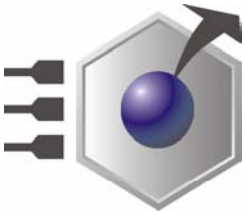
EmbeddedDNA®



EuroTecH

An0001

CPU-1210: Power Consumption

Rev. 0.3

September. 2005

COPYRIGHT 1994-2005 Eurotech S.p.A. All Rights Reserved.

ABOUT THIS MANUAL

Revision History

Rev.	Changes	Date
0.1	Preliminary	16-03-2000
0.2	Changed source example	18-05-2000
0.3	Corrected textual errors	07-06-2005

Via J. Linussio 1
33020 AMARO (UD)
ITALY
Phone: +39 0433 485 411
Fax: +39 0433 485 499

web: http://www.eurotech.it
e-mail: mailto:sales@eurotech.it

NOTICE

Although all the information contained herein has been carefully verified, Eurotech S.p.A. assumes no responsibility for errors that might appear in this document, or for damage to property or persons resulting from an improper use of this manual and of the related software. Eurotech S.p.A. reserves the right to change the contents and form of this document, as well as the features and specifications of its products at any time, without notice.

Trademarks and registered trademarks appearing in this document are the property of their respective owners

Conventions

The following table lists conventions used throughout this guide.

Icon	Notice Type	Description
	Information note	Important features or instructions
	Warning	Information to alert you to potential damage to a program, system or device or potential personal injury

(This page is intentionally left blank.)

Contents

Conventions 3

Contents 5

Chapter 1 Introduction 7

Chapter 2 Power Measurements 8

Chapter 3 Reducing CPU power consumption 10

Chapter 4 Programming Example 13

Related Documents 15

Where to find us 15

(This page is intentionally left blank.)

Chapter 1 Introduction

This document shows the power consumption of the Eurotech CPU-1210 board under different memory configurations and clock settings.

The CPU-1210 is a highly integrated PC/104 CPU module with the following features:

- Fully DOS and PC/AT compatible
- Fully PC/104 version 1.0 compliant
- Static 386SX processor
- 2 Serial Ports: 16550 compatible
  - One selectable between RS232, RS422 or RS485
  - One fixed as RS232
- 1 Floppy disk (available also on the parallel port through an external adapter)
- 1 Parallel Port, (EPP, ECP or SPP)
- 1 PC/AT Keyboard interface
- 1 Standard EIDE hard drive interface.
- Selectable operating frequencies 8MHz, 12MHz, 16MHz, 20MHz, 33MHz or 40MHz
- Memory (depending on option): 2MB, 4MB or 8MB EDO DRAM
- A 32-pin socket is available for a DISK ON CHIP (DOC), PEROM, Static Ram or EPROM.

The following pages show how to reduce the power consumption of the CPU-1210.

Chapter 2 Power Measurements

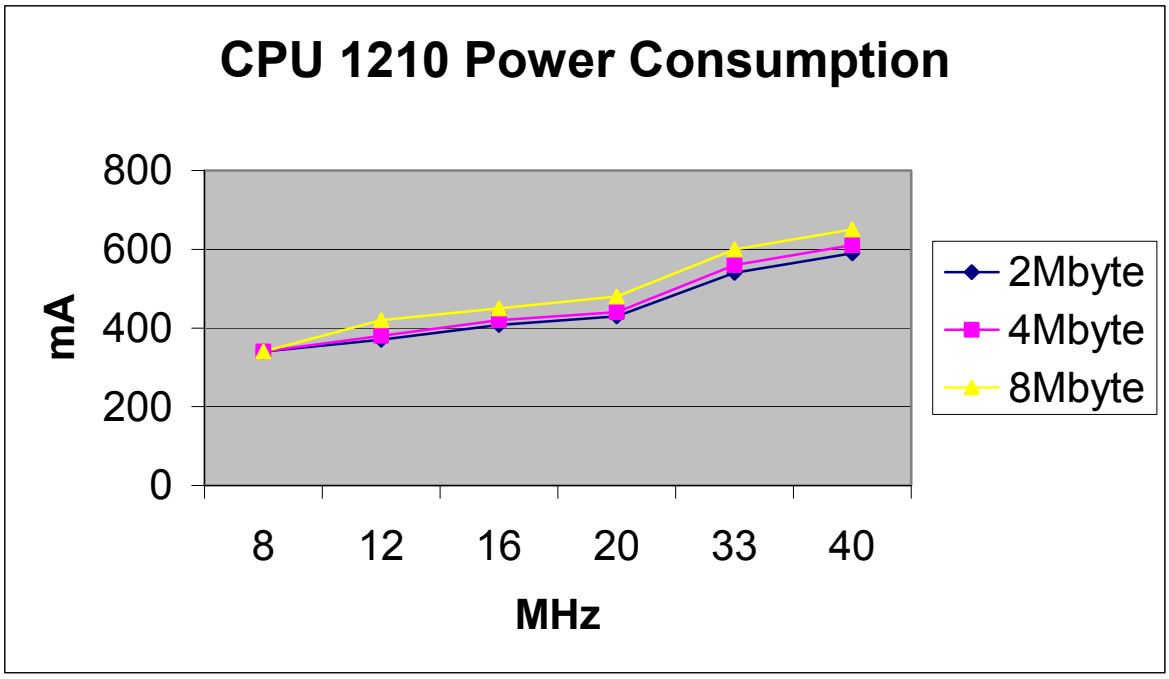
The CPU-1210 requires +5VDC ± 5% to function correctly. Supply current has been measured under all memory configurations and all available clock frequency settings.

Please note that the CPU clock frequency is set via the CPU BIOS set-up utility
Refer to the CPU-1210 user manual for additional information regarding this utility.

