NIBA

Network Development System
for **I**nternet **B**ased **A**ppliance

User' Manual

Jan. 2001

aiji **Total Solution Provider for Embedded System**

AIJI System

User's manual

NIBA

JAN. 2001

URL: www.aijisystem.com
www.mculand.com
Tel: + 82-31-223-6611
Fax: + 82-31-223-6613
#301 Dongyang Dexvil Bldg. 1015
Kwonsun-dong kwonsun-gu Swon-city

AIJI System. Co., Ltd.

Contents

INTRODUCTION

NIBA is a vLinux training kit that is suitable for code development and exploration of S3C3510/30 with vLinux. It includes much of the hardware and software required completing your application development. It supports various function related with network, communication such as IIC, UART, IrDA, 10/100 Ethernet, multimedia module such as sound CODEC, storage media such as SMART MEDIA and NAND FLASH memory module. Using the JTAG interface, you can debug the NIBA directly.

System Requirements

- Host computer: IBM compatible PC
- NIBA (Training kit of S3C3510/30)
- DC power supply with the following outputs:
  DC 5V Max. 3A

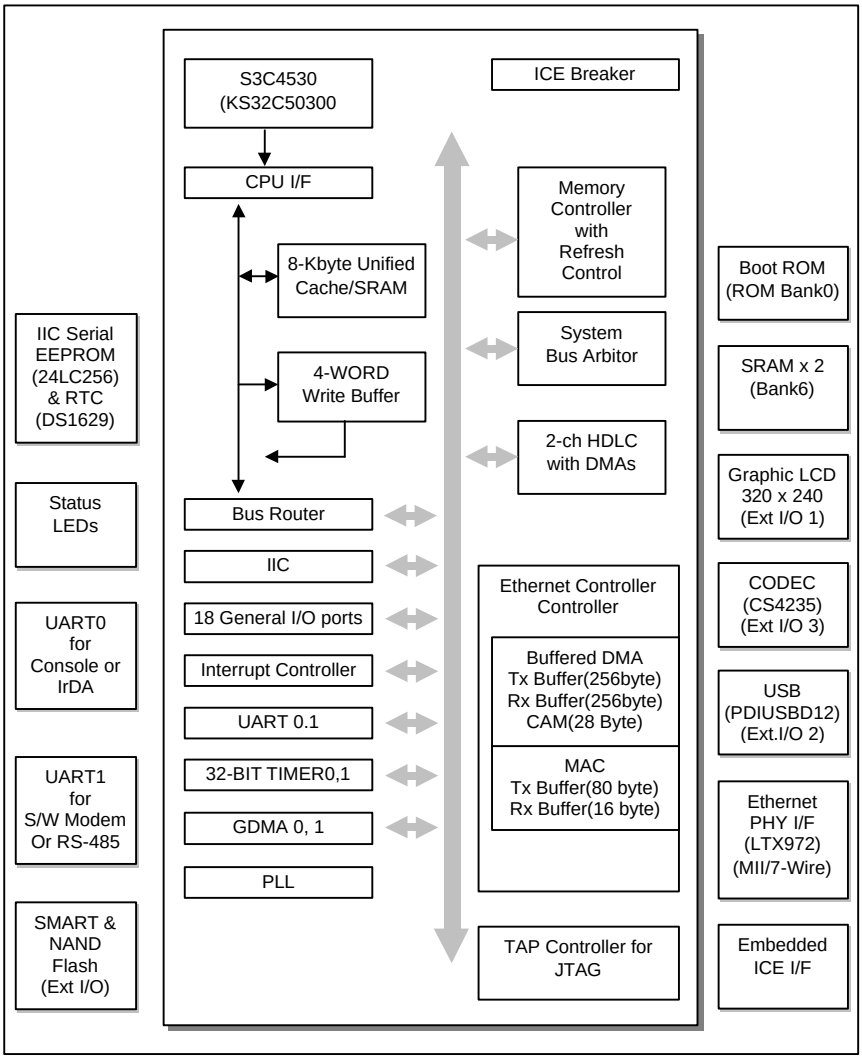

Figure 1. NIBA Block Diagram

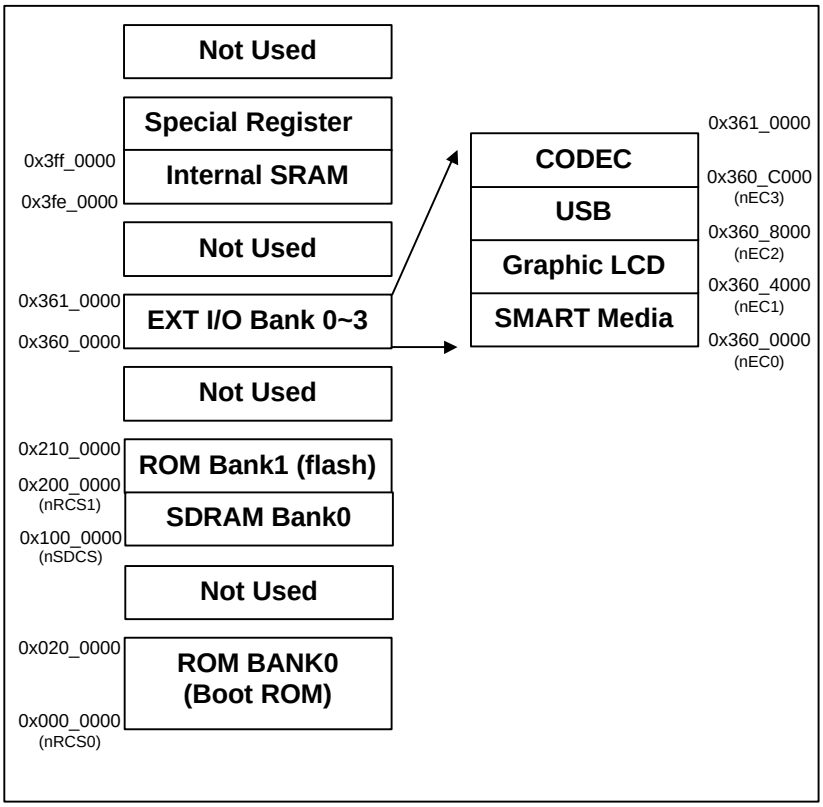

Figure 2. Memory Map

Board Components

The arrangement of major components on the board is shown in Figure 3. The major components include:

A Flash ROM

There is a socket (U6) which accept 512Kbyte size of 8-bit Flash ROM. (default for console and monitor)

User Flash memory (Selectable Boot ROM)

A mounted 48 TSOP type flash, U4, is mounted for save vLinux image. It has 4 Mbyte (16 bit) size.
If you want to use this for boot ROM, J1 should be set to nRCS0 and U6 should be removed. (The default setting is nRCS1)

Two SDRAM

There are two SDRAM (U9 and U10). The total size of them is 16 Mbyte (16 bit x 2)

Smart Media & NAND Flash

A mounted NAND Flash ROM (U2) and Smart media socket (U3) is provided for saving user data.

