



LAGUNA NETWORK PROCESSOR

Operating Manual For GW2380 Network Processor

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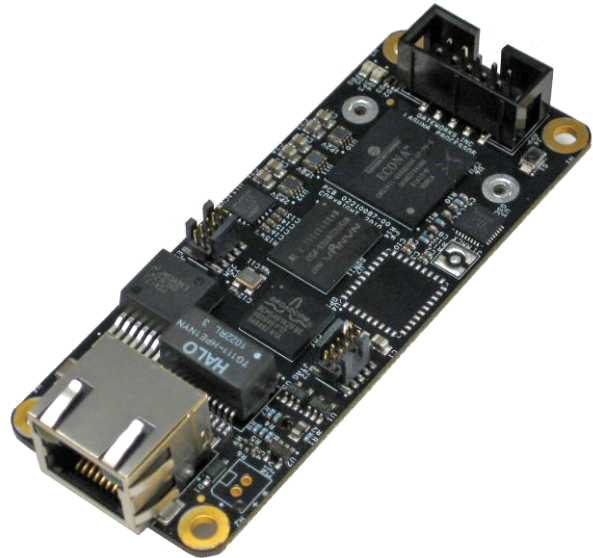


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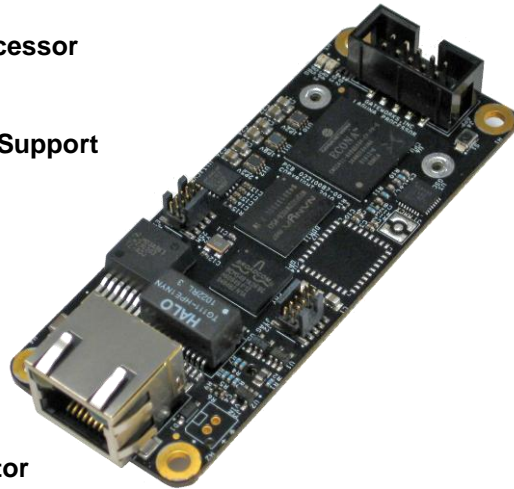
1. INTRODUCTION

1.1. Product Description

The GW2380 is designed for small form factor, low power embedded applications such as Man Portable Units (MPU), Automatic Meter reading (AMR) equipment, and remote sensor networks. The GW2380 uses a high performance ARM11 SoC coupled with a PCI Express Mini Card socket to provide support for a wide variety of current and next generation radio modules. These modules include 802.11a/b/g, 802.11n, and 4G WiMax. Additional radio functionality can be provided through the peripheral expansion connector which allows support for ZigBee® and Bluetooth® mezzanine modules. Other peripherals include a Gigabit Ethernet port and the Gateworks System Controller for providing embedded features such as real time clock, voltage and temperature monitoring, and advanced power management with programmable board shut-down and wake-up for remote sensor applications. The GW2380 also features a dedicated 10-pin AMR serial connector for support of utility meters based upon ANSI C12.18, C12.19, and C12.21 protocols. The -40 to +85C operating temperature range is ideally suited for harsh and severe outdoor environments. Optional features include a GPS Receiver for location services. An OpenWRT board support package is included for Linux 2.6 operating systems.

1.2. Standard Features

- ◆ Cavium® CNS3411 300MHz ARM11 SoC Processor
- ◆ 64Mbytes DDRII-400 SDRAM Memory
- ◆ 16Mbytes Flash System Memory
- ◆ PCI Express Mini card Socket Includes USB Support
- ◆ 10/100/1000 Base-TX Ethernet Channel
- ◆ GSC System Controller
- ◆ Real Time Clock with Battery Backup
- ◆ Voltage and Temperature Monitor
- ◆ 8Kbits Serial EEPROM
- ◆ TTL Serial Port
- ◆ Programmable Watchdog Timer
- ◆ JTAG with TTL Serial Console
- ◆ AMR Interface Connector (GE I210+)
- ◆ Zigbee® and Bluetooth® Expansion Connector
- ◆ 2W @ 25C Typical Operating Power
- ◆ 7W Available for PCI Express Mini Card
- ◆ 8 to 42VDC Input Voltage – Passive PoE or 2-pin Connector
- ◆ Small 35 x 87mm Form Factor
- ◆ -40°C to 85°C Operating Temperature
- ◆ Optional GPS Receiver with MMCX Antenna Connector
- ◆ OpenWRT Linux v2.6 Board Support Package
- ◆ 1 Year Warranty



1.3. Ordering Options – Standard Configuration*

Order Code	ARM11 processor	SDRAM	Flash	Operating Temp
GW2380	CNS3411 @ 300MHz	64Mbytes	16Mbytes	-40°C to 85°C

