

# **AED505 ARMBASE Single Board Computer**

## **Reference Guide**

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## 1. Revision Notes

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<b>Date</b>	<b>Description</b>	<b>Document Version</b>	<b>Applies To</b>
2 June 05	▪ Preliminary Release	1.0	AND0016-0001-010 Rev 1.0

## 2. Introduction

### 2.1 Highlights

- **PC104/PC104+ Single Board Computer using the CM-X255 module**
- **Intel's XScale PXA255 CPU, up to 400 MHz**
- **Power over Ethernet**
- **16 - 64 MB SDRAM**
- **1 - 128 MB Flash Disk**
- **PCI, ISA and Local Bus expansions in PC/104 format**
- **3 x COM with RS232 drivers, 2 with full modem signals**
- **GPIO, PS/2 keyboard and mouse interfaces**
- **Host and slave USB ports**
- **IDE Hard disk interface**
- **Compact Flash (CF) Socket**
- **Sound I/O**
- **Touchscreen interface**
- **VGA graphics controller. Connectors for TFT and STN panels plus CRT Monitor. Extra connector for Simple STN Interface.**
- **10/100BaseT Ethernet port**
- **PCMCIA slot**
- **RTC with Lithium battery**

**The AED505** is a PC/104+ compliant, single board computer (SBC). The CM-X255 Core Module mounted on board provides many of the available functions. The AED505 baseboard provides the remaining functions as well as all the connectors, switches, potentiometers and jumpers needed to configure the SBC for an application.

The AED505 provides a versatile connection to most available TFT and STN displays, supporting +ve and -ve Vee supply requirements up to 30V, with selectable software or hardware control and temperature compensation. AED505 provides connectors for both CCFL and LED backlights. Special provision is made for simple connection to STN displays with integrated controllers.

The Power over Ethernet function can power AED505 through its Ethernet connection without need for a local power supply.

The AED505 contains PC/104 expansion connectors giving access to a wide range of off the shelf PC104 and PC104+ functionality. The AED505 also has a PCMCIA controller and slot. A PCMCIA card may be inserted securely in the slot, with no need for extra mechanical components. Standard PCMCIA modules can add capabilities such as a larger solid state disk, modem or wireless LAN.

## 2.2 Block Diagram

### 2.3 I/O Function Summary

The Anders AED505 SBC comprises a CM-X255 ARM Core Module mounted on an AED505 ABM Base Module. Most of the SBC functions are generated on the Core Module. The Base Module provides interface electronics and externally accessible connectors for these as well as its own functions.

The Table below lists all of these AED505 functions together with their key parameters.

Some functions require specific versions of the CM-X255 Core Module. These are shown as appropriate within the Table.

<b>Function</b>	<b>Parameters</b>	<b>Core Option</b>
CPU SDRAM Flash Disk	See Features List of CM-X255 module	
Power over Ethernet	Onboard fuse links can be populated to select Power over Ethernet in slave mode. Alternative fuse links allow local power to be used.	
Flat Panels	40 pin 2.54 mm IDC Header connector for TFT panels 20 pin 2.54 mm IDC Header connector for CSTN panels – direct drive 20 pin 2.54 mm IDC Header connector for CSTN panels – integrated controller Jumper settings for 2.8V, 3.3V or 5V Flat Panels Vee Polarity switch Vee Control Potentiometer Sockets for Vee Threshold and Limit Resistors CCFL Backlight connector with Brightness Control potentiometer LED Backlight connector and Brightness Control resistor socket Software/Hardware Vee Control Select jumper	
CRT Monitor	RGB Signals are from a DAC fed from the Core LCD Interface. Standard HD-15 VGA Connector	
Touch Screen Interface	4 pin 2mm Header with 4 wire resistive touch screen interface.	AT
COM A	RS-232 levels, Rx/Tx Console, DB9M Connector	
COM C	RS-232 levels, Full Modem, 2 mm Header	
COM D	RS-232 levels, Full Modem, 2 mm Header	B
Compact Flash (CF)	Compact Flash for bootable IDE flash disk memory. Hirose CF Connector	
PCMCIA	Support for 16-bit PCMCIA only. 32 bit Cardbus	

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	standard is not supported. Single PCMCIA slot with card guides for Types I, II and III	
IDE	PIO Mode. Derived from local bus. Master/slave jumper. 44 pin 2mm header including HDD power.	
Ethernet	2 x 10/100 Base T Ethernet port. RJ45 connector and activity LEDs. Realtek RTL8139DL controller with MAC and PHY functions.	E,B
PS/2	Standard connectors for PS2 keyboard and mouse	B,S
GPIO	16 Lines on 2 x 10 pin 2.54mm headers	B,S
Host USB	2 x Host Ports, 12 Mbps. USB Type A connectors.	B
Slave USB	1 x Slave Port, 12 Mbps. USB Type B connector	
Audio I/O	Stereo Audio Out on 4 pin 2mm header. Mono Microphone and Line In on 4 pin 2 mm header.	A
PC104	Standard PC104 Connector. 20 bit address. No DMA support. ? Interrupts.	
PC104+	Standard PC104+ connector and implementation of PCI bus.	B
RTC Battery	Battery for Real Time Clock on ARM Core module.	R
Local Power Connector	Accepts +5V DC and +12V DC from an inline power adapter. Fusible Links.	

