

NLX Generic Riser Card Design Overview

Version 1.2

IMPORTANT INFORMATION AND DISCLAIMERS

1. INTEL CORPORATION (AND ANY CONTRIBUTOR) MAKES NO WARRANTIES WITH REGARD TO THIS NLX DOCUMENT AND IN PARTICULAR DOES NOT WARRANT OR REPRESENT THAT THIS DOCUMENT OR ANY PRODUCTS MADE IN CONFORMANCE WITH IT WILL WORK IN THE INTENDED MANNER. NOR DOES INTEL (OR ANY CONTRIBUTOR) ASSUME RESPONSIBILITY FOR ANY ERRORS THAT THE DOCUMENT MAY CONTAIN OR HAVE ANY LIABILITIES OR OBLIGATIONS FOR DAMAGES INCLUDING, BUT NOT LIMITED TO, SPECIAL, INCIDENTAL, INDIRECT, PUNITIVE, OR CONSEQUENTIAL DAMAGES WHETHER ARISING FROM OR IN CONNECTION WITH THE USE OF THIS DOCUMENT IN ANY WAY.

2. NO REPRESENTATIONS OR WARRANTIES ARE MADE THAT ANY PRODUCT BASED IN WHOLE OR IN PART ON THE DOCUMENT WILL BE FREE FROM DEFECTS OR SAFE FOR USE FOR ITS INTENDED PURPOSE. ANY PERSON MAKING, USING OR SELLING SUCH PRODUCT DOES SO AT HIS OR HER OWN RISK.

3. THE USER OF THIS DOCUMENT HEREBY EXPRESSLY ACKNOWLEDGES THAT THE DOCUMENT IS PROVIDED AS IS, AND THAT INTEL CORPORATION (AND ANY CONTRIBUTOR) MAKES NO REPRESENTATIONS, EXTENDS NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR REPRESENTATION THAT THE DOCUMENT OR ANY PRODUCT OR TECHNOLOGY UTILIZING THE DOCUMENT OR ANY SUBSET OF THE DOCUMENT WILL BE FREE FROM ANY CLAIMS OF INFRINGEMENT OF ANY INTELLECTUAL PROPERTY, INCLUDING PATENTS, COPYRIGHT AND TRADE SECRETS NOR DOES INTEL (OR ANY CONTRIBUTOR) ASSUME ANY OTHER RESPONSIBILITIES WHATSOEVER WITH RESPECT TO THE DOCUMENT OR SUCH PRODUCTS.

4. A LICENSE IS HEREBY GRANTED TO COPY AND REPRODUCE THIS DOCUMENT FOR ANY PURPOSE PROVIDED THIS “IMPORTANT INFORMATION AND DISCLAIMERS” SECTION (PARAGRAPHS 1-4) IS PROVIDED IN WHOLE. NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY OTHER INTELLECTUAL PROPERTY RIGHTS IS GRANTED HEREIN.

Copyright © 1997, 1998 Intel Corporation. All rights reserved.

Version 1.2, August 1998

† Third-party brands and names are the property of their respective owners.

Revision History

1.0	Original reference document
1.1	Updated Section 2.5, Hybrid Audio Connector, with modifications to some signal names and descriptions: Pin U1 is now MIC PLUG IN; pin U7 is now FP SPKR EN; pin U11 is now HP PLUG IN; and pin U15 is now FP MIC EN.
1.2	Updated Section 2.5, Hybrid Audio Connector, and removed table.