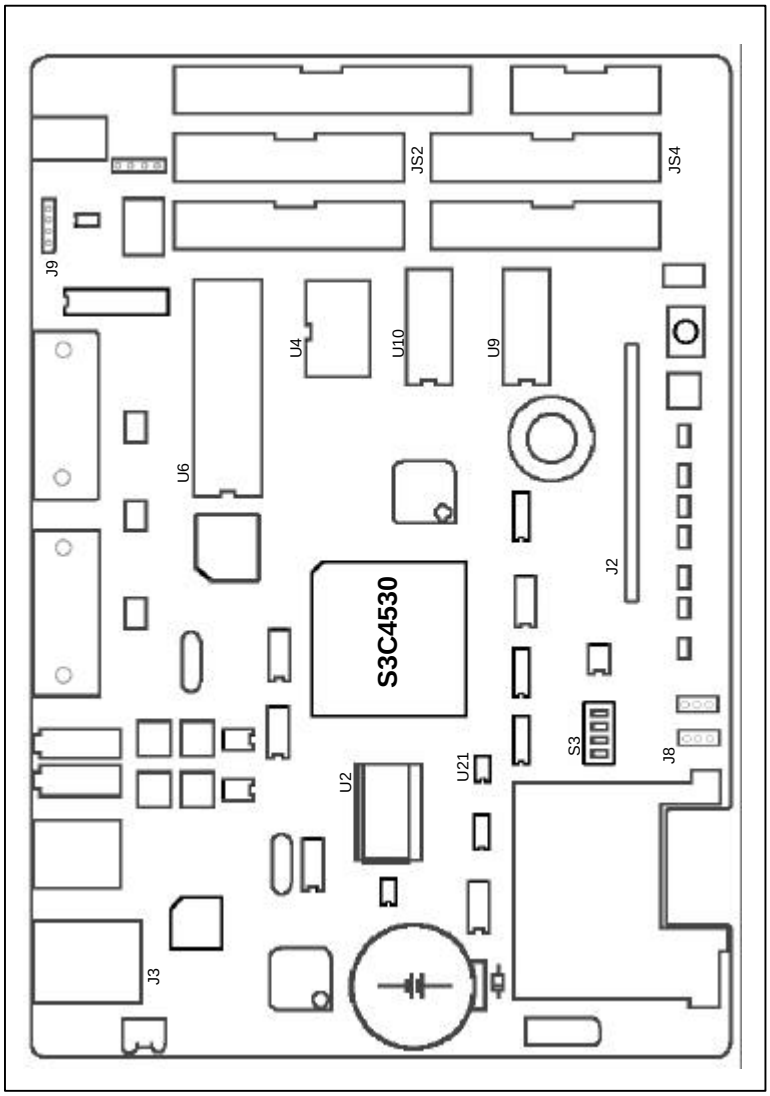

Figure 3. Memory Map

EEPROM (24LC256)

There is a IIC Serial EEPROM (U19). The size of EEPROM is 32Kbyte .

RTC & Thermometer

There is a DS1629 (U21) for RTC and thermometer check. The RTC clock is supplied by the crystal (X2-32.768KHz).

Serial Port for Console

9-pin serial port (P1) and IrDA (U32) are supplied for serial data communication (Console) between the host PC and the NIBA.
You can select RS232 or IrDA interface with J8.

Serial Port for S/W Modem & RS-422

9-pin serial port (P2) and J9 are supplied for Modem. You can use RS232 or RS422 interface without any hardware jumper setting.

Ethernet interface

There are RJ45 connector (J3) and Ethernet controller (U15) for network. (LTX972, 10/100 BASE-T)

Graphic LCD interface

There is a 17-pin connector (J2) for graphic LCD (320 x 240 Mono 16 gray). You can control the LCD's contrast by the variable resister (VR1).

Audio in/out (CODEC)

There is CODEC IC (CS4235) for Audio in/out. You can control audio volume by the gain control variable resisters (VR2~VR5)

JTAG Port

One 14-pin JTAG port (JP2) is supplied to connect with OPENice32 or other JTAG based emulator.

USB Connector (PDIUSBD12)

One USB connector (J6) is supplied.

Expansion Connectors

Five connectors (26 pin – JS1 ~ JS4 and 34 pin – JP1) are supplied for system expansion. They contain board data bus, address bus, external memory bank/device control, and external master control signals.

Reset Button

Three is a button (S1) for system reset.

LED Indicators

Seven LEDs are supplied on the NIBA. Each LED shows the system status such as POWER, HALT, TX, RX, LINK, USB LINK

The Board Configuration

The NIBA is set with its default configuration. You can use the board with its default settings directly. However, you can also change the default board setup according to the your needs.

Console interface Selection–JP8

JP8

Status	Description
UART  IrDA	Use Uart (P1) for Console
UART  IrDA	Use IrDA (U32) for Console

Boot ROM Selection

JP1

Status	Description
nRCS0  nRCS1	Use U6 as boot ROM
nRCS0  nRCS1	Use U4 as boot ROM **Memory inserted in U6 should removed**.

Memory Selection (unit & Endian)

By using the number 1, 2,3 key of the switch labeled S3, you can select the memory unit & Endian.

