

SB-X300

Reference Guide Rev 1.2



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Document Revision Information

| Date | Description |
|--------------------|--|
| August 24, 2008 | Preliminary release |
| September 9, 2008 | LCD connector pin count updated in the block diagram and features table |
| May 1, 2009 | SB-X300 Revision 1.1 introduced Revision notes for SB-X300 board revision 1.1 on page 12 |
| August 11, 2009 | Chapter 3.2.15, General purpose FPC (P11), updated: adapter name changed to IDEFPC |
| September 27, 2009 | Table 22 IDEFPC Signal Mapping, added |
| May 12, 2010 | Power supply voltage upper limit changed to 4.2V. |
| May 2011 | Document Layout Updated. Added revision notes for SB-X300 rev 1.2 on page 9 Added revision notes for SB-X300 rev 1.3 on page 10 Added revision notes for SB-X300 rev 1.4 on page 10 Updated figures 2 and 3 with SB-X300 rev1.4 view. Updated tables 5 and 6 with SB-X300 rev1.4 components. Updated table 25 with Differences between SB-X300 board revisions. Chapter 3.2.2 and Table 1 revised with SB-X300 rev 1.4 functionality. Chapter 3.2.3 revised with SB-X300 rev 1.4 functionality. Chapter 3.2.4 revised with SB-X300 rev 1.4 functionality. Chapter 3.2.9 revised with SB-X300 rev 1.4 functionality. Chapter 3.3.2 moved to chapter 3.3.3 Added chapters 3.3.2, 3.3.4, 3.3.5 Added tables 29 and 30. |

Please check for a newer revision of this manual at CompuLab's web site – <http://www.compulab.co.il/>. Compare the revision notes of the updated manual from the web site with those of the printed or electronic version you have.

1 INTRODUCTION

1.1 About This Document

This document is part of a set of reference documents providing information necessary to operate and program CompuLab's CM-X300 Embedded PC Module, which are listed under Related Documents in this section.

Additional chapters are as follows:

2. Overview
3. Functional Description

1.2 Terminology

Table 1 Acronyms

| Term | Description |
|------|--|
| CAMI | CompuLab's Aggregated Module Interface. A standardized module connector interface allowing interchangeability with other CM brand modules. |

1.3 Related Documents

For additional information not covered in this manual, refer to the documents listed in the Table 2.

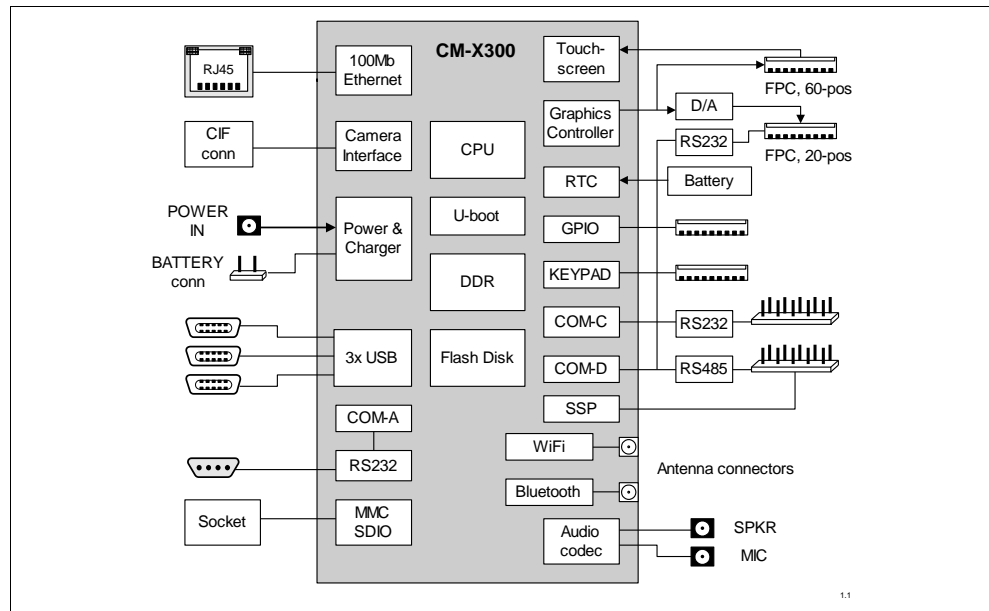
Table 2 Related documents

| Document | Location |
|-----------------------------------|---|
| X300 Products Developer Resources | http://compuLab.co.il/x300/html/x300-developer.py |

2 OVERVIEW

2.1 Block Diagram

Figure 1 SB-X300 Block Diagram



2.2 SB-X300 Features

The SB-X300 serves as a carrier card for the CM-X300 module. It features interface connectors for the majority of CM-X300 functions and adds some additional functionality which makes the SB-X300 and CM-X300 bundle a complete system-on-board.

Table 3 SB-X300 features

SB-X300 doesn't have assembling options. The "CM Option" column specifies the P/N code of CM-X300 required to have the particular feature.