### 2.4 Electrical, Mechanical and Environmental Specifications

Specification	Value or Range
Supply Voltage	48V Power over Ethernet OR (+12V DC and + 5V DC)
Power Consumption	
Dimensions	170mm x 115mm x ??mm
Operating Temp (Case)	
Storage Temperature	-40° to +85° C
Relative Humidity	10% to 90% (Operational) 05% to 95% (Storage)
Shock	50G/20 ms
Vibration	20G/0 – 600 Hz

### 3. Connector and Jumper Description

This Section describes the AED505 Connectors in terms of

- Silkscreen Reference
- Function
- Type
- Pin Definition

It also describes the AED505 Jumpers in terms of

- Function
- Silkscreen Reference
- Pin Definition
- Shorting Options

#### 3.1 Flat Panels

##### 3.1.1 TFT Panel Connector

<b>Silkscreen Reference</b>	CN16
<b>Connector Function</b>	TFT Panel signal and power
<b>Connector Type</b>	20x2 Pin IDC Header 2.54mm

<b>Pin</b>	<b>Definition</b>	<b>Pin</b>	<b>Definition</b>
01	LCD-VDD	21	LCD-G4
02	LCD-VDD	22	LCD-G3
03	LCD-VDD	23	GND
04	LCD-VDD	24	LCD-G2
05	NC	25	LCD-G1
06	LCD-DE-N	26	LCD-G0
07	GND	27	GND
08	LCD-FAM	28	LCD-R5
09	GND	29	LCD-R4
10	LCD-LP	30	LCD-R3
11	GND	31	GND
12	LCD-B5	32	LCD-R2
13	LCD-B4	33	LCD-R1
14	LCD-B3	34	LCD-R1
15	GND	35	NC
16	LCD-B2	36	NC
17	LCD-B1	37	GND
18	LCD-B1	38	LCD-SCK
19	GND	39	GND
20	LCD-G5	40	NC

### 3.1.2 CSTN Panel Connector

<b>Silkscreen Reference</b>	CN20
<b>Connector Function</b>	CSTN Panel signal and power
<b>Connector Type</b>	10x2 Pin IDC Header 2.54mm

Pin	Definition	Pin	Definition
01	LCD-VDD	11	LCD-G1
02	GND	12	LCD-G2
03	VEE	13	LCD-FRM
04	VEE	14	NC
05	LCD-B1	15	LCD-LP
06	LCD-B2	16	LCD-SCK
07	LCD-B3	17	NC
08	LCD-B4	18	NC
09	LCD-B5	19	VEE/LCD-ENABLE
10	LCD-G0	20	NC

### 3.1.3 CSTN Integrated Controller Panel Connector

Some CSTN displays have integrated controllers, allowing a simpler connection to the driving computer. Connector CN21 provides this simpler interface.

<b>Silkscreen Reference</b>	CN21
<b>Connector Function</b>	CSTN Panel With Controller
<b>Connector Type</b>	10x2 Pin IDC Header 2.54mm

Pin	Definition	Pin	Definition
01	RST-OUT	11	LB-D5
02	LB-IDE-RD#	12	LB-D6
03	LB-IDE-WR#	13	LB-D7
04	LCD-CS#	14	+3V
05	LB-A1	15	GND
06	LB-D0	16	VEE
07	LB-D1	17	GND
08	LB-D2	18	NC
09	LB-D3	19	NC
10	LB-D4	20	NC

### 3.1.4 VGA CRT Connector

The SB-X255 implements an interface to CRT monitor by Video DAC, which converts CM-X255's TFT output digital data to analogue RGB signals. Horizontal and vertical synchronization signals are also generated from the TFT interface. All the CRT interface signals are routed to header P12 as described in par. 3.10. The maximum supported resolution is 1024 x 768.

<b>Silkscreen Reference</b>	CN17
<b>Connector Function</b>	Analogue VGA CRT
<b>Connector Type</b>	VGA HD15

Pin	Definition	Pin	Definition
01	VGA-R	10	GND
02	VGA-G	11	NC
03	VGA-B	12	NC
04	NC	13	HSYNC
05	GND	14	VSYNC
06	GND	15	NC
07	GND	16	CHASS-1
08	GND	17	CHASS-2
09	Fused 3.3V		

### 3.1.5 LCD Voltage Selection Jumper

<b>Silkscreen Reference</b>	CN15
<b>Jumper Function</b>	Selects 2.8V, 3.3V or 5V for Flat Panel Supply Voltage
<b>Jumper Type</b>	3x2 Pin Header 2.54mm

Jumper Setting	Selected Voltage
1 - 2	+3.3V
3 - 4	+5V
5 - 6	+2.8V

### 3.1.6 Vee Circuit

AED505 is designed to drive all types of CSTN and STN graphics LCD panels from different manufacturers. All such panels require a Vee voltage to control their visible contrast and there are a number of factors that any Vee control circuit must handle to successfully drive CSTN/STN panels. These are:

- Different panels require different Vee maximum and range values
- Some panels require a positive Vee voltage, others negative.
- Vee must vary with temperature to compensate for the temperature /contrast characteristic of the driven display.
- There must be a suitable timing relationship between the rise of the Vdd voltage, the Data Lines and Vee must during the Power On sequence, and the fall of these levels during the Power Off sequence.

The following information describes how users can set up AED505 to handle these factors and match the characteristics of their target CSTN/STN panel.

#### 3.1.6.1 Positive/Negative Vee Switch

<b>Silkscreen Reference</b>	SW1
<b>Switch Function</b>	Selects +Vee or -Vee
<b>Switch Type</b>	DPDT

The switch is labelled as SW1 on the PCB silkscreen, which also shows the switch positions for '+Vee' and '-Vee'

**Nb Wrong polarity selection will destroy any connected LCD!**

### 3.1.6.2 Vee Temperature Compensation.

A Thermistor type XXXX must be mounted on the back of the STN/CSTN display to feed back the temperature experienced by the display. The hardware or software Vee circuit – whichever is selected – uses this feedback to compensate the Vee level, maintaining a constant temperature independent contrast on the display.

