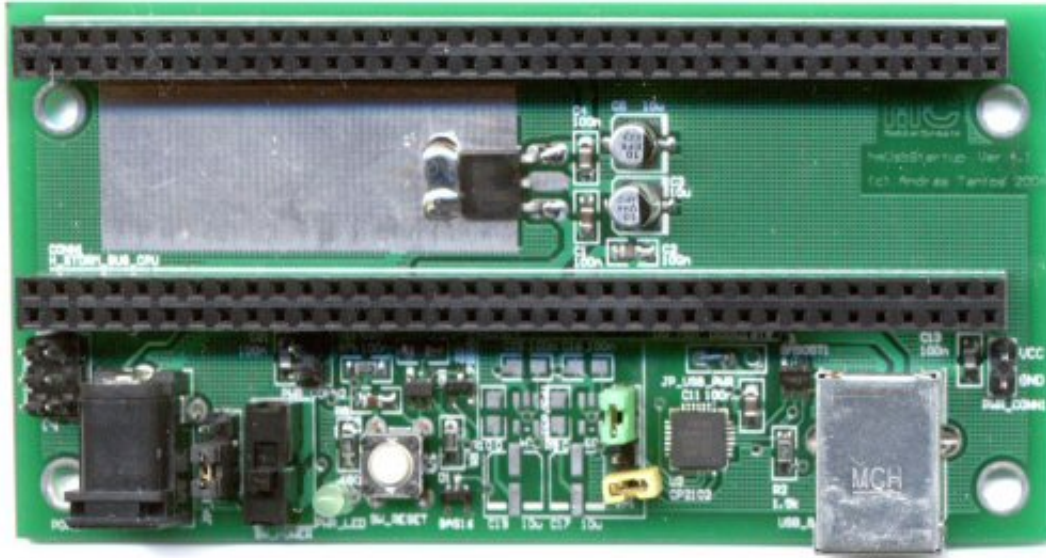


hsStartup

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Introduction

This simple system-board provides the basic functions to start using a CPU board and a Peripheral card. It contains only the bare essentials that are required to run a minimal system. It also provides a starting point for more complicated system-board designs and a reference implementation of a passive system-board.

Features

The main blocks of this system-board are:

- A 3.3V power supply, using a simple 3-lead LDO
- USB interface with integrated USB-to-serial circuit. Both self-powered and bus-powered operation is supported.
- A reset button
- A CPU socket
- A project or Peripheral socket
- Optional 2.5V and 1.8V power supplies in case the modules need them

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Design description

The power supply

The power supply on the board provides a 3.3V power of up to 500mA by using a simple low-drop-out linear voltage regulator (LDO) from [Texas Instruments](#), the TLV2217-33. This regulator provides power to all the components of the system.

Since the maximum power requirement of a CPU and a Peripheral card can be higher than the available current from this regulator, care must be taken when selecting the components. Not all

H-Storm CPU or Peripheral cards are compatible with this system board. So far however all modules require significantly less power than this simple circuit can supply.

Two optional additional LDO regulators can be used to produce 2.5V and 1.8V power for CPU or Peripheral modules in case they need one. These regulators however are capable of providing only 150mA of power so, again care must be taken to compatibility.

One characteristic of these linear regulators is that their efficiency drops as the input supply voltage gets higher. For this reason, the input power supply voltage for this system-board should be in the 5-volt range.

Optionally to the external power supply, the USB port can be used to power the system. In that case all regulators are running from the 5V supply provided by the USB port. Since maximum allowed current draw on a single USB port is 500mA, care must be taken when operating in this mode with the 2.5V and the 1.8V power regulators populated.

A red LED is mounted on the board that lights up when the main supply provides power to the system and a switch is provided to turn the board on and off. The switch interrupts the circuit between the external power source and the LDO regulator so when it's turned off, all the active electronics is isolated from the power supply.

USB interface

A USB-to-serial interface circuit is implemented on the board. This circuit connects to the first serial port on the CPU modules for the TXD and RXD lines (pin A47 and A50). The interface does not handle any of the hand-shake signals. The RxD line can be interrupted with a jumper on the system board in case the first serial port (or the interface that's connected to those pins on the CPU card) is used for some other purpose. The DTR signal on the serial port can be used to pull the nRESET signal of the CPU and the peripheral card low, so that a host computer can reset the H-Storm system for development purposes. This functionality can be disabled by a jumper on the board.

Reset circuitry

As it was mentioned previously the nRESET signal of the H-Storm bus can be driven low from the serial interface, using the DTR pin. On top of that a dedicated reset button with a simple de-bounce circuit is provided to manually reset the system. The circuit does not guarantee any minimum reset pulse with though it's very unlikely that a manual press of the button could generate reset pulses shorter than a couple of ms. A pull-up resistor of the value 47k on the system board ensures a proper logic level on the nRESET line when neither of the sources drive a low level to the line.

H-Storm module sockets

A CPU and a project/peripheral socket is provided on the board. All the H-Storm system-bus

signals with the exception of nPROG are connected straight between the two sockets. This makes the two sockets equivalent. One can be used to put a CPU card into it while the other can hold a peripheral card or a prototyping board.

When the second socket is for a Peripheral card, it will answer to bus cycles on the nSEL0 line and generate interrupts on the nIRQ0 line.

IMPORTANT! When the second socket is used for peripheral boards, care must be taken to the fact that the application-specific pins of the two sockets are connected together. If the peripheral board drives some of the application-specific pins in its connector especially with non-LVCMOS33 signals, it can damage the CPU board.

The second connector can also be used to plug a small project or prototyping board into the system. You can implement any functionality on this module, for example signal interface circuits or custom sockets to interface the CPU card to some external component, like a servo, a motor or an optical sensor.

The PnP bus signals are also connected between the two sockets. No device is connected to this bus on the System-board.

Design files

[H-Storm System Manual \(HSOL\)](#)

[Schematic and PCB in PDF format \(HSNCL\)](#)