AVILA
NETWORK COMPUTER

Operating Manual
For
GW2342 Network Processor

Document #10000330
Revision 06
1 October 2005

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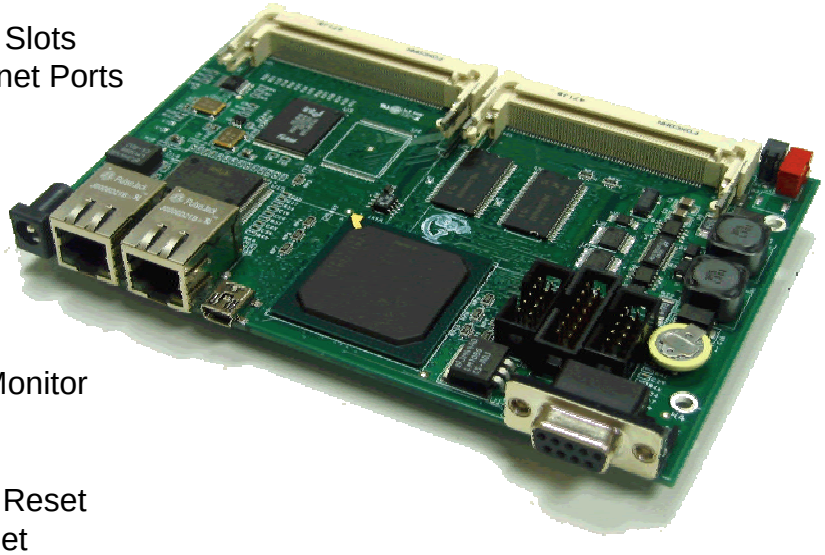
1. INTRODUCTION

1.1. Product Description

The GW2342 is a member of the Gateworks Avila Network Processor family. The GW2342 meets the requirements for enterprise and residential network applications. This single board network processor consists of an Intel® IXP series XScale® CPU operating at speeds up to 533MHz, up to 128Mbytes of SDRAM, and up to 32Mbytes of Flash. Peripherals include four Type III Mini-PCI slots, two 10/100 Base-TX Ethernet channels, Type B USB device controller, Compact Flash socket, and two RS232 serial ports for management and debug. Additional features include serial EEPROM, real time clock, voltage and temperature monitor, fan controller, watchdog timer, passive power over Ethernet, digital I/O, and a wide range DC/DC power supply. Software support includes Linux and VxWorks® operating systems.

1.2. Standard Features



- Intel® XScale® IXP42x Processor Operating at Speeds up to 533MHz
- Up to 128Mbytes SDRAM
- Up to 32Mbytes Flash
- Up to four Type III Mini-PCI Slots
- Two 10/100 Base-TX Ethernet Ports (Auto MDI/MDIX)
- Type B USB Device
- Compact Flash Socket
- Two RS-232 Serial Ports
- 2Kbyte Serial EEPROM
- Battery Powered Real Time Clock
- Voltage and Temperature Monitor
- Watchdog Timer
- General Purpose I/O
- User LED and Push Button Reset
- Passive Power Over Ethernet
- 6-28VDC Input Voltage Range
- Reverse Voltage and Transient Protection
- 14W available for Mini-PCI Sockets
- 3W Typical Operating Power
- 0°C to 70°C Operating Temperature
- Software Support for Linux and VxWorks
- 1 Year Warranty

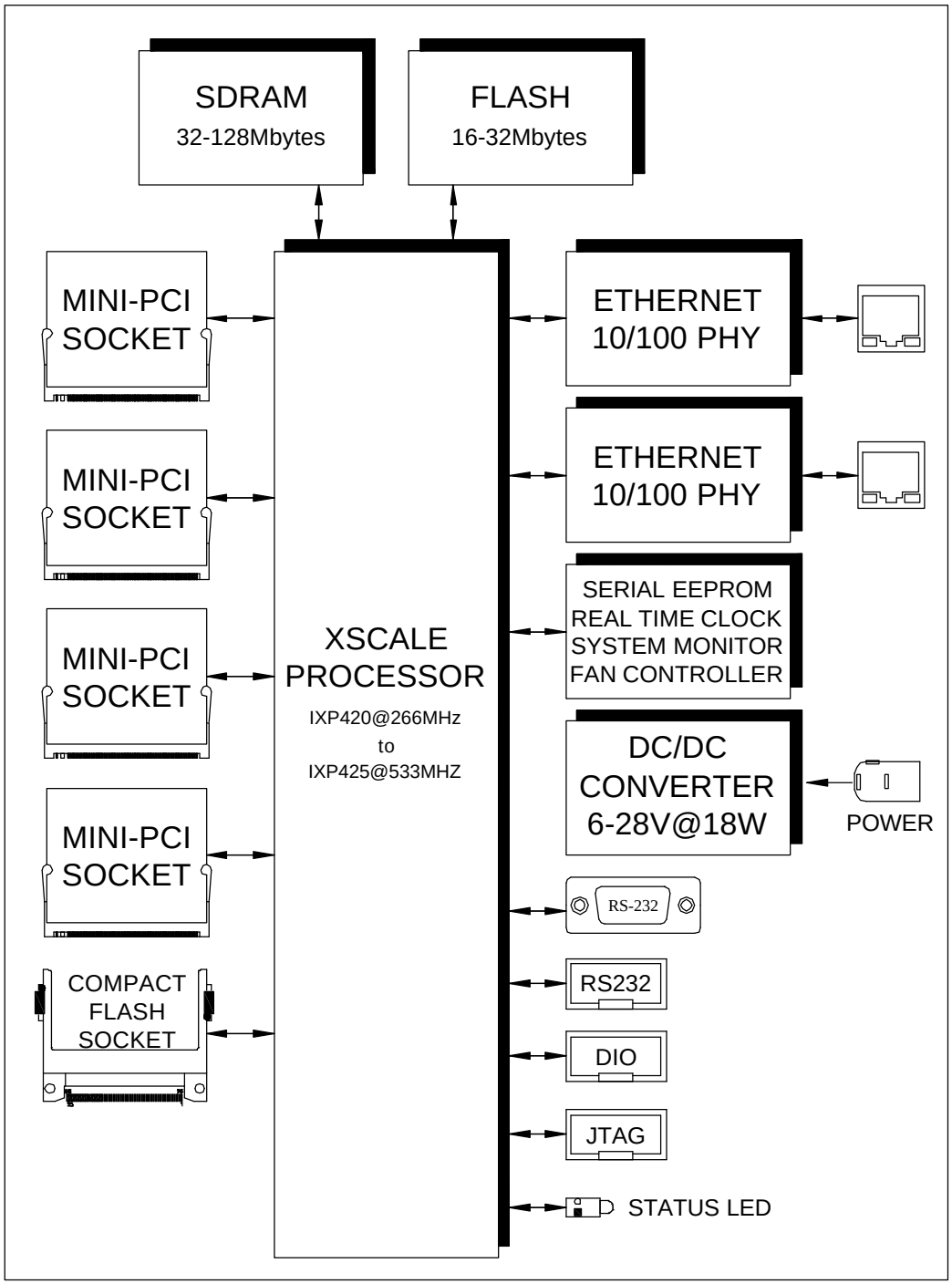
1.3. Ordering Options – Standard Configuration*