Connector CNXX on the AED505 pcb provides a connection point for this thermistor.

### 3.1.6.3 Hardware/Software Vee Selection

AED505 can control Vee either from onboard hardware or from software. The hardware solution uses an onboard potentiometer TR3 and customer installed resistors in connectors CN12 and CN13 to set up the Vee maximum and range values. Alternatively by setting jumper CN14 to Software, the user can program these values.

In either case

- SW1 must be used to configure +Vee or –Vee.
- The Temperature Compensation thermistor must be mounted on the back of the LCD and wired to the connectors xxx and xxx on the AED505 PCB

The hardware Vee supply is derived from the LCD-VDD supply. This is fed through some delay stages to become Vee/LCD Enable. This in turn switches the Vee supply as well as being used as an Enable input to the 20 way CSTN Connector CN20.

The Software Vee supply is generated by an onboard CPLD which is in turn controlled by software.

<b>Silkscreen Reference</b>	CN14
<b>Jumper Function</b>	Selects Hardware or Software Vee control
<b>Jumper Type</b>	3 Pin Header 2.54mm

<b>Jumper Setting</b>	<b>Vee Source</b>
2 - 1	Hardware
2 - 3	Software

#### **3.1.6.4 Vee Hardware Circuit – Potential Divider Network**

The Potential Divider network allows certain Vee parameters to be set up if the Hardware Vee circuit is selected. These are:

- Maximum Vee value (Set to panel Vee (Max) specification)
- Minimum Vee value (Set to panel Vee (Min) specification)
- Vee value within range

Fig. X shows this network.

R1 is an external resistor used to set the maximum possible value of Vee (Up to 30V). This is connected to **CN12**.

R2 is an external resistor used to set the minimum possible value of Vee (Up to 30V). This is connected to **CN13**.

TR3 is a board mounted potentiometer allowing adjustment of Vee within the range set by R1 and R2

Nb Wire links instead of resistors can be fitted to CN12 and CN13 to allow the potentiometer to sweep the full 0 – 30V Vee range.

#### **3.1.6.5 Test Points TP1 and TP2**

These are located on the AED505 PCB near SW1 and TR3. They can be used for monitoring Vee with a meter or 'scope.

### 3.1.7 Backlight Connectors

AED505 can drive either a CCFL or an LED backlight.

#### 3.1.7.1 CCFL Backlight

AED505 provides connector CN18 to drive and control a CCFL backlight inverter. This lights the display and controls its brightness.

<b>Silkscreen Reference</b>	CN18
<b>Connector Function</b>	CCFL Backlight Inverter Connector
<b>Connector Type</b>	53261-0590

<b>Pin</b>	<b>Definition</b>	<b>Pin</b>	<b>Definition</b>
01	+12V	05	Brightness 2
02	GND	06	PAD-1
03	+5V (Enable)	07	PAD-2
04	Brightness 1		

Nb Brightness 1 is variable and is controlled by Potentiometer **TR2**.  
Brightness 2 is fixed.

The CCFL Brightness circuit is controlled by an external resistor (usually 100 Ohms 1 Watt) fitted to **CN10**.

### 3.1.7.2 LED Backlight

AED505 provides connector CN19 to drive and control an LED backlight. This lights the display and controls its brightness.

<b>Silkscreen Reference</b>	CN19
<b>Connector Function</b>	LED Backlight Connector
<b>Connector Type</b>	53261-0590

Pin	Definition	Pin	Definition
01	+12V	05	LED n Connection
02	GND	06	PAD-1
03	+5V	07	PAD-2
04	NC		

Different LED Backlight Options and Connections are as follows:

#### LED Backlight without Integral Resistor

For Backlights with two or more LEDs connected in series, connect across Pin 01 (+12V) and Pin 05 (LED n Connection)

For Backlights with one LED, or LEDs connected in parallel, connect across Pin 03 (+5V) and Pin 05 (LED n Connection). This method is not recommended unless each branch has a resistor.

#### LED Backlight with Integral Resistor

The voltage is 12V for 2 or more LEDs in series. Connect across Pins 01 and 02. Pin 05 can be used if additional

The LED Backlight circuit is controlled by an external resistor (usually 100 Ohms 1 Watt) fitted to **CN11**.

### 3.2 Power Options

AED505 can be powered **either** by its Power Over Ethernet (PoE) connection **or** by a locally connected power supply delivering +5V and +12V DC voltages.

PoE is protected by fuse links F1 and F2.  
Local Power is connected by fuse links FX and FX

**Ensure that only one set of links is populated before applying power to AED505!**

#### 3.2.1 Power over Ethernet

This is an ideal choice if the total board power requirement is 13W or less, and elimination of a local power supply is desirable.

See <http://www.poweroverethernet.com> for more information

It will be necessary to

- Provide a PoE source (Power Sourcing Equipment or PSE) to inject 48V DC power into the remote end of the Ethernet cable (CAT 5 or better, length 100 metres or less)
- Ensure Local Power Fusible Links FX and FX are **depopulated**
- Populate Links F1 and F2 as shown:

Fusible Link	Type	Rating
F1		
F2		

It is then possible to plug the PoE Ethernet cable into RJ45 Connector **CN1** on AED505. On board DC/DC converters will then derive the +12V, +5V and +3.3V DC supplies necessary for the onboard and peripheral power.

