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NS9750 Jumpers and Components

Making DEVICE NETWORKING *easy*™

NS9750 Jumpers and Components

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Contents

Changes

This section describes changes to the *NS9750 Jumpers and Components* since the previous release of the document, March 2004 (90000529_A).

- Page 6: The entry for PCI or CardBus has changed.

Using This Guide

Review this section for basic information about this guide, as well as for general support contact information.

About this guide

This guide provides information about the jumpers, components, and configuration of the NS9750 development board. The NS9750, part of the NetSilicon NET+ARM line of SoC (System-on-Chip) products, supports any type of high bandwidth application in Intelligent Networked Devices.

The NET+ARM is part of the NET+Works integrated product family, which includes the NET+OS network software suite.

Who should read this guide

This guide is for hardware developers, system software developers, and application programmers who want to use the NS9750 for development.

To complete the tasks described in this guide, you must:

- Understand the basics of hardware and software design, operating systems, and microprocessor design.
- Understand the NS9750 architecture.

What's in this guide

The *NS9750 Jumpers and Components* describes the use and configuration of the NS9750 development board.

Conventions used in this guide

This table describes the typographic conventions that may be used in this guide:

This convention	Is used for
italic type	Emphasis, new terms, variables, and document titles.
bold, sans serif type	Menu commands, dialog box components, and other items that appear on-screen.
Select **Menu → option**	Menu commands. The first word is the menu name; the words that follow are menu selections.
`monospaced type`	Filenames, pathnames, and code examples.

Related documentation

- For information on the chip you are using, see the *NS9750 Hardware Reference*.
- For NS9750 schematics and BOM, review the documentation CD-ROM that came with your development kit.
- See the NET+OS software documentation for information appropriate to the chip you are using.

Customer support

To get help with a question or technical problem with this product, or to make comments and recommendations about our products or documentation, use the contact information listed in this table:

For	Contact information
Technical support	Telephone: 1 800 243-2333 / 1 781 647-1234 Fax: 1 781 893-1388 E-mail: tech_support@netsilicon.com
Documentation	techpubs@netsilicon.com
NS9750 Errata	www.netsilicon.com/support/errata.jsp
NetSilicon home page	www.netsilicon.com
Online problem reporting	www.netsilicon.com/problemreporting.jsp

NS9750 Jumpers and Components

The *NS9750 Jumpers and Components* provides a description of the NS9750 development board. This document also explains the board's default states and provides information for configuring other states.

Overview

The NS9750 contains 50 GPIO pins. Each of the 50 pins can be multiplexed to provide up to four different functions. The NS9750 development board implements each of the optional functions. See the *NS9750 Hardware Reference* for more information about the options for each pin.

The development board uses 0 ohm resistors to enable the functions.

You can identify the board by the following information:

- **Market name.** NS9750 development board
- **NS9750.** A 32-bit, 200MHz NET+ARM processor.

NS9750 development board features

The NS9750 development board provides these basic features:

- 200MHz NS9750
- 16 MB 100MHZ SDRAM, 8 MB flash, 1 MB serial EEPROM (serial EEPROM connected to SPI port B)
- 10/100 Mbps MII PHY, magnetics and RJ45 connector
- 10/100 Mbps RMII PHY, magnetics and RJ45 connector
- 10/100 Mbps MII connector
- CardBus socket and mini-PCI v1.0
- 32-bit PCI v2.2 supported (connector included)
- USB OHCI host and device connectors, with PnP support for USBd
- Up to quad RS232 or 485, SPI, and two HDLC serial I/O supported
  - Default to 1xSPI, 1x8-pin RS232, and 1x4-pin RS232
- I^2C connector plus 4-pin header
- Generic header for 8-bit LCD (up to 24-bit can be supported)
- 1284 peripheral supported (connector included)
- SO-DIMM connector for external peripherals
- Two timers

- Three diagnostic LEDs (five supported)
- 20-pin JTAG header
- Reset pushbutton switch
- Full schematics and BOM available (see your hardware CD and the NetSilicon Web site)
- Supported interfaces, in some cases, must be customer-enabled (using jumper, switch, or resistor changes)

GPIO-related configurations

Table 1 shows the default configuration for the NS9750 development board. The remainder of this section provides options for configuring the development board in other, common ways. See also the GPIO resistor matrix, available on your hardware CD, to determine additional configurations.

Default configurations

Default function	Description
SPI on port B	Can boot from SEEPROM or connect to a 4-pin header.
Serial port on port A	Full modem control, RS232 mode.
8-bit LCD	LCD available using headers P34 and P36.
Serial port on port C	TX, RX, RTS, and CTS available in RS232 mode.
LEDs 1-5	Available on GPIO16, GPIO17, GPIO45, GPIO46, and GPIO47. The LEDs are not available when R140–R144 are removed. The default configuration has CR5 and CR6 unavailable.
GPIO44	Available on P21 pin 5.
GPIO39	Available on P23 pin 8.
USB host	USB host available on P31 USB “A-type” connector.

