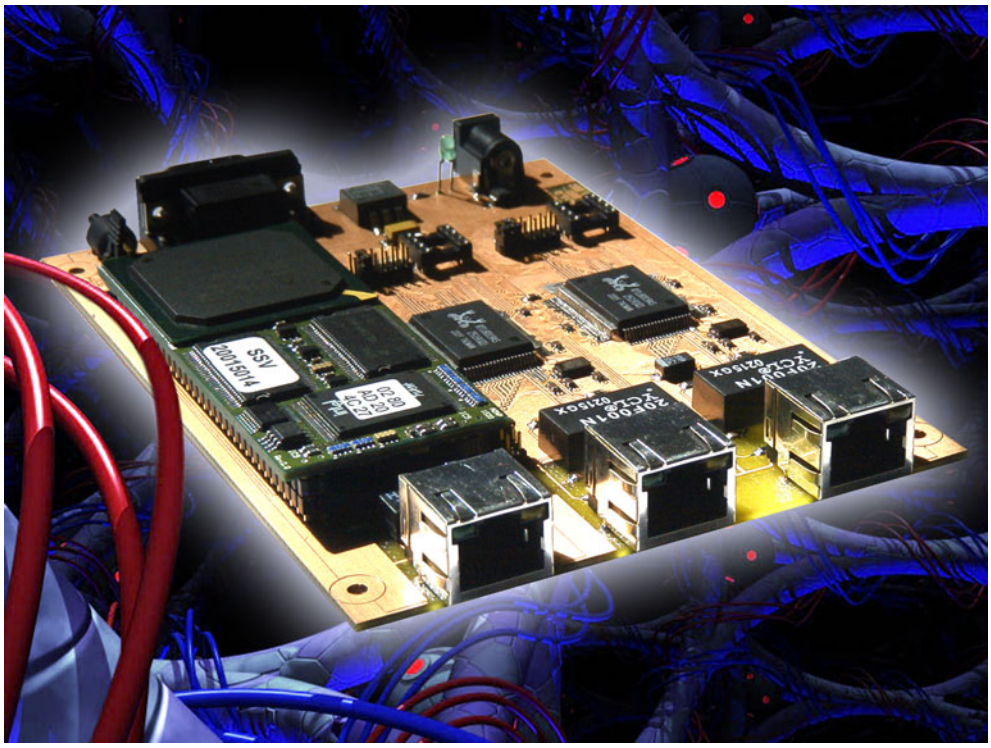
Multi-LAN Carrier Board CAB/LAN1



User Manual

Content

1 Introduction

The focus of the LAN Carrier Board is on safe communication via Ethernet technology. The board offers therefore three LAN-ports, which are ready to go. One 10/100Mbps LAN-port and two 10Mbps ports are available to integrate the LAN Carrier Board into many industrial solutions. Of course the purpose of this board is not limited only to communicating via Ethernet. With the modular DIL/NetPC ADNP/1520 there are plenty of ideas to realize.

This document describes how to start with the LAN Carrier Board. For further information about the individual components of this product you may follow the links from our website at: *http://www.dilnetpc.com*

Our Website contains a lot of technical information, which will be updated in regular periods.

1.1 Conventions Used in this Document

Convention	Usage
italic	Filenames, as well as Internet addresses such as www.dilnetpc.com
italic	User inputs, command lines and pathnames
bold	New terms
`monospace text`	Program code

Table 1-1: Convention usage

1.2 Checklist

Compare the content of your LAN Carrier Board package with the standard checklist below. If any item is missing or appears to be damaged, please contact SSV Embedded Systems.

Standard Items

- LAN Carrier Board
- DIL/NetPC ADNP/1520
- Null modem cable
- Power supply
- Power cable
- User manual
- Support CD-ROM

1.3 Main Features

LAN Carrier Board

- 128-pin QIL socket for one DIL/NetPC (like the ADNP/1520)
- One 10/100Base-T Ethernet Interface
- Two 10Base-T Ethernet Interfaces
- RS232 Serial Interface (COM1)
- Power LED
- Ethernet TX/RX-LEDs
- One Reset Switch
- 5VDC Power Input Connector
- Size 139x101mm

DIL/NetPC ADNP/1520

- AMD™ SC520 CPU with 133MHz Clock Speed and FPU
- 32/64Mbytes SDRAM Memory
- 16Mbytes Flash Memory
- 10/100Mbps Ethernet Interface
- Real Time Clock
- IDE Support
- Two 16C550 UART Serial Ports
- 20-bit General Purpose High-Speed Parallel I/O
- 7 Interrupt Inputs, 4 Chip Select Outputs
- In-System Programming Features
- 128-pin QIL connector
- 3.3 Volt Low Power Design, Single 3.3 VDC Supply
- Size 82x36mm