"+" means that the feature is always available, regardless of P/N code.

| Feature | Specification | CM Option |
|----------------------------|---|-----------|
| CPU SDRAM Flash Disk | See Feature List of CM-X300 module | |
| Serial port A | Rx/Tx only, RS-232 levels, mini-serial connector | + |
| Serial port C | Full modem controls, RS-232 levels, standard 10-pin header, adapter to DB-9 | + |
| Serial port D | Rx/Tx + RTS/CTS, RS-232/422/485 levels, standard 10-pin header | + |
| LAN | One 100 Mbps Ethernet port. DM9000A controller. RJ-45 connector and activity LED's | E |
| LCD Panel | STN and TFT panel support. 60-pos FPC connector for direct interface to certain TFT panels. 22mA backlight converter. | + |
| CRT interface | Through video DAC | + |
| GPIO | 22 lines, on FPC or 100-mil header. | + |
| Host USB | Two host ports, 12 Mbps, front panel connectors. One of ports is shared with Bluetooth interface. | + |
| Slave USB | Slave USB-2 (480 Mbps) dedicated port. Shared with camera interface on non-PXA310 configured modules. | + |
| Touch Panel | Part of Wolfson W9712L controller for resistive panels. Interface to LCD panel | AT |
| Sound I/O | Part of Wolfson W9712L controller, line input (stereo) and microphone (mono), speakers (stereo) jacks | AT |
| RTC Battery | Real time clock component on CM-X300, operated from lithium battery on SB-X300 | + |
| WiFi | WiFi interface, including on-board antenna & connectors, provided by CM-X300 | W |
| Bluetooth | Bluetooth interface, including on-board antenna & connectors, provided by CM-X300 | W |
| Video Input | Camera interface, shared with USB device interface on non-PXA310 configured modules. | + |
| SDIO / MMC | Two interfaces supported | + |

Table 4 Electrical, Mechanical and Environmental Specifications

| | |
|-----------------------|---|
| Supply Voltage | High efficiency switched power supply in battery operation mode. Support of sleep mode. Unregulated 3.3 to 4.2 volt input from battery or regulated 5V from wall adapter. |
| Power Consumption | 2W to 5W in full activity, depending on CPU speed and selected features. Below 50mW in sleep mode |
| Dimensions | 87 mm (L) x 68.5 mm (W) x 19.5 mm (H) |
| Weight | 48 grams |
| Operation temp (case) | Commercial : 0° to 70° C Extended : -20° to 70° C Industrial : -40° to 85° C |
| Storage temperature | -40° to 85° C |
| Relative humidity | 10% to 90% (operation) 05% to 95% (storage) |
| Shock | 50G / 20 ms |
| Vibration | 20G / 0 - 600 Hz |
| MTBF | > 100,000 hours |

2.2.1 Revision notes for SB-X300 board revision 1.1

- 2.5mm audio sockets replaced with 3.5mm sockets
- LCD backlight circuit enabled
- 3.3V and 5V power header added for connecting external devices
- Battery and CM-X300 charger support enabled
- CRT display connector added

2.2.2 Revision notes for SB-X300 board revision 1.2

- Silk labels for connectors and switches printed on the board.
- Improved reliability of backlight and RS-232 circuits
- SD-Socket circuit changed
- Improved board power circuit.
- Added an additional battery charger and supervisor.
- Improved power circuit
- A general purpose push button added.
- USB OTG power is now applied by CM-X300 PMIC.

2.2.3 Revision notes for SB-X300 board revision 1.3

- SB-X300 baseboard charger functionality improved.
- Main power source LED added
- SD-Socket circuit changed
- Charger selector jumper circuit improved
- Improved LCD Backlight circuit
- General purpose pushbutton functionality improved
- Improved power circuit

2.2.4 Revision notes for SB-X300 board revision 1.4

- SB-X300 baseboard charger functionality improved.
- Main power source LED added
- Improved LCD Backlight circuit
- General purpose push button functionality improved
- Improved power circuit to support on-the fly power source alteration (When E2 is not populated).
- Reduced static noise on audio I/O.

3 FUNCTIONAL DESCRIPTION

3.1 Board Layout

3.1.1 Top Side Components

Figure 2 shows the top side of SB-X300. The top side components are listed in Table 5.

