Whether you need your product to say a few words or talk for several minutes, Sensory's **SC-6x** speech and music processors can deliver a few seconds to several hours of speech.

Every Sensory speech product is made with your design in mind. Efficient technology allows you to cut costs and size by using smaller and fewer devices. A complete range of development tools and software helps you get your products to market faster.

POWERFUL TECHNOLOGY

The SC-6x product family introduces a new world of speech synthesis opportunities. This family is built around a 12.32 million instructions per second (MIPS) Digital Signal Processor (DSP) to enable advanced speech algorithms, yielding speech quality never before obtained at such low data rates.

These DSPs provide three low-power modes, two timer interrupts, one DAC interrupt and five general-purpose interrupts. These features increase battery life and speed of response to button and keyboard presses.

Sensory SC-6x employs three processing methods - CX, MX, LPC - that produce natural sounding speech while using a relatively small amount of memory. Your product's quality will speak for itself.

If your product needs music, Sensory offers several choices, including simultaneous speech with high quality polyphonic music.

A RANGE OF CHOICES

Not only can you choose the optimum combination of price and capacity, you can adopt any of these digital storage alternatives: On-chip mask programmable ROM, External memory (SC-614 only).

TYPES OF SYNTHESIS

	Data Rate Kbps	Memory Required per Minute of Speech (KB)
CX synthesis is your solution for producing long durations of great speech and sound effects at the lowest possible system cost. MX offers data rates as low as 1K bits-per-second, yielding high quality speech with minimal development effort.	3.0~11.2	22.5~84.0
MX synthesis provides optimal speech and sound effects. Its highly sophisticated analysis can reproduce the subtle qualities of a broad range of character voices. CX offers up to six choices of data rates to help you optimize speech quality and memory cost.	1.0~3.5	7.5~26.2
LPC is mathematically simpler than MX or CX, requiring less processing power but more editing.	1.8	13.5

Music Synthesis
Sensory also provides a way to enhance your products with high quality music synthesis. Sensory's music synthesizer provides polyphonic music using standard Musical Instrument Digital Interface (MIDI) files that have been converted into compact bitstreams. This gives the ability to play up to 14 channels of music.

Music + Speech
The music synthesizer can also play polyphonic music simultaneously with speech (MX or CX), adding even more excitement to your products.

SC-6X FAMILY

SC-601

The SC-601 has a 1.5 Mb ROM to support up to 24 minutes of internally-stored MX speech or up to 8 minutes of CX speech.

SC-604

The SC-604 contains the same powerful core, ROM and RAM as the other SC-6x devices, but has a reduced I/O set and pin count which makes it the most economical of the SC-6x family members.
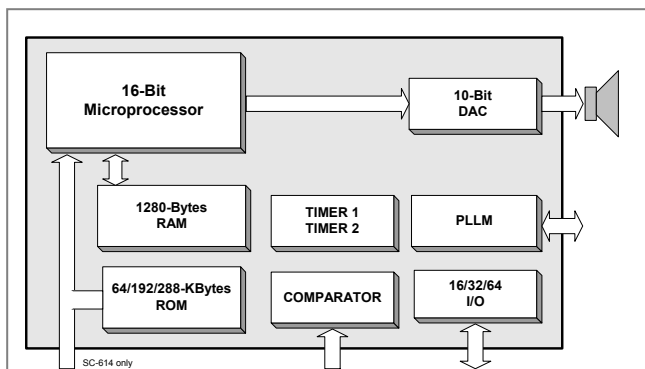
SC-605

The SC-605 has a 2.36Mb (288KB) ROM to support up to 37 minutes of internally-stored MX speech or up to 12 minutes of CX speech. This device is a perfect one-chip system solution, functioning as master controller, speech processor, and data memory.

SC-614

The SC-614 expands the capability of the SC-6x family by incorporating 64 I/O pins for interfacing with the outside world. It can also address up to 64Mb of external memory, providing over **18** hours of speech duration!

SC-691

The SC-691 is a pre-programmed slave synthesizer implemented on the SC-6x family line that accepts commands and compressed speech data from other microprocessors or microcontrollers and converts it to speech output. Since no SC-6x programming knowledge is needed, this is the simplest SC-6x family member to develop with.

SC-6X BLOCK DIAGRAM

	SC-604	SC-605	SC-601	SC-614
ROM (bytes)	64K	288K	192K	64K
RAM (bits)	10880	10880	10880	10880
I/O Pins (packaged)	16	32	32	64
I/O Pins (die)	16	32	32	64
Pin Count (package)	64	100	100	100
Pin Count (die)	36	53	53	85
Built-In DAC	Yes	Yes	Yes	Yes
Built-In Comparator	Yes	Yes	Yes	Yes
Max Speech Duration (1.0 Kbps internal ROM)	6.5 min	37 min	24 min	6.5 min *

Sensory SC-6x family of processors

* The SC-614 can be interfaced to external memory for longer

SPEECH SYNTHESIS DURATION FOR SC-6X DEVICES [1]

Single-Chip Speech Duration (8 KHz Sampling Rate)								
Speech Algorithm	MX		CX					
Compression Rate (bps)	**1000**	**2400**	**3000**	**3700**	**4500**	**6200**	**7700**	**11200**
SC-605	37min	15min	12min	9min 50sec	8min 5sec	5min 50sec	4min 45sec	3min 15sec
SC-601	24min	10min	7min 45sec	6min 20sec	5min 10sec	3min 45sec	3min	2min 5sec
SC-604/614	6min 30sec	2,40 min	2 min	1,35min	1min 20sec	55sec	45sec	30sec
Additional Duration Available by Adding External Memory (8 KHz Sampling Rate)								
4 Mb ROM or flash	1hr 9min	29min	23min	18min	15min	11min	9min	6min 10sec
8 Mb ROM or flash	2hr 19min	58min	46min	37min	31min	22min	18min	12min
16 Mb ROM or flash	4hr 39min	1hr 56min	1hr 33min	1hr 15min	1hr 2min	45min	36min	24min
64 Mb ROM or flash	9hr 19min	3hr 53min	3hr 6min	2hr 31min	2hr 4min	1hr 30min	1hr 12min	49min

[1] These times are examples which assume a small (2Kw) control code, the exact speech duration depends on the size of the control code.

SENSORY®