Contents

1 Purpose	4
2 Generic NLX Riser Card	5
2.1 Mounting Holes (A in Figure 1)	6
2.2 PCI Connector Slots (B in Figure 1)	6
2.3 ISA Connector Slots (C in Figure 1)	6
2.4 Audio Connector Header (D in Figure 1)	7
2.5 Hybrid Audio Connector (E in Figure 1)	9
2.6 Optional 2x13 Analog Audio (F in Figure 1)	9
2.7 Feature Connector Header (J11 and J12) (G in Figure 1)	12
2.8 Motherboard Edge Connector (H in Figure 1)	13
2.9 IDE Connector (I in Figure 1)	13
2.10 IDE Connector (J in Figure 1)	13
2.11 Floppy Connector (K in Figure 1)	13
2.12 Serial Bus Connector (J10) (L in Figure 1)	14
2.13 USB—Universal Serial Bus (J9) (M in Figure 1)	14
2.14 Front Panel Connector (N in Figure 1)	15
2.15 Fan Control Jumper Block (O in Figure 1)	16
2.16 Power Supply Connector (P in Figure 1)	17
2.17 Auxiliary Power Connector (Q in Figure 1)	17
2.18 Standard Riser Headers	18
2.18.1 Front Panel Connector	18

1. Purpose

The guidelines provided in this document apply only to the “generic riser card.” The generic riser card described in this document is intended to be used as a baseline design. It may be implemented as is, or it may be modified in any manner to suit the needs of the customer.

The document is intended only to provide a starting point for further development; it is not intended to be a blueprint for creating a riser card. The information is presented “as is” and will not be subject to frequent updates. If the riser card design is used as presented in the document, it is strongly recommended that the riser card be put through a standard qualification process. For the latest motherboard design information, please refer to the *NLX Motherboard Specification* and the *NLX Electrical Design Suggestions*.

2. NLX Generic Riser Card

The motherboard will connect to the generic riser card, allowing the IDE, floppy, power, and standard front panel I/O connectors to be moved up on the riser, minimizing cabling to the motherboard and decreasing the cable length to the peripheral bays. The card offers support for three add-in cards: one PCI slot, one ISA slot, and one shared connector slot.

Figure 1 shows the riser card layout. The card must accommodate the features and requirements described in the following sections. These sections describe the card with reference to the callouts in Figure 1.

NOTE

In Figure 1, the holes referenced at callout “R” are used for airflow/cooling considerations, because this riser card covers part of the airflow produced by the NLX power supply in the chassis. The designer must take into consideration any thermal issues that might arise because of improper cooling of the system.