2 Board Layout

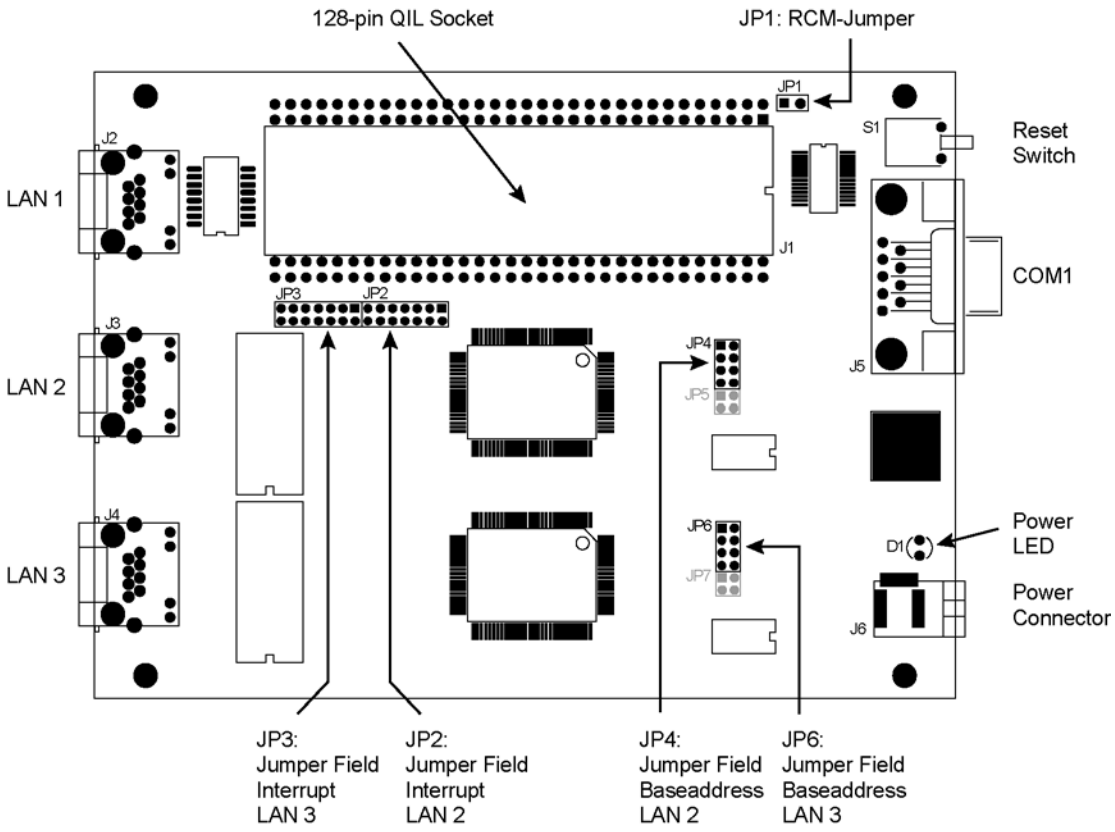


Figure 2-1: Top view of Multi-LAN Carrier Board

3 Board Components

3.1 128-pin QIL socket

The QIL socket with 128 pins can hold one DIL/NetPC like the ADNP/1520. Please refer to chapter 4.1 how to mount your DIL/NetPC safely. If you are interested in pin signals please refer to the appendix.

3.2 10/100Mbps Ethernet (LAN 1)

The ADNP/1520 is using an SMSC™ LAN91C111 chip that allows Ethernet connectivity with a speed up to 100Mbps. The RJ45 Ethernet interface LAN 1 on the Multi-LAN Carrier Board is a connection over a transformer to the 128 QIL interface pins, which are connected to the SMSC LAN controller on the ADNP/1520.

3.3 10Mbps Ethernet (LAN 2 and LAN 3)

Next to the LAN 1 port there are two 10Mbps Ethernet ports available, which are called LAN 2 and LAN 3. These ports have standard RJ45 interfaces. LAN 2 and LAN 3 are not provided through your ADNP/1520. Instead they come along with two Realtek LAN controller chips onboard. Both LAN-ports can be configured separately via jumper settings. This concerns the base addresses and interrupts.

3.4 COM1 Serial Interface

The Multi-LAN Carrier Board is equipped with one serial COM interface: COM1 (9-pin Sub-D male connector). COM1 is used for basic communication with the Carrier Board. It follows the RS232 protocol.

3.5 Onboard Jumper

JP1: RCM jumper for terminal mode
JP2: Jumper field for LAN 2 interrupt
JP3: Jumper field for LAN 3 interrupt
JP4: Jumper field for LAN 2 base address
JP5: Reserved. Please do not set.
JP6: Jumper field for LAN 3 base address
JP7: Reserved. Please do not set.

3.6 Power LED

Next to the power connector the Multi-LAN Carrier Board has got a green power LED, marked as D1 in figure 2-1 (see above). This LED shines permanently when the board is provided with 5V DC voltage through your power supply.

3.7 Reset Button

Press the reset button if the system hangs or you need to restart it. Pressing the reset button will only restart the ADNP/1520. To reset connected devices, turn off power from the system.

3.8 Power Connector

Caution: Providing the Multi-LAN Carrier Board with a voltage higher than the regular 5V DC ±10% could resolve in damaged board components.

The Multi-LAN Carrier Board needs a supply voltage of 5V DC to work. In your carrier board package you will find a plug-in power supply unit to provide the system with the necessary power.

4 The Multi-LAN Carrier Board in use

4.1 Mounting the ADNP/1520 DIL/NetPC

Caution: Too high pressure on the DIL/NetPC can resolve in damaged components and/or in bent or broken pins.

To mount the ADNP/1520 on the Multi-LAN Carrier Board put it carefully on the 128-pin QIL socket. Please note, that the ADNP/1520 is positioned in the right way as shown in figure 4-1. After that, press the ADNP/1520 carefully down, so that the QIL socket fixes it.

