

IB110

**Freescale I.MX535 ARM Cortex™-A8
Embedded BOARD**

USER'S MANUAL

Version 1.0a

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Introduction

Product Description

The IB110 Embedded board is based on the Freescale I.MX535 Microprocessor. I.MX535 is a high-performance ARM Cortex-A8 microprocessor with speeds up to 1GHz. The device offers 3D graphics acceleration while also supporting numerous peripherals, including DDR3 and USB OTG that are well suited for industrial applications.

The following subsystems are part of the device:

- Microprocessor unit (MPU) subsystem based on the ARM Cortex-A8 Microprocessor
- OpenGL ES 2.0 3D accelerator
- OpenVG 1.1 graphics accelerator
- Multi-format HD1080 video decoder
- Multi-format HD720 video encoder

IB110/IB110F FEATURES:

- Freescale I.MX535 1GHz ARM Cortex-A8 Microprocessor
- 1G Byte DDR3 RAM
- 1x 18 bit LVDS connector
- 1x 18 bit TTL LCD connector
- 2x COM port connector (1x RJ45, 1x pin header)
- 1x Mini-PCIe(x1) slot (*w/ USB support only*)
- 10/100 Based-T Ethernet (RJ-45) connector
- 12V DC-IN power connector
- 1x SD card slot, 1 x Micro SD
- 1x USB OTG
- 3x USB host (1x USB type A, 2x pin header)
- 1x HDMI port (option)
- 1x VGA port (option)
- 1x SATA Port (option)
- LAN PoE support (option)
- 1 x eMMC FLASH (option)
- 8 bits GPIO (option)
- Resistive touch connector

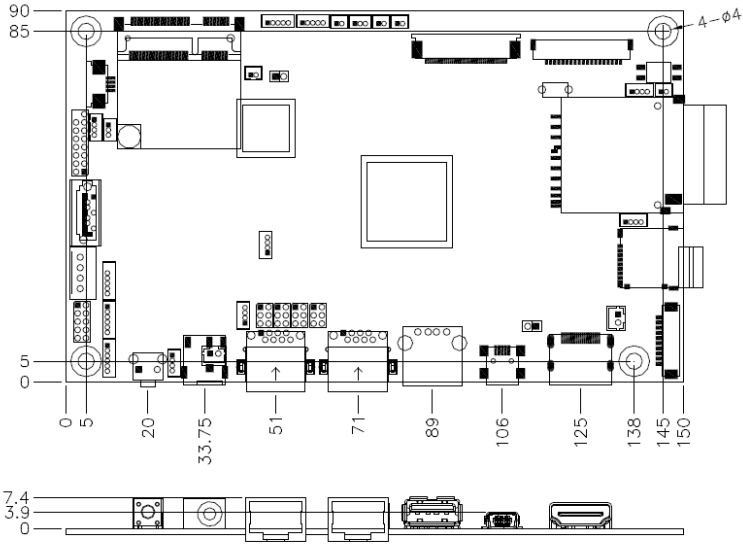
Checklist

Your IB110/IB110F/IB110H package should include the items listed below.

- The IB110 Embedded Board
- This User's Manual

Board Dimensions

Top Side



Units: mm

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Installations

This section provides information on how to use the jumpers and connectors on the IB110 in order to set up a workable system. The topics covered are:

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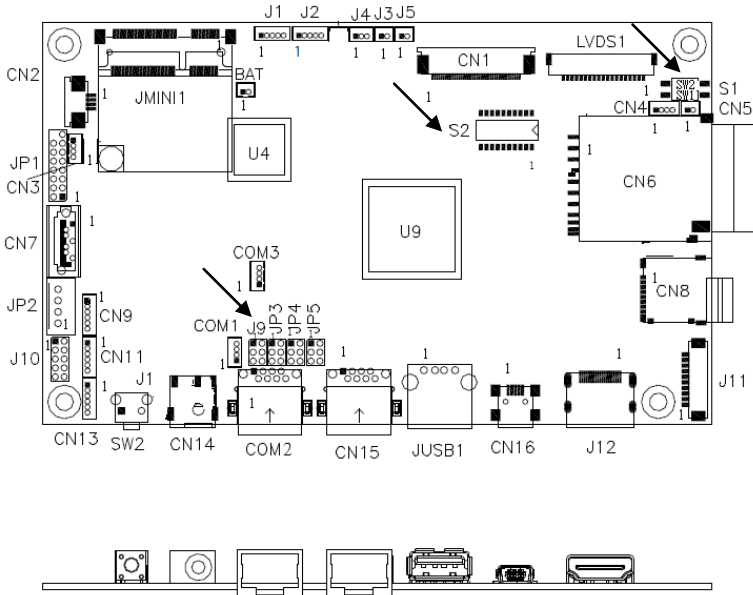
Setting the Jumpers

Jumpers are used on IB110 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on IB110 and their respective functions.