Order Code	Processor	SDRAM	Flash	Mini-PCI
GW2342-C2R2F1E4	IXP425 (533MHz)	64Mbytes	16Mbytes	4

* Contact factory for different configurations of CPU, DRAM, Flash, number of Mini-PCI sockets and selection of peripherals

1.4. Functional Blocks

The functional block diagram for the GW2342 network processor is shown below followed by a detailed description of each major functional block. The network processor includes several options that are specified at the time of ordering. Options include the processor type, amount of system memory, amount of Flash memory, and number of Mini-PCI sockets.



GW2342 Functional Block Diagram

Processor
The GW2342 supports the Intel® IXP420, IXP422 and IXP425 processors. The features common to these processors are listed below. The primary difference between these processors is support for encryption, operating speed, operating temperature and cost. See the following table below for the differences between the processor families.

- StrongARM Version 5TE Compliant
- Network processing engines to offload Ethernet filtering
- 32-bit SDRAM interface operating at 133MHz
- 32-bit PCI interface operating at 33MHz for Mini-PCI support
- 16-bit Expansion interface for Flash support
- Two 802.3 MII/RMII interfaces for Ethernet PHY support
- USB 1.1 device controller
- Two serial ports
- Four internal timers
- Internal bus performance monitoring unit
- General purpose Input/Outputs
- Watchdog Timer

Feature	IXP420	IXP422	IXP425
Speed (MHz)	266, 400, 533	266	266, 400, 533
Hardware Encryption	No	Yes	Yes
Extended Temperature	266 only	No	266, 400, 533
Cost	Low	Mid	High

IXP42x Processor Feature Comparison

SDRAM
The DRAM resides in two synchronous DRAM devices soldered directly to the board. This architecture supports SDRAM memory capacities from 32Mbytes up to 128Mbytes. The 32-bit SDRAM interface operates at 133MHz. The Gateworks standard shipping configuration is 64Mbytes.

Flash
The Flash resides in one or two J3 Intel StrataFlash® devices soldered directly to the board. This architecture supports Flash memory capacities from 4Mbytes up to 32Mbytes. The 16-bit Flash interface operates at 33MHz. The Gateworks standard shipping configuration is 16Mbytes.

Compact Flash
The GW2342 supports a single Compact Flash socket located on the rear of the board. The Compact Flash socket accepts small removable mass storage cards with storage capacities up to 4Gbytes.

Mini-PCI Sockets
Mini-PCI is a small form factor PCI card that uses the same signal protocol, electrical specifications, and configuration definitions as conventional PCI. There are up to four Mini-PCI sockets available on the GW2342. There are a wide variety of Mini-PCI cards available for expanding the networking functionality of the GW2342. Even though the mini-PCI specification limits the socket operating power to 2.5W, there is a total of 14W to be distributed as needed.

Ethernet
The GW2342 supports two Ethernet ports using an Intel LXT973 PHY Transceiver. Both channels operates in a 100BASE-TX or 10BASE-T configuration and support auto MDI/MDIX for automatically switching twisted pair inputs and outputs. Additional features include full-duplex operation for both 10Mbps and 100Mbps configurations as well as support for auto-negotiation. The Ethernet ports are available through standard RJ45 connectors. The connectors have two integrated status lights. The green status light indicates link and activity. The light is on for link and blinking for activity. The yellow status light indicates speed. The light is on for 100Mbps and off for 10Mbps.

EEPROM
The Atmel AT24C16AN is an Electrically Erasable Programmable Read Only Memory (EEPROM) with 16Kbits of storage. The 16kbits of storage is organized in a 2048 x 8-bit configuration. Additional features include 1,000,000 erase/write cycles and a 100-year minimum data retention time. Data is transmitted to and from the EEPROM over the processor I2C bus. The I2C clock frequency is 0 to 400KHz. The I2C base address is A0 hex for writes and A1 hex for reads.

Real Time Clock
The Dallas Semiconductor DS1672 is designed to count seconds and can be used to derive time-of-day, week, month, and year using software. A battery ensures uninterrupted operation when the main power supply drops below the battery voltage. The battery capacity is 35mAH. The real time clock requires 0.425 micro amps typical and 1 micro amp maximum for backup operation. This results in a battery life of 4 years minimum and more than 9 years typical. Data is transmitted to and from the Real Time Clock over the processor I2C bus. The I2C clock frequency is 0 to 400KHz. The I2C base address is D0 hex for writes and D1 hex for reads.