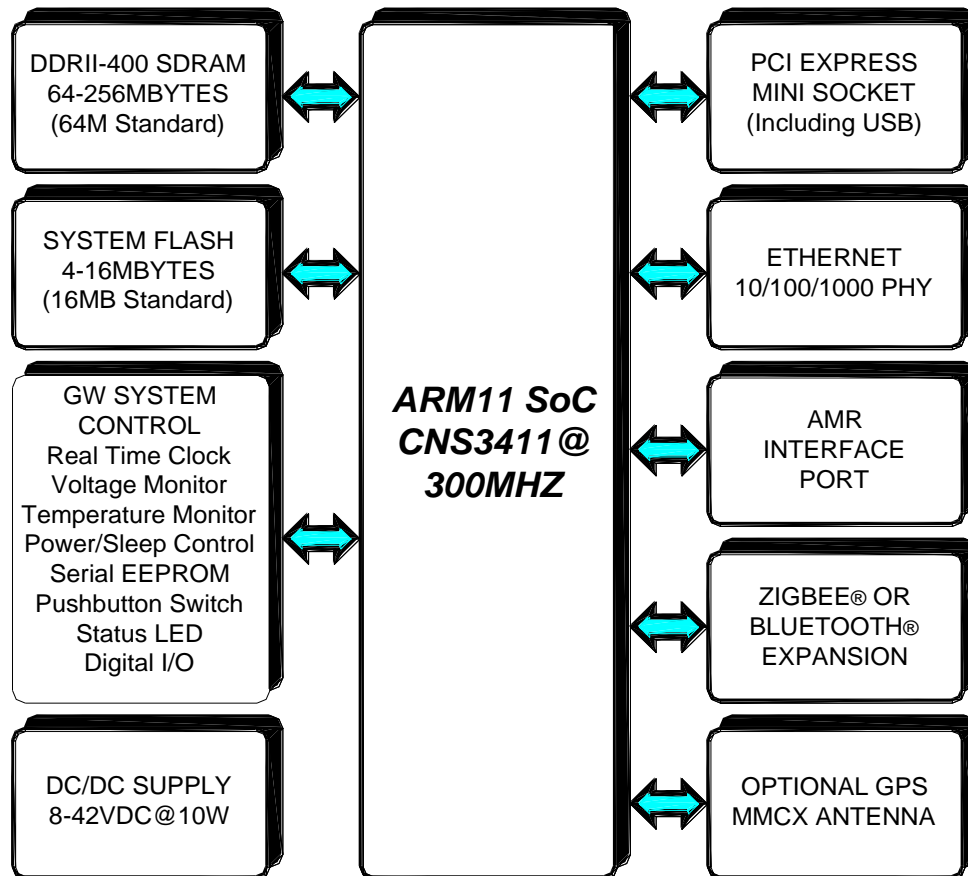
* Contact factory for different configurations of CPU, DRAM, Flash, and support peripherals

1.4. Ordering Options – Accessories

Order Code	Description
GW11008	USB JTAG Programmer
GW16056	USB JTAG Programmer Adapter
GW10062	USB JTAG 14-pin to 10-pin Programmer Adapter Cable
GW10054	GW2380 Gigabit PoE Injector
GW11021	GW2380 12V Supply
GW10064	GW2380 2-pin to 2.5mm Jack Power Adapter Cable
GW11021	GW2380 Development Kit

1.5. Functional Blocks

The functional block diagram for the GW2380 network processor is shown below followed by a detailed description of each major functional block.



Functional Block Diagram

Processor

The Cavium[®] ECONA[™] CNS3411 CPU provides a rich set of integrated processors and peripherals for supporting seamless voice, video, and data connectivity.

- ARM11 CPU core
- Vector floating point processor
- 32K L1 instruction and data cache and 256K L2 cache
- 32-bit DDRII SDRAM interface supports 800MHz data rates
- 16-bit Expansion interface for Flash and peripheral support
- Level 2 through Level 4 packet processing offload engine
- Level 7 content inspection engine supports up to 4K signatures
- Hardware cryptographic engine supports MD5, SHA-1, SHA-256, SHA-512, DES/3DES, AES, KASUMI, modular exponentiation, and others
- Hardware RAID-5/-6 Controller
- PCI Express V1.1 interface supports PCI Express Mini Card socket
- MII interface supports 10/100/1000 Ethernet port
- USB v2.0 host controllers support low, full, and high speed operation
- Universal asynchronous serial ports
- General purpose digital inputs and outputs with read back

DDR SDRAM

The DRAM resides in one synchronous DDRII SDRAM device soldered directly to the board. This architecture supports DDRII memory capacities of 64Mbytes, 128Mbytes, or 256Mbytes. The 32-bit DDRII interface operates with a 400MHz clock to support data transfer rates up to 800MHz. The factory default GW2380 includes 64Mbytes of DDRII-400.

System Flash

The System Flash resides in a Spansion[®] S25FL129P, a Numonyx[®] M25P128, or a compatible Flash device. This architecture supports Flash memory capacities from 4Mbytes up to 16Mbytes. The Flash interfaces to the ARM processor over the Serial Peripheral Interface (SPI) bus, is mapped into the ARM processor peripheral bus address space, supports the Common Flash Interface, and is constructed of uniform 256 byte sectors. The Flash also supports 100,000 erase cycles with a 20-year typical data retention time. The factory default GW2380 includes 16Mbytes of System Flash.