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Jumper Locations on IB110

Top Side




J9: COM2 RS232 (RJ45-Pin 2) +12V Power Setting

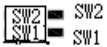
J9	Setting	Function
	Pin 2-4 Short/Closed	COM2 Port Pin 2 +12V

Note: Pin 2 maximum output current is 0.5A
Default setting is Pin 2-4 open.

J9: COM2 RS232 (RJ45-Pin 7) +5V Power Setting

J9	Setting	Function
	Pin 1-3 Short/Closed	COM2 Port Pin 7 +5V

Note: Pin 7 maximum output current is 0.5A.
Default setting is Pin 1-3 open.

S1 (sw1, sw2): System Boot Configuration

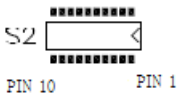
S1 (sw1, sw2)	Boot From
00	CN6 (SD1)
01	CN8(SD2)
10	eMMC NAND

Note:

1: Switch On

0: Switch Off

Default setting is 00 (sw1=0,sw2=0)

S2: System Boot Configuration (factory use only)**JP3, JP4, JP5: RS232, RS422, RS485 Selection**

Mode	JP3	JP4	JP5
RS232	3-5 Short 4-6 Short	3-5 Short 4-6 Short	1-2 Short
RS422	1-3 Short 2-4 Short	1-3 Short 2-4 Short	3-4 Short
RS485	1-3 Short 2-4 Short	1-3 Short 2-4 Short	5-6 Short

Default setting is RS232 mode.

Notes:**RS232 Mode: COM2 Port**

Pin #	Signal Name
1	RTS
2	
3	TX
4	GND
5	GND
6	RX
7	
8	CTS

RS422 Mode: COM2 Port

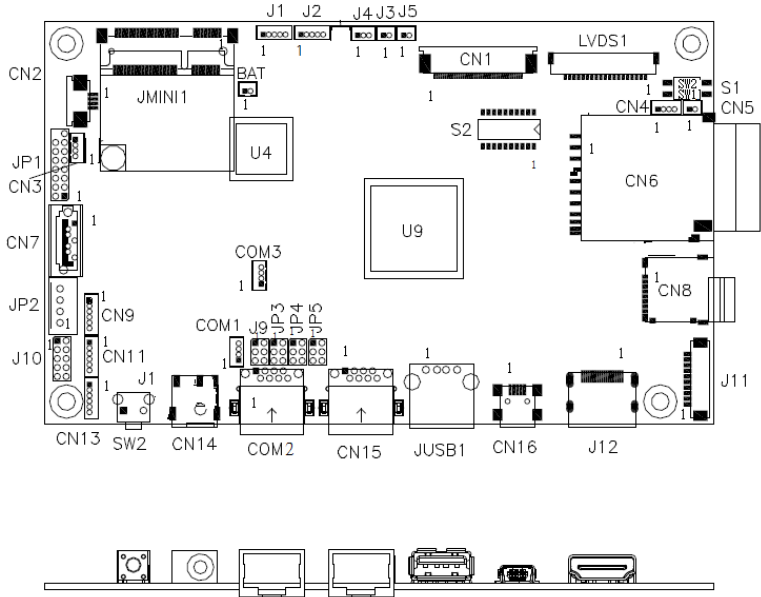
Pin #	Signal Name
1	RX-
2	
3	RX+
4	
5	
6	TX+
7	
8	TX-

RS485 Mode: COM2 Port

Pin #	Signal Name
1	
2	
3	
4	
5	
6	DATA+
7	
8	DATA-

Connectors on IB110

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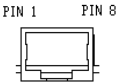
Connector Locations on IB110

CN6: SD Card Connector**CN8: Micro SD Card Connector****COM1 PORT: COM1 RS232 Connector**

(Debug Port, factory use only)



Pin #	Signal Name
1	COM1 RX, Receive data
2	COM1 TX, Transmit data
3	GND, ground
4	NC

COM2 PORT: RJ45 Pin Connector

Pin #	Signal Name
1	COM2 RTS, Request to send
2	VDD1 (+12V)
3	COM2 TX, Transmit data
4	GND, ground
5	GND, ground
6	COM2 RX, Receive data
7	VDD2 (+5V)
8	COM2 CTS, Clear to send

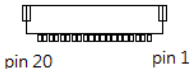
Note: Please refer to J9 setting for Pin2 and Pin7.