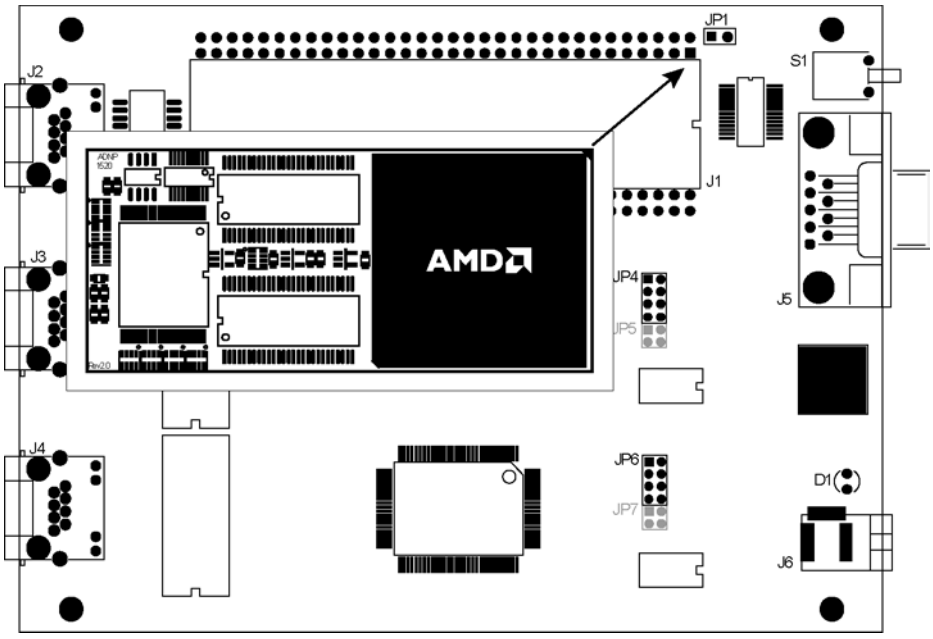


Figure 4-1: Mounting the ADNP/1520 DIL/NetPC

4.2 Providing with Power

Caution: Providing the Carrier Board with a voltage higher than the regular 5V DC ±10% could resolve in damaged board components.

Caution: SSV recommends to power off the Multi-LAN Carrier Board every time you alter or modify board configurations like jumper settings or cable connections.

The Multi-LAN Carrier Board needs a supply voltage of 5V DC to work. In your carrier board package you will find a plug-in power supply unit to provide the system with the necessary power.

4.3 RCM Jumper

Use this jumper to activate the RCM mode of the ADNP/1520. The RCM mode (Remote Console Mode) offers the possibility to control the ADNP/1520 via a terminal program. To activate the RCM mode place a jumper cap on both pins of the RCM jumper, so that it is closed. If you remove the jumper cap, or place the jumper cap on just one pin, the jumper is open and you can not use the RCM mode. If closed you will see some boot messages on the serial port COM1. If the RCM jumper is open, these messages are blocked.

Figure 4-2 shows the exact position of the RCM jumper.

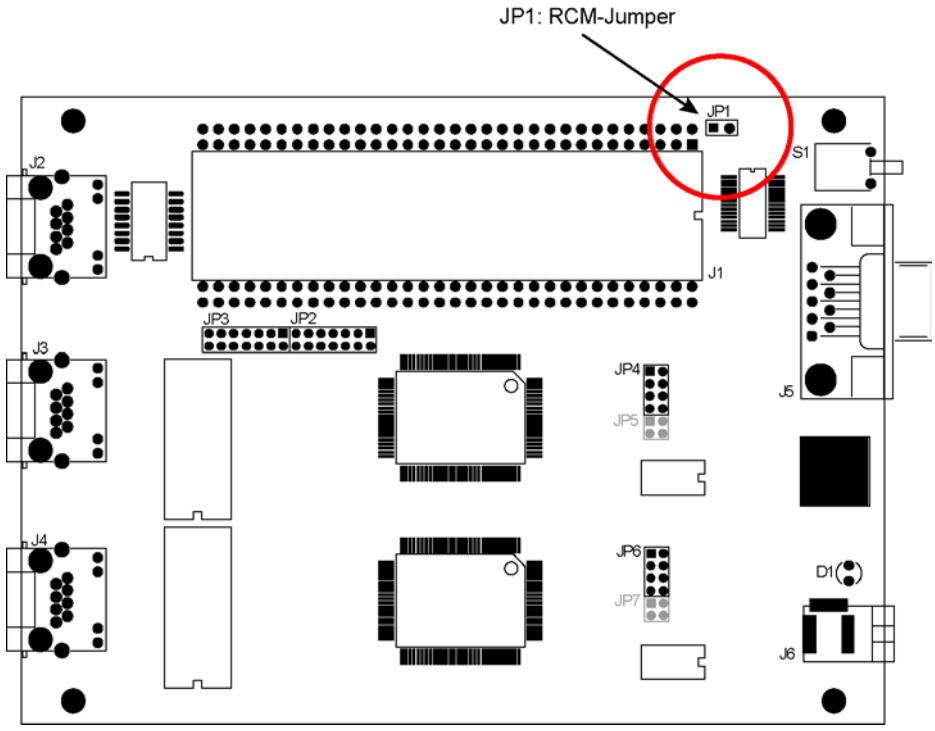
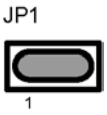
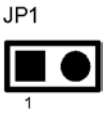


Figure 4-2: RCM jumper

RCM mode enabled



RCM mode disabled



4.4 Reset Button

Press the reset button if the system hangs or you need to restart it. Pressing the reset button will only restart the ADNP/1520. To reset any connected devices turn off power from the system.

4.5 COM1 Serial Link

COM1 is mostly used for basic communication with the carrier board and follows the RS232 protocol. The interface has a 9-pin Sub-D male connector. When using a remote terminal on this port, make sure the RCM jumper is set (see chapter 4.3).

For a basic communication with the Multi-LAN Carrier Board use a null modem cable on port COM1. This cable comes along with your Multi-LAN Carrier Board package. Please connect the Multi-LAN Carrier Board with a COM port of your development system (for example COM1 or COM2) by using this cable.