### 3.2.2 Locally Supplied Power

If the total power demand of the AED505 SBC and its connected peripherals exceeds 13 Watts, or if PoE is not suitable for any other reason then a local power source such as an inline power adapter can be used.

- Ensure POE Fusible Links F1 and F2 are **depopulated!**
- Populate Fusible Links FX and FX

Fusible Link	Type	Rating
FX		
FX		

- Connect to CN31 as shown below:

<b>Silkscreen Reference</b>	CN31
<b>Connector Function</b>	Local Power Connector
<b>Connector Type</b>	B4PS-VH

Pin	Definition	Pin	Definition
01	+5V	03	GND
02	GND	04	+12V

### 3.2.3 Power Status LEDs

There are three green Power Status LEDs on AED505, to show presence of 3.3V, 5V and 12V power.

### 3.3 Touch Screen

AED505 supports 4-Wire Resistive Touch Screens. Use Connector CN28:

<b>Silkscreen Reference</b>	CN28
<b>Connector Function</b>	Touch Screen Connector
<b>Connector Type</b>	4 Way Header 2.54mm

Pin	Definition	Pin	Definition
01	MX	03	PX
02	MY	04	PY

### 3.4 Serial Communications

AED505 provides three RS232 Serial Communications ports, COM A, COM C and COM D.

COM A is a simple Console Port: COM C and COM D are full function Modem RS232 Ports.

COM A is driven directly from the CM-X255 module. COM C and COM D are driven from CM-X255 TTL signals converted to RS232 levels by baseboard MAX3423IPWR devices.

#### 3.4.1 COM A Console Port

<b>Silkscreen Reference</b>	CN33
<b>Connector Function</b>	COM A Connector
<b>Connector Type</b>	9 Way DB9M

Pin	Definition	Pin	Definition
01	NC	06	NC
02	COM-A-RX-RS232	07	NC
03	COM-A-TX-RS232	08	NC
04	NC	09	NC
05	GND	10,11	Chassis 1, 2

#### 3.4.2 COM C RS232 Port

<b>Silkscreen Reference</b>	CN35
<b>Connector Function</b>	COM C Connector
<b>Connector Type</b>	5x2 Way Header 2.54mm

Pin	Definition	Pin	Definition
01	COM-C-DCD-RS232	06	COM-C-DSR-RS232
02	COM-C-RX-RS232	07	COM-C-RTS-RS232
03	COM-C-TX-RS232	08	COM-C-CTS-RS232
04	COM-C-DTR-RS232	09	COM-C-RI-RS232
05	GND	10	NC

### 3.4.3 COM D RS232 Port

<b>Silkscreen Reference</b>	CN34
<b>Connector Function</b>	COM D Connector
<b>Connector Type</b>	10 Way Header 2.54mm

Pin	Definition	Pin	Definition
01	COM-D-DCD-RS232	06	COM-D-DSR-RS232
02	COM-D-RX-RS232	07	COM-D-RTS-RS232
03	COM-D-TX-RS232	08	COM-D-CTS-RS232
04	COM-D-DTR-RS232	09	COM-D-RI-RS232
05	GND	10	NC

### 3.5 IrDA Port

IrDA devices can be connected to Connector CN32 as shown:

<b>Silkscreen Reference</b>	CN33
<b>Connector Function</b>	IrDA Connector
<b>Connector Type</b>	5 Way Header 2.54mm

Pin	Definition	Pin	Definition
01	+3.3V	04	GND
02	NC	05	IrDA-TX
03	IrDA-RX		

### 3.6 Compact Flash (CF)

AED505 provides an IDE Mode CF connector CN8

<b>Silkscreen Reference</b>	CN8
<b>Connector Function</b>	CF Connector
<b>Connector Type</b>	Hirose N121-50PD-SF-EJR

Pin	Definition	Pin	Definition
01	GND	27	LB-D11
02	LB-D3	28	LB-D12
03	LB-D4	29	LB-D13
04	LB-D5	30	LB-D14
05	LB-D6	31	LB-D15
06	LB-D7	32*	IDE-TERM-CS1#
07*	IDE-TERM-CS0#	33	GND
08	GND	34*	IDE-TERM-RD#
09	GND	35*	IDE-TERM-WR#
10	GND	36	+5V
11	GND	37	IDE-INT
12	GND	38	+5V
13	+5V	39	GND
14	GND	40	NC
15	GND	41	RST-OUT#
16	GND	42	LB-IORDY
17	GND	43	NC
18	LB-A2	44	NC
19	LB-A1	45	DASP# To Green LED
20	LB-A0	46	PDIAG#
21	LB-D0	47	LB-D8
22	LB-D1	48	LB-D9
23	LB-D2	49	LB-D10
24	NC	50	GND
25	GND	51	CHASSIS-1
26	GND	52	CHASSIS-2

**Note:** \* indicates signals generated by baseboard logic – not direct from the core module.

### 3.7 PCMCIA

AED505 has a single PCMCIA slot with card guides, supporting 16 bit Cardbus. Card Types, I, II and III are supported. Jumper CN4 must be used to select +3.3V or +5V for the PCMCIA Vcc voltage.