Please refer to JP3, JP4 and JP5 setting for RS422 and RS485 mode selection.

COM3 PORT: COM3 RS232 Connector

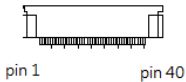
Pin #	Signal Name
1	NC
2	GND, ground
3	COM3 RX, Receive data
4	COM3 TX, Transmit data

LVDS1: LVDS Display Connector



Pin #	Signal Name
1	+3.3V
2	+3.3V
3	NC
4	NC
5	TX0-
6	TX0+
7	GND
8	TX1-
9	TX1+
10	GND
11	TX2-
12	TX2+
13	GND
14	TXC-
15	TXC+
16	GND
17	+5V
18	+5V
19	GND
20	Backlight ADJ

CN1: LCD 18 Bit Parallel Signal Connector




Pin #	Signal Name
1	+5V
2	+5V
3	Backlight ADJ
4	GND
5	GND
6	+3.3V
7	+3.3V
8	Mode
9	DE
10	VSYNC
11	HSYNC
12	GND
13	B5(MSB)
14	B4

INSTALLATIONS


15	B3
16	GND
17	B2
18	B1
19	B0
20	GND
21	G5(MSB)
22	G4
23	G3
24	GND
25	G2
26	G1
27	G0
28	GND
29	R5(MSB)
30	R4
31	R3
32	GND
33	R2
34	R1
35	R0
36	GND
37	DCLK
38	GND
39	L/R
40	U/D

CN2: Resistive Touch Panel Connector



Pin #	Signal Name
1	Touch YP
2	Touch XP
3	Touch YM
4	Touch XM

CN3: Resistive Touch Panel Connector

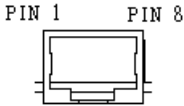


Pin #	Signal Name
1	Touch YP
2	Touch XP
3	Touch YM
4	Touch XM


Note: CN3 signals are same as CN2.

CN15: 10/100Mb LAN (PoE supported)

This RJ45 LAN connector supports PoE function.



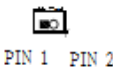
CN4: LED Backlight Control Connector



Pin #	Signal Name
1	+9.6V
2	Backlight ADJ
3	Backlight Enable
4	GND


Note: Pin 1 maximum output current is 0.5A

CN5: LED Backlight Power




Pin #	Signal Name
1	GND
2	+9.6V

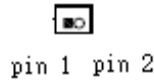
Note: Pin 2 maximum output current is 0.5A

CN9: I2C3 Connector

Pin #	Signal Name
1	GND, ground
2	I2C3_SDA
3	I2C3_SCL
4	+3.3V
5	I2C3_INT_1n
6	I2C3_RESETn

CN11: I2C3 Connector


Pin #	Signal Name
1	GND, ground
2	I2C3_SDA
3	I2C3_SCL
4	+3.3V
5	I2C3_INT_2n
6	I2C3_RESETn

J3: Speaker Right Out Connector

Pin #	Signal Name
1	SPEAKER_RIGHT-
2	SPEAKER_RIGHT+

Note: The maximum output power is 2 W with 4 Ω speaker or 1.4 W with 8 Ω speaker

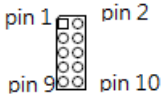
J5: Speaker Left Out Connector



Pin #	Signal Name
1	SPEAKER_LEFT-
2	SPEAKER_LEFT+

Note: The maximum output power is 2 W with 4 Ω speaker or 1.4 W with 8 Ω speaker

J10: Digital I/O 4 In/4 Out Connector




Signal Name	Pin #	Pin #	Signal Name
GND	1	2	+3.3V
OUT3 (U46.P17)	3	4	OUT1 (U46.P15)
OUT2 (U46.P16)	5	6	OUT0 (U46.P14)
IN3 (U46.P13)	7	8	IN1 (U46.P11)
IN2 (U46.P12)	9	10	IN0 (U46.P10)

Note: All In/Out signals level are 3.3V .