Temperature and Voltage Monitor
The Analog Devices AD7418 provides temperature and voltage monitoring capability. The GW2342 operating temperature is monitored through this device. The temperature accuracy is ±1°C at 25°C and ±2°C over the entire temperature range of -40°C to +125°C. The GW2342 input voltage is also monitored through this device. A resistor divider is used on the A/D input to scale the input voltage down. Multiple the A/D voltage reading by 23.1 to get the actual input voltage. Data is transmitted to and from the Temperature and Voltage Monitor over the

processor I2C bus. The I2C clock frequency is 0 to 400KHz. The I2C 7-bit base address is 50 hex for writes and 51 hex for reads.

Fan Speed Controller
Fan speed control increases fan service life and decreases system acoustic airflow noise. The GW2342 includes a Microchip TC653BE that controls the speed of a fan based on temperature. This device keeps the fan off until the GW2342 temperature reaches 35 degrees Celsius. The controller adjusts the fan speed from 50% to 100% between 35 and 45 degrees Celsius.

Serial I/O
The GW2342 includes two RS232 serial I/O ports. One serial I/O port is available through a 10-pin header and the other is available through a 9-pin female D-shell connector. The serial ports are 16550-compliant UARTs with additional depth for both the transmit and receive buffers. The interface supports transfer rates from 1200bps up to 120Kbps.

Digital I/O
The IXP processor includes a 16 bits of digital I/O. Some of these signals are used for controlling and monitoring the status of devices local to the GW2342 and some of them are available on a 10-pin header for application use. The function of each digital I/O signal is described in Section 2, Digital I/O Mapping.

USB
The GW2342 includes a version 1.1 Device Controller interface. The interface operates as a half-duplex, slave-only device at a baud rate of 12Mbps. The interface does not operate as a USB host. A standard USB Type B connector is provided on the board.

JTAG Port
A JTAG debug port is available to facilitate program download directly into Flash memory. See Section 2, JTAG Programming, for more information.

Status LED and Push Button Reset
The GW2342 includes a status LED and a push button reset. The LED is connected to the digital I/O and can be controlled by software. See Section 2 Configuration and Installation for the mapping of the LED.

DC/DC Converter
A switching DC/DC converter supplies power to the GW2342. This allows the board to support a wide input voltage range and low power operation. The DC/DC has a minimum input voltage of 6VDC and a maximum of 28VDC. **DO NOT EXCEED THE 28VDC INPUT MAXIMUM OR DAMAGE MAY OCCUR TO THE BOARD**. Also note that if a power over Ethernet injector is used to power the board, there will be voltage loss due to the resistance of the Ethernet cable. This should be taken into account when sizing the voltage supply.

2. CONFIGURATION AND INSTALLATION

The following section gives memory, interrupt, I2C and digital I/O mappings specific to the GW2342. See the *Intel IXP4XX Product Line and IXC1100 Control Plane Processors Developer's Manual* for more information on these interfaces.

2.1. Memory Mapping

The memory map and Expansion bus chip select mapping for the GW2342 is shown below.

Memory Address	Size	Description
0000_0000 – 0FFF_FFFF	256Mbyte	Flash Memory (32Mbyte max)
0100_0000 – 2FFF_FFFF	756Mbyte	SDRAM Memory (128 Mbyte max)
3000_0000 – 3FFF_FFFF		Reserved
4000_0000 – 47FF_FFFF		Reserved
4800_0000 – 4FFF_FFFF	128Mbyte	PCI Bus
5000_0000 – 5FFF_FFFF	256Mbyte	Expansion Bus
6000_0000 – 63FF_FFFF	64Mbyte	Queue Manager
6400_0000 – BFFF_FFFF		Reserved
C000_0000 – C3FF_FFFF	64Mbyte	PCI Controller Configuration and Status
C400_0000 – C7FF_FFFF	64Mbyte	Expansion Bus Configuration
C800_0000 – C800_0FFF	1Kbyte	COM1 Serial Port
C800_1000 – C800_1FFF	1Kbyte	COM2 Serial Port
C800_2000 – C8FF_2FFF	1Kbyte	Performance Monitor
C800_3000 – C8FF_3FFF	1Kbyte	Interrupt Controller
C800_4000 – C8FF_4FFF	1Kbyte	GPIO Controller
C800_5000 – C8FF_5FFF	1Kbyte	Timers
C800_6000 – C8FF_6FFF	1Kbyte	Reserved
C800_7000 – C8FF_7FFF	1Kbyte	Reserved
C800_8000 – C8FF_8FFF	1Kbyte	Reserved
C800_9000 – C8FF_9FFF	1Kbyte	Ethernet MAC A
C800_A000 – C8FF_AFFF	1Kbyte	Ethernet MAC B
C800_B000 – C8FF_BFFF	1Kbyte	USB Controller
C800_C000 – C800_FFFF		Reserved
C801_0000 – CBFF_FFFF		Reserved
CC00_C000 – CC00_00FF	256byte	SDRAM Configuration Registers
CC00_0100 – FFFF_FFFF		Reserved

Note: The bottom 256Mbytes is configurable through bit 31 of the EXP_CONFG0 register.

Memory Map

Chip Select	Description
CS0	Flash Memory (U3)
CS1	Compact Flash Socket #CS0 (J5)
CS2	Compact Flash Socket #CS1 (J5)
CS3	Flash Memory (U4)
CS4-CS7	Not Used

Expansion Bus Chip Selects

2.2. PCI Device Mapping

The GW2342 PCI device mapping is listed below.

Bus Number	Device Number	Fcn Number	IRQ Number	Description
00	01	0	28	Mini-PCI Slot (J3)
00	02	0	27	Mini-PCI Slot (J1)
00	03	0	26	Mini-PCI Slot (J4)
00	04	0	25	Mini-PCI Slot (J2)

PCI Device Map

2.3. Interrupt Mapping

The IXP42X processor allows for 32 interrupts which originate from either internal processor blocks or from the 14 dedicated GPIO pins. The interrupt mapping is shown below.