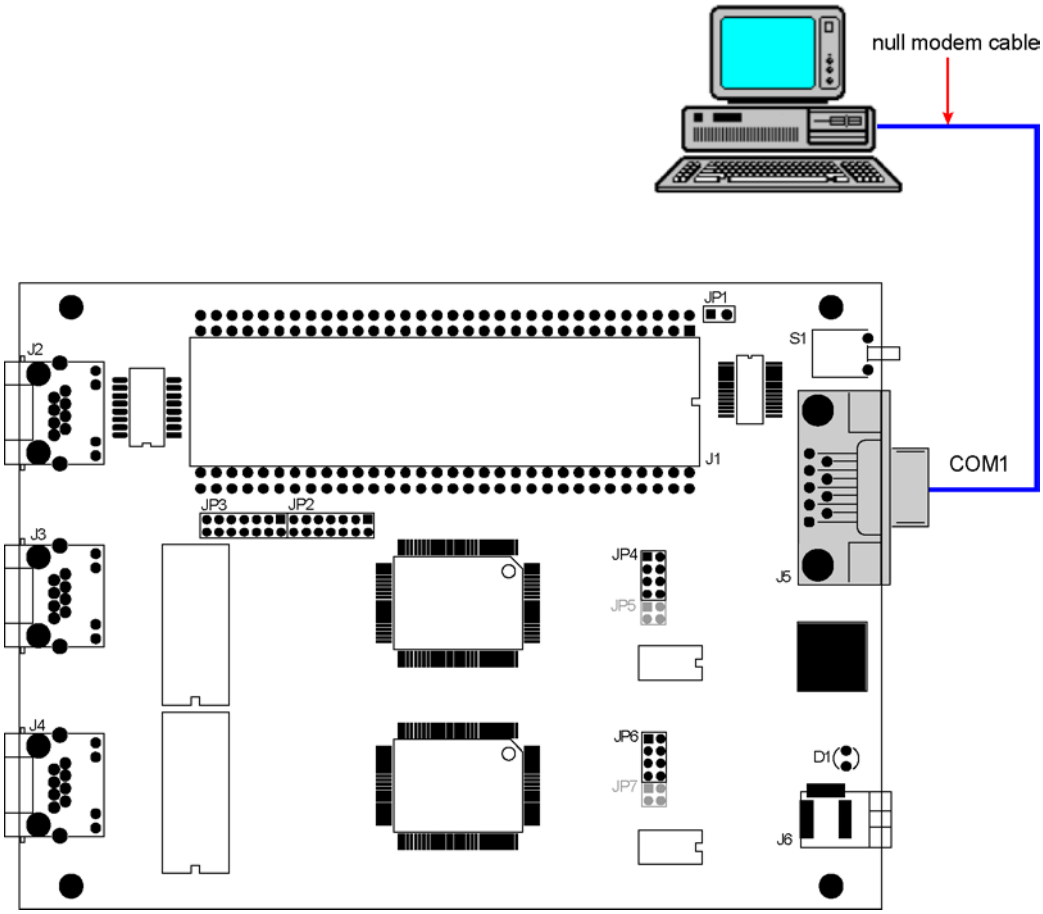


Figure 4-3: Serial link

4.6 Ethernet Links

The Ethernet link on port LAN 1 requires a patch cable that is 100Base-T compliant, i.e. a CAT5 cable. For Ethernet links on ports LAN 2 and 3 the patch cable must be 10Base-T compliant. Furthermore one hub or switch and an Ethernet LAN adapter for your development system is needed. The figures 4-4 and 4-5 show the connections with port LAN 1. Connections to ports LAN 2 and LAN 3 can be made equivalently. Please refer to chapter 4.7 for jumper settings for ports LAN 2 and LAN 3.