Table 1: NS9750 development board default configuration

IEEE 1284 parallel port configuration alternatives

- Populate these resistors with 0 ohm jumpers: RN34, RN35, R538, R544.
- Unpopulate these resistors: RN42, R8, R9, R136, R140–R142, R144, R335–R338, R355–R357, R406.
- Be sure these resistors are unpopulated: RN44, RN45, RN36, RN37, RN38, RN39, R150, R162, R163, R165, R169, R171, R172, R173, R178, R180, R187, R195, R197, R373–R376, R386–R393, R407–R409, R422, R427–R429, R434, R438, R441, R449, R464, R474–R476, R478, R482, R502, R510, R514, R518, R519, R534, R535, R539, R540.

USB host

- Populate these resistors with 0 ohm jumpers: R137 and R136 (default).
- Unpopulate these resistors: R143 and R144 (default).
- Be sure these resistors are unpopulated: R187, R394, R395, R519, R544 (default).
- Set SW9 switches 1 and 3 to ON (default).

USB device

- Populate this resistor with 0 ohm jumper: R139.
- Unpopulate this resistor: R137.
- Be sure these resistors are unpopulated: R395, R143.
- Set SW9 switch 2 to ON for `device`.
- Set SW9 switch 4 to ON for `low-speed device`.

Serial port B in RS232, full modem control

- Populate these resistors with 0 ohm jumpers: R150, R151, R180, R191, R422, R449, R450, R486.
- Unpopulate this resistor: RN42.
- Be sure these resistors are unpopulated: RN35, RN44, R185, R190, R370–R377, R423–R429, R488, R496, R509.

Serial port D in RS232, full modem control

- Populate these resistors with 0 ohm jumpers: R154, R155, R164, R464, R474, R483, R502, R518.
- Unpopulate these resistors: RN33, R140–R142, R159, R160, R406.
- Be sure these resistors are unpopulated: RN35, RN36, RN39, R186, R407–R409, R430–R433, R490, R507.

Non GPIO-related configurations

The non GPIO-related configurations are based on this setup: looking directly into the DB9 connectors and going clockwise, the upper right port is port B, the lower right port is port A, the lower left port is port C, and the upper left port is port D.

Serial port A 422/485 mode

▶ **To change full modem RS232 serial port A into RS422/485 mode:**

1. Change SW18 switch 1 to OFF.
2. Change SW18 switch 3 to ON; this changes RS422/485 to 2-wire mode.
3. Change SW18 switch 4 to ON, to use on board termination.

PCI CardBus

To ensure that PCI CardBus is the default, be sure that SW10 switch 5 is turned ON.

Mini-PCI

To use mini-PCI, be sure that SW10 switch 5 is turned OFF.

RMII

▶ **To use RMII on Ethernet jack labeled P14:**

- Populate these resistors with 0 ohm resistors: R75, R77, R84, R91, R97, R118, R300, R302, R316, R317, R328, R331, R332, R603, and RN74.
- Unpopulate these resistors: R106, R117, R127, R129, R342, R600, R604, RN21, RN25.
- RN74 pin 9 trace needs to be cut. An alternate method is to shift RN74 over so the pin 8-to-pin 9 connection is not made.

PCI or CardBus

Be sure that your board corresponds to the interface type you purchased: PCI or CardBus. Contact your Application Engineer for information.

Default configuration switch settings

Table 2 shows the default configuration settings for the NS9750 development board and explains each setting.

Switch	Switch setting	Description
SW1	Switch 1 = ON Switch 2 = OFF Switch 3 = OFF Switch 4 = OFF	Selects static chip select 0 for ~CS1 on SRAM
SW2	Switch 1 = OFF Switch 2 = OFF Switch 3 = OFF Switch 4 = ON	Selects static chip select 3 for ~CS4 on SRAM
SW3	Switch 1 = OFF Switch 2 = OFF Switch 3 = ON Switch 4 = OFF	Selects static chip select 2 for ~CS2 on SRAM
SW4	Switch 1 = OFF Switch 2 = OFF Switch 3 = ON Switch 4 = OFF Switch 5 = OFF Switch 6 = ON Switch 7 = OFF Switch 8 = OFF	Selects address(13) for bank address(0) on SDRAM and address(14) for bank address(1) on SDRAM
SW8	Switch 1 = OFF Switch 2 = OFF Switch 3 = ON Switch 4 = OFF	Selects NS9750 as a host for PCI

Table 2: Default configuration switch settings

Switch	Switch setting	Description
SW9	Switch 1 = ON Switch 2 = OFF Switch 3 = ON Switch 4 = OFF	Selects NS9750 as USB host
	Switch 1 = OFF Switch 2 = ON Switch 3 = OFF Switch 4 = OFF	Selects NS9750 as USB device
	Switch 1 = OFF Switch 2 = OFF Switch 3 = OFF Switch 4 = ON	Implements slow speed USB device

Table 2: Default configuration switch settings

Configuration register switch settings

Table 3 provides switch settings and descriptions for several configuration registers. See the *NS9750 Hardware Reference* for more information about the configuration registers.