Interrupt	Function
0	WAN/HSS NPE – Not Used
1	Ethernet NPE A
2	Ethernet NPE B
3	Queue Manager (1-32)
4	Queue Manager (33-64)
5	General Purpose Timer 0
6	GPIO(0)
7	GPIO(1)
8	PCI Interrupt - Not Used
9	PCI DMA Channel 1
10	PCI DMA Channel 2
11	General Purpose Timer 1
12	USB
13	Console UART
14	Timestamp Timer
15	High-Speed UART – Not Used
16	Watchdog Timer
17	Performance Monitoring Unit
18	XScale PMU
19	GPIO(2)
20	GPIO(3)
21	GPIO(4)
22	GPIO(5) - Not Used (Serial Enable)
23	GPIO(6) - Not Used (I2C Bus SCL)
24	GPIO(7) - Not Used (I2C Bus SDA)
25	GPIO(8) - Mini-PCI Slot J2 - INTA J4 – INTB
26	GPIO(9) - Mini-PCI Slot J4 - INTA

	J1 – INTB
27	GPIO(10) - Mini-PCI Slot J1 - INTA J3 - INTB
28	GPIO(11) - Mini-PCI Slot J3 - INTA J2 - INTB
29	GPIO(12) – Compact Flash
30	SW Interrupt 0
31	SW Interrupt 1

Interrupt Map

2.4. Digital I/O Mapping

The GW2342 uses the IXP42x Processor digital I/O for controlling and monitoring the status of various devices. The IXP42x processor includes three 16-bit registers for configuring, initializing, and using the digital I/O. The output enable register (GPOER) configures each bit as an input or output. The data output register (GPOUTR) controls the digital I/O configured as outputs. The input register (GPINR) reads the digital I/O configured as inputs. See the *Intel IXP4XX Product Line and IXC1100 Control Plane Processors Developer's Manual – Chapter 13.* The digital I/O bit mapping is shown below.

GPIO Bit	Description
0	Digital I/O Header (J8 pin 1) input or output
1	Digital I/O Header (J8 pin 3) input or output
2	Digital I/O Header (J8 pin 5) input or output
3	Digital I/O Header (J8 pin 7) input or output Shared with Status LED output 0=on and 1=off
4	Digital I/O Header (J8 pin 9) input or output.
5	Reserved
6	I2C Bus - SCL
7	I2C Bus - SDA
8	Mini-PCI Interrupt - See IRQ Map (Section 2.3)
9	Mini-PCI Interrupt - See IRQ Map (Section 2.3)
10	Mini-PCI Interrupt - See IRQ Map (Section 2.3)
11	Mini-PCI Interrupt - See IRQ Map (Section 2.3)
12	Compact Flash Interrupt – See IRQ Map (Section 2.3)
13	PCI Reset input 0 = active and 1=inactive
14	Reserved for Watchdog Timer Strobe
15	Reserved