Figure 2 SB-X300 Top view

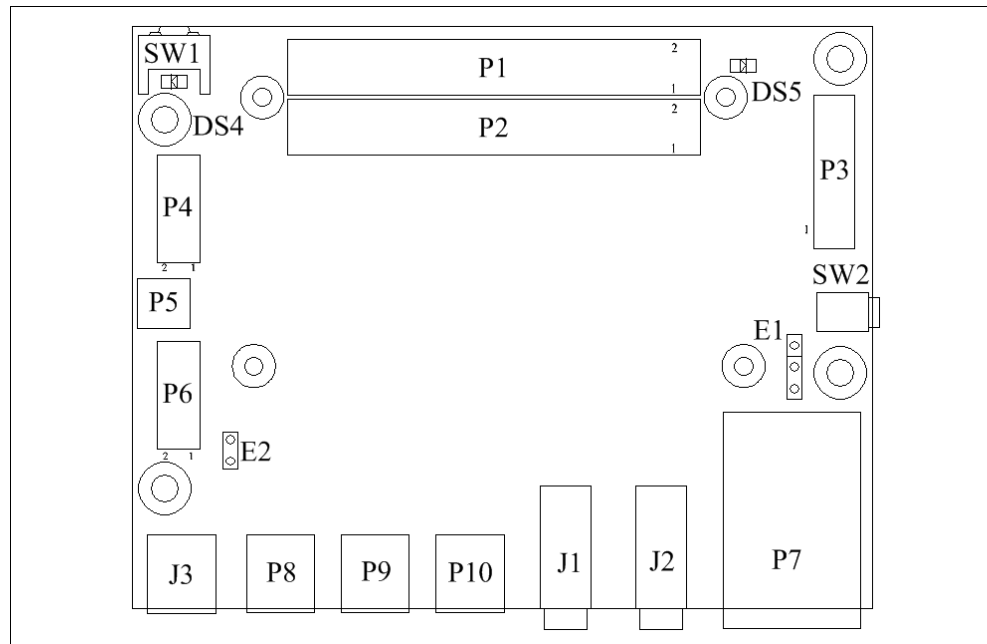


Table 5 Top Side Components

| Reference | Function |
|-----------|---|
| E1 | Header for connecting power to external devices (not assembled) |
| E2 | Charger select jumper |
| J1 | Line input/microphone jack |
| J2 | Line output jack |
| J3 | Power jack |
| P1, P2 | CAMI connectors A, B accordingly |
| P3 | LCD connector |
| P4 | COM-C serial port header (full UART) |
| P5 | Battery connector |
| P6 | SSP and COM-D serial port header (RS-485) |
| P7 | LAN socket |
| P8 | USB device connector |
| P9 | USB host connector |
| P10 | USB OTG connector |
| SW1 | Reset button |
| SW2 | General purpose push button |
| DS4 | Main power LED |
| DS5 | 3.3V power LED |

3.1.2 Bottom Side Components

Figure 3 shows the bottom side of SB-X300 board revision 1.4. The bottom side components are listed in Table 6.

Figure 3 SB-X300 Bottom (X-Ray view – as seen from the top side)

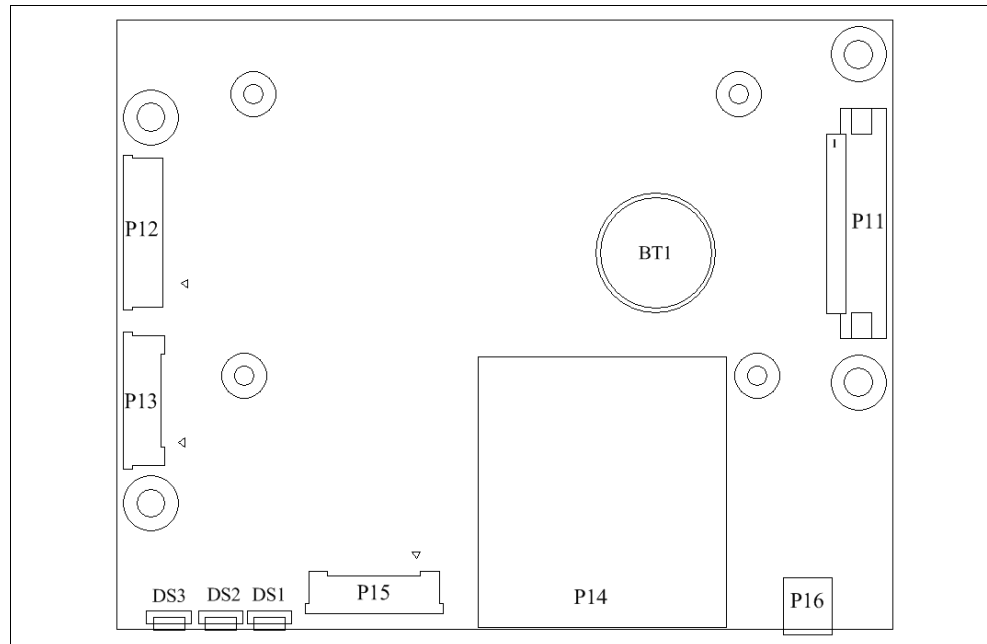


Table 6 Bottom Side Components

| Reference | Function |
|-----------|--------------------------------|
| DS1 | General purpose LED |
| DS2 | SB-X300 charger fault LED |
| DS3 | SB-X300 charger status LED |
| BT1 | RTC Backup battery |
| P11 | GPIO connector |
| P12 | Camera Interface connector |
| P13 | Keypad connector |
| P14 | SDIO socket |
| P15 | CRT connector |
| P16 | COM-A serial console connector |

NOTE: For board layout of SB-X300 revisions other than 1.4 please refer to SB-X300 design section in the CM-X300 developer resources page at <http://www.compuLab.co.il/>.

3.2 Connectors Pinout

3.2.1 DC Voltages Header (E1)

Header is used for routing SB-X300's internal 5V and 3.3V supplies to external devices such as LCD, if required. Not assembled by default.

Table 7 DC Voltages Header (E1) Signals

| Pin | Signal | Description |
|-----|--------|-------------|
| 1 | VCC3_3 | 3.3V supply |
| 2 | GND | GND |
| 3 | VCC5 | 5.0V supply |

3.2.2 Charger and Power Source Selector (E2)

The main power source of SBC-X300 may be one of the following:

- Wall adapter 5V DC through connector J3
- Lithium battery 3.6V through connector P5

When SBC-X300 draws its power from a lithium battery, one of the two integrated battery chargers may be used to recharge the battery.

- SB-X300 battery charger, software independent.
- CM-X300 battery charger, software controlled.

Both chargers use the 5V (when available) at J3 to charge the battery at P5.