PCI Express Mini Socket

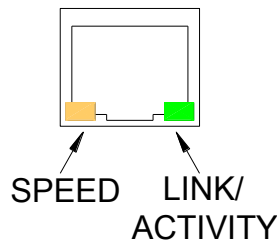
The PCI Express Mini Socket is a small form factor PCI card that uses the same signal protocol, electrical specifications, and configuration definitions as conventional PCI Express. The GW2380 PCI Express Mini Socket also supports a USB interface in addition to the PCI Express interface. The GW2380 doubles the amount of 3.3V power specified by the Mini-PCI standard from 3.5W to 7W to accommodate higher power radios.

10/100/1000 Ethernet

The GW2380 supports one 10/100/1000 Ethernet port. The Ethernet port operates in a 10BASE-T, 100BASE-TX or 1000BASE-T configuration and supports auto MDI/MDIX for automatically switching data receive and data transmit pairs. Additional features include full-duplex operation as well as support for auto-negotiation. The Ethernet MAC address is programmed into the Gateworks System Controller Configuration EEPROM during automated factory test.

The Ethernet port is available through a standard RJ45 connector with integrated status lights. The green status light indicates link and activity. The green light is on for link and blinking for activity. The yellow status light indicates speed. The yellow light is off for 10Mbps, on for 100Mbps, and blinking for 1000Mbps. The connector supports passive power over Ethernet by combining input power and ground with the data pairs. The power connections are diode protected to prevent power applied on one data pair from back feeding onto other data pairs.

The standard RJ45 Ethernet jack can be replaced with an 8-pin header. Contact the factory for additional information on this option.



Ethernet RJ45 Connector

Gateworks System Controller

The Gateworks System Controller (GSC) is a custom battery-backed microcontroller designed by Gateworks to implement many of the features found on the GW2380. This includes features such as real time clock with battery backup, system temperature and voltage monitor, configuration EEPROM, and digital I/O. The individual peripherals are discussed below and additional information can be found in the Software chapter of this manual.

Real Time Clock

The real time clock is provided by the Gateworks System Controller as discussed in the Software chapter of this manual. The Gateworks System Controller emulates an industry standard Dallas Semiconductor DS1672 to support the real time clock. This includes a 32-bit counter that counts seconds for determining time of day, week, month, and year. The real time clock is battery backed to retain time information when power is removed from the GW2361. The battery is a 12.5mm BR1225 coin cell. The I2C address for the real time clock is 0x68h.

System Temperature and Voltage Monitor

The system temperature and voltage monitor is provided by the Gateworks System Controller as discussed in the Software chapter of this manual. The Gateworks System Controller does not emulate a specific device to support the temperature and voltage monitoring functions. The I2C address for the temperature and voltage monitor is 0x29h. The following temperature and voltage parameters are monitored by the Gateworks System Controller. The GSC mapping includes the value referenced by the software driver written for the Gateworks System Controller.

Parameter	GSC Mapping
Board Temperature	temp1
Input Voltage	vin
1.2V CPU Core	core
1.8V DDRII	dram
2.5V Gigabit PHY	io1
3V GSC Battery	bat

GSC Monitored Temperature and Voltages

Configuration EEPROM

The configuration EEPROM is provided by the Gateworks System Controller as discussed in the Software chapter of this manual. The Gateworks System Controller emulates an Atmel 24C04. The EEPROM is divided into a general purpose section available to the application and a section reserved by Gateworks for storing various system configuration parameters. The I2C address for the configuration EEPROM is 0x50h.

Digital I/O

There are four programmable digital I/O signals available for application use. The digital I/O is provided by the Gateworks System Controller as discussed in the Software chapter of this manual. The Gateworks System Controller emulates an industry standard Texas Instruments PCA9555 to support these digital I/O signals. Each signal can be configured as an input or an output with read back and for polled or interrupt driven operation. The application program must enable pull up resistors for all signals that are configured as inputs. This is done by writing a logical one to the associated bit in the output register. The I2C base address is 0x23h. The maximum drive current for any single I/O is 6mA.

Additional System Level Functions

Several other system level functions are available through the Gateworks System Controller. These functions are listed below.

- Controlling the local or external status LED.
- Configuring the pushbutton switch or the external pushbutton switch to generate a software interrupt or a hardware reset.
- Supporting an encryption key with a pushbutton erase trigger.
- Supporting programmable hardware sleep and wakeup.

Status LEDs

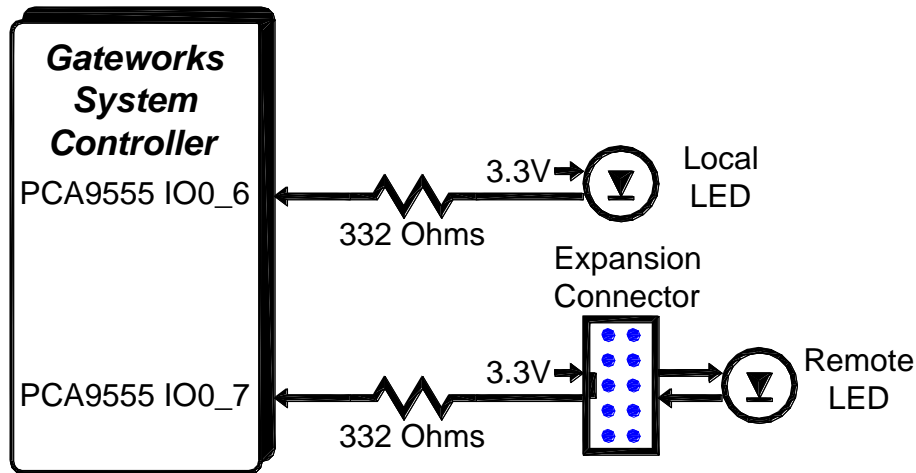
The GW2380 includes two status LEDs mounted directly to the board. One status LED indicates the presence of 3.3V power and the other status LED is software programmable. The software programmable status LED is controlled with the Gateworks System Controller mapping shown in the table below. The LED is also programmable with the standard Linux SYSFS commands.