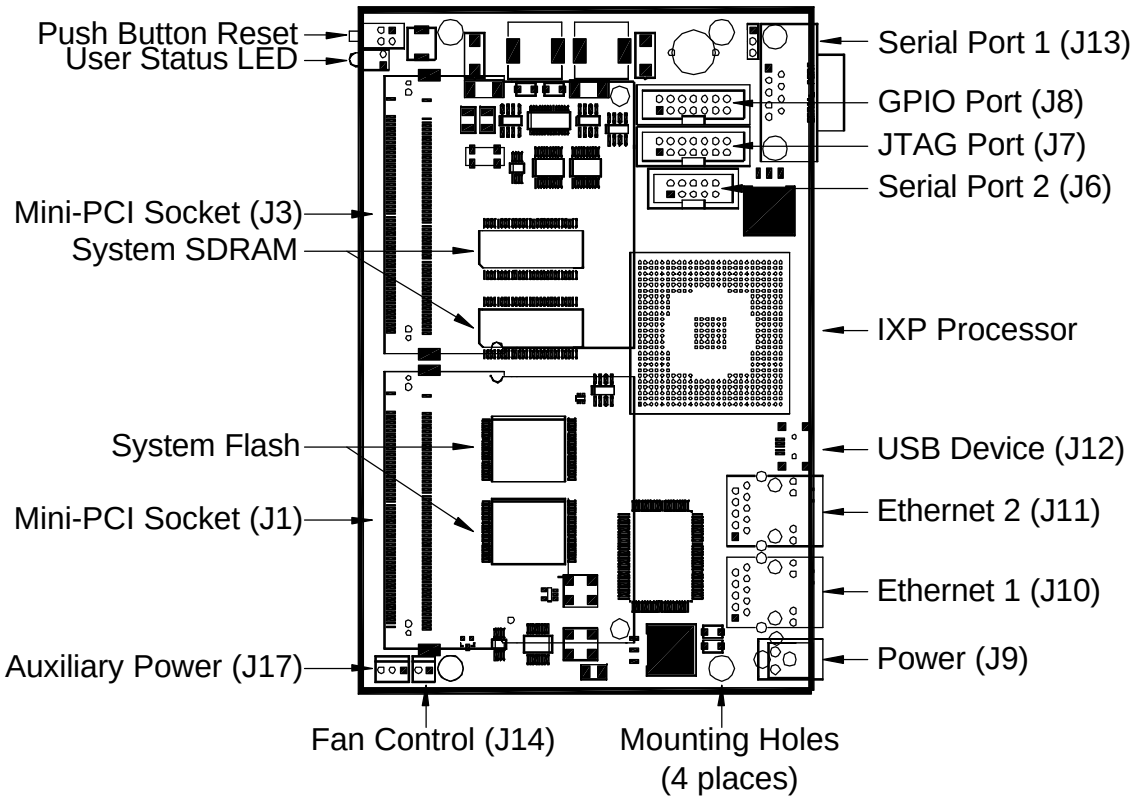
Digital I/O Map

2.5. Interface Connectors

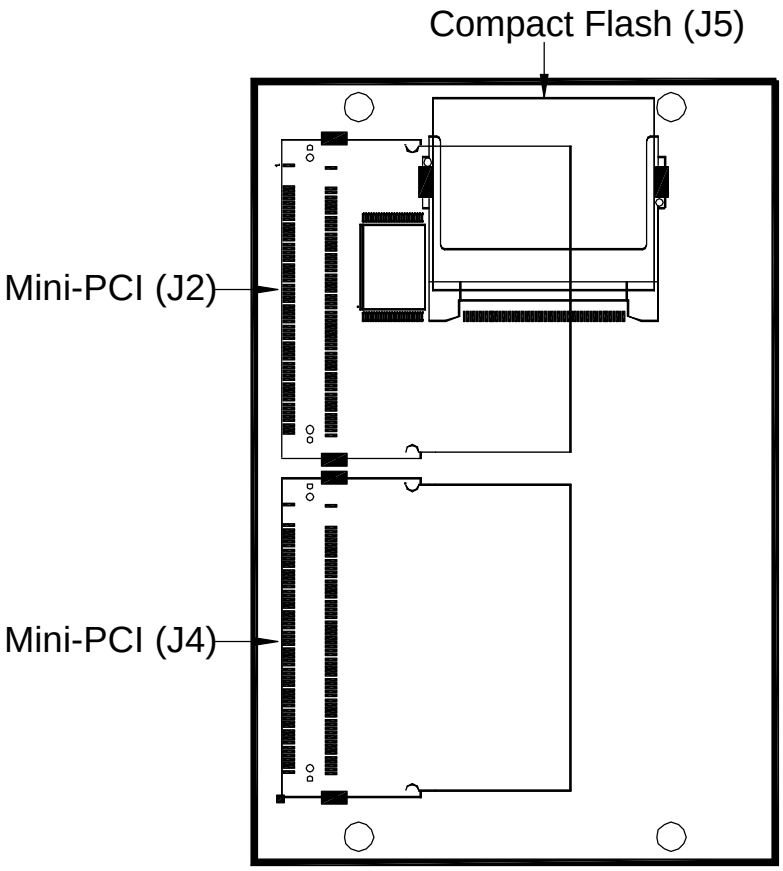
The Gw2342 interface connector pin assignments and signal descriptions are included in the following sections. The connectors are listed in the table below and the connector locations are shown in the following diagrams.

Connector	Function
J1	Mini-PCI Socket Top Side
J2	Mini-PCI Socket Bottom Side
J3	Mini-PCI Socket Top Side
J4	Mini-PCI Socket Bottom Side
J5	Compact Flash Socket Bottom Side
J6	COM2 Serial Port Header
J7	JTAG Port Header
J8	Digital I/O Header
J9	Power Connector
J10	Ethernet Connector
J11	Ethernet Connector
J12	USB Device Connector
J13	COM1 Serial Port Connector
J14	Fan Controller
J17	Auxiliary Power

Connectors



Top Side Component Locations



Bottom Side Component Locations

Mini-PCI Sockets (J1, J2, J3, J4)
There are four Mini-PCI sockets for expanding the peripheral support with high-speed PCI devices. The GW2342 supports standard 3.3V Mini-PCI cards. Support is not provided for audio, modem, and networking sideband signaling as defined in the Mini-PCI specification. The GW2342 Mini-PCI connector signaling is illustrated in the following table.

Pin	Signal	Connect	Pin	Signal	Connect	Pin	Signal	Connect
1	TIP	NC	44	AD26	AD26	87	AD7	AD7
2	RING	NC	45	CBE3#	CBE3#	88	VCC3	VCC3
3	LANRXP	NC	46	AD24	AD24	89	VCC3	VCC3
4	LANTXP	NC	47	AD23	AD23	90	AD6	AD6
5	LANRXN	NC	48	IDSEL	IDSEL	91	AD5	AD5
6	LANTXN	NC	49	Ground	Ground	92	AD4	AD4
7	LANRSV	NC	50	Ground	Ground	93	Reserved	Reserved
8	LANRSV	NC	51	AD21	AD21	94	AD2	AD2
9	LANRSV	NC	52	AD22	AD22	95	AD3	AD3
10	LANRSV	NC	53	AD19	AD19	96	AD0	AD0
11	LANGNP	NC	54	AD20	AD20	97	VCC5	NC
12	LANRNN	NC	55	Ground	Ground	98	Reserved	Reserved
13	LANYEP	NC	56	PAR	PAR	99	AD1	AD1
14	LANYEN	NC	57	AD17	AD17	100	Reserved	Reserved
15	CHSGND	CHSGND	58	AD18	AD18	101	Ground	Ground
16	Reserved	Reserved	59	CBE2#	CBE2#	102	Ground	Ground
17	INTB#	INTB#	60	AD16	AD16	103	ACSYNC	NC
18	VCC5	NC	61	IRDY#	IRDY#	104	M66EN	NC
19	VCC3	VCC3	62	Ground	Ground	105	ACDIN	NC
20	INTA#	INT#	63	VCC3	VCC3	106	ACDOUT	NC
21	Reserved	Reserved	64	FRAME#	FRAME#	107	ACCLK	NC
22	Reserved	Reserved	65	CLKRUN#	Pull Down	108	ACID0	NC
23	Ground	Ground	66	TRDY#	TRDY#	109	ACID1	NC
24	VCC3AX	VCC3	67	SERR#	SERR#	110	ACRST	NC
25	CLK	CLK	68	STOP#	STOP#	111	AMON	NC
26	RST#	RST#	69	Ground	Ground	112	Reserved	Reserved
27	Ground	Ground	70	VCC3	VCC3	113	AGND	NC
28	VCC3	VCC3	71	PERR#	PERR#	114	Ground	Ground
29	REQ#	REQ#	72	DEVSEL#	DEVSEL#	115	AOUT	NC
30	GNT#	GNT#	73	CBE1#	CBE1#	116	AIN	NC
31	VCC3	VCC3	74	Ground	Ground	117	AGND	NC
32	Ground	Ground	75	AD14	AD14	118	AINGND	NC
33	AD31	AD31	76	AD15	AD15	119	AGND	NC
34	PME#	NC	77	Ground	Ground	120	AGND	NC
35	AD29	AD29	78	AD13	AD13	121	Reserved	Reserved
36	RSVD	RSVD	79	AD12	AD12	122	MPCIACT	NC
37	Ground	Ground	80	AD11	AD11	123	VCC5AX	NC
38	AD30	AD30	81	AD10	AD10	124	VCC3AX	VCC3
39	AD27	AD27	82	Ground	Ground	125	CHSGND	CHSGND
40	VCC3	VCC3	83	Ground	Ground	126	CHSGND	CHSGND
41	AD25	AD25	84	AD9	AD9	127	NC	NC
42	AD28	AD28	85	AD8	AD8	128	NC	NC
43	Reserved	Reserved	86	CBE0#	CBE0#			

Mini-PCI Connector

Compact Flash Socket (J5)

The pin assignment for the industry standard Compact Flash socket is shown below. The Compact Flash is connected to the expansion bus on the IXP processor. The GW2342 Compact Flash connector signaling is illustrated in the following table. The Compact Flash interrupt mapping is listed in Section 2, Interrupt Mapping.