#### 3.7.1 PCMCIA Voltage Selection Jumper

<b>Silkscreen Reference</b>	CN4
<b>Connector Function</b>	PCMCIA Voltage Selection Jumper
<b>Connector Type</b>	3 Way Header 2.54mm

<b>Jumper Setting</b>	<b>PCMCIA VCC</b>
2 - 1	+5V
2 - 3	+3.3V

### 3.7.2 PCMCIA Slot Connections

<b>Silkscreen Reference</b>	CN5
<b>Connector Function</b>	PCMCIA Connector
<b>Connector Type</b>	ICM-CB68H-5112-502N

Pin	PCMCIA Signal	CM-X255 Conn. Pin	Pin	PCMCIA Signal	CM-X255 Conn. Pin
01	GND	GND	37	CAD2/D11	LB-D11
02	CAD0/D3	LB-D3	38	CAD4/D12	LB-D12
03	CAD1/D4	LB-D4	39	CAD6/D13	LB-D13
04	CAD3/D5	LB-D5	40	RFU/D14	LB-D14
05	CAD5/D6	LB-D6	41	CAD8/D15	LB-D15
06	CAD7/7	LB-D7	42	CAD10/CE2#	P1CE2#
07	CCBE0#/CE1#	P1CE1#	43	CVS1/VS1#	NC
08	CAD9/A10	LB-A10	44	CAD13/IORD#	P1IOR#
09	CAD11/OE#	P1OE#	45	CAD15/IOWR#	P1IOW#
10	CAD12/A11	LB-A11	46	CAD16/A17	LB-A17
11	CAD14/A9	LB-A9	47	RFU/A18	LB-A18
12	CCBE1#/A8	LB-A8	48	CBLOCK#/A19	LB-A19
13	CPAR/A13	LB-A13	49	CSTOP#/A20	LB-A20
14	CPERR#/A14	LBA14	50	CDEVSEL#/A21	LB-A21
15	CGNT#/WE#	P1WE#	51	VCC-1	PCM-VCC
16	CINT#/READY	PCM-IRQ1	52	VPP2	+5V
17	VCC	PCM-VCC	53	CTRDY#/A22	LB-A22
18	VPP1	+5V	54	CFRAME#/A23	LB-A23
19	CCLK/A16	LB-A16	55	CAD17/A24	LB-A24
20	CIRDY#/A15	LB-A15	56	CAD19/A25	LB-A25
21	CCBE2#/A12	LB-A12	57	CVS2/VS2#	NC
22	CAD18/A7	LB-A7	58	CRST/RESET	PCMRST
23	CAD20/A6	LB-A6	59	CSERR#/WAIT#	SKT1WAIT
24	CAD21/A5	LB-A5	60	CREQ#/INPACK#	NC
25	CAD22/A4	LB-A4	61	CCBE3#/REG#	BREG#
26	CAD23/A3	LB-A3	62	CAUDIO#/BVD2	NC
27	CAD24/A2	LB-A2	63	CSTSCHG/BVD1	NC
28	CAD25/A1	LB-A1	64	CAD28/D8	LB-D8
29	CAD26/A0	LB-A0	65	CAD30/D9	LB-D9
30	CAD27/D0	LB-D0	66	CAD31/D10	LB-D10
31	CAD29/D1	LB-D1	67	CCD2#/CD2#	NC
32	RFU/D2	LB-D2	68	GND-3	GND
33	CCLKRUN#/WP		69	CHASSIS-1	GND
34	GND-1	GND	70	CHASSIS-2	GND
35	GND-2	GND	71	CHASSIS-3	GND
36	CCD1#/CD1#	PCD1	72	CHASSIS-4	GND

### 3.8 IDE Support

AED505 provides a standard 44 pin 2mm IDE connector allowing direct connection to 2½" hard drives, including power.

#### 3.8.1 IDE Connector

<b>Silkscreen Reference</b>	CN6
<b>Connector Function</b>	Standard IDE Connector
<b>Connector Type</b>	44 Pin Header 2mm

Pin	IDE Signal	CM-255 Conn. Pin	Pin	IDE Signal	CM-255 Conn. Pin
01	RESET#	RST-OUT#	23	IOW#	LB-IDE-WR#
02	GND-1	GND	24	GND-4	GND
03	DATA7	LB-D7	25	IOR#	LB-IDE-RD#
04	DATA8	LB-D8	26	GND-5	GND
05	DATA6	LB-D6	27	IOCHRDY	LB-IORDY
06	DATA9	LB-D9	28	CSEL	GND via CN7
07	DATA5	LB-D5	29	DMAACK#	+3.3V
08	DATA10	LB-D10	30	GND-6	GND
09	DATA4	LB-D4	31	IRQ	IDE-INT
10	DATA11	LB-D11	32	IO16#	NC
11	DATA3	LB-D3	33	ADDR1	LB-A1
12	DATA12	LB-D12	34	PDIAG#	PDIAG#
13	DATA2	LB-D2	35	ADDR0	LB-A0
14	DATA13	LB-D13	36	ADDR2	LB-A2
15	DATA1	LB-D1	37	CS0#	IDE-TERM-CS0*
16	DATA14	LB-D14	38	CS1#	IDE-TERM-CS1*
17	DATA0	LB-D0	39	DASP#	DASP#
18	DATA15	LB-D15	40	GND-7	GND
19	GND-2	GND	41	5V-1	+5V
20	KEY	NC	42	5V-2	+5V
21	DMAREQ	NC	43	GND-8	GND
22	GND-3	GND	44	NC	NC

**Note:** Signals marked \* are generated by AED505 baseboard logic, rather than by the Core module.

### 3.8.2 IDE Master/Slave jumper

<b>Silkscreen Reference</b>	CN7
<b>Connector Function</b>	IDE Master/Slave Selection Jumper
<b>Connector Type</b>	2 Way Header 2.54mm

<b>Jumper Setting</b>	<b>IDE Setting</b>
IN	MASTER
OUT	SLAVE

### 3.9 Ethernet

AED505 has two 10/100 Ethernet ports, ETH1 and ETH2. ETH1 supports Power over Ethernet. ETH1 is driven from the core module and ETH2 is driven by a Realtek RTL8139DL device with MAC and PHY functions on the AED505 baseboard.