Note: For SW17 – SW20, switches 3 and 4 are RS485/422 options for their respective ports.

Switch	Switch setting	Description
SW10	Switch 1 = OFF	rtck
	Switch 2 = OFF	boot_strap[4]
	Switch 3 = OFF	boot_strap[3]
	Switch 4 = ON	boot_strap[2]
	Switch 5 = ON	boot_strap[1]
	Switch 6 = ON	boot_strap[0]
	Switch 7 = OFF	GPIO[49]
	Switch 8 = ON	GPIO[44]
SW11	Switch 1 = OFF	reset_done
	Switch 2 = OFF	GPIO[24]
	Switch 3 = OFF	GPIO[20]
	Switch 4 = ON	GPIO[19]
	Switch 5 = OFF	GPIO[17]
	Switch 6 = OFF	GPIO[12]
	Switch 7 = OFF	GPIO[10]
	Switch 8 = OFF	GPIO[8]
SW12	Switch 1 = OFF	GPIO[4]
	Switch 2 = OFF	GPIO[2]
	Switch 3 = OFF	GPIO[0]
	Switch 4 = OFF	GPIO[41]
	Switch 5 = OFF	GPIO[40]
	Switch 6 = OFF	GPIO[39]
	Switch 7 = OFF	GPIO[38]
	Switch 8 = OFF	GPIO[37]

Table 3: Configuration register switch settings

Switch	Switch setting	Description
SW13	Switch 1 = OFF	GPIO[36]
	Switch 2 = OFF	GPIO[35]
	Switch 3 = OFF	GPIO[34]
	Switch 4 = OFF	GPIO[33]
	Switch 5 = OFF	GPIO[32]
	Switch 6 = OFF	GPIO[31]
	Switch 7 = OFF	GPIO[30]
	Switch 8 = OFF	GPIO[29]
SW14	Switch 1 = OFF	GPIO[28]
	Switch 2 = OFF	GPIO[27]
	Switch 3 = OFF	GPIO[26]
	Switch 4 = OFF	GPIO[25]
	Switch 5 = OFF	GPIO[23]
	Switch 6 = OFF	GPIO[22]
	Switch 7 = OFF	GPIO[21]
	Switch 8 = OFF	GPIO[18]
SW15	Switch 1 = OFF	GPIO[16]
	Switch 2 = OFF	GPIO[15]
	Switch 3 = OFF	GPIO[14]
	Switch 4 = OFF	GPIO[13]
	Switch 5 = OFF	GPIO[11]
	Switch 6 = OFF	GPIO[9]
	Switch 7 = OFF	GPIO[7]
	Switch 8 = OFF	GPIO[6]
SW16	Switch 1 = OFF	GPIO[5]
	Switch 2 = OFF	GPIO[3]
	Switch 3 = OFF	GPIO[1]
	Switch 4 = OFF	pll_test_n = low
	Switch 5 = OFF	bist_en_n = low
	Switch 6 = ON	scan_en_n = low
	Switch 7 = ON	pll_test_n = high
	Switch 8 = ON	bist_en_n = high

Table 3: Configuration register switch settings

Switch	Switch setting	Description
SW17	Switch 1 = ON	Selects RS232 on port C rather than RS485/422.
	Switch 2 = OFF	No effect.
	Switch 3 = OFF	ON is 4-wire mode, OFF is 2-wire mode.
	Switch 4 = OFF	ON uses board termination, OFF does not.
SW18	Switch 1 = ON	Selects RS232 on port A rather than RS485/422.
	Switch 2 = OFF	No effect.
	Switch 3 = OFF	ON is 4-wire mode, OFF is 2-wire mode.
	Switch 4 = OFF	ON uses board termination, OFF does not.
SW19	Switch 1 = ON	Selects RS232 on port D rather than RS485/422.
	Switch 2 = OFF	No effect.
	Switch 3 = OFF	ON is 4-wire mode, OFF is 2-wire mode.
	Switch 4 = OFF	ON uses board termination, OFF does not.
SW20	Switch 1 = ON	Selects RS232 on port B rather than RS485/422.
	Switch 2 = OFF	No effect.
	Switch 3 = OFF	ON is 4-wire mode, OFF is 2-wire mode.
	Switch 4 = OFF	ON uses board termination, OFF does not.

Table 3: Configuration register switch settings

PN:(1P) 90000529 B