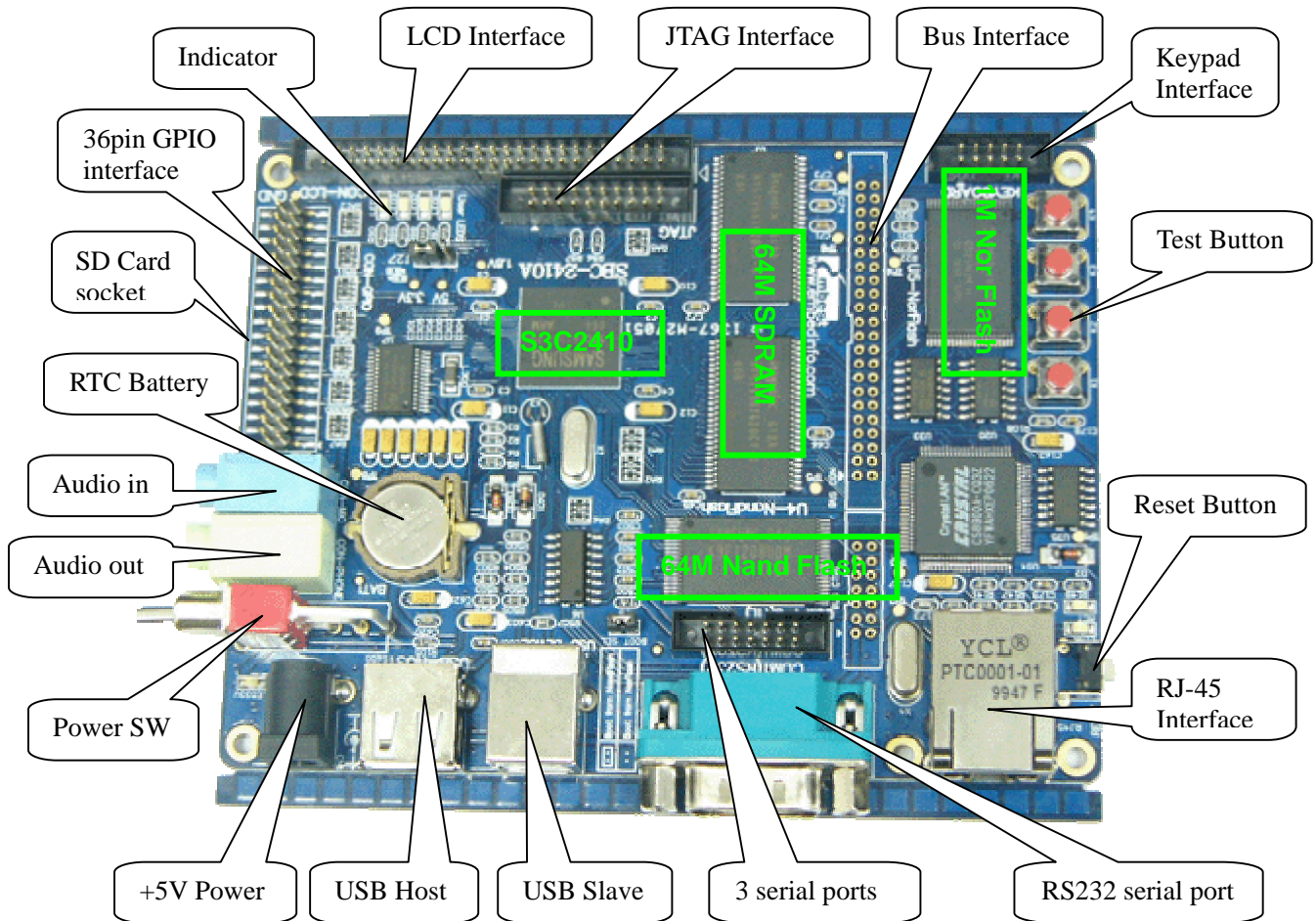


## SBC2410-II Single Board Computer

- ARM920T Single-board Computer based upon Samsung S3C2410A
- RS232, USB Host/Device, LCD, Keypad, SD card, Jtag, Ethernet...
- Full Bus and Peripheral Signal Expansion
- Capable of supporting Linux or WinCE OS



Embest SBC2410-II Single Board Computer

### Description

The SBC2410-II is another full-featured single board computer (SBC) using the Samsung S3C2410A processor released by Embest Company. The 16/32-bit S3C2410A processor is based upon the ARM920T architecture and can operate at 200MHz. It contains a memory management unit making it a suitable platform for stand alone applications, embedded real time operating systems and complex operating systems such as Linux or WinCE.