The GW2380 also supports a panel LED through the peripheral expansion connector. The software programmable panel LED is controlled with the Gateworks Systems Controller mapping shown in the table below. The LED is also programmable with the standard Linux SYSFS commands.

Parameter	GSC Mapping
Local Status LED	GSC PCA9555 Bit IO0_7
Panel LED	GSC PCA9555 Bit IO0_6

GSC Status LED Mapping

The GW2380 includes 332 ohm current limit resistors for providing approximately 5mA of drive assuming a 1.5V drop across the LED. This is shown in the diagram below.



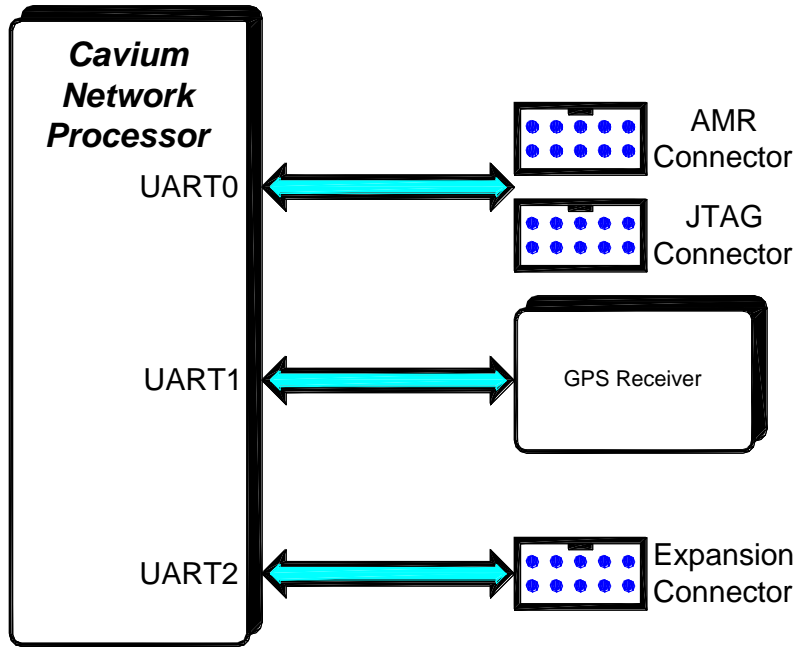
Status LED Architecture

JTAG Programming Port

The primary purpose for the JTAG Port is for automated factory testing and to facilitate downloading the application program into Flash memory. This feature requires the GW11008 USB JTAG Programmer with a GW16056 JTAG cable adapter. The JTAG programming port also includes serial port 0 of the ARM processor in a logic-level configuration. This serial port facilitates an operator console through the USB JTAG Programmer and associated adapter. See ordering options for more information. Refer to the Software chapter of this manual for USB JTAG Programmer instructions.

Serial I/O

The ARM processor includes three asynchronous serial ports connected as shown in the following diagram. Serial Port 0 is connected directly to the AMR connector and to the JTAG programming connector. The serial port available at the JTAG connector supports a serial console with the GW11008 USB JTAG Programmer and adapter. See ordering options for more information. Serial Port 1 is connected directly to an optional GPS Receiver. Serial Port 2 is connected directly to a 10-pin peripheral expansion header in a digital configuration. It is important to note that all serial port connections are digital and do not include RS232 transceivers. This means they are limited to 3.3V levels and will be damaged if connected to an RS232 interface with up to +/-12V levels.



Serial Port Architecture

Pushbutton Switch

The GW2380 includes a pushbutton switch and the ability to add an external switch through the peripheral expansion connector. The pushbutton switch is monitored by the Gateworks System Controller to provide software selectable hardware reset or software interrupt generation, to erase the Configuration EEPROM based on a key press sequence for security reasons, and to turn on and off GW2380 power based on a key press sequence. The default configuration for the pushbutton switch is to generate a hardware reset.

The GW2380 includes 332 ohm current limit resistors for providing approximately 6mA of drive assuming a 1.2V drop across the LED. This is shown in the diagram below.

Optional GPS Receiver

The GW2380 includes a GPS Receiver as a factory ordering option. The GPS Receiver delivers position, velocity, and time information. The module supports National Marine Electronics Association (NMEA) communication protocols. An MMCX connector is provided for connecting to an externally mounted active antenna. The GPS communicates to the ARM processor through a serial port. The pulse-per-second signal is mapped to the ARM processor GPIOA0 digital I/O signal. This signal is capable of generating interrupts. Consult the factory for additional information.