The two ports are functionally identical.

The Operating System assigns the core module ETH1 as Port 0, and the base board ETH2 as Port 1

Each port has two LEDs:

GREEN = Activity at 10MBPS  
YELLOW = Activity at 100MBPS

#### 3.9.1 ETH1

<b>Silkscreen Reference</b>	CN1
<b>Connector Function</b>	RJ45 Ethernet Connector with POE Function
<b>Connector Type</b>	GWL-5-88-G/Y

<b>Pin</b>	<b>Definition</b>	<b>Pin</b>	<b>Definition</b>
01	ETH1-TDP	07	POE SUPPLY
02	ETH1-TDN	08	POE SUPPLY
03	ETH1-RDP	A_1	GRN LED +
04	POE SUPPLY	K_1	GRN LED -
05	POE SUPPLY	A_2	YELL LED +
06	ETH1_RDN	K_2	YELL LED -

### 3.9.2 ETH2

<b>Silkscreen Reference</b>	CN39
<b>Connector Function</b>	RJ45 Ethernet Connector
<b>Connector Type</b>	SI-40138

Pin	Definition	Pin	Definition
01	ETH2-TDP	07	NC
02	ETH2-TDC	08	CHASSIS GND
03	ETH2-TDN	A_1	YELL LED +
04	ETH2-RDP	K_1	YELL LED -
05	ETH2-RDC	A_2	GRN LED +
06	ETH2-RDN	K_2	GRN LED -

### 3.9.3 Ethernet Fusible Links

Fusible Link	Part No.	Rating
FB8	HZ0805E601R-00	
FB9	HZ0805E601R	
FB10	HZ0805E601R	

### 3.10 PS2 Mouse and Keyboard Connectors

#### 3.10.1 PS2 Mouse

<b>Silkscreen Reference</b>	CN24
<b>Connector Function</b>	Std PS2 Mouse Connector
<b>Connector Type</b>	MD-60SM

Pin	Definition	Pin	Definition
01	PS2_MDAT	06	NC_2
02	NC_1	07	CHAS_1
03	GND	08	CHAS_2
04	VCC	09	CHAS_3
05	PS2_MCLK		

### 3.10.2 PS2 Keyboard

<b>Silkscreen Reference</b>	CN25
<b>Connector Function</b>	Std PS2 Keyboard Connector
<b>Connector Type</b>	MD-60SM

<b>Pin</b>	<b>Definition</b>	<b>Pin</b>	<b>Definition</b>
01	PS2_KDAT	06	NC_2
02	NC_1	07	CHAS_1
03	GND	08	CHAS_2
04	VCC	09	CHAS_3
05	PS2_KCLK		

### 3.10.3 PS2 Fusible Links

<b>Fusible Link</b>	<b>Part No.</b>	<b>Rating</b>
FB3		
FB4		
FB5		
FB6		
FB7		
	MINISMDC110-2	

### 3.11 GPIO

AED505 provides 16 lines of general purpose 3.3V TTL level Digital I/O on two 10 – way header connectors. This I/O is controlled by a XC95144XL device.

#### 3.11.1 CN37

<b>Silkscreen Reference</b>	CN37
<b>Connector Function</b>	Digital I/O Connector
<b>Connector Type</b>	5x2 Way 2.54mm Header

Pin	Definition	Pin	Definition
01	DIO0	06	DIO5
02	DIO1	07	DIO6
03	DIO2	08	DIO7
04	DIO3	09	GND
05	DIO4	10	GND

#### 3.11.2 CN38

<b>Silkscreen Reference</b>	CN38
<b>Connector Function</b>	Digital I/O Connector
<b>Connector Type</b>	5x2 Way 2.54mm Header

Pin	Definition	Pin	Definition
01	DIO8	06	DIO13
02	DIO9	07	DIO14
03	DIO10	08	DIO15
04	DIO11	09	GND
05	DIO12	10	GND

### 3.12 USB Interface

AED505 provides a dual Type A USB Host connector as well as a single Type B Slave connector. 12Mbps USB 1.1 is supported. Pins VCC\_1 and VCC\_2 can deliver 5V DC to external USB devices. They have fused overcurrent protection as required by USB standard specifications.

#### 3.12.1 Twin USB Host Connector

<b>Silkscreen Reference</b>	CN23
<b>Connector Function</b>	Dual USB Type A Connector
<b>Connector Type</b>	896-30-008-90-000

<b>Pin</b>	<b>Definition</b>	<b>Pin</b>	<b>Definition</b>
01	VCC_1	07	+USB_2
02	- USB_1	08	GND_2
03	+USB_1	09	SHLD_1
04	GND_1	10	SHLD_2
05	VCC_2	11	SHLD_3
06	-USB_2	12	SHLD_4

#### 3.12.2 USB Slave Connector

<b>Silkscreen Reference</b>	CN22
<b>Connector Function</b>	USB Type B Connector
<b>Connector Type</b>	897-30-004-90-000

<b>Pin</b>	<b>Definition</b>	<b>Pin</b>	<b>Definition</b>
01	+5V	04	GND
02	- DATA	05	CHASS_1
03	+DATA	06	CHASS_2

### 3.12.3 Fusible Links

Fusible Link	Part No.	Rating
FB1	HI1206N101R-00	
FB2	HI1206N101R-00	

### 3.13 Audio I/O

AED505 provides Mono Microphone, Stereo Line In and Stereo Speaker Output. These are driven by an AC97 on the ARMCORE. Line In and Microphone cannot be used simultaneously.