Embest SBC2410-II single board computer takes advantage of the S3C2410A ARM920T microcontroller, supporting a variety of onboard peripherals such as 1Mbyte Nor Flash, 64Mbyte Nand Flash, 64Mbyte SDRAM, 1 USB Host and 1 USB Device, 1 RS232 ports, 1 10M Ethernet interface, AC97, battery backed RTC, LEDs, test and reset buttons. In addition to this, expansion connections are made available via a number of header connectors and support peripheral LCD

hardware, touch screen, matrix keypad, SD card, 3 serial ports, JTAG and 36 GPIOs.

The SBC2410-II is capable of supporting Linux and WinCE OS. Linux source code and WinCE BSP are provided with this board. Also plenty of example programs, which greatly help designer better understand the hardware operations and also quicken your development steps.

Embest offers, as an option, a full-featured Integrated Development Environment (IDE) that can be used to develop applications, download binaries to the target and debug applications. The IDE runs from a PC and can be ordered with either a high-speed JTAG interface (up to 800kbps) or standard interface (120kbps). Optional LCD display hardware is also available for this development board and can be easily connected to an existing header.

## ***Hardware Features***

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The S3C2410A processor consists of 16-/32-bit RISC (ARM920T) CPU core, separate 16KB instruction and 16KB data cache, MMU to handle virtual memory management, LCD controller (STN & TFT), NAND flash boot loader, System Manager (chip select logic and SDRAM controller), 3-ch UART, 4-ch DMA, 4-ch Timers with PWM, I/O ports, RTC, 8-ch 10-bit ADC and touch screen interface, IIC-BUS interface, IIS-BUS interface, USB host, USB device, SD host & multimedia card interface, 2-ch SPI and PLL for clock generation.

The SBC2410-II exposes many of these features to the user in support of developing specific solutions. This board is characterized as follows:

- Dimensions: 120x90mm
- Working temperature: -20~70 Celsius
- Power supply: +5V
- Samsung S3C2410 (ARM920T core with MMU capable of 266<sup>+</sup> MHz operation)
- Flash: 1Mbyte Nor Flash, 64Mbyte Nand Flash
- SDRAM: 64Mbyte
- 1 50pin (2.0mm) LCD Display interface (STN or TFT)
- 1 10M Ethernet interface (RJ-45 interface)
- 1 RS232 serial port
- 3 serial ports available through 14pin (2.0mm space) interface
- 1 10pin (2.0mm space) Keyboard interface
- 1 USB host and 1 USB device
- Audio Input/Output
- RTC (battery backed)
- 1 20pin (2.0mm space) standard JTAG interface (mainly for downloading bootloader)
- SD card interface and holder
- 4 Status LEDs
- 4 Test buttons
- 1 Power switch
- 1 Reset button
- 2 Bus interface
- 1 20pin standard JTAG interface
- 36pin GPIO expansion connector

## Software

The board is able to support Linux and WinCE OS. We preloaded embedded OS arm-Linux as the default OS onto the board. Based on this platform and development packages, we compiled and ported plenty of software for customers references such as MP3 player under console mode, USB dynamic image catching, Web server (support CGI), Ftp and its server, Telnet and its server, Keyboard standard drivers, etc. The Executable binaries and source code are all included in CD and preloaded on SBC2410-II board. So the board is all ready for using.

The board is also able to run under WinCE OS and provided with WinCE BSP. The system includes Word reader, Excel reader, Power Point reader, pictures browser, PDF reader, Word compiler, IE browser, Media player, some games, etc.

Please make the following software modules we provided with the board for your references:

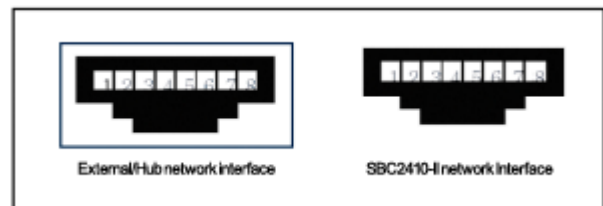
Software			
OS	Item	Feature	Description
Linux	vivi (bootloader source code)	Xmodem	Support Xmodem transmit protocol
		<b>USB</b> (Do not provide source code)	<b>Add USB downloading function in vivi, supporting downloading/ updating image with USB</b>
		Kernel Parameter	Support kernel parameter setting
		Set Partation	Support partition setting
		etc.	
	Kernel	Version	Linux kernel 2.4.18
		File system	ROM/CRAM/EXT2/FAT32/NFS/YAFF S
	Driver	Interrupt & Timer	System Interrupt & Timer
		Serial device	Three serial ports
		Block memory	Block memory device driver
		Flash memory	Nand Flash driver
		10M Ethernet	CS8900
		RTC	
		USB Host	
		LEDs	
		Buttons	User buttons
		Language	Multi-language Support
		SD/MMC	
		LCD	
	<b>Embedded GUI</b>	<b>Qt/Embedded</b>	
	Network protocol & application	TCP/IP	
		NFS	
		Telnet Server	
File transfer		(FTPclient/server)	
Remote login			
Web server		Web server (HTTP v1.1, boa)	