Key Parameter	Specification
Tracking Sensitivity	-160 dBm
Acquisition Sensitivity	-146 dBm
Hot Start	< 2 seconds
Cold Start	<38 seconds
Re-acquisition	<1 second
Horizontal Position Accuracy CEP (50%)	<2.5m
Horizontal Position Accuracy 2dRMS (90%)	<5.0m
Altitude Position Accuracy CEP (50%)	<5m
Altitude Position Accuracy 2dRMS (90%)	<8m
Horizontal Velocity Accuracy Deviation CEP (50%)	0.06m/s
Horizontal Velocity Accuracy Deviation 2dRMS (90%)	0.06m/s
Pulse Per Second - Relative to UTC CEP (50%)	+/-25ns
Pulse Per Second - Relative to UTC 2dRMS (90%)	+/-100ns

GPS Specifications

Primary DC/DC Converter

A switching DC to DC converter supplies power to the GW2380. This allows support for a wide input voltage range and higher power radios with efficiencies as high as 95%. The GW2380 is classified at a Safety Extra Low Voltage Device (SELV) since the maximum input voltage is below the 60VDC SELV limit as defined by IEC 60950-1 and other standards.

Feature	Benefit
High efficiency (up to 95%)	Reduces heat generated in enclosure
Wide input range (8-42VDC)	Operates in wide variety of applications
High power output (up to 10W)	Supports high power PCI Express Mini cards
Thermal shutdown	Protects against over heating
Output current limit	Protects against short circuits
Controlled startup	Reduces component stress and power surges
Reverse voltage protection	Protects against improper installation
Common mode input filter	Reduces emissions for agency certification

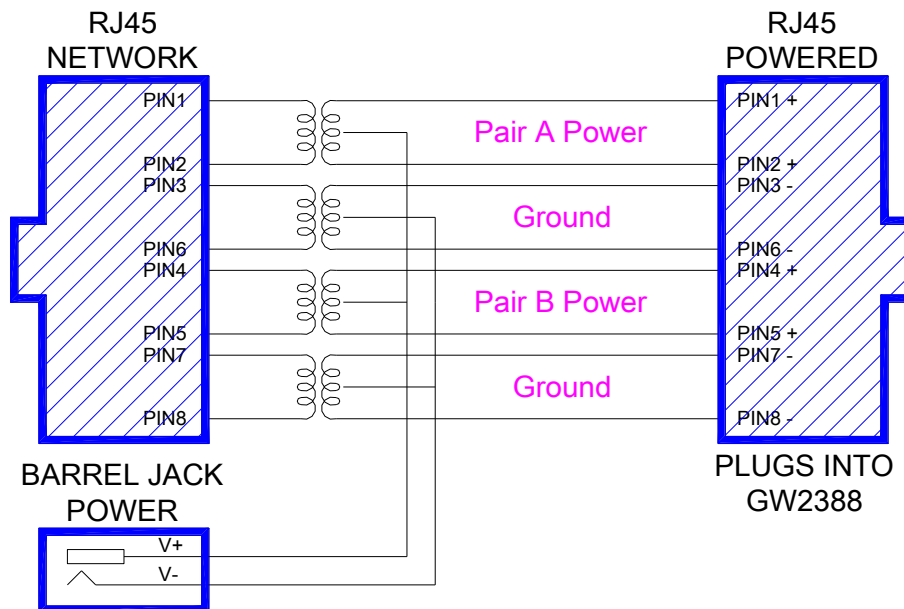
Primary DC/ DC Converter Features

Input Power

The input power is supplied through the input power connector or the RJ45 Ethernet connector in a passive power over Ethernet configuration.

The following guidelines should be used when power is supplied through the RJ45 Ethernet connector.

- If using an 802.3af supply, the device signature should be disabled and the deliverable power set to maximum. The passive PoE architecture does not return a device signature.
- If using a passive PoE supply or injector, ensure that it is rated for the necessary voltage and power.
- The positive input voltage must be applied to the data pair connected to pins 1 and 2 and to the data pair connected to pins 4 and 5 of the RJ45 cable as shown in the diagram below.
- The negative input voltage must be applied to the data pair connected to pins 3 and 6 and to the data pair connected to pins 7 and 8 of the RJ45 cable as shown in the diagram below.
- The positive inputs are all diode protected so that powering through one will not back feed through the others.
- The RJ45 connector is rated for a 0.6A maximum current per data pair for a total of 1.2A per connector. It may be necessary to use both connectors or to increase the operating voltage to lower the current depending on the total power required. Refer to the application examples below.
- The RJ45 connector is not a hot plug connector and **ALL CABLE CONNECTIONS SHOULD BE MADE BEFORE POWER IS APPLIED.**



Passive Power over Ethernet Schematic

As an example, assume the application includes a 5W high power radio card. The total required power is 5W for the radios plus 3W for the GW2380. The following cases should be considered:

Case 1 – 24V Input Voltage

Consuming 8W of power from a 24V supply requires a 0.33A input current. This can safely be done over one CAT5 pair such as pair A in the figure above.

Case 2 – 8V Input Voltage

Consuming 8W of power from an 8V supply requires a 1A input current. This requires using both pair A and pair B in the figure above.