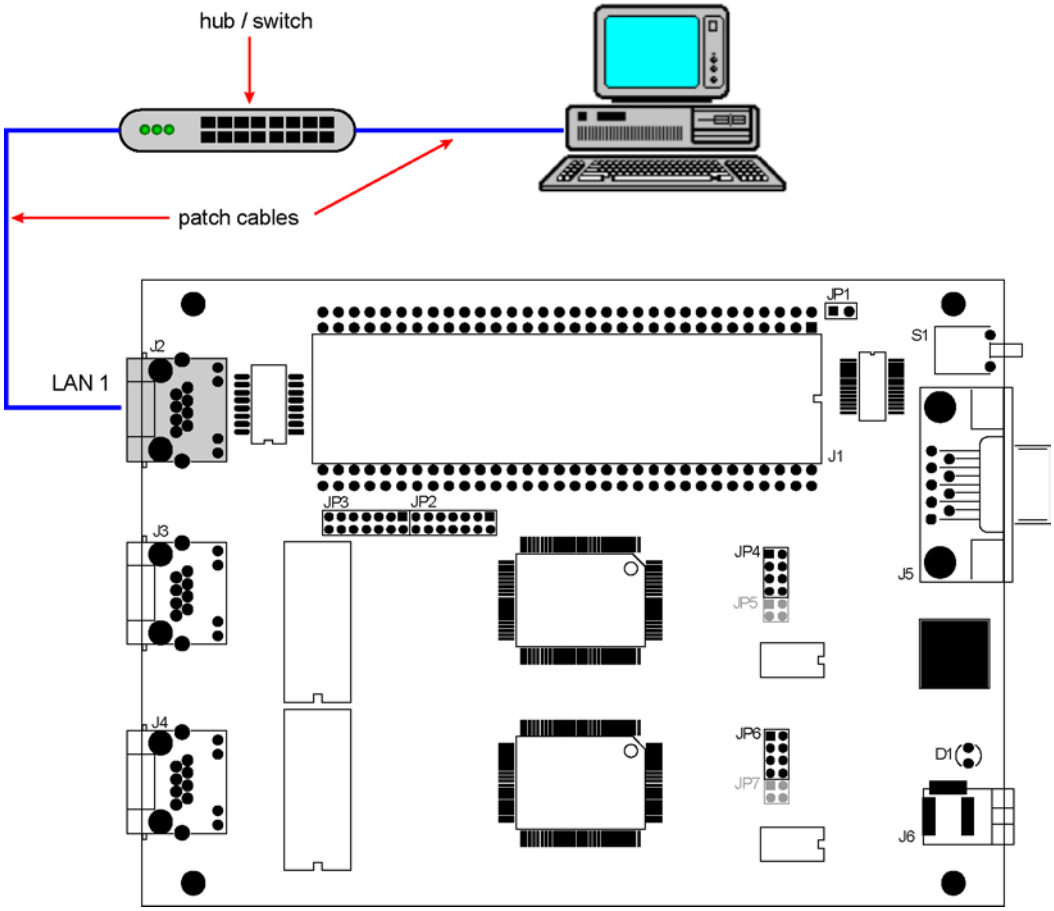


Figure 4-4: Ethernet link on LAN 1 with hub or switch

If you want to connect your development system directly to the Multi-LAN Carrier Board place a crossover cable between these two systems as shown in figure 4-5.

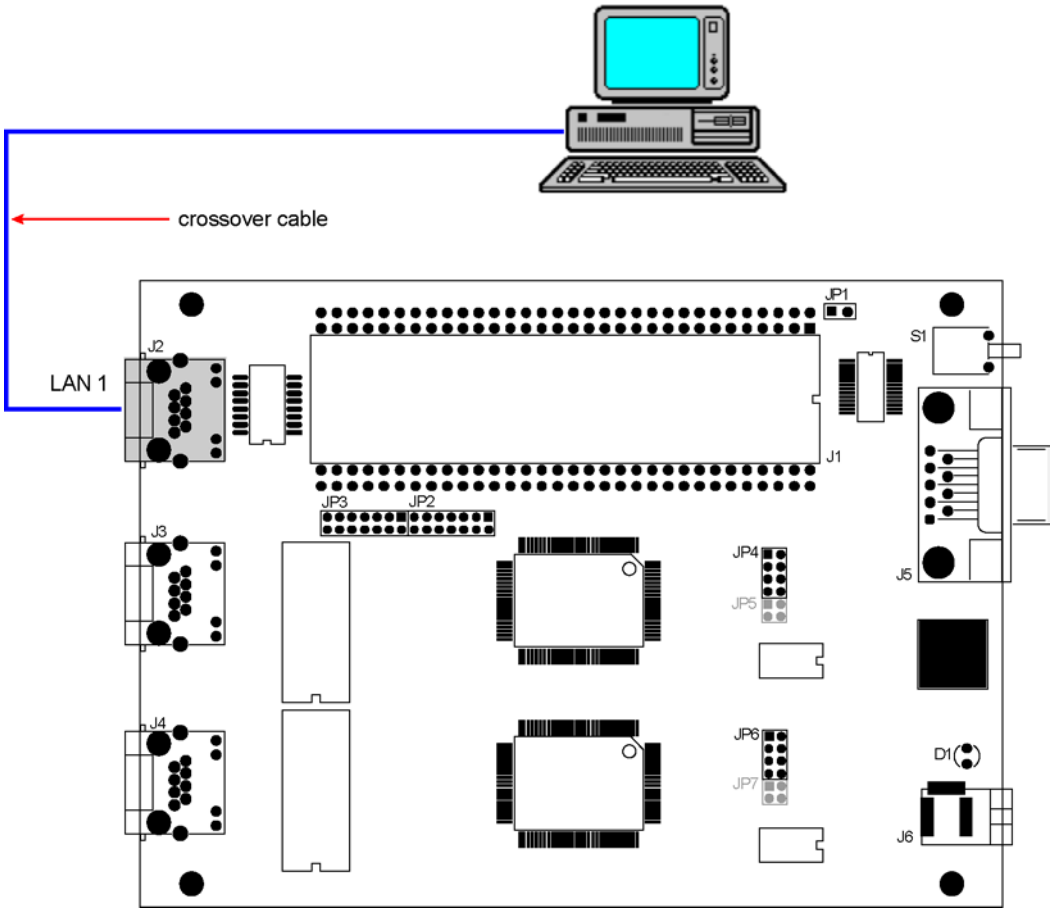


Figure 4-5: Ethernet link on LAN 1 with crossover cable

4.7 Jumper Settings for LAN 2 and LAN 3 Ethernet Ports

4.7.1 Setting the LAN 2 and LAN 3 Interrupt

The interrupts (IRQs) for Ethernet ports LAN 2 and LAN 3 can be set by jumper fields JP2 and JP3. Jumpers at JP2 will set the IRQ for LAN 2, whereas jumpers at JP3 will set the IRQ for LAN 3. The following figure shows where these jumpers are positioned on the Multi-LAN Carrier Board.