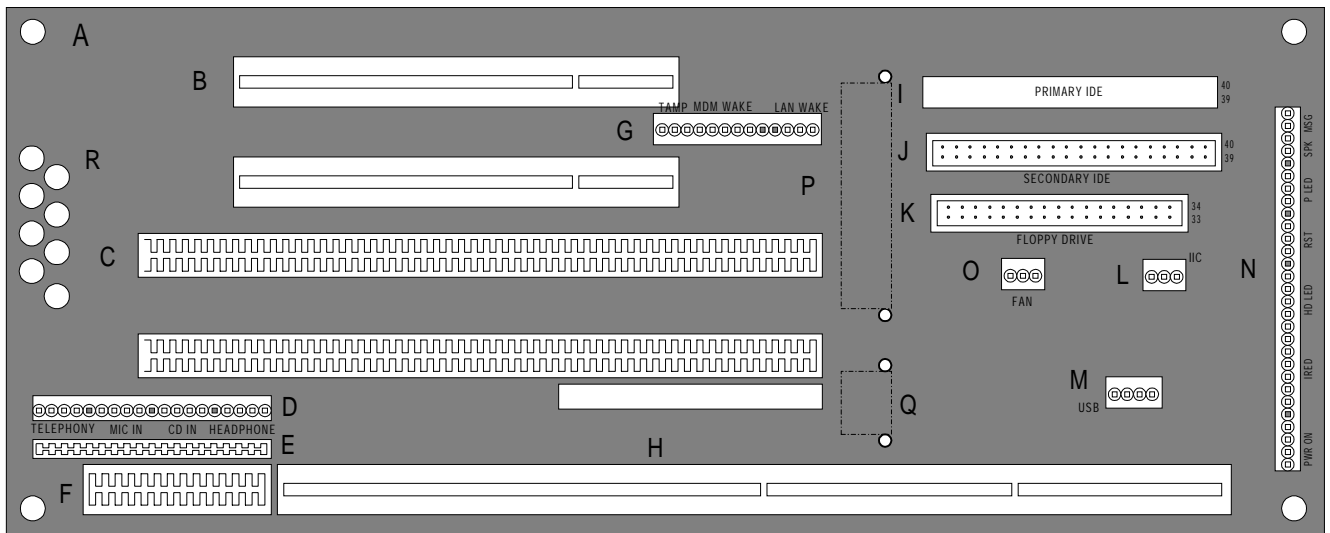


Figure 1: Generic Riser Layout

A	Mounting Holes	G	Feature Connector Header	M	USB—Universal Serial Bus
B	PCI Connector Slots	H	Motherboard Edge Connector	N	Front Panel Connector
C	ISA Connector Slots	I	Primary IDE	O	Fan Control Jumper Block
D	Audio Connector Header	J	Secondary IDE	P	Power Connector
E	Hybrid Audio Circuit	K	Floppy Drive	Q	Power Connector
F	Optional 2x13 Analog Audio	L	IIC (I ² C)	R	Holes used for airflow/cooling

2.1 Mounting Holes (A in Figure 1)

These holes are intended to provide the means by which the riser is mounted to the chassis. Refer to the mechanical drawing for the exact hole locations.

2.2 PCI Connector Slots (B in Figure 1)

These connectors are used to allow the user to increase system functionality by using PCI add-in cards.

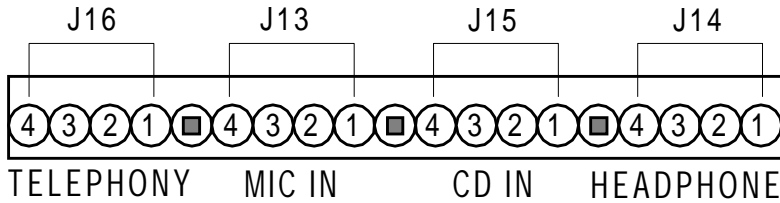
Simulation results show that to ensure the integrity of the PCI bus, the riser should provide 33 Ohm series termination placed as close as possible to the 340-pin connector. The designer should take great care in routing the PCI bus and should keep line lengths under 4.5 inches. Refer to *NLX Electrical Design Suggestions* and the *NLX Motherboard Specification* for details.

2.3 ISA Connector Slots (C in Figure 1)

These connectors are used to allow the user to increase system functionality by using ISA add-in cards.

All terminating resistors except those needed for IDEA_DPS and IDEB_DPS are on the motherboard. The pullup resistor to VCC for the above signals should be greater than 1K Ohm. No other special care is needed other than standard routing practices. Refer to *NLX Electrical Design Suggestions* and the *NLX Motherboard Specification* for details.

2.4 Audio Connector Header (D in Figure 1)



Telephony

Pin #	Signal Name	Type	I/O*	Description	Signal Type
J16-1	MDM_SPKR	AUDIO	I	Analog mono input signal from telephony device to the audio amplifier hybrid or motherboard	Analog 1V RMS
J16-2	GROUND	PWR	NA	Digital (main motherboard) ground plane	NA
J16-3	GROUND	PWR	NA	Digital (main motherboard) ground plane	NA
J16-4	MODEM_MIC	AUDIO	O	Amplified microphone mono signal from amplifier hybrid or motherboard	Analog 1V RMS

* I/O Column: relative to the riser, "O" = output, from riser to telephony header. "I" = input, from telephony header to riser .

Mic In

Pin #	Signal Name	Type	I/O*	Description	Signal Type
J13-1	+12V	PWR	NA	Power.	NA
J13-2	MIC	AUDIO	I	Preamplified microphone input from microphone jack on front panel.	Analog 1V RMS
J13-3	BIAS	AUDIO	I	Reference voltage from microphone amplification circuitry on the hybrid amplifier.	NA
J13-4	MIC ENA	AUDIO	I	This signal indicates if headphones have been plugged into the front panel MIC_IN jack. The signal is connected to one of the wipers on the MIC_IN jack. It is pulled LOW through a pulldown on the motherboard (typically 100k). <ul style="list-style-type: none"> Signal is HIGH when the microphone is plugged in. Signal is LOW when it is not. 	TTL

* I/O Column: relative to the riser, "O" = output, from riser to the header. "I" = input, from header to riser.

