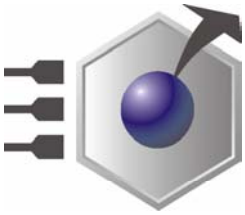
EmbeddedDNA®



EuroTecH

An0048

CPU-1232; Expansion Socket

Rev. 1.1

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ABOUT THIS MANUAL

This application note contains some useful information about the Expansion Socket installed into the CPU-1232 Revision B with a Rev B02 PIsi Firmware.

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

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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

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Contents

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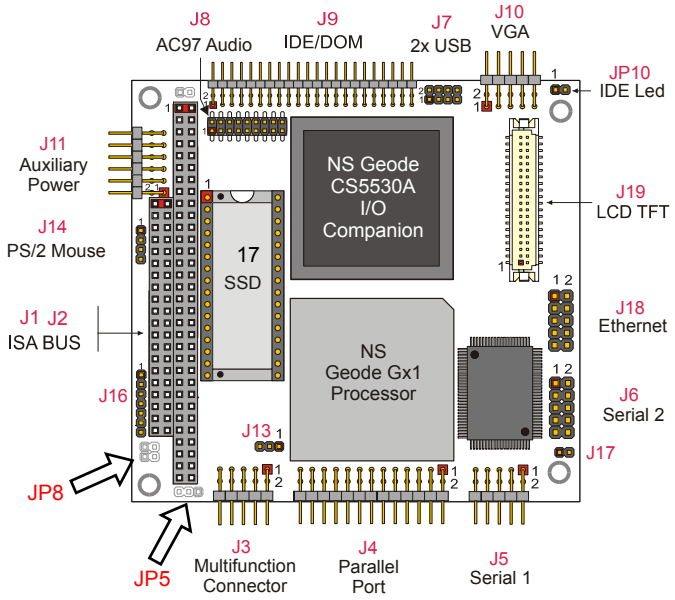
Chapter 1 Expansion Socket

The CPU-1232 expansion socket is provided to install different types of memory devices to store data or to enable booting from an on-board device reducing the space of your system.

Expansion Socket location

Figure 1 shows the position of the SSD Expansion socket over the CPU-1232 board and its pin-outs.

Figure 1. CPU-1232 Layout



The SSD Expansion socket related jumper settings are described in the following table:

Table 1. Expansion Socket Jumper setting

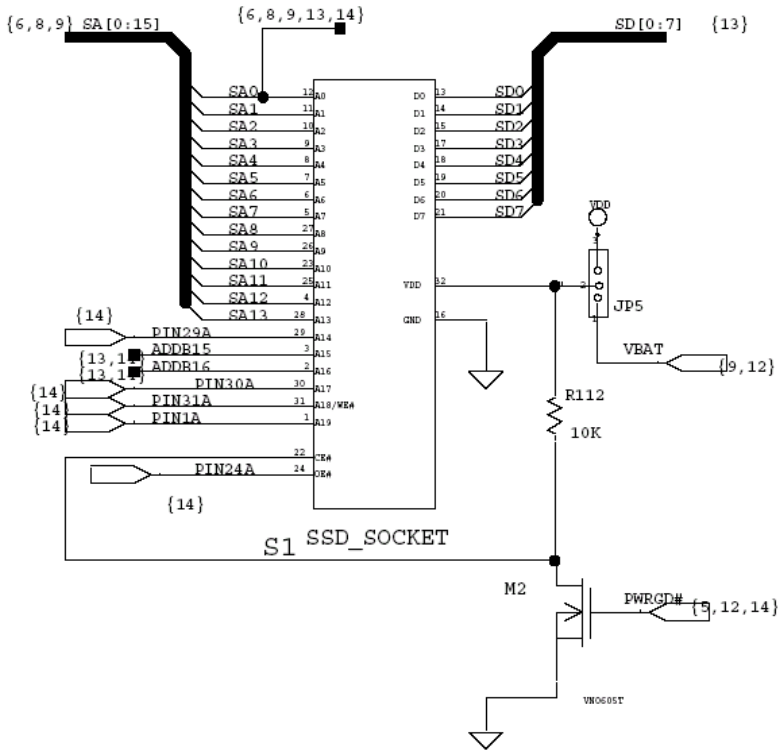
PIN#	Type	Function	Default
JP5	2 pin jumper	Power Supply Source Selection for SSD Socket 1-2: Vbattery 2-3: VDD	2-3
JP8	2 pin jumper	External BIOS Open: Module starts with internal BIOS (inside Flash EPROM) Closed: Module starts with External BIOS	Open

In general Vbattery has to be used to backup the volatile memory.
The external BIOS jumper has to be used to inform logic to Boot BIOS from the expansion socket and not directly from standard flash BIOS.