		Web based management suite	(Sample only)
<b>WinCE</b>	Bootloader	vivi (Do not provide source code)	<b>Add USB downloading function in vivi, supporting downloading/ updating image with USB</b>
		Eboot	Ethernet bootloader for wince
	Driver	Serial device	Serial port 0
		Flash memory	Nand Flash driver
		10M Ethernet	CS8900
		USB Host	
		USB device	
		LED	
		RTC	
		EINT	
		LCD	
		Audio	
		SD/MMC card	

### SBC2410-II Interfaces Introduction

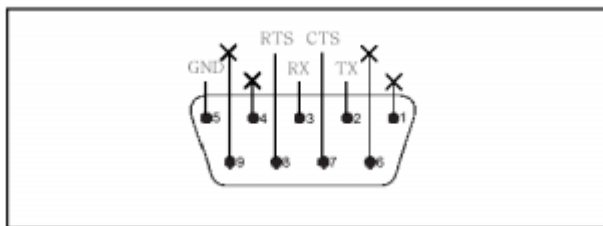
#### 1. LAN: RJ45

Pin	Name	Description
1	TX+	Transmit Data+
2	TX-	Transmit Data-
3	RX+	Receive Data+
4	NC	Not Connected
5	NC	Not Connected
6	RX-	Receive Data-
7	NC	Not Connected
8	NC	Not Connected

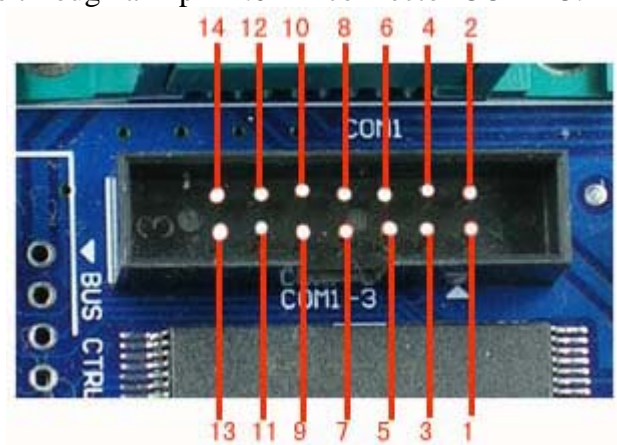


#### 2. Serial Ports:

The Samsung S3C2410A itself has 3 serial ports. The board has one standard serial port through DB9 connector. All three serial ports are available through a 14pin 2.0mm connector COM1-3.



RS232 Serial Port 1



COM1-3

Pin	Description	Pin	Description
1	VDD33V	2	VDD33V
3	nCTS0	4	nRTS0
5	TXD0	6	RXD0
7	TXD1	8	RXD1
9	TXD2	10	RXD2
11	NC	12	NC
13	GMD	14	GND

NC = Not Connected

### 3. ROM Boot Selection: BOOTSEL

The Samsung S3C2410A supports Nor Flash or Nand Flash boot modes. Boot mode can be selected through BOOTSEL jumper selection settings.

If BOOTSEL is shorted, boot from Nand Flash.

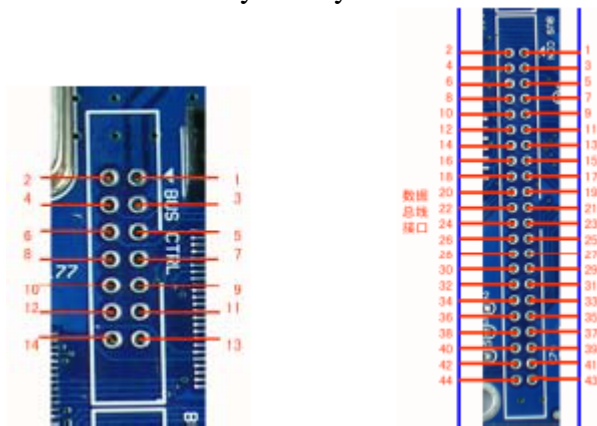
If BOOTSEL is open, boot from Nor Flash.

