

IB100

TI AM3517 ARM Cortex™-A8
Embedded BOARD

USER'S MANUAL

Version 1.0

Acknowledgments

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Table of Contents

Introduction	1
Product Description.....	1
Checklist.....	3
IB100 Specifications	4
Board Dimensions	6
Installations	9
Setting the Jumpers	10
Connectors on IB100 MRS	16

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Introduction

Product Description

The IB100 embedded board is based on the TI AM3517 ARM processor. TI AM3517 is a high-performance ARM Cortex-A8 with speeds up to 600 MHz. The device offers 3D graphics acceleration while also supporting numerous peripherals, including DDR2 and USB OTG PHY 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 processor
- POWERVR SGX™ Graphics Accelerator Subsystem for 3D graphics acceleration to support display and gaming effects
- Display subsystem with several features for multiple concurrent image manipulation, and a programmable interface supporting a wide variety of displays. .
- High performance interconnects provide high-bandwidth data

transfers

for multiple initiators to the internal and external memory controllers and to on-chip peripherals. The device also offers a comprehensive clock-management scheme.

IB100 FEATURES:

- TI AM3517 600MHz ARM Cortex-A8 microprocessor
- 256 MB DDR2 RAM
- 512MB NAND flash
- 1 x 18 Bit LCD connector
- 1x COM port connector
- 1 x Mini-PCIe (x1) slot (*w/ USB support*)
- 10/100 Based-T Ethernet (RJ-45) connector
- 12V DC-in power connector
- 1 x SD card slot
- 1 x USB OTG
- 1 x USB host
- LAN PoE support (option)
- Resistive touch connector

Checklist

Your IB100 package should include the items listed below.

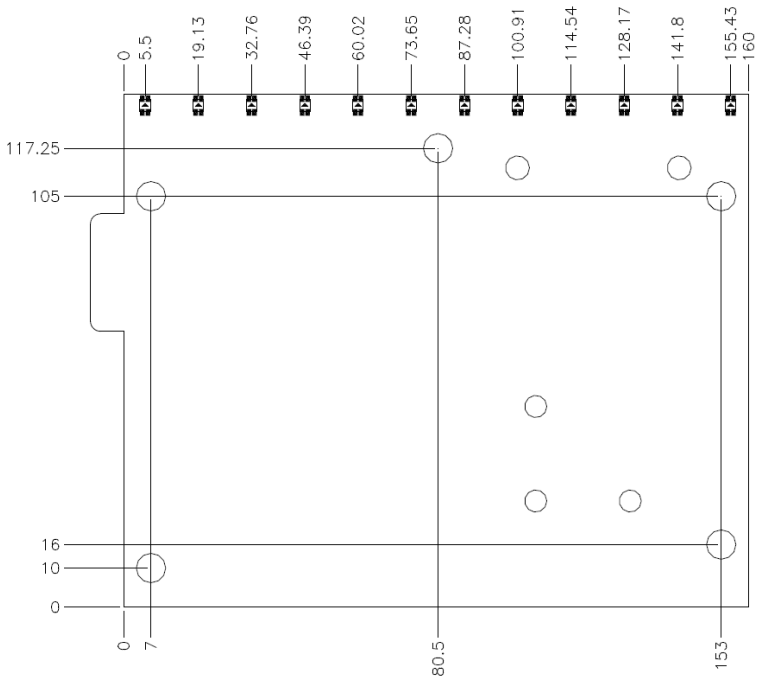
- The IB100 Embedded board
- This User's Manual

IB100 Specifications

Mainboard	IB100-MRS
MPU Type Operating Frequency	TI AM3517: 65nm Bulk, 491-NFBGA, 600MHz (ARM CortexTM-A8 Core) 700mW TDP (Est.)
Cache	Instruction cache: 16KB Data cache: 16KB L2 cache: 256KB
RAM	DDR2-667 1.8V Onboard 256MB (64x16 x2) C0241604000101000P/C0211304000370000P
Storage	NAND 256MB onboard (SLC flash 16bits) SD slot support up to 2GB
Video	POWERVR SGX™ Graphics Accelerator Subsystem for 3D 3D / OpenGL ES – Transportation 1.1 and 2.0, OpenVG1.
LAN	10/100 Based-T Ethernet
USB	USB - 2xHost (TUSP1211), 1xOTG
Power Control	TPS65023
PoE	TPS23757 PoE (PD) 12W
LCD Panel	Ampire AM-800600C3TMQW-TC0H LCD Size: 8" Resolution: 800 x 600 Contract Ratio: 500/1 Viewing Angle: 140/120 Brightness: 200nit
Touch Panel	Touch controller (TSC2004) 4 wired-resistive Build on LCD Panel
Audio	Speaker & Mic
Edge I/O	<ul style="list-style-type: none"> • 10/100 LAN x1 (RJ45) (PoE supported) • USB x 1 (USB Host. A-Type) • USB OTG x 1 (mini USB B type) • COM1 RS-232 x 1 for (RJ45 connector) • LEDs light bar x 1 (2xGPIO pin control Red and Green/Daughter Board) (LED x12) • SD slot x 1 • 12V DC-IN Jack with lock x 1