NOTE: SB-X300 board revision 1.1 or older do not feature a battery charger. Only CM-X300 battery charger may be used with SB-X300 revision 1.1

Table 8 Charger and Power Source Selector (E2)

| E2 Pos. | SB-X300 board revision | Notes/Limitations |
|---------|------------------------|--|
| 1-2 | 1.2 or newer | <ol style="list-style-type: none"> 1. Battery connected to P5 is the main power source of SBC-X300. 2. When a DC 5V source is available at J3, CM-X300 battery charger may be activated by software. 3. SB-X300 battery charger is disabled. 4. It is highly recommended to prevent battery voltage from dropping lower than 3.3V at all times. 5. SBC-X300 will not start until a valid battery is connected to P5 |
| | 1.1 | <ol style="list-style-type: none"> 1. DC 5V at J3 is the main power source of SBC-X300. 2. CM-X300 battery charger is disabled. 3. Battery should not be connected to P5. |
| N.A. | 1.2 or newer | <ol style="list-style-type: none"> 1. Either a battery at P5 or a DC 5V at J3 is the main power source of SBC-X300. 2. When both sources are available, battery charging by SB-X300 charger is enabled. 3. CM-X300 battery charger is disabled. |
| | 1.1 | <ol style="list-style-type: none"> 1. System is powered off. |
| 2-3 | 1.1 | <ol style="list-style-type: none"> 1. Battery connected to P5 is the main power source of SBC-X300. 2. When a DC 5V source is available at J3, CM-X300 battery charger may be activated by software. 3. It is highly recommended to prevent battery voltage from dropping lower than 3.3V at all times. 4. SBC-X300 will not start until a valid battery is connected to P5 |

NOTE: On the fly alteration of jumper E2 setting is not supported

NOTE: For more information on CM-X300 (software controlled) battery charger please refer to CM-X300 reference manual.

3.2.3 Line Input and Microphone (J1)

Standard 3.5mm audio jack.

Table 9 Line Input Jack (J1) Signals

| Pin | Signal | Description |
|--------|---------|----------------------------------|
| Tip | INL-MIC | Connected to AUD-INL-MIC on CAMI |
| Ring | INR | Connected to AUD-INR on CAMI |
| Sleeve | GND | Common |

3.2.4 Line Output (J2)

Standard 3.5mm audio jack.

Table 10 Line Output Jack (J2) Signals

| Pin | Signal | Description |
|--------|--------|-------------------------------|
| Tip | OUTL | Connected to AUD-OUTL on CAMI |
| Ring | OUTR | Connected to AUD-OUTR on CAMI |
| Sleeve | GND | Common |

3.2.5 Power Jack (J3)

5V DC input jack, Compatible with power supply adaptor 209C10020 available from CompuLab. Please refer to section 3.2.2 for more information on SBC-X300 power.

Table 11 Power Jack (J3) Signals

| Pin | Signal | Description |
|----------|--------|-------------|
| Internal | +5VDC | 5.0 VDC |
| Sleeve | GND | GND |

3.2.6 CAMI Connectors (P1, P2)

CM-X300 board interface connectors. For signal descriptions please refer to CM-X300 reference manual.

3.2.7 TOPPLY LCD Connector (P3)

The TOPPOLY LCD connector (P15) allows seamless integration with the TD035STEE1 LCD module available from CompuLab. LCD interface, control, power and touch-screen interface signals are routed to this connector.

Table 12 LCD Connector (P3) Signals

| Pin No. | Signal | Description |
|---------|--------|---|
| 1 | GND | GND |
| 2 | YU | Touch panel. Connected to AC97_TS_YP on CAMI. |
| 3 | XR | Touch panel. Connected to AC97_TS_XP on CAMI. |
| 4 | YL | Touch panel. Connected to AC97_TS_YM on CAMI. |
| 5 | XL | Touch panel. Connected to AC97_TS_XM on CAMI. |
| 6 | GND | GND |
| 7 | N.C. | No connect |
| 8 | N.C. | No connect |
| 9 | GND | GND |
| 10 | N.C. | No connect |
| 11 | N.C. | No connect |
| 12 | N.C. | No connect |
| 13 | N.C. | No connect |
| 14 | N.C. | No connect |
| 15 | GND | GND |
| 16 | N.C. | No connect |
| 17 | XRES | Reset. Connected to I2C_GPIO3_4 on CAMI. |
| 18 | N.C. | No connect |
| 19 | N.C. | No connect |
| 20 | VDC | 3.3 VDC |
| 21 | GND | GND |
| 22 | B0 | GND |
| 23 | B1 | Connected to LCD-B1 on CAMI. |
| 24 | B2 | Connected to LCD-B2 on CAMI. |
| 25 | B3 | Connected to LCD-B3 on CAMI. |
| 26 | B4 | Connected to LCD-B4 on CAMI. |
| 27 | B5 | Connected to LCD-B5 on CAMI. |
| 28 | GND | GND |
| 29 | G0 | Connected to LCD-G0 on CAMI. |
| 30 | G1 | Connected to LCD-G1 on CAMI. |
| 31 | G2 | Connected to LCD-G2 on CAMI. |
| 32 | G3 | Connected to LCD-G3 on CAMI. |
| 33 | G4 | Connected to LCD-G4 on CAMI. |
| 34 | G5 | Connected to LCD-G5 on CAMI. |
| 35 | GND | GND |
| 36 | R0 | GND |
| 37 | R1 | Connected to LCD-R1 on CAMI. |
| 38 | R2 | Connected to LCD-R2 on CAMI. |
| 39 | R3 | Connected to LCD-R3 on CAMI. |
| 40 | R4 | Connected to LCD-R4 on CAMI. |
| 41 | R5 | Connected to LCD-R5 on CAMI. |
| 42 | GND | GND |
| 43 | VDDIO | VCC3_3 |
| 44 | N.C. | No connect |
| 45 | GND | GND |
| 46 | PCLK | Connected to LCD-SCK on CAMI. |
| 47 | GND | GND |
| 48 | DE | Connected to LCD-DE on CAMI. |
| 49 | DOUT | Serial data output. Connected to I2C_GPIO3_1 on CAMI. |

| Pin No. | Signal | Description |
|---------|--------|---|
| 50 | XCS | Serial chip select. Connected to I2C_GPIO3_3 on CAMI. |
| 51 | DIN | Serial data input. Connected to I2C_GPIO3_0 on CAMI. |
| 52 | N.C. | No connect |
| 53 | SCL | Serial clock input. Connected to I2C_GPIO3_2 on CAMI. |
| 54 | VSYNC | Connected to LCD-FRM on CAMI |
| 55 | HSYNC | Connected to LCD-LP on CAMI |
| 56 | N.C. | No connect |
| 57 | N.C. | No connect |
| 58 | LED- | White LED supply, '-' terminal |
| 59 | LED+ | White LED supply, '+' terminal |
| 60 | GND | GND |