Schematic Diagram

To allow user to detect which signals are connected to the Expansion socket, Figure 2 describe the electrical connections and the pin-out versus the PC/104 BUS and some specific pins connected to the pLSI logic which manages the different installable chips over the SSD Expansion socket.

Figure 2. Expansion Socket Schematic Diagram



The PWRGD# signal is used on the logic to control the chip selection for static RAM to prevent erroneous writing access into memory during no valid power supply periods when data lines are not stabilized and supply of the SSD Socked is present because it is derived directly from battery.

Supported devices

The Expansion socket allows the user to install different types of memory devices as listed below:

NonvRam or 512K RAM
Flash
Eurom Disk on Chip 64K
EPROM 128K/256K
No devices

The user has to verify carefully the compatibility and the proper BIOS settings to make the installed devices function correctly.

For detailed information regarding the hardware compatibility please refer to Table 2 where according to the Figure 2 electrical connection you can verify the components pin-out.
The pin-out of the Expansion socket depends on the JP8 jumper setting and from the BIOS settings according to the following table where JP8 is open.

Table 2. Expansion socket pin-out, no external BIOS

Device	BIOS Key	Pin 1 A19	Pin 2 A16	Pin 3 A15	Pin 29 A14	Pin 30 A17	Pin 31 A19
ATMEL Flash Perom	101	AD18	((AD(16) AND NOT rombios) OR (rombios AND SA(16) AND NOT em_bios))	(AD(15) AND NOT rombios) OR (rombios AND SA(15) AND NOT em_bios)	NOT (NOT smemwn AND decodifica_E8000)	(AD(17) AND NOT rombios)	SA14
Flash BIOS on E8000h	001	0			NOT (NOT smemwn AND decodifica_E8000)		1
Disk on Chip 64K	010	AD18			SA14		NOT (NOT smemwn AND decode_E8000)
SRAM 512K	011	0			1		NOT (NOT smemwn AND decode_DOC)
N/A	100	0			SA14		1
No Device	000	0			1		1
N/A	110	AD19			SA14		1
N/A	111	0			1		1

The pin-out of the socket depends on the BIOS settings that modify the glue logic as described in the previous table.

Take care that when no static devices are installed you should prevent data losses by powering the socket with a backed up battery supply. The backup battery may be connected to the Multifunction connector, for detailed information please refer to the CPU-1232 user manual.

When JP8 is closed the Expansion socket is reserved to place an External Flash device and the Pin-out is as follows:

Table 3. Expansion socket pin-out, external BIOS

Device	JP8	Pin 1 A19	Pin 2 A16	Pin 3 A15	Pin 29 A14	Pin 30 A17	Pin 31 A19
External BIOS	Closed	AD18				NC	

The external BIOS is read directly from the SDD socket not from PC/104 bus only if EXROM is 1; the External BIOS Flash is a 128K so pin 30 is not connected (NC).

Expansion Socket BIOS Settings

The *Expansion Socket* may house different types of *solid-state* memory device. If you want to use a PEROM or SRAM, you must also configure the “Floppy Disk 1 to 4” as an Expansion Socket. Anyway a Disk On Chip (DOC) is always seen as a hard disk, and it doesn’t need a further setting in the “Floppy Disk 1 to 4” section. If the assigned floppy is *FD1* and the *boot try sequence* is *FD1/HD1*, the system starts bootstrapping from the memory mounted on the expansion socket.