### 4. USB Interface

The SBC2410-II has 1 USB Host (type A) and 1 USB Slave (type B).

### 5. BUS Interface

CPU internal system Bus is available through two 2.0mm space BUS interfaces. BUS CTRL interface is mainly for system bus control signal, BUS CON is mainly for address data line.



#### BUS CTRL

Pin	Description	Pin	Description
1	VDD5V	2	VDD33V
3	nRESET	4	nGCS4
5	NGCS2	6	nGCS1
7	LnWBE0	8	LnWBE1
9	LnWBE2	10	LnWBE3
11	EINT3	12	EINT8
13	GND	14	GND

#### BUS CON

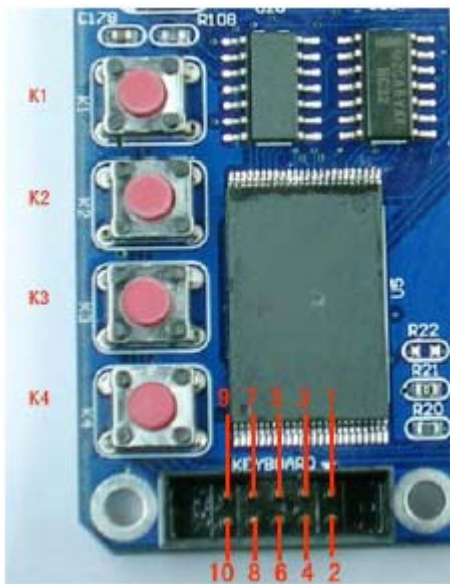
Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	LDATA0	2	LDATA1	3	LDATA2	4	LDATA3
5	LDATA4	6	LDATA5	7	LDATA6	8	LDATA7
9	LDATA8	10	LDATA9	11	LDATA10	12	LDATA11
13	LDATA12	14	LDATA13	15	LDATA14	16	LDATA15
17	LADDR0	18	LADDR1	19	LADDR2	20	LADDR3
21	LADDR4	22	LADDR5	23	LADDR6	24	LADDR7
25	LADDR8	26	LADDR9	27	LADDR10	28	LADDR11
29	LADDR12	30	LADDR13	31	LADDR14	32	LADDR15
33	LADDR16	34	LADDR17	35	LADDR18	36	LADDR19
37	LADDR20	38	LADDR21	39	LADDR22	40	LADDR23
41	LADDR24	42	LnOE	43	LnWE	44	nWait

### 6. Audio Interface

The S3C2410A has I2S Bus. The SBC2410-II board use a Philips UDA1341 decode chip which use I2S interface. So user can play mp3 or wav formats audio files via this chip and related software.

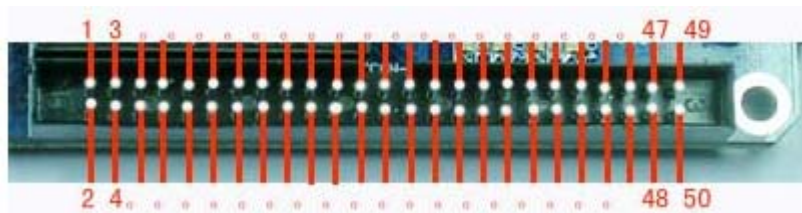
### 7. Keypad Interface

The SBC2410-II board has 4 test buttons using the S3C2410A I/Os. Also the I/Os are educed through a 10pin 2mm space connector to give designers flexible way for the keypad design.



Pin	Description	Pin	Description
1	VDD33V	2	VDD33V
3	EINT7	4	EINT1
5	NC	6	EINT2
7	NC	8	EINT3
9	GND	10	GND