All LCD data, clock and control signals are terminated with 51 Ohm serial dumping resistors.

Connecting different LCD panels to SB-X300 is possible with CompuLab's CONEMFPC + CONLCD-GEN-V2 solution.

- CONEMFPC adaptor board connects directly to the connector P3 on the SB-X300 and mates it to a FPC connector.
- CONLCD-GEN-V2 adaptor board provides a convenient 100-mil header to route the signals from an FPC connector.
- 40-lead FPC cable required in order to interconnect between CONEMFPC and CONLCD-GEN-V2 FPC connectors.

See the CompuLab part numbers for the accessories listed above in the Table 13.

Table 13 Accessories for Connecting Generic LCD

| Name | P/N | Description |
|---------------|------------|--|
| CONEMFPC | 503R010110 | Assembled PCB, CONEMFPC |
| CONLCD-GEN-V2 | 503R101301 | Assembled PCB, CONLCD-GEN-V2 |
| 40-lead FPC | 410X60401 | Cable, FFC, 40 cont, 0.5mm pitch, L=30cm |

3.2.8 COM-C Serial Port (P4)

This is a full-modem serial interface with RS-232 levels. TTL levels may be also available on custom order. The interface header is 2 x 5-pin 100mil header and it is compatible with "Krista-Micro P/N 12-762" serial adapter cable.

Table 14 COM-C Serial Port (P4) Signals

| Pin No. | Signal | Description |
|---------|--------|------------------------------|
| 1 | DCD | RS-232 version of COM-C-DCD# |
| 2 | RXD# | RS-232 version of COM-C-RX |
| 3 | TXD# | RS-232 version of COM-C-TX |
| 4 | DTR | RS-232 version of COM-C-DTR# |
| 5 | GND | GND |
| 6 | DSR | RS-232 version of COM-C-DSR# |
| 7 | RTS | RS-232 version of COM-C-RTS# |
| 8 | CTS | RS-232 version of COM-C-CTS# |
| 9 | RI | RS-232 version of COM-C-RI# |
| 10 | N.C. | No connect |

3.2.9 Battery Connector (P5)

Lithium battery connector, a battery connected to P5 may be used as the main power source of SBC-X300. P5 mates with Molex P/N 87439-0300. Please refer to section 3.2.2 for more information on SBC-X300 power.

Table 15 Battery Connector (P5) Signals

| Pin No. | Signal | Description |
|---------|--------|---------------------------|
| 1 | VBAT | Battery voltage |
| 2 | TBAT | Battery thermistor output |
| 3 | GND | Common wire |

3.2.10 SSP and COM-D Serial Port, RS-485 (P6)

The interface header is 2 x 5-pin 100mil header.

SSP part of P6 provides access to the PXA3xx's SSP3 port routed directly through the CAMI connectors.

The second part of P6 features a full-duplex RS-485 version of the COM-D serial interface. Differential pairs are terminated near the driver by a 120 Ohm differential termination. Transmit is enabled by the COM-D-RTS# signal on CAMI.

NOTE: RS-232 version of the COM-D port is available on connector P15. Please refer to section 3.2.19 for more information.

Table 16 SSP and COM-D RS-485 Serial Port (P6) Signals

| Pin No. | Signal | Description |
|---------|----------|--------------------------|
| 1 | SSP_SFRM | SSP SFRM signal |
| 2 | TXP | RS-485 Transmit pair '+' |
| 3 | SSP_SCLK | SSP SCLK signal |
| 4 | TXN | RS-485 Transmit pair '-' |
| 5 | SSP_TXD | SSP TXD signal |
| 6 | RXP | RS-485 Receive pair '+' |
| 7 | SSP_RXD | SSP RXD signal |
| 8 | RXN | RS-485 Receive pair '-' |
| 9 | GND | GND |
| 10 | GND | GND |

3.2.11 Ethernet (P7)

SB-X300 is equipped with a standard Ethernet RJ-45 connector and magnetics. P7 provides access to the ETH1 port on CAMI. The connector is equipped with two signaling LED's.

Table 17 Ethernet Connector (P7) Signals

| Pin No. | Signal | Description |
|---------|--------|---|
| 1 | TXP | Transmit pair '+' |
| 2 | TXN | Transmit pair '-' |
| 3 | RXP | Receive pair '+' |
| 4 | TERM1 | Terminated by 75 Ohm and 1nF serial RC-circuit to GND |
| 5 | TERM1 | Terminated by 75 Ohm and 1nF serial RC-circuit to GND |
| 6 | RXN | Receive pair '-' |
| 7 | TERM2 | Terminated by 75 Ohm and 1nF serial RC-circuit to GND |
| 8 | TERM2 | Terminated by 75 Ohm and 1nF serial RC-circuit to GND |

3.2.12 USB Device (P8)

P8 is a mini-USB type-AB connector, interfaced with the USB3 port of CM-X300. The USB3 port is protected from a short-circuit condition on VBUS, ESD (data signals only) and EMI (data signals only).