Pin	Signal	Connect	Pin	Signal	Connect
1	Ground	Ground	26	CD1#	No Connect
2	D3	EXP D3	27	D11	EXP D11
3	D4	EXP D4	28	D12	EXP D12
4	D5	EXP D5	29	D13	EXP D13
5	D6	EXP D6	30	D14	EXP D14
6	D7	EXP D7	31	D15	EXP D15
7	CS0#	EXP CS1#	32	CS1#	EXP CS2#
8	A10	EXP A10	33	VS1#	No Connect
9	ATASEL#	Ground	34	IORD#	EXP RD#
10	A09	Ground	35	IOWR#	EXP WR#
11	A08	Ground	36	WE#	Pull Up
12	A07	Ground	37	INTRQ	No Connect
13	VCC	VCC	38	VCC	VCC
14	A06	Ground	39	CSEL#	Ground
15	A05	Ground	40	VS2#	No Connect
16	A04	Ground	41	RESET#	RESET#
17	A03	Ground	42	IORDY#	No Connect
18	A02	EXP A2	43	INPACK#	No Connect
19	A01	EXP A1	44	REG#	Pull Up
20	A00	EXP A0	45	DASP#	No Connect
21	D00	EXP D0	46	PDIAG#	No Connect
22	D01	EXP D1	47	D08	EXP D8
23	D02	EXP D2	48	D09	EXP D9
24	IOCS16#	No Connect	49	D10	EXP D10
25	CD2#	No Connect	50	GND	GND

Compact Flash Connector

COM2 Serial Port Header (J6)

The COM2 serial port is available through a 10-pin header in a 2x5 configuration with 0.1-inch pin spacing. The mating connector is an AMP/Tyco 746288-1, available from Digi-Key as part number AKN10A-ND. The pin assignment supports a ribbon cable connection to a standard 9-pin D-shell connector.

Pin	Signal	Pin	Signal
1	No Connect	2	No Connect
3	Transmit Data	4	Clear To Send
5	Receive Data	6	Request To Send
7	No Connect	8	No Connect
9	Ground	10	No Connect

COM2 Serial Port Header

JTAG Port Header (J7)

These JTAG port is available through a 14-pin header in a 2x7 configuration with 0.1-inch pin spacing. The mating connector is an AMP/Tyco 746288-2, available from Digi-Key as part number AKN14A-ND. The primary purpose for the JTAG Port is to facilitate program download into Flash memory.

Pin	Signal	Pin	Signal
1	VCC3 Pull Up	2	Ground
3	JTAG RST	4	Ground
5	JTAG TDI	6	Ground
7	JTAG TMS	8	Ground
9	JTAG TCK	10	Ground
11	JTAG TDO	12	Board Reset
13	VCC3 Pull Up	14	Ground

JTAG Port Header

Digital I/O Header (J8)

The digital I/O is available through a 10-pin header in a 2x5 configuration with 0.1-inch pin spacing. The mating connector is an AMP/Tyco 746288-1, available from Digi-Key as part number AKN10A-ND. Note that GPIO3 is shared with the status LED as described in Section 2, Digital I/O Mapping.

Pin	Signal	Pin	Signal
1	GPIO0	2	Ground
3	GPIO1	4	Ground
5	GPIO2	6	Ground
7	GPIO3	8	Ground
9	GPIO4	10	Ground

Digital I/O Header

Power Connector (J9)

Power is applied to the GW2342 through a standard 2.5mm x 5.5mm barrel jack or through either Ethernet Connector. The input voltage range is 6VDC minimum and 28VDC maximum. The power jack should have the positive input voltage on the inner sleeve and ground on the outer sleeve. The mating connector is a G/S SR2048A, available from Jameco as part number 190537CJ. The schematic symbol representing this configuration is shown below.

Power Connector

Ethernet Connectors (J10, J11)

The GW2342 contains two 10/100 Base-TX Ethernet channels. Both Ethernet channels are available through standard 8-pin RJ45 connectors. Both Ethernet connectors support passive power over Ethernet. This enables the GW2342 operating voltage to be provided through the Ethernet connector rather than the Power connector. The input voltage range is 6VDC minimum and 28VDC maximum.

Pin	Signal	Standard Wire Color
1	TX+	WHITE/ORANGE
2	TX-	ORANGE
3	RX+	WHITE/GREEN
4	PoE + V	BLUE
5	PoE +V	WHITE/BLUE
6	RX-	GREEN
7	GND	WHITE/BROWN
8	GND	BROWN

Ethernet Connector J10

Pin	Signal	Standard Wire Color
1	TX+	WHITE/ORANGE
2	TX-	ORANGE
3	RX+	WHITE/GREEN
4	PoE + V	BLUE
5	PoE +V	WHITE/BLUE
6	RX-	GREEN
7	GND	WHITE/BROWN
8	GND	BROWN

Ethernet Connector J11

USB Device Connector (J12)

The GW2347 includes a Type B connector to support the USB Device configuration. The interface does not operate as a USB host.