Following are the results of these measurements:

	On Board Memory		
Clock Frequency	**2 MB**	**4 MB**	**8 MB**
8 MHz	340 mA	370 mA	410 mA
12 MHz	370 mA	380 mA	420 mA
16 MHz	408 mA	420 mA	450 mA
20 MHz	430 mA	440 mA	480 mA
33 MHz	540 mA	560 mA	600 mA
40 MHz	590 mA	610 mA	650 mA

All current measurements are ± 5mA



Chapter 3 Reducing CPU power consumption

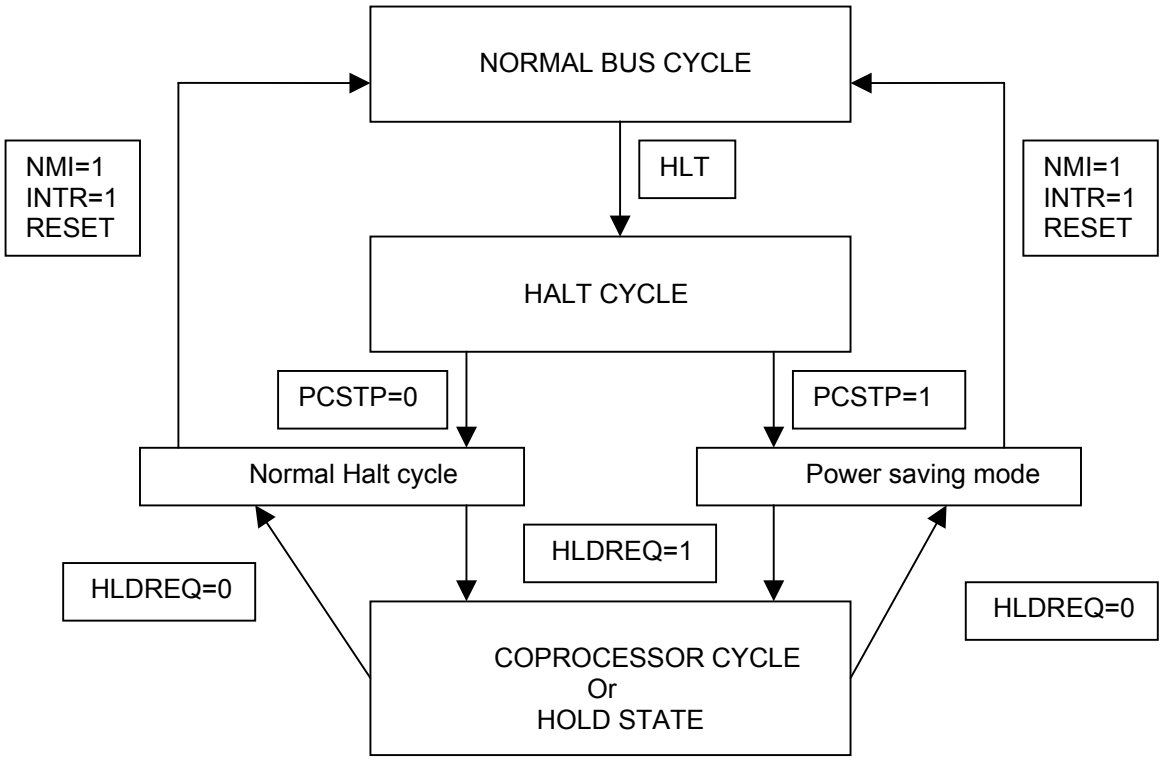
At the core of the CPU-1210 is the M6117C chip; you can easily stop the internal clock of CPU core in order to save almost 80% of its power consumption.

Due to the pure CMOS process, it will keep internal states from leaking current when Vcc is still powered on and clock has stopped.

There is one control bit called “Power Stop Clock” (PCSTP) in the internal control register, this is used to determine if M6117C is going to enter power saving mode or not.

Note that chip enters power saving mode by executing the HALT instruction, and exits with any interrupt or reset.

The following flow chart depicts power saving mode:



(This page is intentionally left blank.)

Chapter 4 Programming Example

The following example code is used to halt the CPU and restart when the keyboard interrupt is enabled:

```
.model small
.386p

cseg segment para public 'code' use16
     org     100h
     assume  cs:cseg,ds:cseg

start:  jmp ini
old21   db  ?

ini:
     in  al,21h
     mov byte ptr cs:old21,al              ; Save old interrupt mask

     mov al,0fdh                           ; Bit 0=1 disable timer int
                                           ; Bit 1=0 enable keyb int
     out 21h,al                            ; Only Keyb interrupt enabled

     push cx
     mov cx,65000                          ; A little delay
delay:
     in al,80h
     loop delay
     pop cx                                ; Register restore

     mov eax,00008000h
     db  0d6h,0fah,03h,02h                 ; Copy EAX to CR02h register
                                           ; Bit 15 (PCSTP) =1

     hlt                                   ; Stop ALIM6117C

     mov al,byte ptr cs:old21              ; Restore old mask
     out 21h,al

     mov ax,4c00h                          ; Return to DOS
     int 21h

cseg ends                                  ; End
     end start
```

After this a keyboard interrupt is able to wake-up the chip

WARNING:

If you keep the timer interrupt enabled you'll receive an interrupt after 50mS. Be sure to disable interrupt 0, as shown in the previous piece of code!

Related Documents

- The CPU-1210 module user manual (Available from the Eurotech download area)
- M6117C Embedded micro controller manual; D/N 6117DSC1.DOC ALI Acer Labs

Where to find us

Eurotech S.p.A.
Via Jacopo Linussio, 1 - 33020 Amaro (UD) ITALY
Tel. +39 0433 485.411 - Fax +39 0433 485.499

welcome@eurotech.it

http://www.eurotech.it