NOTE: SBC-X300 does not supply 5V to VBUS pin of P8.

Table 18 USB Device Connector (P8) Signals

| Pin No. | Signal | Description |
|---------|--------|-----------------------------|
| 1 | VBUS | 5.0 VDC |
| 2 | D- | Connected to USB3-N on CAMI |
| 3 | D+ | Connected to USB3-P on CAMI |
| 4 | N.C. | No connect |
| 5 | GND | GND |

3.2.13 USB Host (P9)

P9 is a mini-USB type-AB connector, interfaced with the USB1 port of CM-X300. The USB1 port is protected from a short-circuit condition on VBUS, ESD (data signals only) and EMI (data signals only).

Table 19 USB Host Connector (P9) Signals

| Pin No. | Signal | Description |
|---------|--------|-----------------------------|
| 1 | VBUS | 5.0 VDC |
| 2 | D- | Connected to USB1-N on CAMI |
| 3 | D+ | Connected to USB1-P on CAMI |
| 4 | N.C. | No connect |
| 5 | GND | GND |

3.2.14 USB Device/Host (P10)

P10 is a mini-USB type-AB connector, interfaced with the USB2 port of CM-X300. The USB2 port is protected from a short-circuit condition on VBUS, ESD (data signals only) and EMI (data signals only).

Table 20 USB Device/Host Connector (P10) Signals

| Pin No. | Signal | Description |
|---------|--------|---------------------------------|
| 1 | VBUS | 5.0 VDC |
| 2 | D- | Connected to USB2-N on CAMI |
| 3 | D+ | Connected to USB2-P on CAMI |
| 4 | ID | Connected to USB_OTG_ID on CAMI |
| 5 | GND | GND |

3.2.15 General purpose FPC (P11)

The General purpose FPC is a 40-pin 0.5mm FPC connector for general purpose usage.

The IDEFPC adaptor available from CompuLab allows interfacing signals on P11 with a 2x20 pin 100mil header

NOTE: IDEFPC is not fully compatible with P11, see Table 22 for IDEFPC signal mapping.

Table 21 GPIO Connector (P11) Signals

| Pin No. | Signal | Description |
|---------|-------------|--------------------------------|
| 1 | I2C_GPIO1_0 | Routed directly to CAMI signal |
| 2 | VCC5 | 5.0 VDC |
| 3 | I2C_GPIO1_1 | Routed directly to CAMI signal |
| 4 | I2C_GPIO1_2 | Routed directly to CAMI signal |
| 5 | VCC5 | 5.0 VDC |
| 6 | I2C_GPIO1_3 | Routed directly to CAMI signal |
| 7 | I2C_GPIO1_4 | Routed directly to CAMI signal |
| 8 | GND | GND |
| 9 | I2C_GPIO1_5 | Routed directly to CAMI signal |
| 10 | I2C_GPIO1_6 | Routed directly to CAMI signal |
| 11 | GND | GND |
| 12 | I2C_GPIO1_7 | Routed directly to CAMI signal |
| 13 | I2C_GPIO0_7 | Routed directly to CAMI signal |
| 14 | GND | GND |
| 15 | I2C_GPIO0_6 | Routed directly to CAMI signal |
| 16 | I2C_GPIO0_5 | Routed directly to CAMI signal |
| 17 | GND | GND |
| 18 | I2C_GPIO0_4 | Routed directly to CAMI signal |
| 19 | I2C_GPIO0_3 | Routed directly to CAMI signal |
| 20 | GND | GND |
| 21 | I2C_GPIO0_2 | Routed directly to CAMI signal |
| 22 | I2C_GPIO0_1 | Routed directly to CAMI signal |
| 23 | GND | GND |
| 24 | I2C_GPIO0_0 | Routed directly to CAMI signal |
| 25 | GPIO81 | Routed directly to CAMI signal |
| 26 | GND | GND |
| 27 | I2C-CLK | Routed directly to CAMI signal |
| 28 | I2C-DATA | Routed directly to CAMI signal |
| 29 | GPIO83 | Routed directly to CAMI signal |
| 30 | GND | GND |
| 31 | GPIO84 | Routed directly to CAMI signal |
| 32 | GPIO88 | Routed directly to CAMI signal |
| 33 | GND | GND |
| 34 | GPIO89 | Routed directly to CAMI signal |
| 35 | GPIO90 | Routed directly to CAMI signal |
| 36 | EXTWAKE# | Routed directly to CAMI signal |
| 37 | GND | GND |
| 38 | DF_WP# | Routed directly to CAMI signal |
| 39 | N.C. | No connect |
| 40 | RST_OUT# | Routed directly to CAMI signal |