S3 – Memory unit

Number	Status	Description
1	OFF	Reserved
2	OFF	
1	OFF	Byte
2	ON	
1	ON	Halfword
2	OFF	
1	ON	Word
2	ON	

S3- Endian Selection

Number	Status	Description
3	On	Little Endian
3	OFF	Big Endian

Enable IrDA

S3

Number	Status	Description
4	On	Enable IrDA
4	OFF	Disable IrDA

Setup NIBA Environments

Ethernet 10/100 BASE-T Connector

Same connector and pin out for both 10Base-T and 100Base-Tx

(At the network interface card/hubs)

(At the cables)

RJ45 female connector at the network interface cards and hubs.
RJ45 male connector at the cable

Pin	Name	Descriptions
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4	N/C	Not Connected
5	N/C	Not Connected
6	RX-	Receive Data-
7	N/C	Not Connected
8	N/C	Not Connected

NOTE: TX & RX are swapped on Hub

Connection Method for UTP cable

RJ45 pins on NIBA is defined to Adapter side. So, you straight connect NIBA to HUB through UTP cable. In this case, between the NIBA and Hub, the pin numbers correspond to each others.

Between the NIBA and NIC which is on Host PC, you have to connect each other through UTP cable which is crossover patch cord.

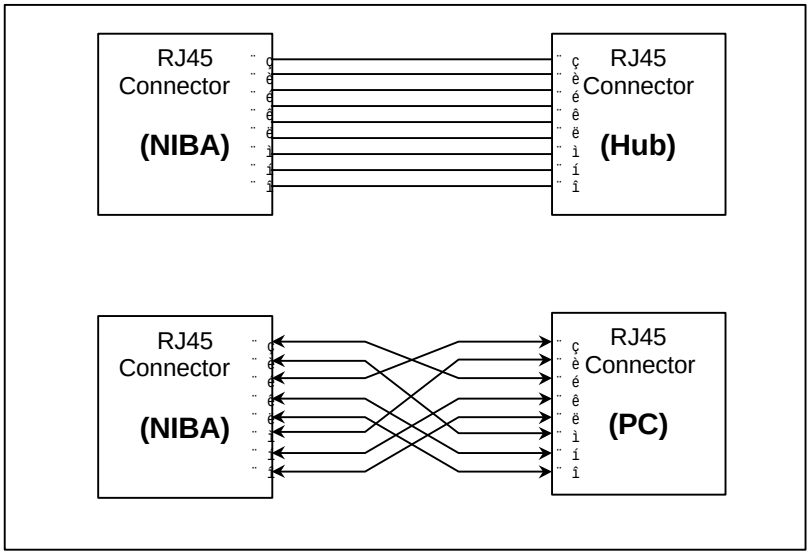

Figure 4. UTP Cable Connection

Connection Configuration for Debug Console

Uart_A (P1) on NIBA is assigned to Debug Console port. Using this port, you can download executable image code to DRAM memory. Also you can monitor and debug the device from this port with Hyper Terminal which is windows utility program supported by windows.

You can communicate through the RS232 cable from Uart_A (P1) to COM1 or COM2 which is serial port on Host PC. NIBA supplies the 9pin D-SUB female connector for communication channel. Detail pin configurations for connecting each others on console port be given as bellows:

Connection Configurations for Debug Console

Configuring the Hyper Terminal

To configure the Hyper Terminal, which is windows utility program for serial communications, please following steps:

1. Run the Hyper Terminal utility program.
   Window 95/98/2000/ NT start tool bar **->** Program **->** Accessories **->** Hyper Terminal Group **->** Double click Hyperterm.exe **->** Enter connection name **->** Select icon **->** Click OK.