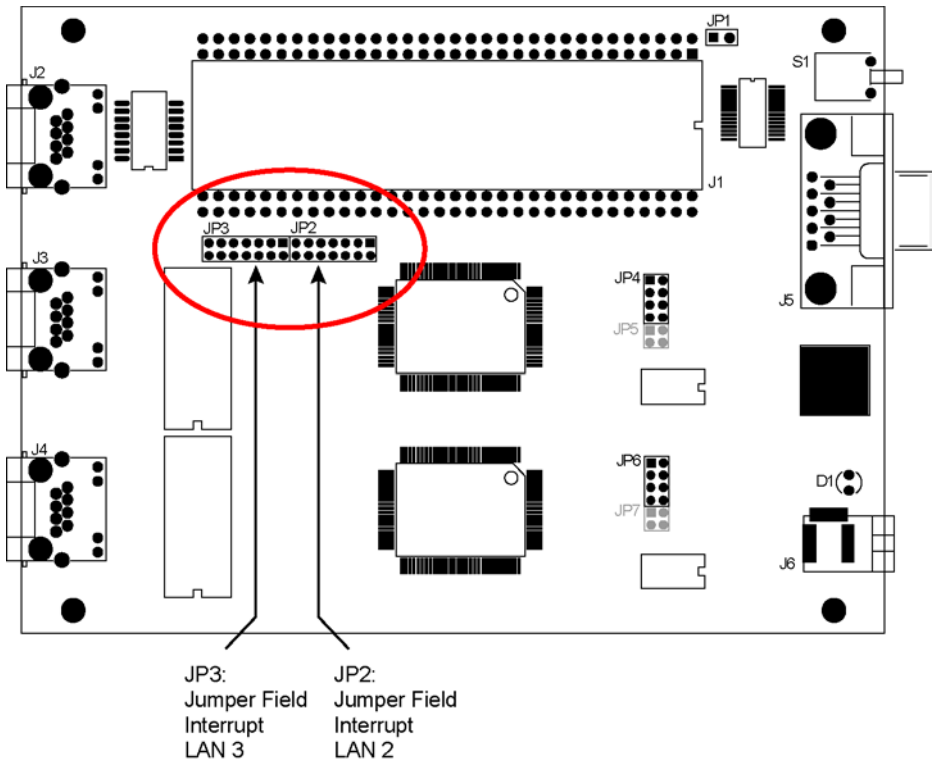
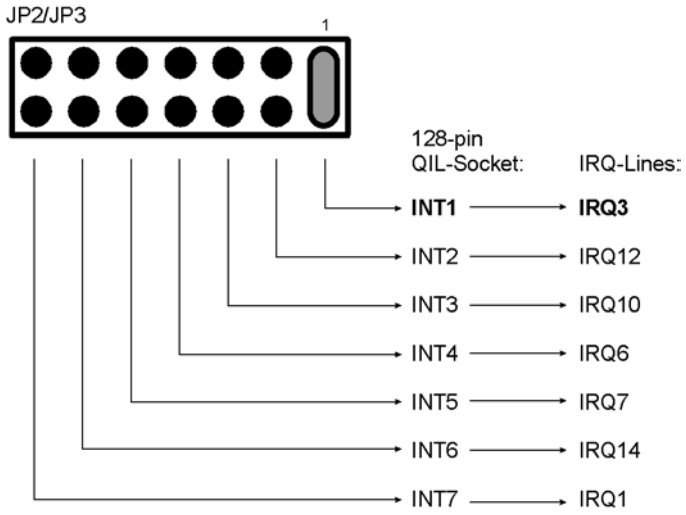


Figure 4-6: Jumper fields for LAN 2 and LAN 3 interrupts

To set the interrupts IRQ1 to IRQ7 place a cap over the appropriate pins as shown in the next figure. IRQ 3 is taken as example. Set only one jumper cap for each jumper field JP2 and JP3.



4.7.2 Setting the LAN 2 and LAN 3 Base address

Two jumper fields JP4 and JP6 are onboard to choose a different base address for LAN 2 or LAN 3.

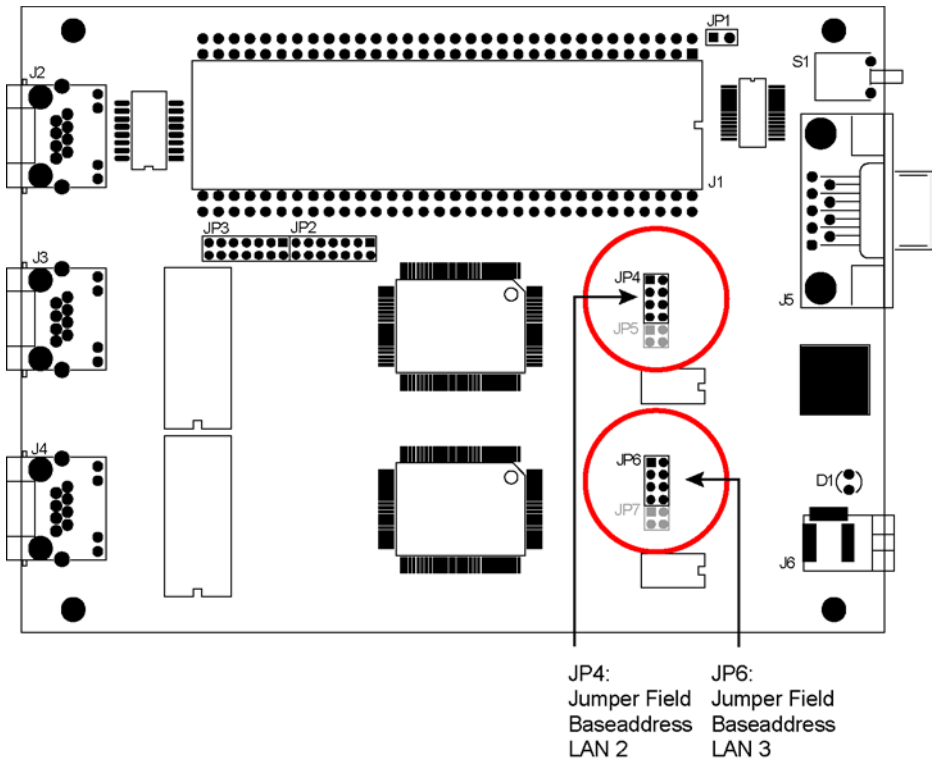


Figure 4-7: Jumper fields for LAN 2 and LAN 3 base addresses

At the time of editing this manual exact jumper positions could not be given. Please contact SSV for further information.