U46 is TCA6416PAW IC. The IC connects with i.MX535 CPU via I2C2 port.

JP2: SATA Power

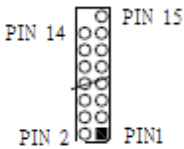


Pin #	Signal Name
1	+5V
2	GND
3	GND
4	+12V

CN7: SATA Bus



Pin #	Signal Name
1	GND
2	SATA_TXP
3	SATA_TXN
4	GND
5	SATA_RXN
6	SATA_RXP
7	GND

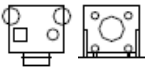
JP1: VGA Port

Pin #	Signal Name
1	VGA_R
2	+5V
3	VGA_G
4	GND
5	VGA_B
6	NC
7	NC
8	VGA_I2C_SDA
9	NC
10	VGA_HSYNC
11	GND
12	VGA_VSYNC
13	NC
14	VGA_I2C_SCL
15	GND

J11: External Key Port

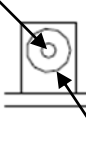
Pin #	Signal Name
1	GND
2	USER_KEY1
3	USER_KEY2
4	NC
5	RESET#
6	NC
7	NC
8	NC
9	+3.3V
10	+5V

Note: USER_KEY1 is used as RETURN key for Android OS.
USER_KEY2 is used as HOME key for Android OS.

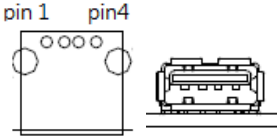
SW2: Push Button for Hardware Reset

BAT: 3.0V Lithium Battery Connector.**CN14: 12V Power Connector**

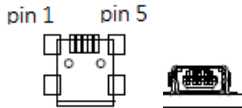
This connector supplies the system board operating voltage.

Pin 1**Pin 2**

Pin #	Signal Name
1	+12V
2	GND

JUSB1: USB2.0 Type A Connector

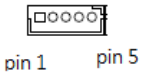
Pin #	Signal Name
1	+5V
2	D-
3	D+
4	GND

CN16: Mini USB OTG Connector

Pin #	Signal Name
1	+5V
2	D-
3	D+
4	ID
5	GND

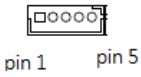
Note: CN16 used as USB device while ID is floating.
(CN16 support USB device only.)

J1: USB2.0 Connector



Pin #	Signal Name
1	+5V
2	D-
3	D+
4	GND
5	+3.3V

J2: USB2.0 Connector

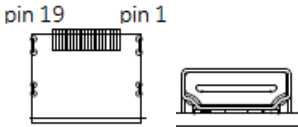


Pin #	Signal Name
1	+5V
2	D-
3	D+
4	GND
5	+3.3V

J4: Line Out Connector



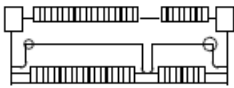
Pin #	Signal Name
1	LINE_OUTL
2	GND
3	LINE_OUTR

J12: HDMI connector

Pin #	Signal Name
1	TX2+
2	GND
3	TX2-
4	TX1+
5	GND
6	TX1-
7	TX0+
8	GND
9	TX0-
10	TXC+
11	GND
12	TXC-
13	NC
14	NC
15	NC
16	NC
17	GND
18	+5V
19	NC

JMINI1: Mini PCIE Connector

pin 51 pin 1



pin 52

pin 2

Signal Name	Pin #	Pin #	Signal Name
NC	1	2	+3.3V
NC	3	4	GND
NC	5	6	NC
NC	7	8	NC
GND	9	10	NC
NC	11	12	NC
NC	13	14	NC
GND	15	16	NC
NC	17	18	GND
NC	19	20	NC
GND	21	22	RESET#
NC	23	24	+3.3V
NC	25	26	GND
GND	27	28	NC
GND	29	30	I2C2_SCL
NC	31	32	I2C2_SDA
NC	33	34	GND
NC	35	36	USB2.0 D-
GND	37	38	USB2.0 D+
+3.3V	39	40	GND
+3.3V	41	42	NC
GND	43	44	NC
NC	45	46	NC
NC	47	48	NC
NC	49	50	GND
NC	51	52	+3.3V