Headers & Expansion Slots	<p>Headers:</p> <ul style="list-style-type: none"> • TFT LCD Connector x 1 (STARCONN 089H40 or equivalent) • GPIO x 8 (8pin, pitch 2.0 with 3.3V) • COM (RS232) x 2 (pitch 2.0, COM2/COM3 debug port) • Audio pin Header x2 (Mic x1 /Speaker x1) • FPC connector for Touch x1 (CSF-0591-4P1T) <p>Slots:</p> <ul style="list-style-type: none"> • Half-Mini PCIe(x1) slot [USB] 26.8mm x 30 mm
Power	12V DC-IN or PoE
Mounting	VESA 75x75 Wall mount
Software Support	Android Linux WinCE
Environment	0°C-45°C

Bottom Side



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Installations

This section provides information on how to use the jumpers and connectors on the IB100 in order to set up a workable system. The topics covered are:

Setting the Jumpers	10
Connectors on IB100 MRS	16

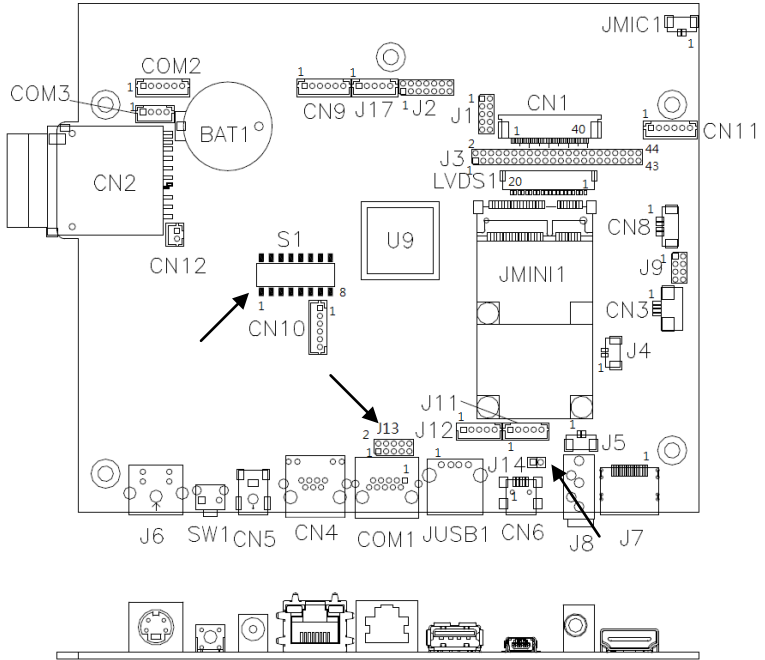
Setting the Jumpers

Jumpers are used on IB100 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 IB100 and their respective functions.