CD In

Pin #	Signal Name	Type	I/O*	Description	Signal Type
J15-1	CD_IN_LT	AUDIO	I	CDROM line in left.	Analog 1V RMS
J15-2	CD_GND	PWR	N/A	Isolated CDROM Ground.	N/A
J15-3	CD_GND	PWR	N/A	Isolated CDROM Ground.	N/A
J15-4	CD_IN_RT	AUDIO	I	CDROM line in left.	Analog 1V RMS

* I/O Column: relative to the riser, "O" = output, from riser to the header. "I" = input, from header to riser.

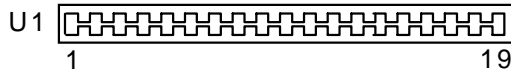
Continued

Audio Connector (D in Figure 1) (continued) Headphone

Pin #	Signal Name	Type	I/O*	Description	Signal Type
J14-1	OUTB	AUDIO	O	Analog line out left signal from the hybrid amplifier to the headphone jack.	Analog 1V RMS
J14-2	AGND	PWR	NA	Low pass filtered ground for audio circuitry.	NA
J14-3	FP_SPKR_EN	AUDIO	I	This signal indicates if headphones have been plugged into the front panel LINE_OUT jack. The signal is connected to one of the wipers on the audio jack. It is pulled low through a pulldown on the motherboard (typically 100k). <ul style="list-style-type: none"> • Signal is HIGH when the headphones are plugged in. • Signal is LOW when they are not 	TTL
J14-4	OUTA	AUDIO	O	Analog line out right signal from the hybrid amplifier to the headphone jack.	Analog 1V RMS

* I/O Column: relative to the riser, "O" = output, from riser to the header. "I" = input, from header to riser.

2.5 Hybrid Audio Connector (E in Figure 1)



This connector is designed to accept a hybrid audio circuit. The hybrid circuit is an amplifier that is able to drive the signals required for MIC, CD_IN, TELEPHONY, and HEADPHONES to the front panel connectors.

NOTE

Third-party riser card suppliers, such as Dytronics Inc. or other suppliers listed on the NLX website (www.teleport.com/~nlx), may have patents covering hybrid audio circuit technology.

2.6 Optional 2x13 Analog Audio (F in Figure 1)

This connector is needed if audio is supported on the riser. If the audio hybrid connector is on the riser, it is strongly recommended that this connector also be placed on the riser.

NOTE

Maximum allowed connector tilt is 0.010 inches from the plane of the riser card for both the short and long axis. Excessive tilts could cause board insertion difficulties and damages. See Figure 2.

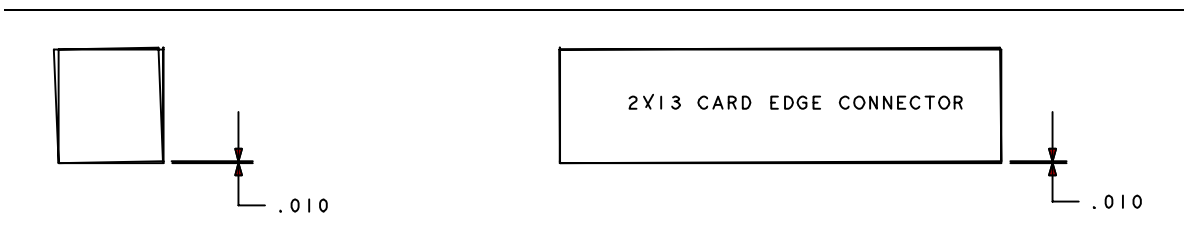
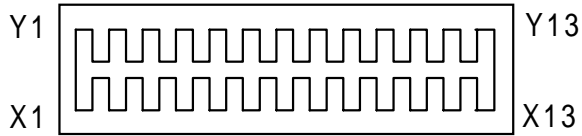


