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MatchPort b/g Pro™ Integration Guide

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Disclaimer and Revisions

Operation of this equipment in a residential area is likely to cause interference to other devices, in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

Note: This product has been designed to comply with the limits for a Class B digital device pursuant to Part 15 of FCC and EN55022:1998 Rules when properly enclosed and grounded. These limits are designed to provide reasonable protection against radio interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this guide, may cause interference to radio communications.

Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

Note: With the purchase of MatchPort b/g Pro, the OEM agrees to an OEM firmware license agreement that grants the OEM a non-exclusive, royalty-free firmware license to use and distribute the binary firmware image provided, only to the extent necessary to use the MatchPort b/g Pro hardware. For further details, please see the MatchPort b/g Pro OEM firmware license agreement.

Disclaimer

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- ◆ Reorient or relocate the receiving antenna.
- ◆ Increase the separation between the equipment and receiver.
- ◆ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ◆ Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device is intended only for OEM Integrators. The OEM integrator should be aware of the following important issues.

Labeling of the End Product

The label on the end product incorporating the MatchPort b/g pro module must clearly state that it contains an FCC-approved RF module. For example: "This product contains an RF transmitter FCC ID: R68MPBGPRO and IC: 3867A-MPBGPRO."

RSS-GEN Sections 7.1.4 and 7.1.5 Statement for Devices with Detachable Antennas

This device has been designed to operate with the antennas listed in the Certificate, and having a maximum gain of 5 dBi. Antennas not included in this list or having a gain greater than 5 dBi are strictly prohibited for use with this device, unless system-level FCC approval is gained. The required antenna impedance is 50 ohms.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.

Integration Note

a) This module is authorized under limited module approval specified to mobile host equipment. So, the antenna must be installed such that 20cm is maintained between the antenna and users.

b) The transmitter module may not be co-located with any other transmitter or antenna.

As long as the two conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emission, PC peripheral requirements, etc.)

Note: In the event that these conditions cannot be met (for example certain laptop configurations, general purpose PCMCIA or similar cards, or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product (including the transmitter) and obtaining a separate FCC authorization.

Note: Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

Date	Rev.	Comments
???	A	Initial Release

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1: Introduction

About the Integration Guide

This guide provides the information needed to integrate the MatchPort b/g Pro™ device server within another product. The intended audiences are the engineers responsible for integrating the MatchPort b/g Pro into their product.

Notes:

◆ *The MatchPort b/g Pro Demo Kit provides hardware and firmware for customer evaluation. The complete kit includes a Module Universal Demo Kit (Lantronix PN MP10010NMK-01) and a MatchPort b/g Pro sample (Lantronix PN FP300200S-01)*

◆ *For developing application firmware on MatchPort b/g Pro, there is a MatchPort Plus Development board with a Background Debug Mode (BDM) connector. Please contact Lantronix for more details.*

Additional Documentation

The following guides are available on the product CD and the Lantronix Web site (www.lantronix.com)

MatchPort b/g Pro User Guide	Provides information needed to configure, use, and update the MatchPort b/g Pro firmware.
MatchPort b/g Pro Command Reference	Lists and explains MatchPort b/g Pro command line and XML commands.
MatchPort b/g Pro Quick Start	Briefly explains the basics to get the MatchPort b/g Pro up and running.
MatchPort Demonstration Kit Quick Start Guide	Provides information needed to configure, use, and update the MatchPort demonstration kit.

2: Description and Specifications

The MatchPort b/g Pro embedded device server is a complete network-enabling solution on a 1.75"x1.75" PCB. This miniature device server empowers original equipment manufacturers (OEMs) to go to market quickly and easily with networking and web page serving capabilities built into their products.

