encoder + Decoder	26.2	2.2	0.6	n * 4.2	n * 19.24

**Table 1 : DSP Requirements for G.728**

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

### Technical Notes

G.728 is a complex coder using a Low-Delay Code-Excited Linear Prediction (LD-CELP) algorithm that employs backward-adaptive Linear Predictive Coding (LPC) analysis in order to achieve a low transcoding delay.

### Interface Details

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

### 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.711, G.722, G.723.1, G.726, 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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