Figure 2: Connector Tilts for 2X13 Connector



Optional 2x13 Analog Audio, Section 1

Pin #	Signal Name	Type	I/O*	Description	Signal Type
X1	CD_INLT	AUDIO	I	CDROM line in left.	Analog 1V RMS
X2	AGND	PWR	NA	Low pass filtered ground for audio circuitry on the riser.	NA
X3	MIC_IN	AUDIO	I	Preamplified microphone input. Preamp circuitry to reside on riser or in microphone.	Analog 1V RMS
X4	LINE_OUT_LT	AUDIO	O	Analog line out left.	Analog 1V RMS
X5	FP_SPKR_EN	AUDIO	I	This signal indicates if headphones have been plugged into the front panel LINE_OUT jack. The signal is connected to one of the wipers on the audio jack. It is pulled low through a pulldown on the motherboard. <ul style="list-style-type: none"> • Signal is HIGH when the headphones are plugged in. • Signal LOW when they are not. 	TTL
X6	VOL_DN#	AUDIO	I	Connects to Volume Down switch on front panel, appropriate pullup resistor on the motherboard. The motherboard provides debounce protection and a pullup resistor.	TTL
X7	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
X8	SMI	SYS	I	System Management Interrupt that is an input to the motherboard.	Open Drain
X9	RESERVED	RES	NA	Reserved.	NA
X10	RESERVED	RES	NA	Reserved.	NA
X11	RESERVED	RES	NA	Reserved.	NA
X12	AGND	PWR	NA	Low pass filtered ground for audio circuitry on the riser.	NA
X13	MODEM_MIC	AUDIO	O	Preamplified microphone mono output signal from motherboard to telephony device.	Analog 1V RMS

* I/O Column: relative to the motherboard, "O" = output, from motherboard to riser. "I" = input, from riser to motherboard

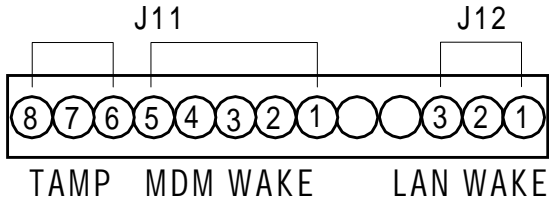
Optional 2x13 Analog Audio, Section 2

Pin #	Signal Name	Type	I/O*	Description	Signal Type
Y1	CD_IN_RT	AUDIO	I	CD ROM line in right.	Analog 1V RMS
Y2	CD_GND	PWR	I	Isolated CDROM ground.	NA
Y3	AVCC	PWR	O	Clean power from the motherboard to audio circuitry on the NLX riser; could be an isolated power source. 1.5Ampere maximum limitation because of the connector / gold finger interface.	5-9V DC
Y4	LINE_OUT_RT	AUDIO	O	Analog line out right.	Analog 1V RMS
Y5	FP_MIC_EN	AUDIO	I	This signal indicates if headphones have been plugged into the front panel MIC_IN jack. The signal is connected to one of the wipers on the MIC_IN jack. The signal is pulled LOW through a pulldown on the motherboard (typically 100k). <ul style="list-style-type: none"> Signal is LOW when the microphone is plugged in. Signal is HIGH when it is not. 	TTL
Y6	VOL_UP#	AUDIO	I	Connects to Volume Up switch on the front panel, appropriate pullup resistor on the motherboard. The motherboard provides debounce and a pullup resistor.	TTL
Y7	AC_RST#	AC'97	O	AC'97 master H/W reset.	TTL
Y8	AC_SD_IN	AC'97	I	Serial, time division, multiplexed, AC'97 input stream to the motherboard from the codec on the riser (output from the codec).	TTL
Y9	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
Y10	AC_SD_OUT	AC'97	O	Serial, time division, multiplexed, AC'97 output from the motherboard to the codec on the riser (input to codec).	TTL
Y11	AC_SYNCH	AC'97	O	48KHz fixed rate sample synch signal from the motherboard to the codec on the riser.	TTL
Y12	AC_BIT_CLK	AC'97	I	12.288 MHz serial data clock.	TTL
Y13	MODEM_SPKR	AUDIO	O	Analog mono output signal from the telephony device to the motherboard.	Analog 1V RMS

* I/O Column: relative to the motherboard, "O" = output, from motherboard to riser. "I" = input, from riser to motherboard

2.7 Feature Connector Header (J11 and J12) (G in Figure 1)

To enable the tamper detect functionality of the riser, a jumper is required across pins 7 and 8 of J11.