The MatchPort b/g Pro has the following features:

- **Power Supply:** Regulated 3.3V input required. There are step-down converters to 1.8V and 1.5V for ICs on board. All voltages have LC filtering to minimize noises and emissions.
- **Controller:** A Lantronix DSTni-FX 32-bit microprocessor, running at 166 MHz internal bus and 83 MHz external bus.
- **Memory:** 64 Mbits Flash and 64 Mbits SDRAM.
- **Ethernet:** 10/100 Base TX with auto-negotiation and HP auto-MDIX. On- board 100-ohm terminations included. Users just need an RJ45 jack and 1:1 Ethernet magnetics with a minimal numbers of discrete components.
- **Integrated Ethernet LED Drivers:** For connections to Ethernet Link and Activities LEDs.
- **Serial Ports:** Two full RS232 serial ports with all hardware handshaking signals. Baud rates can be standard or customized up to 230 Kbps. RS232/422/RS485 functionalities can also be configured on Serial Port 1.
- **Configurable IO Pins (CPs):** Up to 7 pins are configurable as general purpose I/Os if no DTR or DCD is used on serial ports.
- **Interface Signals:** 3.3V-level interface signals.
- **Temperature Range:** Operates over an extended temperature range.

MatchPort b/g Pro Block Diagram

The following drawing is a block diagram of the MatchPort b/g Pro showing the relationships of the components.

Figure 2-1. MatchPort b/g Pro Block Diagram
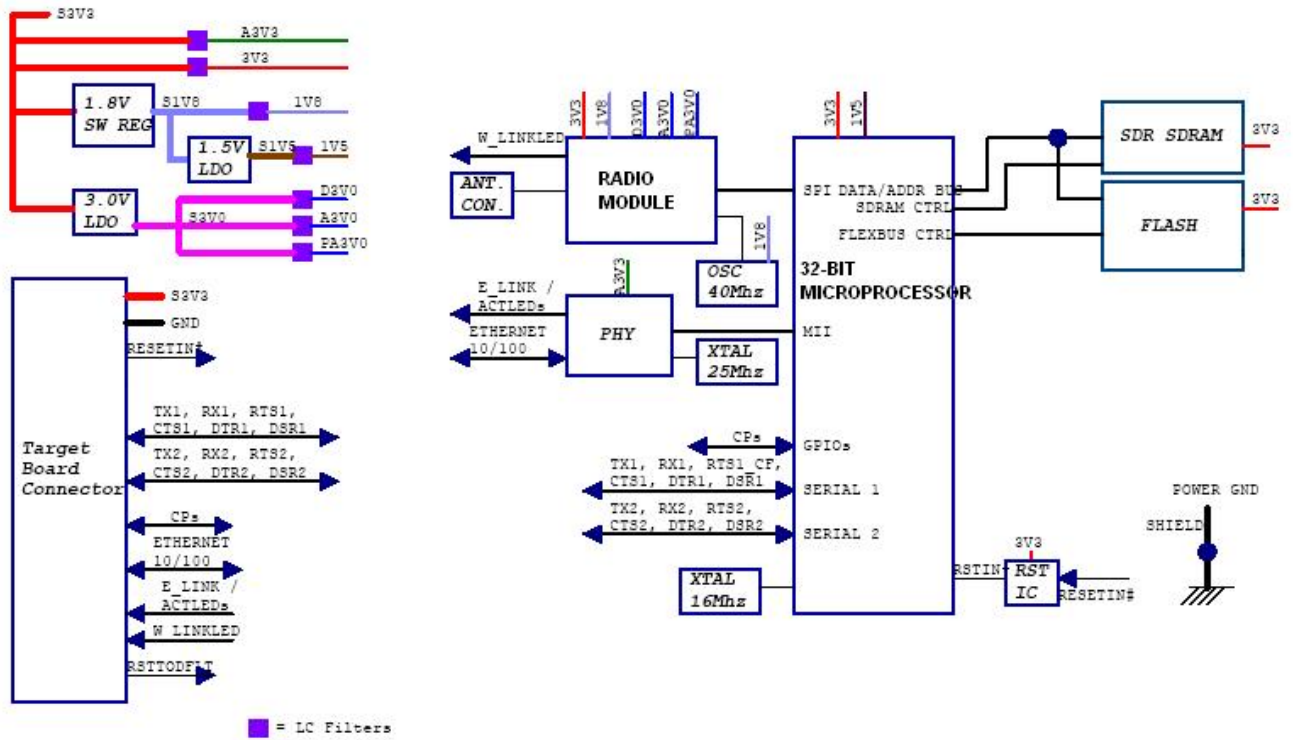
MatchPort b/g Pro Pinouts

There are two headers of 1x20, 2-mm pin spacing. The odd row header is designated as P1; pins are numbered 1 to 39. The even row header is designated as P2; pins are numbered 2 to 40.