### 8. LCD Interface

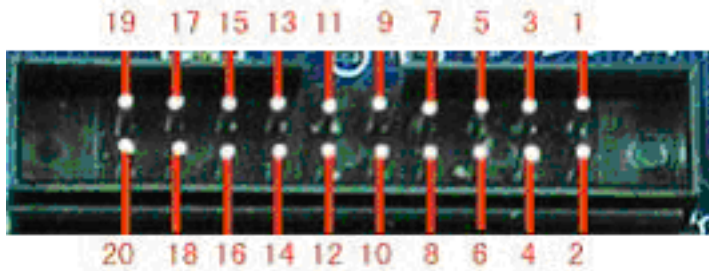


Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	VCC	2	VCC	3	VCC	4	GND
5	nRESET	6	VD0	7	VD1	8	VD2
9	VD3	10	VD4	11	VD5	12	VD6
13	VD7	14	VD8	15	VD9	16	VD10
17	VD11	18	GND	19	VD12	20	VD13
21	VD14	22	VD15	23	VD16	24	VD17
25	VD18	26	VD19	27	VD20	28	VD21
29	VD22	30	VD23	31	GND	32	LCD PWREN
33	LCDVF2	34	LCDVF1	35	LCDVF0	36	VM/VDEN
37	VFRAME/VSYNC	38	VLINE/HSYNC	39	VCLK/LCD HCLK	40	LEND
41	nDIS OFF	42	GND	43	xMON	44	nXPON
45	AIN7	46	GND	47	YMON	48	Nypon
49	AIN5	50	GND				

Note: LCD power supply can select 3.3V or 5V through J27 jumper  
 1-2 shorted: 5V power supply      2-3 shorted: 3.3V power supply

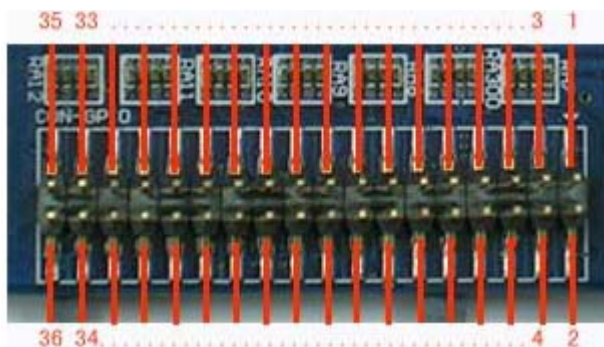
### 9. JTAG Interface

The SBC2410-II board has a 20pin 2.0mm space JTAG interface.



Pin	Description	Pin	Description	Pin	Description
1	VDD33V	2	VDD33V	3	NTRST
4	GND	5	TDI	6	GND
7	TMI	8	GND	9	TCK
10	GND	11	Pull-down resistor	12	GND
13	TDO	14	GND	15	nRESET
16	GND	17	NC	18	GND
19	NC	20	GND		

### 10. 36 GPIOs Connector (CON-GPIO)



Pin	Description	Pin	Description	Pin	Description	Pin	Description
1	VDD33V	2	VDD33V	3	EINT0	4	EINT4
5	EINT5	6	EINT6	7	EINT11	8	EINT13
9	EINT14	10	EINT15	11	EINT16	12	EINT19
13	GND	14	GND	15	I2CSDA	16	I2CSCL
17	CLKOUT0	18	CLKOUT1	19	GPB0	20	GPB1
21	Vref	22	GPB6	23	AIN1	24	AIN0
25	AIN3	26	AIN2	27	AIN6	28	AIN4
29	ADD5V	30	ADD5V	31	SPIMISO	32	SPIMISO
33	SPICLK	34	NSS_SPI	35	GND	36	GND

### 11. Audio In/Out



### Order Information

Order No.	MH3
Item	Embest SBC2410-II Single Board Computer
Price	Please contact us for detailed information.
CD-ROM	<ul style="list-style-type: none"> <li>● software</li> <li>● user manual</li> <li>● circuit schematic drawing</li> <li>● parts datasheet</li> <li>● Embest products reference</li> </ul>
Option hardware	MITSUBISHI 8.4" TFT LCD or Samsung 3.5" TFT LCD
Option Tools	<a href="#">Embest IDE for ARM</a> Development Tools Suite I or II, include: <ul style="list-style-type: none"> <li>● IDE, editor, GNU ARM Compiler and Linker, debugger, full registered version</li> <li>● <a href="#">Embest PowerICE</a> or <a href="#">Embest UnetICE</a></li> <li>● <a href="#">Embest Flash Programmer</a></li> </ul>

Available contents if ordered in kits (SBC2410-II-EVAL Kit)	<ul style="list-style-type: none"><li>● SBC2410-II board (Preload with Linux)</li><li>● 1 serial cable</li><li>● 1 net cable</li><li>● 1 USB cable</li><li>● 5V power adapter</li><li>● 1 CD with product reference</li></ul>
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**Embest Info&Tech Co., LTD.**

Room 509, Luohu Science&Technology Building,  
#85 Taining Rd., Shenzhen, Guangdong, China 518020

Tel: +86-755-25635656/25635626

Fax: +86-755-25616057

Email: [market@embedinfo.com](mailto:market@embedinfo.com)

<http://www.embedinfo.com>

<http://www.armkits.com>