Pin #	Signal Name	Type	I/O*	Description	Signal Type
J11-1	NC	N/A	N/A	No Connection.	N/A
J11-2	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
J11-3	MDM_WAKE#		I	A high to low transition of this signal will cause the system to “wake up.” Activity may be initiated by a pulse train signal.	5V TTL
J11-4	NC	N/A	N/A	No Connection.	N/A
J11-5	5VSB	PWR	N/A	N/A	N/A
J11-6	NC	N/A	N/A	No Connection.	N/A
J11-7	TAMP_DET#	MISC	I	This signal indicates the state of an intrusion sensing device (switch or equivalent). This signal is low when the chassis lid is open—indicating an intrusion. The signal should be open when the chassis lid is closed. Debounce and associated circuitry are located on the motherboard.	Open Drain
J11-8	TAMPDET_EN	MISC	I	Used to enable tamper detect. Pins 7 and 8 must be shorted for the tamper detect switch to work.	5V TTL
J12-1	5VSB	PWR	I	N/A	N/A
J12-2	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
J12-3	LAN_WAKE	MISC	I	This signal, when pulsed high for at least 50ms, will request a system “wake-up.” When power is applied to the system, this signal must remain low.	5V TTL

* I/O Column: relative to the riser, “O” = output, from riser to header. “I” = input, from header to riser

2.8 Motherboard Edge Connector (H in Figure 1)

The NLX motherboard connects to the riser with a 340 pin (2x170) pin, 1mm pitch, card edge connector. The pinout for the riser interconnect and other information is contained in the *NLX Motherboard Specification*.

NOTE

Maximum allowed connector tilt is 0.010 inches from the plane of the riser card for both the short and long axis. Excessive tilts could cause board insertion difficulties and damages. See Figure 3.

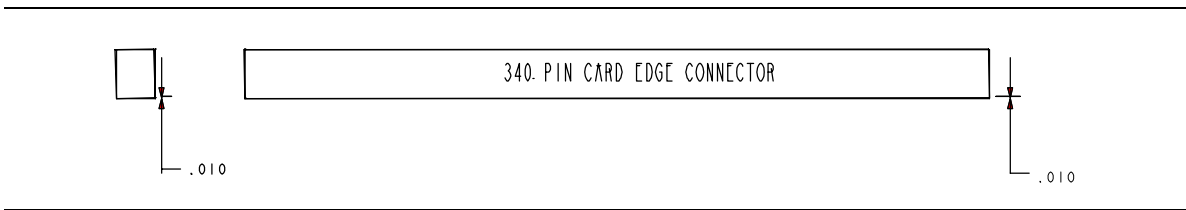


Figure 3: Connector Tilts for 340-pin Connector

2.9 IDE Connector (I in Figure 1)

This is an IDE 2 x 20-pin shrouded connector with independent I/O channel support for ATA/ATAPI/DVD drives. Refer to the *NLX Motherboard Specification*.

2.10 IDE Connector (J in Figure 1)

This is an IDE 2 x 20-pin shrouded connector with independent I/O channel support for ATA/ATAPI/DVD drives. Refer to the *NLX Motherboard Specification*.

2.11 Floppy Connector (K in Figure 1)

This is a 2 x 17-pin shrouded floppy connector. The pullup resistors required for the active low floppy signals are required to be on the riser. The value of these resistors should be less than 1k Ohm. Refer to the *NLX Electrical Design Suggestions* and the *NLX Motherboard Specification* for details.

To eliminate special floppy cables, a change to the pin layout was implemented. A standard 34-pin flat ribbon cable must be used instead of the traditional twisted floppy ribbon cable:

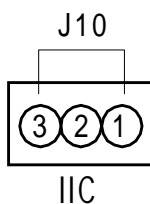
FDME0# from pin 10 to pin 16 (NLX A142)	FDS1# from pin 12 to pin 14 (NLX A140)
FDS0# from pin 14 to pin 12 (NLX A141)	FDME1# from pin 16 to pin 10 (NLX A144)

2.12 Serial Bus Connector (J10) (L in Figure 1)

This header allows a serial bus to be cabled from the motherboard to devices within the chassis.

