

# LC866000 Series

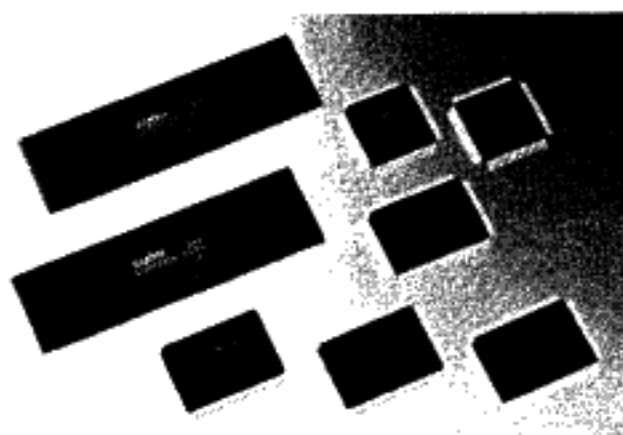
## Overview

The LC866000 Series CMOS 8-bit single-chip microcontrollers are high-speed, advanced function microcontrollers, with on-chip FLT controller/drivers and 8-bit A/D converters. EPROM with window versions and one-time PROM versions have been incorporated into the series, allowing the development time of application systems to be greatly reduced.

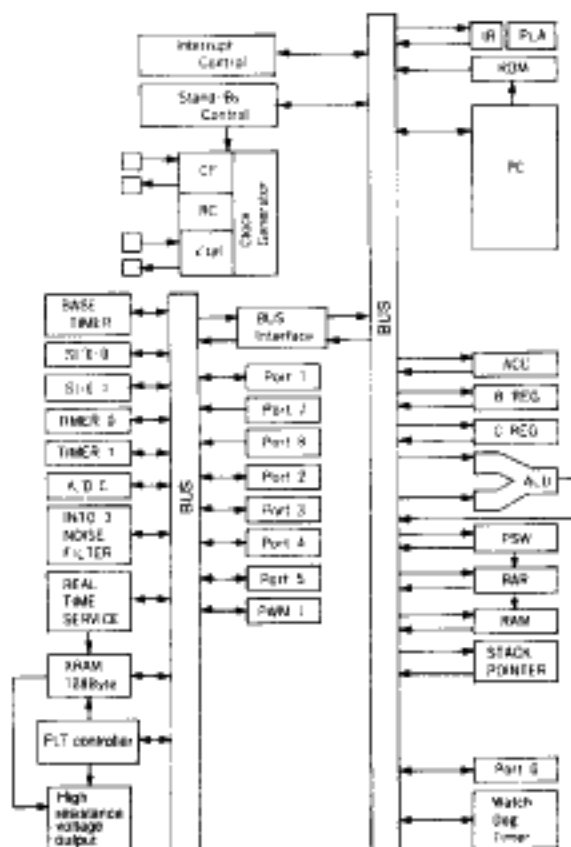
The LC866000 Series microcontrollers integrate many powerful functions on a single chip, optimizing them for device control requiring realtime responses. They are centered around a high-speed CPU core and a realtime service block that can perform its processing independently and in parallel. Also included are 8K to 48K bytes of ROM, 384 to 768 bytes of RAM, FLT controller/drivers, a 4 to 12-channel 8-bit A/D converter, a 16-bit timer/counter, a multiple-use PWM 16-bit timer, a timer for a realtime clock function, a watchdog timer, two channels of 8-bit serial I/O, a remote control signal receive circuit, an 8-bit PWM, I/O ports, numerous interrupts (14 to 17 sources, 10 vectors), and a standby function.

## Features

- 8K to 48K bytes ROM
- 384 to 768 bytes RAM
- FLT controller/drivers
  - Segment key-scan function
  - 26 to 38 outputs (16 digits maximum)
  - Can receive input from the FLT pin (LC8664XX Series)
- 4 to 12-channel 8-bit A/D converter
- 16-bit timer/counter
  - With 8-bit programmable prescaler
  - Can be split into two 8-bit timer/counters
- Multiple-use PWM 16-bit timer (with the following 4 modes)
  - One 16-bit timer
  - Two 8-bit timers
  - 8-bit timer + 8-bit PWM
  - 9 to 16-bit PWM
- 14-bit timer for realtime clock function
- Watchdog timer (with external RC)
- Two 8-bit serial I/O channels
  - With one 8-bit baud rate generator
- Remote control signal receive circuit
- 16 to 49 I/O ports, 8 to 12 input-only ports
- Numerous interrupt functions
  - 14 to 17 sources (5 to 8 external, 9 internal) and 10 vectors
  - Control function for 3 levels of overlapping interrupts
- Standby mode (HALT/HOLD mode)
- High-speed operation
  - Minimum cycle time: 1  $\mu$ s (bus cycle: 0.5  $\mu$ s)
  - High-speed execution of register/RAM bit manipulation instructions: 1  $\mu$ s



LC866232 Block Diagram



- Symmetrical instruction set common with LC866000 Series
  - 68 instructions
- Realtime service function
  - Performs 4-byte data transfer between special-function registers within 5  $\mu$ s of an event being generated