2. CONNECTORS

The GW2380 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	Populated	Function
J1	No	Optional GPS MMCX Antenna
J2	Yes	JTAG Programming and Serial Console
J3	Yes	Power Input
J4	Yes	AMR Port
J5	Yes	PCI Express Mini Card
J6	No	Optional 10/100/1000 Ethernet Header
J7	Yes	10/100/1000 Panel Ethernet with Passive PoE
J8	Yes	Peripheral Expansion
J9	Yes	Battery Coin Cell Socket

Connector Summary

Optional GPS MMCX Antenna (J1)

The optional GPS feature includes an antenna connector for an externally mounted active antenna. The 50 Ohm MMCX antenna connector is a vertical mount Molex 73415-2061, or equivalent.

JTAG Programming and Serial Console (J2)

The JTAG programming port and serial console port are both available through a single 10-pin header in a 2x5 configuration with 0.05-inch pin spacing. The mating cable is a Samtec FFSD series, or equivalent. For example the FFSD-05-S-05.00-01-N is a 5 inch ribbon cable with a mating connector on one end.

Pin	Signal	Pin	Signal
1	JTAG TRST	2	3.3V
3	JTAG TDI	4	Ground
5	JTAG TMS	6	UART0 TXD (3.3V)
7	JTAG TCK	8	UART0 RXD (3.3V)
9	JTAG TDO	10	Board Reset

JTAG Programming Port and Serial Console Connector

Power Input (J3)

The primary power input connector is a 2-pin header in a 1x2 configuration with 2mm pin spacing. The mating connector is a JST PAP-02V-S, available from Digi-Key as part number 455-1486-ND. The mating connector pins are JST SPHD-002T-P05, available from Digi-Key as part number 455-1313-1-ND. The GW10061 12V AC to DC wall transformer connects directly to the 2-pin input power connector. See ordering options for more information.

Pin	Signal
1	Input Power
2	Ground

Power Input Connector

Automatic Meter Reader Port (J4)

The AMR 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.

Pin	Signal	Pin	Signal
1	3.3V	2	Reserved
3	Digital I/O 0 GSC PCA9555 Bit IO0_0	4	Reserved
5	Digital I/O 1 GSC PCA9555 Bit IO0_1	6	Ground
7	UART0 TXD (3.3V)	8	Digital I/O 3 GSC PCA9555 Bit IO0_3
9	UART0 RXD (3.3V)	10	Digital I/O 2 GSC PCA9555 Bit IO0_2

AMR Connector

PCI Express Mini Card (J5)

The PCI Express Mini Card socket is an industry standard form factor.

Pin	Signal	Connect	Pin	Signal	Connect
1	WAKE#	No Connect	2	3.3VAUX	3.3V
3	COEX1	No Connect	4	GND	Ground
5	COEX2	No Connect	6	1.5V	No Connect
7	CLKREQ#	No Connect	8	RSVD	No Connect
9	GND	Ground	10	RSVD	No Connect
11	REFCLK-	REFCLK-	12	RSVD	No Connect
13	REFCLK+	REFCLK+	14	RSVD	No Connect
15	GND	Ground	16	RSVD	No Connect
17	RSVD	No Connect	18	GND	Ground
19	RSVD	No Connect	20	WDIS#	No Connect
21	GND	Ground	22	PERST#	Pull Up
23	PERN0	PERN0	24	3.3VAUX	3.3V
25	PERP0	PERP0	26	GND	Ground
27	GND	Ground	28	1.5V	No Connect
29	GND	Ground	30	SMBCLK	No Connect
31	PETN0	PETN0	32	SMBDAT	No Connect
33	PETP0	PETP0	34	GND	Ground
35	GND	Ground	36	USB-	USB-
37	GND	Ground	38	USB+	USB+
39	3.3VAUX	3.3V	40	GND	Ground
41	3.3VAUX	3.3V	42	LEDWWAN#	No Connect
43	GND	Ground	44	LEDWLAN#	No Connect
45	RSVD	No Connect	46	LEDWPAN#	No Connect
47	RSVD	No Connect	48	1.5V	No Connect
49	RSVD	No Connect	50	GND	Ground
50	RSVD	No Connect	52	3.3VAUX	3.3V

PCI Express Mini Card Socket

Optional 10/100/1000 Ethernet Header (J6)

The Ethernet port is optionally available through an 8-pin header in a 1x8 configuration with 1.25mm pin spacing. The mating connector is a Molex Picoblade 51021-1000, available from Digi-Key as part number WM1728-ND. The mating connector pins are Molex 50058-8100, available from Digi-Key as 50058-8100-ND. Contact the factory for additional information on this option.

Pin	Signal	Pin	Signal
1	TX3-/RX4-	2	TX3+/RX4+
3	TX1-/RX2-	4	TX2-/RX3-
5	TX2+/RX3+	6	TX1+/RX2+
7	TX0-/RX1-	8	TX0+/RX1+

Optional Ethernet Header

10/100/1000 Panel Ethernet with Passive PoE (J7)

The Ethernet port is available through a standard 8-pin RJ45 connector. This connector support passive power over Ethernet enabling the GW2380 power and Ethernet data on a single cable. Each power signal is diode protected to prevent back feeding with the other power signals. The input voltage requirements are given in the Specifications chapter of this manual.