#### 3.13.1 Audio In

<b>Silkscreen Reference</b>	CN27
<b>Connector Function</b>	Line and Mic In Connector
<b>Connector Type</b>	4x1 Way 2.54mm Header

Pin	Definition	Pin	Definition
01	MIC PULLUP	03	GND
02	L/MIC-IN	04	R-IN

#### 3.13.2 Audio Out

<b>Silkscreen Reference</b>	CN26
<b>Connector Function</b>	Stereo Speaker Connector
<b>Connector Type</b>	4x1 Way 2.54mm Header

Pin	Definition	Pin	Definition
01	L-OUT	03	GND
02	GND	04	R-OUT

### 3.14 PC104

AED505 provides a standard PC104 (ISA signal) stack through connector. The ARMCORE local bus lines are connected through their buffers to their counterparts on the PC104 connector. DMA is not supported. 16 bit data transfers are supported; 8 bit data transfers are not.

<b>Silkscreen Reference</b>	CN30
<b>Connector Function</b>	PC104 ISA
<b>Connector Type</b>	

Pin	PC104 Signal	CM-X255 Pin	Pin	PC104 Signal	CM-X255 Pin
A01	IOCHCHK#	N/C	B01	GND	GND
A02	SD7	LB-D7	B02	RESETDRV	RSTDRV
A03	SD6	LB-D6	B03	+5V	VCC5
A04	SD5	LB-D5	B04	IRQ9	GPIRQ0 (Using NOR Gate)
A05	SD4	LB-D4	B05	-5V	NC
A06	SD3	LB-D3	B06	DRQ2	NC
A07	SD2	LB-D2	B07	-12V	NC
A08	SD1	LB-D1	B08	ENDFXR*	NC
A09	SD0	LB-D0	B09	+12V	NC
A10	IOCHRDY	LB-IORDY	B10	KEY_1	NC
A11	AEN	GND	B11	SMEMW#	ISA-WR#*
A12	SA19	LB-A19	B12	SMEMR#	ISA-RD#*
A13	SA18	LB-A18	B13	IOW#	ISA-IOW#*
A14	SA17	LB-A17	B14	IOR#	ISA-IOR#*
A15	SA16	LB-A16	B15	DACK3#	PULLUP
A16	SA15	LB-A15	B16	DRQ3	NC
A17	SA14	LB-A14	B17	DACK1#	PULLUP
A18	SA13	LB-A13	B18	DRQ1	GPIO3
A19	SA12	LB-A12	B19	REFRESH	PULLUP
A20	SA11	LB-A11	B20	SYSCLK	CLK8Mhz
A21	SA10	LB-A10	B21	IRQ7	GPIRQ0(Using NOR Gate)
A22	SA9	LB-A9	B22	IRQ6	GPIRQ0(Using NOR Gate)
A23	SA8	LB-A8	B23	IRQ5	GPIRQ1(Using NOR Gate)
A24	SA7	LB-A7	B24	IRQ4	GPIRQ1(Using NOR Gate)
A25	SA6	LB-A6	B25	IRQ3	GPIRQ1(Using NOR Gate)
A26	SA5	LB-A5	B26	DACK2#	PULLUP
A27	SA4	LB-A4	B27	TC	GND
A28	SA3	LB-A3	B28	BALE	GND
A29	SA2	LB-A2	B29	+5V	VCC5
A30	SA1	LB-A1	B30	OSC	CLK16MHz
A31	SA0	LB-A0	B31	GND	GND
A32	GND	GND	B32	GND	GND

Pin	PC104 Signal	CM-X255 Pin	Pin	PC104 Signal	CM-X255 Pin
C00	GND	GND	D00	GND	GND
C01	SBHE#	GND	D01	MEMCS16*	NC
C02	LA23	LB-A23	D02	IOCS16*	NC
C03	LA22	LB-A22	D03	IRQ10	GPIRQ1 (Using NOR gate)
C04	LA21	LB-A21	D04	IRQ11	GPIRQ1 (Using NOR Gate)
C05	LA20	LB-A20	D05	IRQ12	NC
C06	LA19	LB-A19	D06	IRQ15	NC
C07	LA18	LB-A18	D07	IRQ14	NC
C08	LA17	LB-A17	D08	DACK0#	PULLUP
C09	MEMR#	ISA-RD#*	D09	DRQ0	GPIO2
C10	MEMW#	ISA-WR#*	D10	DACK5#	PULLUP
C11	SD8	LB-D8	D11	DRQ5	NC
C12	SD9	LB-D9	D12	DACK6#	PULLUP
C13	SD10	LB-D10	D13	DRQ6	NC
C14	SD11	LB-D11	D14	DACK7#	PULLUP
C15	SD12	LB-D12	D15	DRQ7	NC
C16	SD13	LB-D13	D16	+5V	
C17	SD14	LB-D14	D17	MASTER#	PULLUP
C18	SD15	LB-D15	D18	GND	GND
C19	KEY_2	NC	D19	GND	GND

**Notes:**

- DMA Channels are not supported
- 8 Interrupt signals supported
- Some signals of secondary importance are not supported: MEMSC16, IOCS16#, BALE. The irrelevant signal REFRESH is also not supported.
- Signals marked \* are generated by AED505 logic and do not come directly from the CM-X255 module.

### 3.15 PC104+

Extra pins on connector CN30 add PC104+ (PCI signal) capability to the ISA PC104 function.