Pin	Signal
1	No Connect
2	Data-
3	Data+
4	Ground

USB Device Connector

COM1 Serial Port Connector (J13)

The COM1 serial port connector is an industry standard female 9-pin D-shell connector with the pin assignment given in the table below. The DCE pin assignments permit a direct connection to a standard PC DTE port running terminal emulation software. The mating connector for insulation displacement ribbon cable is CW Industries CWR-280-09-000, available from Digi-Key as part number CMM09G-ND.

Pin Number	Signal
1	No Connect
2	Transmit Data
3	Receive Data
4	No Connect
5	Ground
6	No Connect
7	Clear To Send
8	Request To Send
9	No Connect

COM1 Serial Port Connector

Fan Controller (J14)

The fan is connected to a 2-pin MTA connector. The mating connector is an AMP/Tyco 770602-02, available from Digi-Key as part number A19490-ND. This connector requires separate contacts AMP/Tyco 770666-2, available from Digi-Key as part number A23962-ND.

Pin Number	Signal
1	Fan Power
2	Fan Ground

Fan Speed Control Connector

Auxiliary Power (J17)
Auxiliary power is available through a 3-pin MTA connector. The mating connector is an AMP/Tyco 770602-03, available from Digi-Key as part number A19491-ND. This connector requires separate contacts AMP/Tyco 770666-2, available from Digi-Key as part number A23962-ND.

Pin Number	Signal
1	Input Power
2	Reset#
3	Ground

Auxiliary Power Connector

2.6. JTAG Programming

The GW2342 Flash memory is programmed through the JTAG port. Gateworks offers a low cost GW16102 JTAG programmer that enables the developer to program or recover the Flash image through a standard PC parallel port. Gateworks also offers a GW16013 JTAG gang programmer for simultaneously programming up to 16 GW2342 processors in a production environment.

The following are the steps required to use the GW16012 JTAG programmer.

1. Connect the GW16012 JTAG programmer to a PC parallel port using the standard DB25 cable included with programmer.
2. Connect the 10-pin IDC female from the GW16012 dongle to the GW2342 JTAG connector.
3. Create a bootable DOS floppy with the FLASH.EXE program and the binary image. The FLASH.EXE program is a DOS program, which must be run from a DOS prompt, it cannot be run from a Windows DOS box. The development kit CDROM contains both the FLASH.EXE program and the default factory programmed image.
4. Insert the DOS bootable floppy, with the FLASH.EXE program and binary image into the PC's floppy drive and boot to DOS.
5. Run the FLASH.EXE program with the following syntax
   CC:> flash *image.bin* {p} {v} where p=program, v=verify and *image.bin* is the binary image.

   Examples:
   C:> flash gw2342.bin p
   Program the Flash with the gw2342.bin image
   C:> flash gw2342.bin v
   Verify that the Flash matches the gw2342.bin image
   C:> flash gw2342.bin pv
   Program and verify the Flash with the gw2342.bin image

2.7. Getting Started

The GW2342 is factory configured with Redboot v2.01 and a uCLinux port programmed into Flash memory. The software is configured to use either serial port for a serial console. To get started, connect a serial cable from to another computer running a terminal software application such as Windows HyperTerminal. Configure the terminal program for 115,200 baud, 8 data bits, 1 stop bit, no parity and no flow control. Apply power and watch for Redboot and Linux output on the serial console.

It is also possible to communicate to the GW2342 using a telnet session over Ethernet. First, connect the J10 Ethernet port on the GW2342 to the Ethernet port on a Host Computer using either a standard or a crossover cable. The default telnet address for the GW2342 is 192.168.3.2. Second, configure the Host Computer IP address to be on the same subnet (i.e. 192.168.3.99). Third, switch to Host Computer to a command prompt and type C:>telnet 192.168.3.2. The GW2342 console information will now be routed to the Host Computer display.

2.8. Manufactures Website Links / Support Mailing List

The section provides links to hardware and software related web sites. An email mailing list is also available for Avila board support issues. To subscribe send an empty email to: ***avila-subscribe@lists.unixstudios.net*** then confirm with a reply email. You can then post and view messages on the mailing list.

Hardware

Processor - Intel IXP420 and IXP425
http://developer.intel.com/design/network/products/npfamily/ixp425.htm

Flash - Intel TE28F320J3, TE28F640J3, TE28F640J3
http://developer.intel.com/design/flcomp/prodbref/298044.htm

Ethernet PHY - Intel LXT973
http://developer.intel.com/design/network/products/lan/PHYs/lxt973.htm

Serial EEPROM - Philips Semiconductor PCF8594
http://www.semiconductors.philips.com/

Real Time Clock - Dallas Semiconductor DS1672
http://www.maxim-ic.com/

Temperature and Voltage Monitor - Analog Devices AD7418
http://www.analog.com/

Fan Controller – Microchip TC653BEVUA
http://www.microchip.com/

Software

Linux
http://www.linux.org/

RedBoot
http://sources.redhat.com/redboot/

RedHat - LInux
http://www.redhat.com/

uCLinux
http://www.uclinux.org/

MontaVista - Linux
http://www.mvista.com/pro/downloads/ixp425.html

VxWorks - Windriver
http://www.windriver.com/partnerships/eval-cd/details.html?pgmid=IntelIXDP425t22

Intel IXP4xx Software - VxWorks, **Windows CE.NET**, **Linux**
http://developer.intel.com/design/network/products/npfamily/ixp425swr1.htm