Table 22 IDEFPC Signal Mapping

| Pin No. | IDEFPC Signal | Description |
|---------|---------------|--|
| 1 | RST_OUT# | |
| 2 | GND | |
| 3 | I2C_GPIO0_7 | |
| 4 | I2C_GPIO1_0 | |
| 5 | I2C_GPIO0_6 | |
| 6 | I2C_GPIO1_1 | |
| 7 | I2C_GPIO0_5 | |
| 8 | I2C_GPIO1_2 | |
| 9 | I2C_GPIO0_4 | |
| 10 | I2C_GPIO1_3 | |
| 11 | I2C_GPIO0_3 | |
| 12 | I2C_GPIO1_4 | |
| 13 | I2C_GPIO0_2 | |
| 14 | I2C_GPIO1_5 | |
| 15 | I2C_GPIO0_1 | |
| 16 | I2C_GPIO1_6 | |
| 17 | I2C_GPIO0_0 | |
| 18 | I2C_GPIO1_7 | |
| 19 | GND | |
| 20 | N.C. | |
| 21 | N.C. | |
| 22 | GND | |
| 23 | GPIO83 | |
| 24 | GND | |
| 25 | GPIO88 | |
| 26 | GND | |
| 27 | I2C-CLK | |
| 28 | GND | |
| 29 | GPIO90 | |
| 30 | GND | |
| 31 | I2C-DATA | |
| 32 | N.C. | |
| 33 | DF_WP# | |
| 34 | N.C. | |
| 35 | GPIO84 | |
| 36 | EXTWAKE# | |
| 37 | GPIO81 | |
| 38 | GPIO89 | |
| 39 | LED* | Connecting this pin to GND will light the LED on IDEFPC. |
| 40 | GND | |

3.2.16 Camera Interface (P12)

Mating connector order details: ELCO 24-5602-030-000-829

Table 23 Camera Interface (P12) Signals

| Pin No. | Signal | Description |
|---------|------------|---|
| 1 | AGND | GND |
| 2 | FLASH | Connected to I2C_GPIO2_0 on CAMI |
| 3 | DATA0 | Connected to CIF_DD0 on CAMI |
| 4 | SDA | I2C data, connected to I2C_SDA on CAMI |
| 5 | DATA1 | Connected to CIF_DD1 on CAMI |
| 6 | SCL | I2C clock, connected to I2C_SCL on CAMI |
| 7 | DATA2 | Connected to CIF_DD2 on CAMI |
| 8 | STANDBY | Connected to I2C_GPIO2_2 on CAMI |
| 9 | DATA3 | Connected to CIF_DD3 on CAMI |
| 10 | PCLK | Connected to CIF_PCLK on CAMI |
| 11 | DATA4 | Connected to CIF_DD4 on CAMI |
| 12 | VDDC(1.8V) | 1.8V camera supply |
| 13 | DATA5 | Connected to CIF_DD5 on CAMI |
| 14 | MCLK | Connected to CIF_MCLK on CAMI |
| 15 | DATA6 | Connected to CIF_DD6 on CAMI |
| 16 | RESET | Connected to I2C_GPIO2_3 on CAMI |
| 17 | DATA7 | Connected to CIF_DD7 on CAMI |
| 18 | VSYNC | Connected to CIF_FV on CAMI |
| 19 | DATA8 | Connected to CIF_DD8 on CAMI |
| 20 | HSYNC | Connected to CIF_LV on CAMI |
| 21 | DATA9 | Connected to CIF_DD9 on CAMI |
| 22 | NC | No connect |
| 23 | NC | No connect |
| 24 | NC | No connect |
| 25 | SHUTTER | Connected to I2C_GPIO2_1 on CAMI |
| 26 | VAAS(2.8V) | 2.8V camera supply |
| 27 | NC | No connect |
| 28 | VDDQ(2.8V) | 2.8V camera supply |
| 29 | DGND | GND |
| 30 | VAAM(2.8V) | 2.8V camera supply |

3.2.17 Keypad FPC (P13)

The keypad FPC is a 20-pin 0.5mm FPC connector.

The KEYPAD (CompuLab P/N: 503M100100) accessory available from CompuLab is compatible with P13.

Table 24 Keypad Connector (P13) Signals

| Pin No. | Signal | Description |
|---------|-----------|-----------------------------------|
| 1 | KP-MKIN0 | Connects directly to CAMI signal. |
| 2 | KP-MKIN1 | Connects directly to CAMI signal. |
| 3 | KP-MKIN2 | Connects directly to CAMI signal. |
| 4 | KP-MKIN3 | Connects directly to CAMI signal. |
| 5 | INT | Connects directly to CAMI signal. |
| 6 | KP-MKIN4 | Connects directly to CAMI signal. |
| 7 | KP-MKIN5 | Connects directly to CAMI signal. |
| 8 | KP-MKIN6 | Connects directly to CAMI signal. |
| 9 | KP-MKIN7 | Connects directly to CAMI signal. |
| 10 | ONKEY# | Connects directly to CAMI signal. |
| 11 | KP-MKOUT0 | Connects directly to CAMI signal. |
| 12 | KP-MKOUT1 | Connects directly to CAMI signal. |
| 13 | KP-MKOUT2 | Connects directly to CAMI signal. |
| 14 | KP-MKOUT3 | Connects directly to CAMI signal. |
| 15 | GND | GND |
| 16 | KP-MKOUT4 | Connects directly to CAMI signal. |
| 17 | KP-MKOUT5 | Connects directly to CAMI signal. |
| 18 | N.C. | No connect |
| 19 | N.C. | No connect |
| 20 | GND | GND |

3.2.18 MMC/SD Socket (P14)

P14 is a standard 3.3V push-push type MMC/SD card socket.