2. Select COM port to communicate with NIBA_v20 target board.
   Choose COM1 or COM2 as the serial communication port and click OK

3. Set the serial port properties.
   - Bits per second: 57600 bps
   - Data bits: 8 bits
   - Stop bits: 1
   - Flow control: None

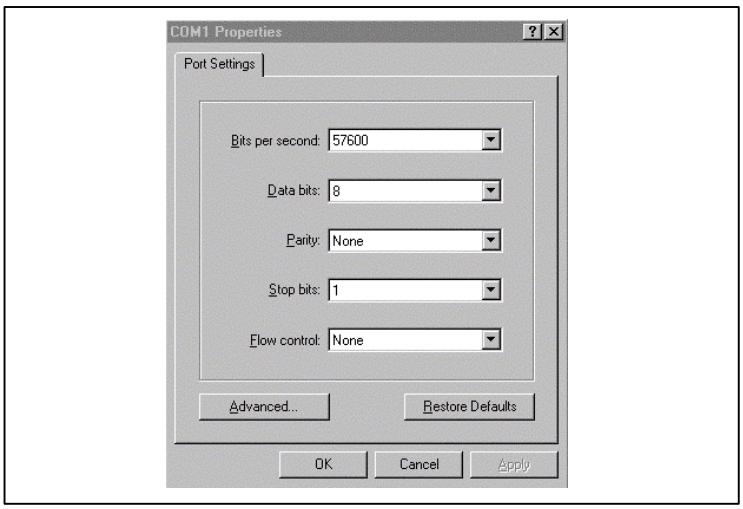

Figure 5. Choose Setting Page

4. Select the Properties from the File menu.

5. Choose Setting Page

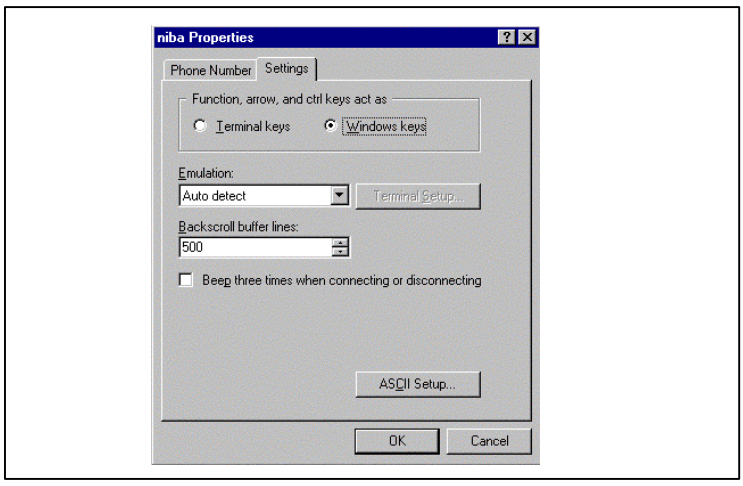

Figure 6. Choose Setting Page

6. Re-connect Hyper-Terminal to run at new properties
   Disconnect: Call **->** Disconnect
   Connect: Call **->** Call

7. Power-On Reset or Push the reset button on NIBA board
   Now, The diagnostic menu is showed on the Hyper-Terminal.

Downloading Executable Binary Image File without ADW

Without an emulator, you can download a binary image file through the serial cable to target.

To download an executable binary file, follow the steps:

1. Type “P” to download user program to NIBA on the on the NIBA_v2.0 console (Hyper-Terminal) menu.

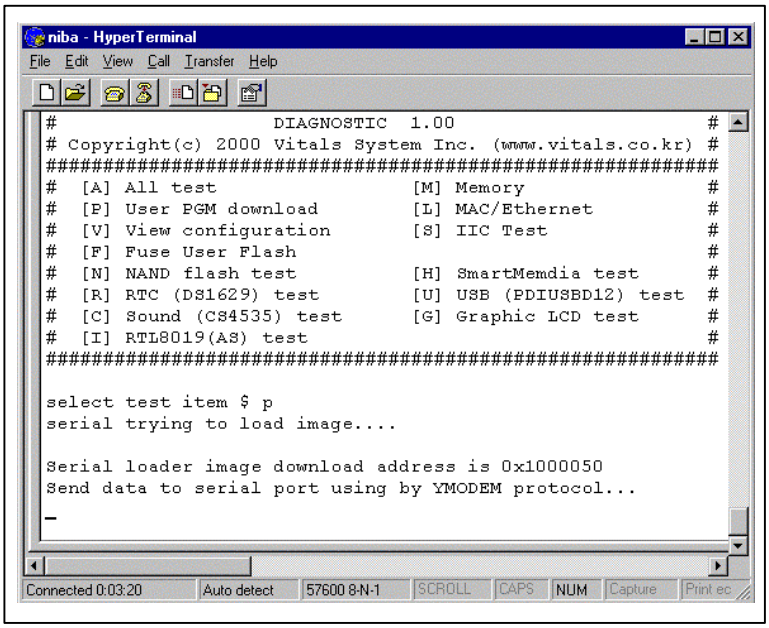

Figure 7. NIBA Diagnostic Window

2. Select the Send File from the Transfer menu

   File Name: Select the file name which you want to download.

   Protocol: Select the Ymodem.

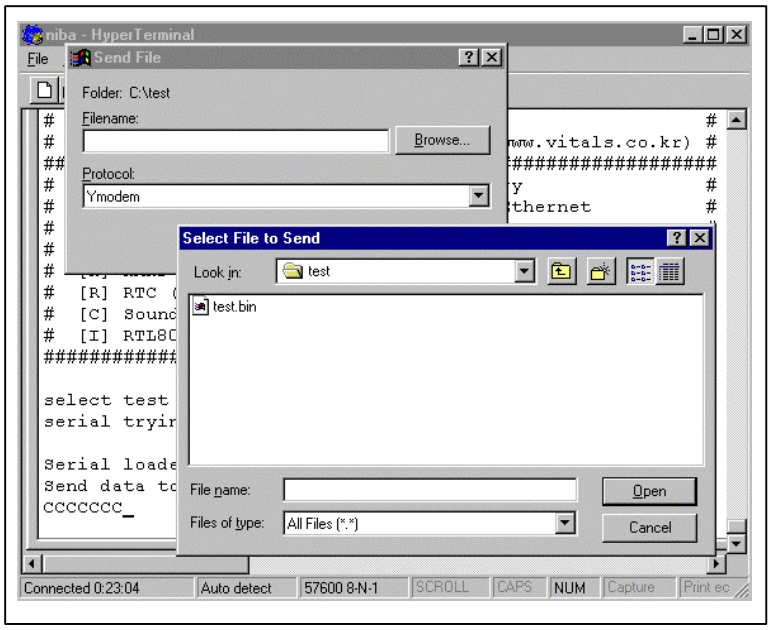

Figure 8. Select a file and Protocol

3. Click OK.

   Then, the file that you selected will be downloaded.