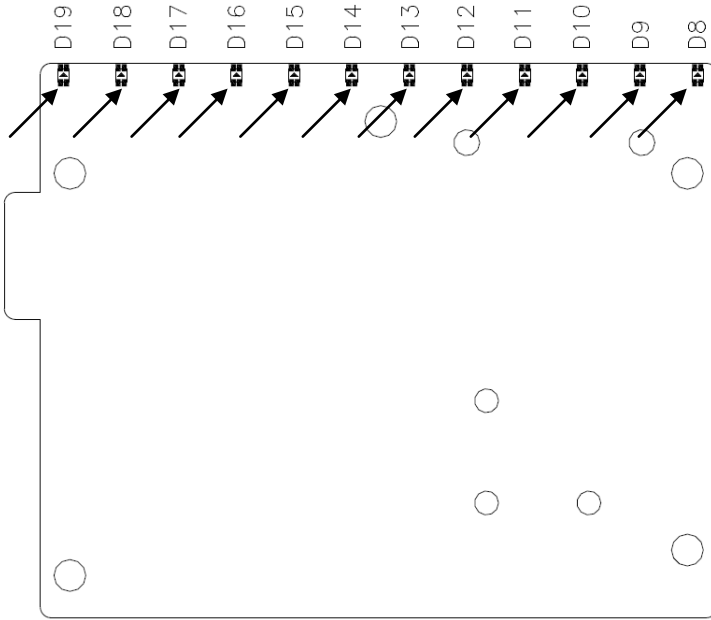
Jumper Locations on IB100.....	11
Jumper Locations on IB100.....	11
J13: COM1 RS232 (RJ45) PIN8 /+5V/+3V Power Setting.....	13
J13: COM1 RS232 (RJ45) PIN3 /+5V/+3V Power Setting.....	13
J14: CN6 ID Pin Control (factory use only).....	14
S1 (sw1,sw2,sw3,sw4,sw5,sw6): System Boot Configuration	
S1 (sw8): DVI Signal Output Control	15
D8,D9,D10,D11,D12,D13,D14,D15,D16,D17,D18,D19:.....	15

Jumper Locations on IB100

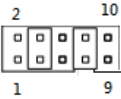
Top Side



Bottom Side



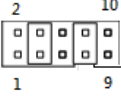
J13: COM1 RS232 (RJ45) PIN8 /+5V/+3V Power Setting

J13	Setting	Function
	Pin 2-4 Short/Closed	COM1 PORT PIN 8 +5V
	Pin 4-6 Short/Closed	COM1 PORT PIN 8 +3V
	Pin 8-10 Short/Closed	COM1 PORT PIN 8 COM2_TX

Note: Pin 8 maximum output current is 0.5A

Default setting is Pin 2-4 Open, Pin 6-8 Open, Pin 8-10 Open.

J13: COM1 RS232 (RJ45) PIN3 /+5V/+3V Power Setting

J13	Setting	Function
	Pin 1-3 Short/Closed	COM1 PORT PIN 3 +5V
	Pin 3-5 Short/Closed	COM1 PORT PIN 3 +3V
	Pin 7-9 Short/Closed	COM1 PORT PIN 3 COM2_RX

Note: Pin 3 maximum output current is 0.5A.

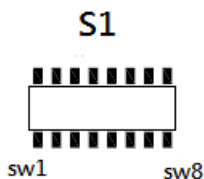
Default setting is Pin 1-3 Open, Pin 5-7 Open, and Pin 7-9 Open

J14: CN6 ID Pin Control (Factory use only)

J14	DVI Signal Output
Pin 1-2 Short/Closed	CN6 USB used as host mode

Note: Default is Pin 1-2 open.

S1 (sw1,sw2,sw3,sw4,sw5,sw6): System Boot Configuration



S1 (sw1 .. sw6)	First	Second	Third	Fourth
000100	USB	SD	NAND flash	
100100	USB	COM3	SD	
111110	USB	COM 3	SD	NAND flash

Note:

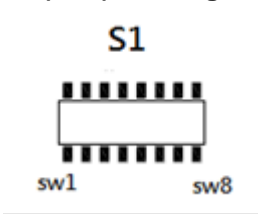
1: Switch On

0: Switch Off

Default setting is 111110

(sw1=1,sw2=1,sw3=1,sw4=1,sw5=1,sw6=0)

S1 (sw8): DVI Signal Output Control



S1 (sw8)	Function
0(Off)	Disable DVI Signal output
1(On)	Enable DVI Signal output

Note:

Default setting is 1 (On).

D8,D9,D10,D11,D12,D13,D14,D15,D16,D17,D18,D19:
Double colors LED indicator

Pin #	Description
U4. P07	Low: red color indicator light High: red color indicator dark
U4. P06	Low: green color indicator light High: green color indicator dark

Note: D8,D9, ..D19 are double color LED indicator, which have red and green colors. ALL of them are parallel connected together.

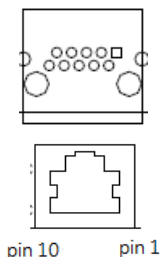
U4 is TCA6416PAW IC; The IC connects with AM3517 CPU via I2C2 port.