To change the base address for LAN 2 or LAN 3 set jumper fields JP4 and JP6 appropriately.

If no jumper cap is placed over JP4 or JP6 the base address will be #300H. The address room reaches from #300H to #3E0H and from #200H to #2E0H both for LAN 2 and LAN 3.

5 Appendix

The appendices give you more detailed information about the signals on the individual connectors. Table cells marked with NC indicate signals which are not connected.

Appendix 1: Pin Assignment – 128-pin QIL Connector (1st Part)

Pin	Name	Group	Function
1	PA0	PIO	Parallel I/O, Port A, Bit 0*
2	PA1	PIO	Parallel I/O, Port A, Bit 1*
3	PA2	PIO	Parallel I/O, Port A, Bit 2*
4	PA3	PIO	Parallel I/O, Port A, Bit 3*
5	PA4	PIO	Parallel I/O, Port A, Bit 4*
6	PA5	PIO	Parallel I/O, Port A, Bit 5*
7	PA6	PIO	Parallel I/O, Port A, Bit 6*
8	PA7	PIO	Parallel I/O, Port A, Bit 7*
9	PB0	PIO	Parallel I/O, Port B, Bit 0*
10	PB1	PIO	Parallel I/O, Port B, Bit 1*
11	PB2	PIO	Parallel I/O, Port B, Bit 2*
12	PB3	PIO	Parallel I/O, Port B, Bit 3*
13	PB4	PIO	Parallel I/O, Port B, Bit 4*
14	PB5	PIO	Parallel I/O, Port B, Bit 5*
15	PB6	PIO	Parallel I/O, Port B, Bit 6*
16	PB7	PIO	Parallel I/O, Port B, Bit 7*
17	PC0	PIO	Parallel I/O, Port C, Bit 0*
18	PC1	PIO	Parallel I/O, Port C, Bit 1*
19	PC2	PIO	Parallel I/O, Port C, Bit 2*
20	PC3	PIO	Parallel I/O, Port C, Bit 3*
21	RXD1	SIO	COM1 Serial Port, RXD Pin
22	TXD1	SIO	COM1 Serial Port, TXD Pin
23	CTS1	SIO	COM1 Serial Port, CTS Pin
24	RTS1	SIO	COM1 Serial Port, RTS Pin
25	DCD1	SIO	COM1 Serial Port, DCD Pin
26	DSR1	SIO	COM1 Serial Port, DSR Pin
27	DTR1	SIO	COM1 Serial Port, DTR Pin
28	RI1	SIO	COM1 Serial Port, RI Pin
29	RESIN	RESET	Reset Input
30	TX+	LAN	Ethernet Interface, TX+ Pin
31	TX-	LAN	Ethernet Interface, TX- Pin
32	GND	----	Ground

Table A1-1: ADNP/1520 pinout – pin 1 to 32

The PIO pins 1 to 20 are driven by an in-system programmable (ISP) high density PLD (ispMACH256 or similar). It is possible to change the function of these pins over the ADNP/1520 JTAG interface. Please contact our support staff for more information.

Appendix 1: Pin Assignment – 128-pin QIL Connector (2nd Part)

Pin	Name	Group	Function
33	RX+	LAN	Ethernet Interface, RX+ Pin
34	RX-	LAN	Ethernet Interface, RX- Pin
35	RESOUT	RESET	Reset Output
36	VBAT	PSP	SC520 Real Time Clock Battery Input
37	CLKOUT	PSP	Clock Output (Default 1.8432 MHz)
38	TXD2	PSP	COM2 Serial Port, TXD Pin
39	RXD2	PSP	COM2 Serial Port, RXD Pin
40	INT5	PSP	Programmable Interrupt Input 5
41	INT4	PSP	Programmable Interrupt Input 4
42	INT3	PSP	Programmable Interrupt Input 3
43	INT2	PSP	Programmable Interrupt Input 2
44	INT1	PSP	Programmable Interrupt Input 1
45	CS4	PSP	Programmable Chip Select Output 4
46	CS3	PSP	Programmable Chip Select Output
47	CS2	PSP	Programmable Chip Select Output 2
48	CS1	PSP	Programmable Chip Select Output 1
49	IOCHRDY	PSP	I/O Channel Ready
50	IOR	PSP	I/O Read Signal, I/O Expansion Bus
51	IOW	PSP	I/O Write Signal, I/O Expansion Bus
52	SA3	PSP	System Expansion Bus, Address Bit 3
53	SA2	PSP	System Expansion Bus, Address Bit 2
54	SA1	PSP	System Expansion Bus, Address Bit 1
55	SA0	PSP	System Expansion Bus, Address Bit 0
56	SD7	PSP	System Expansion Bus, Data Bit 7
57	SD6	PSP	System Expansion Bus, Data Bit 6
58	SD5	PSP	System Expansion Bus, Data Bit 5
59	SD4	PSP	System Expansion Bus, Data Bit 4
60	SD3	PSP	System Expansion Bus, Data Bit 3
61	SD2	PSP	System Expansion Bus, Data Bit 2
62	SD1	PSP	System Expansion Bus, Data Bit 1
63	SD0	PSP	System Expansion Bus, Data Bit 0
64	Vcc	PSP	3.3 Volt Power Input

Table A1-2: ADNP/1520 pinout – pin 33 to 64

Appendix 1: Pin Assignment –128-pin QIL Connector (3rd Part)