## Applications

- VCR (control/display/electronic tuning/remote control unit)
- CD (control/display/remote control unit)

- Amplifier (control/display)
- Tuner (control/display/electronic tuning)
- Home electronics (control/display/remote control unit)
- Communications equipment (control/display)
- Automobile devices (control/display)

## ■ LC866000 Series

Type No.	ROM (bits)	RAM (bits)	Cycle time	FLT outputs	Ports	S/O	Timers	AD converter	Package	Evaluation chip	Notes								
LC86602B	32K × 8		1 μs (bus cycle) 0.5 μs	14 segment-only 15 common segment/digit	8 inputs 16 I/Os  (CMOS/N ch open drain selection possible)	8 bits × 2	16 bits × 2 can be split into 8-bit timers + 14-bit timer for realtime clock	5 bits × 4 ch	DIP-64S QFP-64E	LC866032	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> </ul>								
LC86602B	28K × 8	512 × 8																	
LC866024B	24K × 8																		
LC866020C	20K × 8																		
LC866016C	16K × 8	384 × 8																	
LC866012C	12K × 8																		
LC866008C	8K × 8																		
LC866032	32K × 8	512 × 8	1 μs (bus cycle) 0.5 μs	16 segment-only 15 common segment/digit	12 inputs 1 output 24 I/Os  (CMOS/N ch open drain selection possible)	8 bits × 2 can be used for bus	16 bits × 2 can be split into 8-bit timers + 14-bit timer for realtime clock	5 bits × 6 ch	DIP-64S QFP-64E	—	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> <li>• 8-bit PWM output</li> </ul>								
LC866032	32K × 8	512 × 8							—										
LC866132A	32K × 8								DIP-64E	—									
LC866128A	28K × 8	640 × 8										QFP-60E	LC866132						
LC866124A	24K × 8																		
LC866120A	20K × 8	512 × 8																	
LC866116A	16K × 8	384 × 8																	
LC866112A	12K × 8																		
LC866108A	8K × 8																		
LC866132	32K × 8	640 × 8							1.5 μs (bus cycle) 0.5 μs	22 segment-only 16 common segment/digit		14 inputs 5 control select and voltage I/Os  (CMOS/N ch open drain selection is possible) 12 intermediate select and voltage I/Os  (CMOS/N ch open drain selection is possible) However, CMOS output selection port is normally wired and voltage.	8 bits × 2 can be used for bus and 15-bit communication	16 bits × 2 can be split into 8-bit timers + 14-bit timer for realtime clock	5 bits × 8 ch	QFP-60E	—	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> </ul>	
LC866432A	32K × 8	768 × 8														DIP-60E	—		
LC866428A	28K × 8	768 × 8																	QFP-60E
LC866424A	24K × 8																		
LC866420A	20K × 8	640 × 8																	
LC866416A	16K × 8	512 × 8																	
LC866412A	12K × 8																		
LC866408A	8K × 8																		
LC866448	48K × 8	768 × 8																	
LC866448	48K × 8																		
LC866232A	32K × 8		1 μs (bus cycle) 0.5 μs	16 segment-only 15 common segment/digit	12 inputs 1 output 43 I/Os  (CMOS/N ch open drain selection is possible)	8 bits × 2	16 bits × 2 can be split into 8-bit timers + 14-bit timer for realtime clock	5 bits × 6 ch			QFP-100E					LC866232	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• Realtime service function</li> <li>• 8-bit PWM output</li> </ul>		
LC866228A	28K × 8	640 × 8									DIP-100E								—
LC866224A	24K × 8								QFP-100E	LC866232									
LC866220A	20K × 8																		
LC866216A	16K × 8	640 × 8																	
LC866232	32K × 8	640 × 8																	
LC866232	32K × 8	640 × 8																	
LC866448A	48K × 8		1 μs (bus cycle) 0.5 μs	10 segment-only 10 common segment/digit	12 inputs 1 output 49 I/Os  (CMOS/N ch open drain selection is possible for 43 pins)	8 bits × 2 can be used for bus	16 bits × 2 can be split into 8-bit timers + 14-bit timer for realtime clock	5 bits × 12 ch			QFP-100E	LC866448	<ul style="list-style-type: none"> <li>• FLT controller/drivers</li> <li>• PWM output for tuners</li> <li>• Realtime clock function</li> <li>• Remote control signal receive circuit</li> <li>• 2-channel realtime service function</li> <li>• 8-bit PWM output</li> </ul>						
LC86644A	44K × 8	768 × 8							DIP-100E	—									
LC86640A	40K × 8										QFP-100E			LC866448					
LC86636A	36K × 8																		
LC86632A	32K × 8	768 × 8																	
LC86628A	28K × 8																		
LC86624A	24K × 8																		
LC86620A	20K × 8																		
LC86616A	16K × 8																		
LC86612A	12K × 8																		
LC86608A	8K × 8																		
LC86604A	4K × 8																		
LC86600A	0K × 8																		

\*: Under development