Connectors on IB100 MRS

Connector Locations on IB100	17
CN2: SD Card Connector	18
COM1 Port: RJ45 10 Pin Connector	18
COM2 Port: COM2 RS232 Connector	18
COM3 Port: COM3 RS232 Connector, Debug Port Connector	19
LVDS1: LVDS Display Connector	19
CN1: LCD 18 Bit Parallel Signal Connector	20
J3: LCD 24 Bit Parallel Signal Connector (Factory use only)	21
CN3: Resistive Touch Panel Connector	21
CN4: 10/100Mb LAN (PoE supported)	22
CN8: LED Backlight Control Connector	22
CN9: I2C3 Connector	22
CN11: I2C2 Connector	22
CN10: SPI1 Connector	23
J2: ARM JTAG Debug Port (Factory use only)	23
J9: Resistive Touch Connector (Factory use only)	23
J17: RS232 Connector (Factory use only)	23
JMIC1: Mic Connector	23
J4: Speaker Right Out Connector	23
J5: Speaker Left Out Connector	23
J1: Digital I/O 4 In/4 Out Connector	24
SW1: Push Button for Hardware Reset	24
J6: S-Video Connector	24
BAT1: CR2032 3V LITHIUM Battery Socket	24
CN5: 12V Power Connector	24
JUSB1: USB2.0 Type A Connector	25
J11: USB2.0 Connector	25
J12: USB2.0 Connector	25
CN6: Mini USB OTG Connector	25
J8: Line-out Phone-Jack Connector	25
J7: DVI Connector	26
JMINI1: Mini PCIE Connector	27
CN12: 5V Connector	27

CN2: SD Card Connector

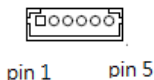
COM1 Port: RJ45 10 Pin Connector



Pin #	Signal Name
1	COM3 RXD, Receive data (Same signal as COM3 Port Pin 1)
2	COM1 RTS, Request to send
3	VDD1
4	COM1 TXD, Transmit data
5	GND, ground
6	GND, ground
7	COM1 RXD, Receive data
8	VDD2
9	COM1 CTS, Clear to send
10	COM3 TXD, Transmit data (Same signal as COM3 Port Pin 2)

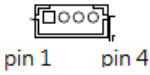
Note: Please refer to J13 setting for Pin3 and Pin8.

COM2 Port: COM2 RS232 Connector



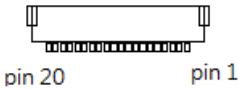
Pin #	Signal Name
1	COM2 RTS, Request to send
2	COM2 TXD, Transmit data
3	COM2 RXD, Receive data
4	COM2 CTS, Clear to send
5	GND, ground
6	NC

**COM3 Port: COM3 RS232 Connector, Debug Port Connector
(Factory use only)**



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

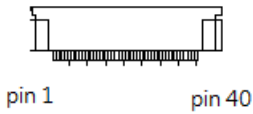
LVDS1: LVDS Display Connector



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 or +12V
18	+5V or +12V
19	GND
20	BACKLIGHT ADJ

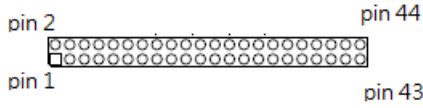
Note: Pin 17 and Pin 18 default setting voltage are +5V.

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

J3: LCD 24 Bit Parallel Signal Connector (Factory use only)



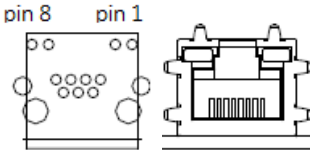
Pin #	Signal Name	Pin #	Signal Name
1	+5V	23	D16
2	+5V	24	D17
3	+3.3V	25	D18
4	+3.3V	26	D19
5	D0	27	D20
6	D1	28	D21
7	D2	29	D22
8	D3	30	D23
9	D4	31	GND
10	D5	32	DE
11	D6	33	VSYNC
12	D7	34	HSYNC
13	GND	35	DCLK
14	D8	36	BACKLIGHT ADJ
15	D9	37	BACKLIGHT ENABLE
16	D10	38	GND
17	D11	39	TOUCH YP
18	D12	40	TOUCH YM
19	D13	41	TOUCH XP
20	D14	42	TOUCH XM
21	D15	43	+12V
22	GND	44	+12V

CN3: Resistive Touch Panel Connector

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

CN4: 10/100Mb LAN (PoE supported)

This RJ45 LAN connector supports PoE function.