Pin	Name	Group	Function
65	SBHE	PSP	System Byte High Enable, Sys. Exp. Bus
66	IOCS16	PSP	I/O Chip Select 16, Sys. Expansion Bus
67	MEMCS16	PSP	Memory Chip Select 16, Sys. Exp. Bus
68	MEMW	PSP	Memory Write Signal, Sys. Expansion Bus
69	MEMR	PSP	Memory Read Signal, Sys. Expansion Bus
70	BALE	PSP	Bus Address Latch Enable, Sys. Exp. Bus
71	AEN	PSP	Address Enable Signal, Sys. Expansion Bus
72	Reserved	PSP	Reserved. Don't use
73	RCME	PSP	Remote Console Mode Enable
74	Reserved	PSP	Reserved. Don't use
75	Reserved	PSP	Reserved. Don't use
76	Reserved	PSP	Reserved. Don't use
77	Reserved	PSP	Reserved. Don't use
78	Reserved	PSP	Reserved. Don't use
79	Reserved	PSP	Reserved. Don't use
80	Reserved	PSP	Reserved. Don't use
81	Reserved	PSP	Reserved. Don't use
82	Reserved	PSP	Reserved. Don't use
83	Reserved	PSP	Reserved. Don't use
84	Reserved	PSP	Reserved. Don't use
85	INT6	PSP	Programmable Interrupt Input 6
86	INT7	PSP	Programmable Interrupt Input 7
87	IDERES	PSP	IDE Interface Reset Output
88	IDECS0	PSP	IDE Interface Chip Select 0
89	IDECS1	PSP	IDE Interface Chip Select 1
90	Reserved	PSP	Reserved. Don't use
91	Reserved	PSP	Reserved. Don't use
92	Reserved	PSP	Reserved. Don't use
93	Reserved	PSP	Reserved. Don't use
94	Reserved	PSP	Reserved. Don't use
95	Reserved	PSP	Reserved. Don't use
96	GND	---	Ground

Table A1-3: ADNP/1520 pinout – pin 65 to 96

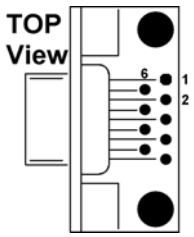
Appendix 1: Pin Assignment –128-pin QIL Connector (4th Part)

Pin	Name	Group	Function
97	LANLED	PSP	LAN Interface Activity LED
98	Reserved	PSP	Reserved. Don't use
99	RSTDRV	PSP	Reset Output, System Expansion Bus
100	SA23	PSP	System Expansion Bus, Address Bit 23
101	SA22	PSP	System Expansion Bus, Address Bit 22
102	SA21	PSP	System Expansion Bus, Address Bit 21
103	SA20	PSP	System Expansion Bus, Address Bit 20
104	SA19	PSP	System Expansion Bus, Address Bit 19
105	SA18	PSP	System Expansion Bus, Address Bit 18
106	SA17	PSP	System Expansion Bus, Address Bit 17
107	SA16	PSP	System Expansion Bus, Address Bit 16
108	SA15	PSP	System Expansion Bus, Address Bit 15
109	SA14	PSP	System Expansion Bus, Address Bit 14
110	SA13	PSP	System Expansion Bus, Address Bit 13
111	SA12	PSP	System Expansion Bus, Address Bit 12
112	SA11	PSP	System Expansion Bus, Address Bit 11
113	SA10	PSP	System Expansion Bus, Address Bit 10
114	SA9	PSP	System Expansion Bus, Address Bit 9
115	SA8	PSP	System Expansion Bus, Address Bit 8
116	SA7	PSP	System Expansion Bus, Address Bit 7
117	SA6	PSP	System Expansion Bus, Address Bit 6
118	SA5	PSP	System Expansion Bus, Address Bit 5
119	SA4	PSP	System Expansion Bus, Address Bit 4
120	SD15	PSP	System Expansion Bus, Data Bit 15
121	SD14	PSP	System Expansion Bus, Data Bit 14
122	SD13	PSP	System Expansion Bus, Data Bit 13
123	SD12	PSP	System Expansion Bus, Data Bit 12
124	SD11	PSP	System Expansion Bus, Data Bit 11
125	SD10	PSP	System Expansion Bus, Data Bit 10
126	SD9	PSP	System Expansion Bus, Data Bit 9
127	SD8	PSP	System Expansion Bus, Data Bit 8
128	Vcc	---	3.3 Volt Power Input

Table A1-4: ADNP/1520 pinout - pin 97 to 128

Appendix 2: Pin Assignment of Components

COM1 Connector (RS232 Only)

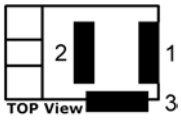


Pin	Signal
1	DCD
2	RXD
3	TXD
4	DTR
5	GND

Pin	Signal
6	DSR
7	RTS
8	CTS
9	RI

Table A2-1: Pinout COM1 (RS232) connector

Power Connector

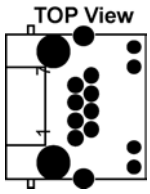


Pin	Name	Signal
1	Vcc	Power In
2	GND	Power-
3	GND	Power

Table A2-2: Pinout power connector

10/100Mbps (10Mbps) Ethernet Connectors

Please note that LAN 2 and LAN 3 have 10Mbps transmission.



Pin	Name	Signal
1	TX+	TXD+
2	TX-	TXD-
3	RX+	RXD+
4	NC	–
5	NC	–
6	RX-	RXD-
7	NC	–
8	NC	–
S1..2	Shield	–

Table A2-3: Pinout 10/100 Mbps Ethernet connectors

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Document History

Revision	Date		Name
1.00	01.09.03	First Version	BKA