3. SPECIFICATIONS

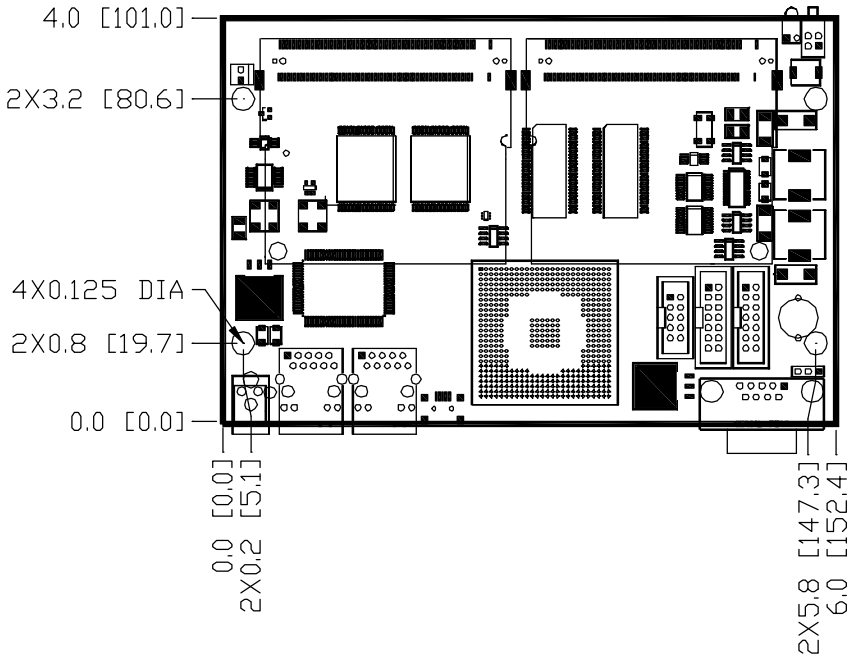
3.1. Electrical

Parameter Operating Voltage	Specification	
	Min	**Max**
Input Voltage	6VDC	28VDC

Parameter Operating Current	Specification	
	Typ	**Max**
Input Current	0.35A @ 12VDC	

3.2. Mechanical

Parameter	Specification
Dimensions, Length x Width	4.0 x 6.0 in (101.6 x 152.4mm)
Dimensions, Height	0.9 in (22.9mm)
Weight	5 ounces (142 oz)



Mechanical Dimensions

3.3. Environmental

Parameter	Specification
Operating Temperature	0 to 70 °C
Storage Temperature	-40 to +85 °C
Non-condensing Relative Humidity	Less than 95% at 40 °C

4. CUSTOMER SUPPORT

4.1. Product Revision History

Revision A – Initial Release (ECO 10000398 dated 01/04)
The GW2342 is initially released at revision A and the printed circuit board at revision 01210030-00.

Revision B – GPIO Mapping (ECO 10000400 dated 05/04)
This revision reassigned the GPIO mapping to better match the Intel development platform. The new mapping enables software ported for the development platform to operate on the GW2342. This revision increased the printed circuit board revision from 01210030-00 to 01210030-01.

Revision C – Compact Flash Interrupt (ECO 10000415 dated 11/04)
This revision adds the Compact Flash Interrupt signal between the Compact Flash socket and general purpose I/O 12 (GPIO12) of the processor. This connection is made through a zero ohm resistor that is not loaded. This means that the Compact Flash interrupt is an option on this revision. This revision increased the printed circuit board revision from 01210030-01 to 01210030-02.

Revision D – Power Supply Audible Noise (ECO 10000443 dated 02/05)
This revision eliminates the audible noise generated by the power supply generated under various conditions. The audible noise is the result of harmonics coupling into the boost regulator inductor and does not affect product performance. This revision only affects the bill of materials. The printed circuit board revision remains at 01210030-02.

Revision E – Thermal Improvement (ECO 10000454 dated 03/05)
This revision corrects a thermal issue with a specific lot of 533MHz IXP425 processors at high temperatures. Increasing the processor core voltage corrects the thermal issue. This revision affects only the bill of materials. The printed circuit board revision remains at 01210030-02.

Revision F – Fan Controller (ECO 10000489 dated 06/05)
This revision adds several peripherals to the GW2342. This includes a fan controller, fan connector, auxiliary power connector, Flash boot socket, and M-Systems Disk on Chip. Only the fan controller, fan connector, and auxiliary power connector are being loaded on the standard product. The other features are available to customers ordering high quantities. This revision enables the watchdog timer interrupt. This revision increases the printed circuit board revision to 01210044-00.

4.2. Technical Assistance

Gateworks technical support staff is available to assist you with questions that you may have. Please contact Gateworks using one of the methods shown below.

Phone: (805) 461-4000
Fax: (805) 461-4001
Email: support@gateworks.com
Website: http://www.gateworks.com

4.3. Warranty

Standard hardware warranty period is ONE year from date of purchase. Gateworks will, solely at its option, repair or replace products, which prove to be defective in materials or workmanship, provided they are returned to a Gateworks authorized repair center. Shipment to Gateworks is at the customer's expense. Gateworks pays return shipment by ground.

Products, which in Gateworks opinion, have been subject to misuse, abuse, neglect or unauthorized alteration or repair are excluded from this warranty.

Products not manufactured by Gateworks are limited to the warranty provided by the original manufacturer and should be returned to the manufacturer in case of defect. Software is licensed AS IS. If for any reason, you are dissatisfied with the software return to Gateworks within 90 days for a full refund.

The liability of Gateworks under this agreement is limited to a refund of the purchase price of the product. In no event shall Gateworks be liable for loss of profits or other damage.

4.4. Return for Repair

You must obtain a Returned Material Authorization (RMA) number before sending any product to Gateworks. Please contact Gateworks using one of the methods shown below to obtain an RMA number. Please be ready with your name, telephone number, company name, company address, shipping address, invoicing address, product number, and a technical description of the problem. A service charge will be applied to units that are out of warranty. Please pack the unit being returned in anti-static material and ship in a sturdy cardboard box with adequate packing material. Mark the RMA number clearly on the outside of the box before returning.

Phone: (805) 461-4000
Fax: (805) 461-4001
Email: support@gateworks.com
Website: http://www.gateworks.com
Address: 7631 Morro Road, Atascadero, CA 93422

4.5. Life Support Policy

Gateworks products are not authorized for use as critical components in life support devices or systems without the express written approval of the president of Gateworks Corporation. Refer to the following for definitions of critical components and life support devices.

1. A critical component is any component of a life support device or system whose failure to perform can be expected to cause the failure of the life support device or system, affect its safety, or limit its effectiveness.

2. Life support devices or systems are devices or systems which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.

4.6. Trademarks

- All brand names or product names mentioned are trademarks or registered trademarks of their respective owners.

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