Table 25 MMC/SD Socket (P14) Signals

| Pin No. | Signal | Description |
|---------|--------|--|
| 1 | DAT3 | Connected to MMC1_DAT3 on CAMI |
| 2 | CMD | Connected to MMC1_CMD0 on CAMI |
| 3 | VSS1 | GND |
| 4 | VDD | 3.3 VDC |
| 5 | CLK | Connected to MMC1_CLK on CAMI |
| 6 | VSS2 | GND |
| 7 | DAT0 | Connected to MMC1_DAT0 on CAMI |
| 8 | DAT1 | Connected to MMC1_DAT1 on CAMI |
| 9 | DAT2 | Connected to MMC1_DAT2 on CAMI |
| 10 | GND | GND |
| 11 | CD | SB-X300 board revisions 1.1 or older - Connected to GPIO82 on CAMI |
| | | SB-X300 board revisions 1.2 or newer - Connected to GPIO84 on CAMI |
| 12 | WP | SB-X300 board revisions 1.2 or older - Connected to GPIO85 on CAMI |
| | | SB-X300 board revisions 1.3 or newer - Connected to GPIO89 on CAMI |

3.2.19 CRT and COM-D Serial Port, RS-232 (P15)

The CRT and COM-D FPC is a 20-pin 0.5mm FPC connector.

The CRT part of P15 connector is interfaced with analog RGB and HSYNC/VSYNC signals for a CRT display.

The COM-D part of P15 is an RS-232 version of the COM-D CAMI port (RXD-TXD-RTS-CTS).

Table 26 CRT and COM-D RS-232 Serial Port (P15) Signals

| Pin No. | Signal | Description |
|---------|---------------|-------------------------------------|
| 1 | N.C. | No connect |
| 2 | UART2_RS_RXD | RS-232 version of COM-D RXD signal |
| 3 | UART2_RS_TXD | RS-232 version of COM-D TXD signal |
| 4 | N.C. | No connect |
| 5 | GND | GND |
| 6 | N.C. | No connect |
| 7 | UART2_RS_RTS# | RS-232 version of COM-D RTS# signal |
| 8 | UART2_RS_CTS# | RS-232 version of COM-D CTS# signal |
| 9 | N.C. | No connect |
| 10 | GND | GND |
| 11 | CRT_HSYNC | CRT Horizontal Sync |
| 12 | GND | GND |
| 13 | CRT_VSYNC | CRT Vertical Sync |
| 14 | GND | GND |
| 15 | CRT_B | CRT Blue analog output |
| 16 | GND | GND |
| 17 | CRT_G | CRT Green analog output |
| 18 | GND | GND |
| 19 | CRT_R | CRT Red analog output |
| 20 | GND | GND |

Accessories available from CompuLab allow interfacing signals available at P15 with standard DB-9 (serial port) and DB-15 (CRT) connectors.

Table 27 Accessories for Connecting CRT and Serial Cable to P15

| Name | P/N | Description |
|-------------|------------|----------------------------------|
| CONFDB9-15 | 503R010100 | Assembled PCB, CONFDB9-15 |
| 20-lead FPC | 182P02000S | Cable, FPC, 20 cont, 0.5mm pitch |

3.2.20 COM-A Serial Console (P16)

This is an RX-TX only RS-232 serial console connector. It matches to a Wieson P/N G9913HT0104-001 or a Famos Technology P/N A129-199D10170 DB-9 adapter cables.

Table 28 COM-A Console Connector (P16) Signals

| Pin No. | Signal | Description |
|---------|--------|-------------------------------|
| 1 | TXD | Connected to COM-A-TX on CAMI |
| 2 | N.C. | No connect |
| 3 | RXD | Connected to COM-A-RX on CAMI |
| 4 | N.C. | No connect |
| 5 | N.C. | No connect |
| 6 | N.C. | No connect |
| 7 | N.C. | No connect |
| 8 | GND | GND |

3.3 Application Information

3.3.1 Reset button (SW1)

The reset button is routed directly to the CAMI RST-IN# pin. For more information on RST-IN# signal please refer to CM-X300 reference guide.

3.3.2 General purpose button (SW2)

The general purpose button (SW2) is connected to the PMIC_EXTWAKE# CAMI signal. When SW2 is pressed, PMIC_EXTWAKE# signal goes high (SB-X300 board revisions 1.3 and later) or low (SB-X300 board revision 1.2). For more information on PMIC_EXTWAKE# signal please refer to CM-X300 reference guide.

NOTE: SB-X300 board revisions 1.1 or older do not feature a general purpose button.

3.3.3 Debug LED (DS1)

The Debug LED is routed directly to CAMI GPIO80 signal. The LED will turn ON when GPIO80 is defined as non-open-drain and its logic state is high.

3.3.4 SB-X300 charger LEDs (DS2, DS3)

SB-X300 charger LEDs are controlled by SB-X300 battery charger fault and status signals. SB-X300 charger status and fault signals are also available at AUX_GPIO3_5 and AUX_GPIO3_6 CAMI signals.

DS2 and DS3 indicate the charger state. The table below summarizes all available states.

Table 29 DS2 and DS3 LEDs states

| DS2 | DS3 | AUX_GPIO3_6 | AUX_GPIO3_5 | Charging state |
|-----|-----|-------------|-------------|---|
| OFF | OFF | High | High | Charge completed with no fault (Inhibit) or Standby |
| OFF | ON | High | Low | Charging in progress |
| ON | OFF | Low | High | Fault |

NOTE: SB-X300 board revisions 1.1 or older do not feature Charger LEDs

3.3.5 Power LEDs (DS4, DS5)

The table below describes SB-X300 power LEDs.

Table 30 Power LEDs description

| LED Ref. | Color | LED activity |
|----------|-------|-------------------------------------|
| DS4 | GREEN | Main power source is available. |
| DS5 | GREEN | VCC3_3 is available onboard SB-X300 |

NOTE: SB-X300 board revisions 1.1 or older do not feature Power LEDs