Pin	Data Signal	Power
1	TX1+/RX1+	PPoE V+
2	TX1-/RX1-	PPoE V+
3	TX2+/RX2+	PPoE V+
4	TX3+/RX3+	PPoE Ground
5	TX3-/RX3-	PPoE Ground
6	TX2-/RX2-	PPoE V+
7	TX4+/RX4+	PPoE Ground
8	TX4-/RX4-	PPoE Ground

Ethernet Connector

Peripheral Expansion (J8)

The JTAG programming port and serial console port are both available through a single 10-pin header in a 2x5 configuration with 0.05-inch pin spacing. The Samtec FFSD series works as a mating cable. For example the FFSD-05-S-05.00-01-N is a 5 inch cable with a mating connector on one end.

Pin	Signal	Pin	Signal
1	UART2 TXD (3.3V)	2	UART2 RXD (3.3V)
3	UART2 RTS (3.3V)	4	UART2 CTS (3.3V)
5	Panel LED	6	ARM CPU GPIOA0
7	Pushbutton Switch	8	ARM CPU GPIOA1
9	Ground	10	3.3V

Peripheral Expansion Connector

Battery Coin Cell Socket (J9)

The GW2380 contains a 12.5mm backup battery socket which allows for easy replacement of the battery. A standard 12.5mm, BR1225, 3V, 50mAH Lithium coin cell should be used when replacing the battery. Replacement batteries can be ordered from Digikey part number P183-ND.

3. SOFTWARE

3.1. Getting Started

The GW2380 is factory configured with the U-boot loader and OpenWRT Linux programmed into Flash memory. The software can be configured through a WebGUI or by using the console through the JTAG serial port or over Ethernet using a Telnet session. Follow this link for additional programming information <http://trac.gateworks.com/wiki/laguna%3Agw2380>.

3.2. Gateworks System Controller

The Gateworks System Controller (GSC) is a custom battery-backed microcontroller designed by Gateworks to implement many of the features found on the GW2380. A complete list of GSC features is shown in the table below with reference to those supported by the GW2380. The GSC communicates with the ARM processor over an I2C serial bus and interrupts the ARM processor using GPIOA1. Follow this link for complete GSC programming information <http://trac.gateworks.com/wiki/gsc>.

Function	GW2388 Support
Real Time Clock	Yes
Voltage & Temperature Monitor	Yes
General Purpose I/O	Yes
Configuration EEPROM	Yes
Fan Controller	No
System Specialized Functions	----
• Alternate Flash Boot	No
• Panel LED	No
• External Status LED	Yes
• Panel Pushbutton Switch	Yes
• External Pushbutton Switch	Yes
• External Tamper Switch	No
• Encryption Key Support	Yes
• Sleep & Wakeup	Yes
• GSC Flash CRC	Yes
• GSC Revision	Yes

Gateworks System Controller Supported Functions

3.3. JTAG Programming

One method of programming the GW2380 Flash with application software is through the JTAG programming interface. The GW11008 USB JTAG Programming Adapter transfers the application software from the developer's computer to the flash memory. Follow this link for JTAG programmer instructions http://www.gateworks.com/products/avila_accessories/gw11008.php.



3.4. 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 board support issues. To subscribe send an empty email to: ***avila-subscribe@lists.gateworks.com*** then confirm with a reply email. You can then post and view messages on the mailing list.

Hardware

Processor – Cavium ECONA ARM CNS34xxx

<http://caviumnetworks.com>

System Flash

<http://spansion.com/Products/Pages/SerialInterface.aspx>

http://www.micron.com/products/nor_flash/serial_nor_flash.html

Gateworks System Controller - Gateworks GSC

<http://trac.gateworks.com/wiki/gsc>.

Real Time Clock (emulation in GSC) - Dallas Semiconductor DS1672

<http://www.maxim-ic.com/datasheet/index.mvp/id/2750>

Digital I/O (emulation in GSC) - Texas Instruments PCA9555

<http://focus.ti.com/docs/prod/folders/print/pca9555.html>

Configuration EEPROM (GSC emulation) - Atmel 24C04

http://www.atmel.com/dyn/resources/prod_documents/doc0180S.pdf

Software

Linux

<http://www.linux.org/>

Open-WRT

<http://openwrt.org>

U-Boot

<http://u-boot.sourceforge.net>

Gateworks Board Support Package

<http://trac.gateworks.com/wiki/laguna%3A%3Agw2380>

4. SPECIFICATIONS

4.1. Electrical

Parameter Operating Voltage	Specification	
	Min	Max
Input Voltage	8VDC	42VDC
Digital I/O – VIH	2.0VDC	
Digital I/O – VIL		0.8VDC
Digital I/O – VOH (IOH = -6mA)	2.0VDC	
Digital I/O – VOL (IOL = 6mA)		0.4VDC