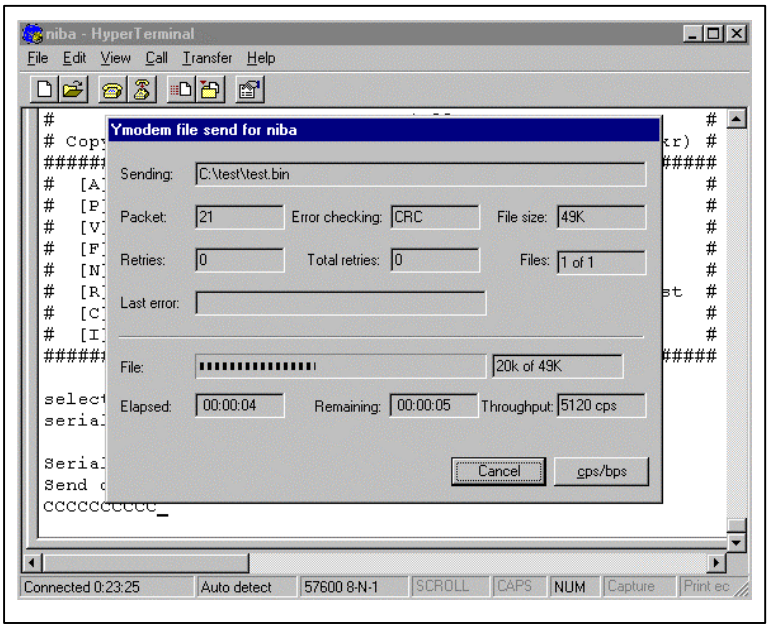

Figure 9. File downloading status

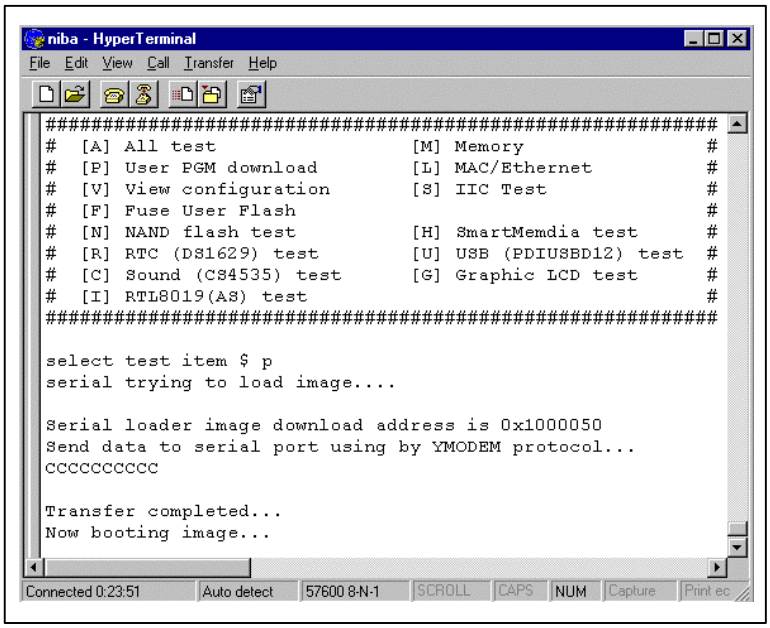

Figure 10. Window after download.

OPENice32 Installation

OPENice32

The OPENice32 can also be connected with the NIBA as a debugging system for software applications development. OPENice32 is a JTAG-based, non-intrusive, debugging system for ARM-based controllers or processors. JTAG provides the interface between a debugger and the ARM-based controller development board.

To use the OPENice32, the following additional equipment are required:

- OPENice32
- 14-way ribbon cable
- 9-pin RS232 cable or parallel cable
- 5 V DC (Max. 3A) power supply

Connecting NIBA and PC

The OPENice32 should be connected to the NIBA's JTAG Port (JP2) via a 14-way cable, and to the host PC via a 9-pin RS232 serial or parallel cable.
To power on the OPENice32, DC 5 V power supply is required.

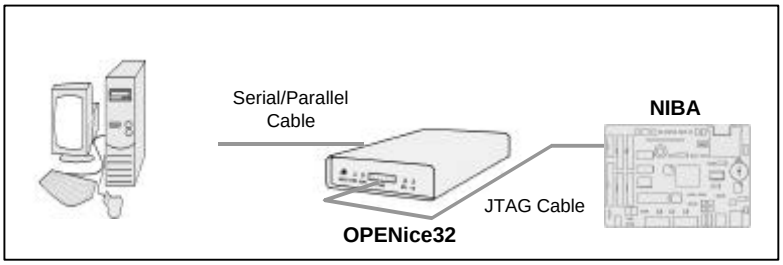

Figure 4. Connection with OPENice32

Powering up the Board and OPENice32

We recommend that you power on the NIBA before the OPENice32 is powered on. In this way, the system initialization and memory configuration for NIBA performed by the Boot Code can be completed first. Otherwise, it may cause the failure of code download via JTAG.