Option	*Description*	*Note*
Disabled (*)	No device selected	**(*) = Default setting**
Disk On Chip	Solid-state memory device - size: 2 ... 144 MB	
PEROM 512 KB	Programmable and Erasable ROM -size 512 KB	
SRAM 512 KB	Static RAM - size 512 KB	

DiskOnChip Map

This option allows you to choose the starting address of Disk On Chip (DOC) memory window

Option	*Description*	*Note*
0CC000h	The starting address is 0CC000h	
0D0000h	The starting address is 0D0000h	
0D4000h	The starting address is 0D4000h	
0D8000h	The starting address is 0D8000h	
0DC000h	The starting address is 0DC000h	
0E0000h	The starting address is 0E0000h	
0E4000h	The starting address is 0E4000h	
0E8000h (*)	The starting address is 0E8000h	**(*) = Default setting**

IMPORTANT NOTE:
With Win NT OS we recommend using memory address *0D0000h*

For detailed information on disk on chip configuration please refer to the devices technical literature.

Chapter 2 BIOS recovery

Sometimes the Flash BIOS device may contain no bootable information, in general when the flash is installed over the CPU for the first time or when BIOS upgrade procedure fails; when one of these situations happen, valid BIOS data information has to be stored into the on board flash memory. This may be done in two different ways:

- Removing the Flash memory, programming it with an external programmer and re-soldering again on the CPU.
- Starting the BOARD using external BIOS and programming the Flash corrupted/empty memory.

The second procedure, without requiring specialized equipment, is the easier, cheaper and less complicated method.

External BIOS features

When something goes wrong during the BIOS programming sequence, a corrupted BIOS code may be written into your Flash memory and doesn't allow you to boot the CPU. The standard BIOS SW upgrade is not available because the CPU doesn't start at all.

To solve this situation the best way is to use the Expansion Socket to install an external Flash or EPROM where the binary code of a minimal CPU-1232 BIOS is programmed.

For an upgraded copy of this safety minimal BIOS please refer to Eurotech Technical support.

The minimal BIOS stored on this memory doesn’t contain VIDEO BIOS extension, for this reason an external Video card with Video BIOS is required. By closing the External BIOS jumper JP8 you will be able to boot the CPU allowing you to reprogram the BIOS flash contents.

Materials required:

- A Development System
- A CPU-1232
- An external VGA module (e.g. Eurotech IO/SV PC/104 VGA module)
- A 28F010 Flash device
- The binary image of the External BIOS to store into the external flash (Refer to Eurotech Technical support) Filename is currently “1232ETH.BIN”
- A flash programmer or a 28F010 preprogrammed flash device
- A DOS bootable floppy with an image of the binary BIOS you've to store on the flash and the related BTOOL program (Refer to the Eurotech Website for an updated version)

Recovery procedure

Here is the procedure to recover a CPU-1232 without Flash BIOS information:

- Program the External 28F010 Flash[1] (The checksum should be D600)
- Configure the Power Supply Source Selection for SSD Socket JP5 jumper in 2-3 position
- Configure the External BIOS so the JP8 jumper Closed
- Install the External Flash over the Expansion socket
- Install the IO/SV VGA board on the PC/104 stack, important connect the monitor to this board
- Connect the keyboard
- Connect a floppy drive on the parallel port
- Power up your system verifying that the system boots from floppy
- After the system has booted you can operate as described into the manual to program the BIOS using the BTOOL utility and the binary BIOS you wish to store.

  e.g. > BTOOL /B BIOS.BIN

- Verify all the programming steps are done properly (erasing, programming and verifying)

Post recovery procedure

When you've finished the BIOS Flash programming procedure:

- Power down the system.
- Remove the IO/SV VGA board as required.
- Remove the External BIOS.
- Set JP5 to required setting.
- Set JP8 jumper to open.
- Verify that the system boots correctly.

[1] Please refer to the component data sheet for further information. For programming details refer to the literature of your programmer.

Related Documents

For further information on the CPU-1232 please refer to the User Manual.

For further information on CPU-1232 I/O Port Map please refer to the Eurotech AN-006.

Where to find us

Eurotech S.p.A.
Via Jacopo Linussio, 1 - 33020 Amaro (UD) ITALY
Tel. +39 0433 486258 - Fax +39 0433 486263

welcome@eurotech.it

http://www.eurotech.it
ftp://ftp.eurotech.it