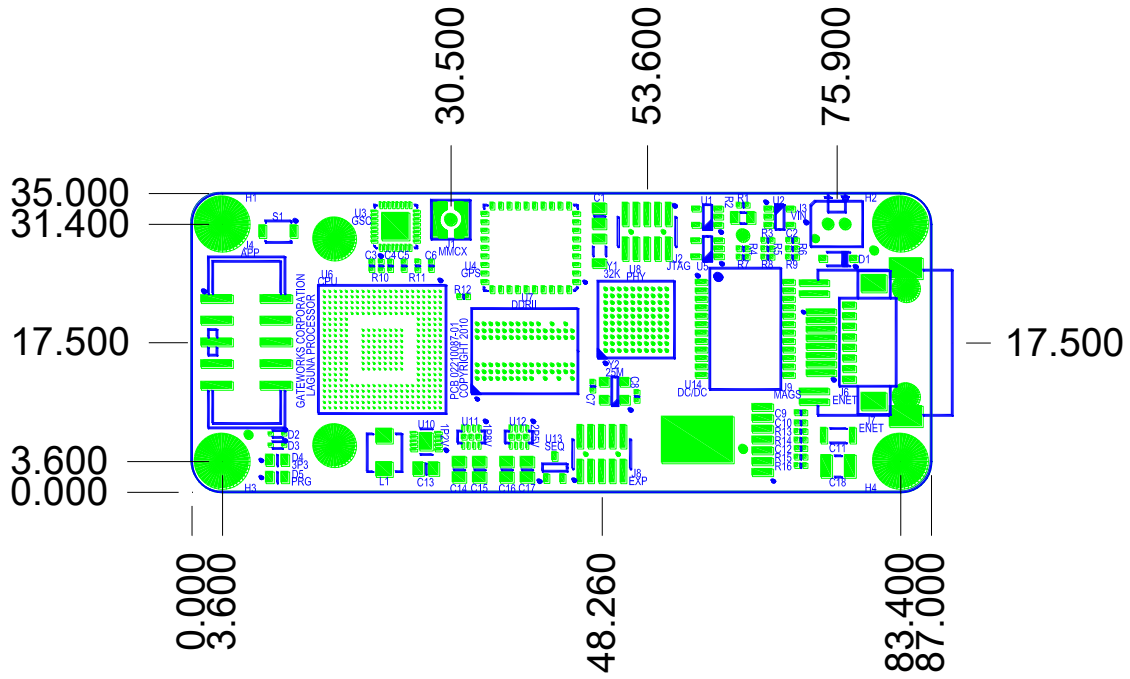
Parameter Operating Current	Specification	
	Typ	
Input Current @ 25C (no PCIe card)	0.08A @ 24VDC	
Input Current @ 85C (no PCIe card)	0.13A @ 24VDC	

4.2. Environmental

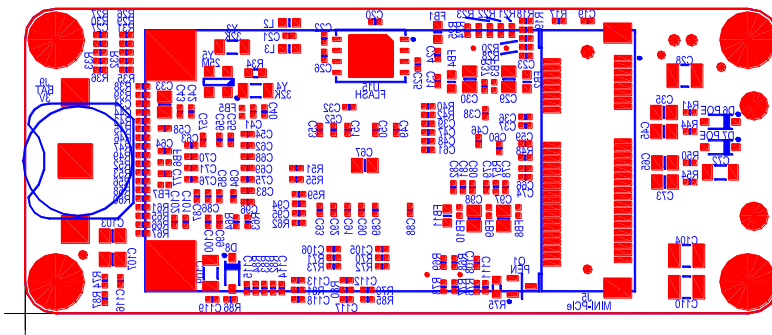
Parameter	Specification
Operating Temperature	-40 to +85°C
Storage Temperature	-40 to +85°C
Non-condensing Relative Humidity	Less than 95% at 40°C
Mean Time Between Failure	TBD

4.3. Mechanical

Parameter	Specification
Dimensions, Length x Width	3.43 x 1.38in (87 x 35mm)
Dimensions, Height	0.87in (22mm)
Weight	1 ounces (28g)



Top Side Mechanical Dimensions



Bottom Side (Looking from Top)

5. CUSTOMER SUPPORT

5.1. Product Revision History

Revision A – Prototype Release (ECO 10010104 dated 06/10)

The GW2380 was initially released at revision A with the printed circuit board at revision 02210087-00.

Revision B – Prototype Corrections (ECO 10010131 dated 09/10)

The printed circuit board was changed to 02210087-01 to include: (1) correcting passive PoE power and ground connections, (2) updating PCI Express Mini Card connections to latest specification, (3) adding 8-pin optional load Ethernet header, (4) replacing core supply with higher power device, (5) rotating input power connector 180 degrees for easier accessibility to the latching mechanism, and (7) implementing various layout changes for improved manufacturability.

5.2. 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) 781-2000

Fax: (805) 781-2001

Email: support@gateworks.com

Website: <http://www.gateworks.com>

5.3. 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.

5.4. 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) 781-2000

Fax: (805) 781-2001

Email: support@gateworks.com

Website: <http://www.gateworks.com>

Address: 3026 South Higuera Street, San Luis Obispo, CA 93401

5.5. 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.

5.6. Copyright & Trademarks

Specifications are subject to change without notice. All brand names or product names mentioned are trademarks or registered trademarks of their respective proprietors.

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