NOTE

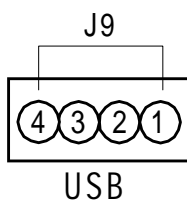
The NLX Motherboard Specification Version 1.2 reserves EEPROM binary device address 101000 for future riser configuration initiatives. However, because of conflict with certain DIMMs, an ECR to the 1.2 specification instead reserves EEPROM binary address 1010111 for the same initiative.



Pin #	Signal Name	Type	I/O*	Description	Signal Type
J10-1	SDA	MISC	I/O	Serial data signal.	5V TTL
J10-2	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
J10-3	SCL	MISC	O	Serial clock signal.	5V TTL

* I/O Column: relative to the riser, "O" = output, from riser to header. "I" = input, from header to riser

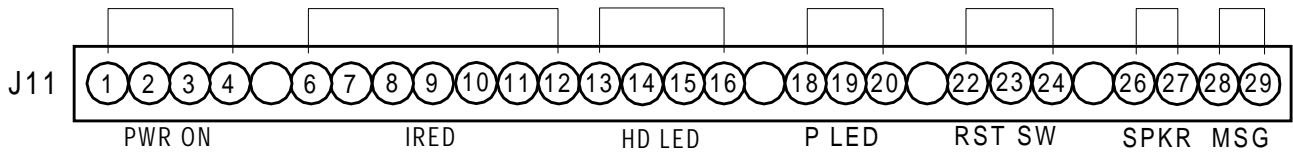
2.13 USB—Universal Serial Bus (J9) (M in Figure 1)



Pin #	Signal Name	Type	I/O*	Description	Signal Type
J9-1	USB1/3_OC#	MISC	I	This signal is used to monitor the status of the USB power supply lines. The riser contains the pullup resistors. <ul style="list-style-type: none"> Signal is low when an overcurrent condition exists on the USB power supply line. Signal is high during normal operation. 	5V TTL
J9-2	USB1/3_N	MISC	I/O	Universal Serial Bus Port— this signal pair comprises the differential data signal for a USB port. Refer to USB specifications for more information.	Per USB Spec
J9-3	USB1/3_P	MISC	I/O	Universal Serial Bus Port— this signal pair comprises the differential data signal for a USB port. Refer to USB specifications for more information.	Per USB Spec
J9-4	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA

* I/O Column: relative to the riser, "O" = output, from riser to header. "I" = input, from header to riser

2.14 Front Panel Connector (N in Figure 1)



Pin #	Signal Name	Type	I/O*	Description	Signal Type
J11-1	SOFT_ON/OFF#	PWR	I	System power on/off request power signal. The motherboard provides debounce protection and pullup resistor. <ul style="list-style-type: none"> In an "off" state, a low level pulse of at least 16ms indicates a switch on request. In an "on" state, a low level pulse of at least 16ms indicates a switch off request. 	Open drain Motherboard specific
J11-2	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
J11-3	FP_SLEEP	MISC	I	Front Panel Sleep—This signal is driven from a front panel button to request a system level "sleep mode." The motherboard provides debounce and pulldown resistor. This signal is active high.	5V TTL
J11-4	+5V	PWR	N/A	Power.	N/A
J11-5	NC	N/A	N/A	No Connection.	N/A
J11-6	+5V	PWR	N/A	Power.	N/A
J11-7	IRSL2	MISC	O	Signals control & configure the infrared transceiver module.	5V TTL
J11-8	IRRX	MISC	I	Infrared serial input data.	5V TTL
J11-9	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
J11-10	IRTX	MISC	O	Infrared serial output data.	5V TTL
J11-11	IRSL0	MISC	O	Signals control & configure the infrared transceiver module.	5V TTL
J11-12	IRSL1	MISC	O	Signals control & configure the infrared transceiver module.	5V TTL
J11-13	+5V	PWR	N/A	Power.	N/A
J11-14	NC	N/A	N/A	No Connection.	N/A
J11-15	HA#	MISC	O	Buffered signal from hard drive to indicate that a hard drive access is occurring.	
J11-16	+5V	PWR	N/A	Power.	N/A
J11-17	NC	N/A	N/A	No Connection.	N/A
J11-18	PWRLED#		O	Control signal for system power LED. A current limiting series resistor (typ. Value 330ohm) is located on the riser. <ul style="list-style-type: none"> Low level indicates the system is in a power-on state. High level indicates a managed state. 	5V TTL
J11-19	NC	N/A	N/A	No Connection.	N/A
J11-20	+5V	PWR	N/A	Power.	N/A
J11-21	NC	N/A	N/A	No Connection.	N/A
J11-22	GROUND	PWR	NA	Digital (main motherboard) ground plane.	N/A