APPENDIX

NIBA v2.0 BOM
NIBA v2.0 Schematics

NIBA v2.0 BOM

Item	Quantity	Reference	Part
1	1	BT1	3.0V
2	1	B1	BEAD 35ohm
3	65	C1,C2,C3,C4,C5,C6,C7,C8, C9,C10,C12,C19,C20,C21, C22,C23,C24,C25,C26,C27, C28,C29,C30,C31,C32,C33, C34,C35,C36,C37,C38,C39, C40,C41,C42,C43,C44,C45, C47,C50,C51,C52,C54,C57, C62,C65,C68,C69,C73,C82, C83,C89,C92,C96,C101, C102,C103,C104,C109,C114, C117,C126,C127,C132,C133	0.1uF
4	1	C11	100uF/25V
5	2	C16,C13	820pF
6	14	C14,C48,C49,C56,C63,C67, C84,C85,C88,C93,C94,C95, C97,C116	10uF
7	6	C15,C60,C74,C76,C90,C99	0.01uF
8	2	C55,C46 10uF/16V	
9	6	C58,C59,C71,C72,C86,C87	22pF
10	1	C61	1nF
11	15	C64,C70,C75,C107,C108, C110,C111,C112,C113,C115, C118,C128,C129,C130,C131	1uF
12	4	C66,C77,C78,C100	56pF
13	3	C79,C80,C81	100uF/16V
14	2	C98,C91	2.2nF
15	9	C105,C106,C119,C120,C121, C122,C123,C124,C125	330pF
16	1	C533	0.001uF/2KV
17	3	D1,D6,D11	1N4004
18	7	D2,D3,D4,D7,D8,D9,D10	LED
19	1	D5	1N4148
20	1	F1	FUSE
21	1	JP1	CONN SOCKET 17X2
22	1	JP2	CONN SOCKET 7X2(JTAG)
23	4	JS1,JS2,JS3,JS4	CONN SOCKET 13x2
24	2	J8,J1	HEADER3
25	1	J2	HEADER 17x1
26	1	J3	RJ45CON
27	2	J4,J7	PHONEJACK STEREO SW
28	1	J5	DC_JACK

Item	Quantity	Reference	Part
29	1	J6	USB_CON
30	1	J9	CON4
31	7	L1,L3,L4,L5,L6,L7,L88	F.B.
32	1	L2	100uH
33	1	P1	CONNECTOR DB9_FEMALE
34	1	P2	CONNECTOR DB9_MALE
35	8	R1,R33,R34,R43,R48,R54, R58,R63	10K
36	16	R2,R3,R4,R5,R6,R7,R8,R9, R10,R11,R12,R13,R19,R20, R21,R35	22
37	10	R14,R18,R47,R64,R65,R66, R71,R72,R73,R74	4.7K
38	1	R15	27K
39	1	R16	1/1W
40	1	R17	1.2K
41	7	R22,R23,R24,R52,R55,R61, R62	470
42	2	R31,R25	50 1%
43	4	R36,R37,R40,R41	2K
44	1	R38	5K
45	1	R39	22.1k
46	1	R42	0
47	2	R45,R46	150
48	1	R50	1.5K
49	2	R51,R53,	18R2 1%
50	3	R56,R499,R577	1M
51	2	R60,R59	47K
52	3	R67,R68,R69	13
53	1	R70	60
54	1	S1	SW PUSHBUTTON(RESET)
55	1	S2	SW SPDT(POWER)
56	1	S3	SW_DIP4
57	1	U1	74LVX245
58	1	U2	K9F6408U0M
59	1	U3	CN015R-113-0
60	1	U4	AM29LV800BT
61	2	U5,U27	74LVX32
62	1	U6	29LV040
63	1	U7	KS32C50300
64	3	U8,U18,U29	74LV14
65	2	U10,U9	KM416S4020B
66	1	U11	74HC245
67	1	U12	TL497A

Item	Quantity	Reference	Part
68	1	U13	OSC(10MHz)
69	1	U15	LXT972
70	1	U16	OSC(25MHz)
71	1	U19	24LC256
72	1	U20	74LV08
73	1	U21	DS1629
74	1	U22	CS4235-6
75	2	U28,U23	LT1017
76	1	U24	74HC32
77	1	U25	78R33
78	1	U26	PDIUSBD12
79	3	U30,U31,U33	MAX3232
80	1	U32	IRM6000
81	1	U34	MAX3488
82	1	U35	74LV4016
83	1	VR1	VR10K
84	4	VR2,VR3,VR4,VR5	VR20K
85	1	X1	16.9344MHz
86	1	X2	32.768KHz
87	1	X3	6.000MHz