<b>Silkscreen Reference</b>	CN30
<b>Connector Function</b>	PC104+ PCI
<b>Connector Type</b>	

Pin	PC104+ Signal	CM-X255 Pin	Pin	PC104+ Signal	CM-X255 Pin
PA1	KEY5V	GND	PB1	RESERVED_1	NC
PA2	VIO_1	+3.3V	PB2	AD02	PCI_AD2
PA3	AD05	PCI_AD5	PB3	GND_7	GND
PA4	C/BEO*	PCI_CBE0#	PB4	AD07	PCI_AD7
PA5	GND_1	GND	PB5	AD09	PCI_AD9
PA6	AD11	PCI_AD11	PB6	VIO_2	+3.3V
PA7	AD14	PCI_AD14	PB7	AD13	PCI_AD13
PA8	VCC+3V3_1	+3.3V	PB8	C/BE1*	PCI_CBE1#
PA9	SERR*	PCI-SERR#	PB9	GND_8	GND
PA10	GND_2	GND	PB10	PERR*	PERR_PU PULLUP
PA11	STOP*	PCI_STOP#	PB11	VCC+3V3_4	+3.3V
PA12	VCC+3V3_2	+3.3V	PB12	TRDY*	PCI_TRDY*
PA13	FRAME*	PCI_FRAME#	PB13	GND_9	GND
PA14	GND_3	GND	PB14	AD16	PCI_AD16
PA15	AD18	PCI_AD18	PB15	VCC+3V3_5	+3.3V
PA16			PB16	AD21	PCI_AD21
PA17	VCC+3V3_3	+3.3V	PB17	AD23	PCI_AD23
PA18	IDSELO	PDI_AD28	PB18	GND_10	GND
PA19	AD24	PCI_AD24	PB19	C/BE3*	PCI_CBE3#
PA20	GND_4	GND	PB20	AD26	PCI_AD26
PA21	AD29	PCI_AD29	PB21	VCC+5V_3	+5V
PA22	VCC+5V_1	+5V	PB22	AD30	PCI_AD30
PA23	REQ0*	PCI_REQ0#	PB23	GND_11	GND
PA24	GND_5	GND	PB24	REQ2*	NC
PA25	GNT1*	NC	PB25	VIO_3	+3.3V
PA26	VCC+5V_2	+5V	PB26	CLK0	PCI_BCLK0
PA27	CLK2	NC	PB27	VCC+5V_4	+5V
PA28	GND_6	GND	PB28	INTD*	PCI_INTB#
PA29	VCC+12V	+12V	PB29	INTA*	PCI-INTA#
PA30	VCC-12V	NC	PB30	RESERVED_2	

Pin	PC104+ Signal	CM-X255 Pin	Pin	PC104+ Signal	CM-X255 Pin
PC1	VCC+5V_5	+5V	PD1	AD00	PCI_AD0
PC2	AD01	PCI_AD1	PD2	VCC+5V_8	+5V
PC3	AD04	PCI_AD4	PD3	AD03	PCI_AD3
PC4	GND_12	GND	PD4	AD06	PCI_AD6
PC5	AD08	PCI_AD8	PD5	GND-18	GND
PC6	AD10	PCI_AD10	PD6	M66EN	GND
PC7	GND_14	GND	PD7	AD12	PCI_AD12
PC8	AD15	PCI_AD15	PD8	VCC+3V3_8	+3.3V
PC9	SB0*	NC	PD9	PAR	PCI_PAR
PC10	VCC+3V3_6	+3.3V	PD10	SDONE	NC
PC11	LOCK*	PCI_LOCK#	PD11	GND_19	GND
PC12			PD12	DEVSEL*	PCI_DEVSEL
PC13	IRDY*	PCI_IRDY#	PD13	VCC+3V3_9	+3.3V
PC14	VCC+3V3_7	+3.3V	PD14	C/BE2*	PCI_CBE2#
PC15	AD17	PCI_AD17	PD15	GND_20	GND
PC16	GND_15	GND	PD16	AD19	PCI_AD19
PC17	AD22	PCI_AD22	PD17	VCC+3V3_10	+3.3V
PC18	IDSEL1	NC	PD18	IDSEL2	NC
PC19	VIO_4	+3.3V	PD19	IDSEL3	NC
PC20	AD25	PCI_AD25	PD20	GND_21	GND
PC21	AD28	PCI_AD28	PD21	AD27	PCI_AD27
PC22	GND_16	GND	PD22	AD31	PCI_AD31
PC23	REQ1*	NC	PD23	VIO_5	+3.3V
PC24	VCC+5V_6	+5V	PD24	GNT0*	PCI_GNT0#
PC25	GNT2*	NC	PD25	GND_22	GND
PC26	GND_17	GND	PD26	CLK1	NC
PC27	CLK3	NC	PD27	GND_23	GND
PC28	VCC+5V_7	+5V	PD28	RST*	RST_OUT#
PC29	INTB*	PCI_INTB#	PD29	INTC*	PCI_INTA#
PC30	RESERVED_3		PD30	KEY3V3	GND
MOUNT_1 – MOUNT_4 Connected to CHASSIS					

### 3.16 Default Boot Jumper

<b>Silkscreen Reference</b>	CN3
<b>Connector Function</b>	Default Boot Connector
<b>Connector Type</b>	2 Way 2.54mm Header

<b>Function required</b>	<b>Jumper Setting</b>
	1 – 2 Open
	1 – 2 Shorted

### 3.17 RESET Jumper

<b>Silkscreen Reference</b>	CN2
<b>Connector Function</b>	RESET Jumper
<b>Connector Type</b>	2 Way 2.54mm Header

<b>Function required</b>	<b>Jumper Setting</b>
System Reset	1 – 2 Shorted
System Run	1 – 2 Open