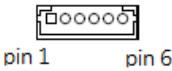
CN8: LED Backlight Control Connector



Pin #	Signal Name
1	+12V
2	BACKLIGHT ADJ
3	BACKLIGHT ENABLE
4	GND

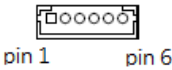
Note: Pin 1 maximum output current is 0.5A

CN9: I2C3 Connector



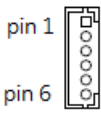
Pin #	Signal Name
1	GND, ground
2	I2C3_SDA
3	I2C3_SCL
4	+3.3V
5	I2C3_INT1n
6	I2C3_RESETn

CN11: I2C2 Connector



Pin #	Signal Name
1	GND, ground
2	I2C2_SDA
3	I2C2_SCL
4	+3.3V
5	I2C2_INT1n
6	I2C2_RESETn

CN10: SPI1 Connector



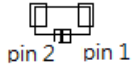
Pin #	Signal Name
1	SPI1_CLK
2	SPI1_SIMO
3	SPI1_SOMI
4	SPI1_CS0
5	+3.3V
6	GND

J2: ARM JTAG Debug Port (Factory use only)

J9: Resistive Touch Connector (Factory use only)

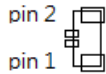
J17: RS232 Connector (Factory use only)

JMIC1: Mic Connector



Pin #	Signal Name
1	GND
2	MIC Input

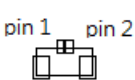
J4: Speaker Right Out Connector



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

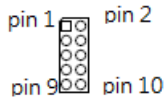
J5: Speaker Left Out Connector



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

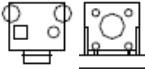
J1: Digital I/O 4 In/4 Out Connector



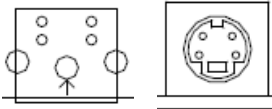
Signal Name	Pin #	Pin #	Signal Name
GND	1	2	+3.3V
OUT3	3	4	OUT1
OUT2	5	6	OUT0
IN3	7	8	IN1
IN2	9	10	IN0

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

SW1: Push Button for Hardware Reset



J6: S-Video connector

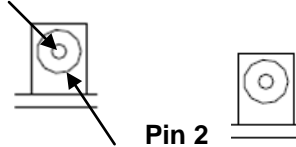


BAT1: CR2032 3V LITHIUM Battery Socket

CN5: 12V Power Connector

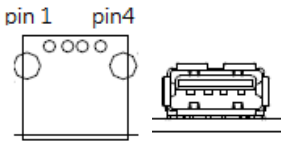
This connector supplies the system board operating voltage

Pin 1



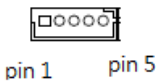
Pin #	Signal Name
1	+12V
2	GND

JUSB1: USB2.0 Type A Connector



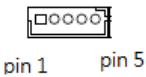
Pin #	Signal Name
1	+5V
2	D-
3	D+
4	GND

J11: USB2.0 Connector



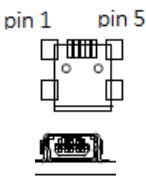
Pin #	Signal Name
1	+5V
2	D-
3	D+
4	GND
5	GND

J12: USB2.0 Connector



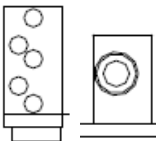
Pin #	Signal Name
1	+5V
2	D-
3	D+
4	GND
5	GND

CN6: Mini USB OTG Connector

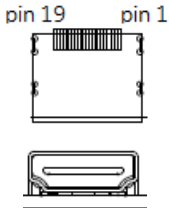


Pin #	Signal Name
1	+5V
2	D-
3	D+
4	ID
5	GND

J8: Line-out Phone-Jack Connector

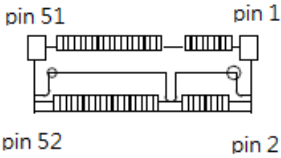


J7: DVI Connector



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



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	RESETn
NC	23	24	NC
NC	25	26	GND
GND	27	28	NC
GND	29	30	NC
NC	31	32	NC
NC	33	34	GND
NC	35	36	USB2.0 D-
GND	37	38	USB2.0 D+
GND	39	40	GND
NC	41	42	NC
GND	43	44	NC
NC	45	46	NC
NC	47	48	NC
NC	49	50	GND
NC	51	52	+3.3V

GN12: 5V Connector

Pin #	Signal Name
1	+5V
2	GND

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