Continued

Front Panel Connector (N in Figure 1) (continued)

Pin #	Signal Name	Type	I/O*	Description	Signal Type
J11-23	FPRST#		I	This signal is driven from a front panel button to request a system level reset. The motherboard provides debounce and pullup resistor. This signal is active low.	Open Drain
J11-24	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
J11-25	NC	N/A	N/A	No Connection.	N/A
J11-26	GROUND	PWR	NA	Digital (main motherboard) ground plane.	NA
J11-27	PCSPKR_LFT	AUDIO	O	Speaker left channel output.	Analog
J11-28	+5V	PWR	N/A	Power.	N/A
J11-29	MSG_WAIT_LED#	MISC	O	Control signal for telephony device to indicate a message is waiting. A current limiting resistor (typ. value 330 Ohm) is located on the riser. <ul style="list-style-type: none"> • Low level turns the LED on. • High level turns the LED off. 	5V TTL

* I/O Column: relative to the riser, "O" = output, from riser to header. "I" = input, from header to riser

2.15 Fan Control Jumper Block (O in Figure 1)

This jumper provides support for a second constant-speed chassis fan. Refer to the *NLX Electrical Design Suggestions* for details.

2.16 Power Supply Connector (P in Figure 1)

When used with a power supply that supports remote on/off, the motherboard can turn off the system power through software control. Pin 14 of the power supply connector lets the motherboard recognize a power supply that supports this “soft-off” feature; the power supply must tie pin 14 to ground.

To enable soft-off control in software, Advanced Power Management (APM) must be enabled in the setup program and in the operating system. When the BIOS receives the correct APM command from the operating systems, the BIOS turns off power to the system. With soft-off enabled, if power is interrupted by a power outage or a disconnected power cord, when the system resumes, the system returns to the on or off state it was in before power was interrupted.

Pin #	Signal Name
1	+3.3V
2	+3.3V
3	Ground
4	+5V
5	Ground
6	+5V
7	Ground
8	PWRGD (Power Good)
9	+5VSB (Standby for Real Time Clock)
10	+12V

Pin #	Signal Name
11	+3.3V
12	-12V
13	Ground
14	PS-ON# (Power Supply remote on/off)
15	Ground
16	Ground
17	Ground
18	-5V
19	+5V
20	+5V

2.17 Auxiliary Power Connector (Q in Figure 1)

Although the generic riser does not support 1394-1995 Firewire, a six-pin power connector is in place at this moment to be used as control for the NLX power supply fan.

Pin #	Signal Name
1	FAN_TACH2
2	FAN_CTL
3	3.3SENSE

Pin #	Signal Name
4	1394GND
5	1394PWR
6	RESERVED

2.18 Standard Riser Headers

2.18.1 Front Panel Connector

All physical controls should be accessible from the front panel. The front panel will be connected to the riser card via cable connection.

- On/Off control
- Reset Control
- Power/HDD LEDs

A dual-color LED for the power LED should be employed so that sleep mode can be indicated.

The design of the riser card and chassis should allow for riser card features to be accessible at the front panel (features are on the riser card). The general concept of interaction for the riser and front panel features is depicted in the *NLX Motherboard Specification*.