PIN #	NAME	FUNCTION	PIN #	NAME	FUNCTION
P1.1	RESETIN#	Active low Reset. Leave floating if not used.	P2.2	GND	Ground
P1.3	RSVD	Reserved. Do not connect	P2.4	NC	No Connect
P1.5	TX1	Transmit Data output (logic level), port 1	P2.6	ETX+	PHY s Differential Ethernet Transmit Data +
P1.7	RTS1	Request to Send output (logic level), port 1	P2.8	ETX-	PHY s Differential Ethernet Transmit Data -
P1.9	RX1	Receive Data input (logic level), port 1	P2.10	ETCT	Differential Ethernet Transmit Data Center Tap
P1.11	CTS1	Clear to Send input (logic level), port 1	P2.12	ERCT	Differential Ethernet Receive Data Center Tap
P1.13	CP1	IO Configurable Pin 1	P2.14	ERX+	PHY s Differential Ethernet Receive Data +
P1.15	CP2	IO Configurable Pin 2	P2.16	ERX-	PHY s Differential Ethernet Receive Data -
P1.17	CP3	IO Configurable Pin 3	P2.18	E_LINKLED	Connect to Link LED. 3.3V level. Active low.
P1.19	CP4	IO Configurable Pin 4	P2.20	E_ACTLED	Connect to Acitivities LED. 3.3V level. Active low.
P1.21	TX2	Transmit Data output (logic level), port 2	P2.22	W_LINKLED	Wireless LAN status LED output Active low
P1.23	RTS2	Request to Send output (logic level), port 2	P2.24	BOOTP_EN#	Network Boot and Boot Loader Enable pin.
P1.25	RX2	Receive Data input (logic level), port 2	P2.26	RSVD	Reserved. Do not connect
P1.27	CTS2	Clear to Send input (logic level), port 2	P2.28	RSVD	Reserved. Do not connect
P1.29	CP5	IO Configurable Pin 5	P2.30	RSVD	Reserved. Do not connect
P1.31	CP6	IO Configurable Pin 6	P2.32	RSVD	Reserved. Do not connect
P1.33	CP7	IO Configurable Pin 7	P2.34	RSVD	Reserved. Do not connect
P1.35	RSVD	Reserved. Do not connect	P2.36	RSVD	Reserved. Do not connect
P1.37	S3.3V	3.3V Power Input	P2.38	RSVD	Reserved. Do not connect
P1.39	GND	Ground	P2.40	RSVD	Reserved. Do not connect

Power and Ground

The MatchPort b/g Pro requires a regulated 3.3Vdc +/- 5% power input at P1.37 and ground at pin P1.39.

Direct connection of 3.3V and ground on MatchPort b/g Pro to 3.3V power and ground planes of the target board is recommended in place of heavy trace routing to minimize noises as well as voltage drops at the connection.

Reset

The MatchPort b/g Pro reset pin RESETIN# is an input-only pin and connects to an 811-type reset IC. This input is for a pushbutton switch type manual reset. If no external reset control is desired, leave this pin floating.

There is an on board capacitor, 0.1uF to ground, at the RESETIN# to filter out transient voltages. However, as always, it is a good practice to have RESETIN# trace on the target board as short as possible to avoid reset occurrences when transient voltages such as those caused by ESD are present.

Ethernet Connections

The MatchPort b/g Pro provides Ethernet interface transmit ETX and receive data ERX connections from a PHY device. Thus, before presenting signals to the outside world using an RJ45 jack, a 1:1 Ethernet Magnetics is needed to interface and to isolate the unit. A recommended connection diagram to an RJ45 jack with integrated 1:1 Ethernet magnetics is shown below.

Figure 2-2. Connection Diagram to an RJ45 Jack
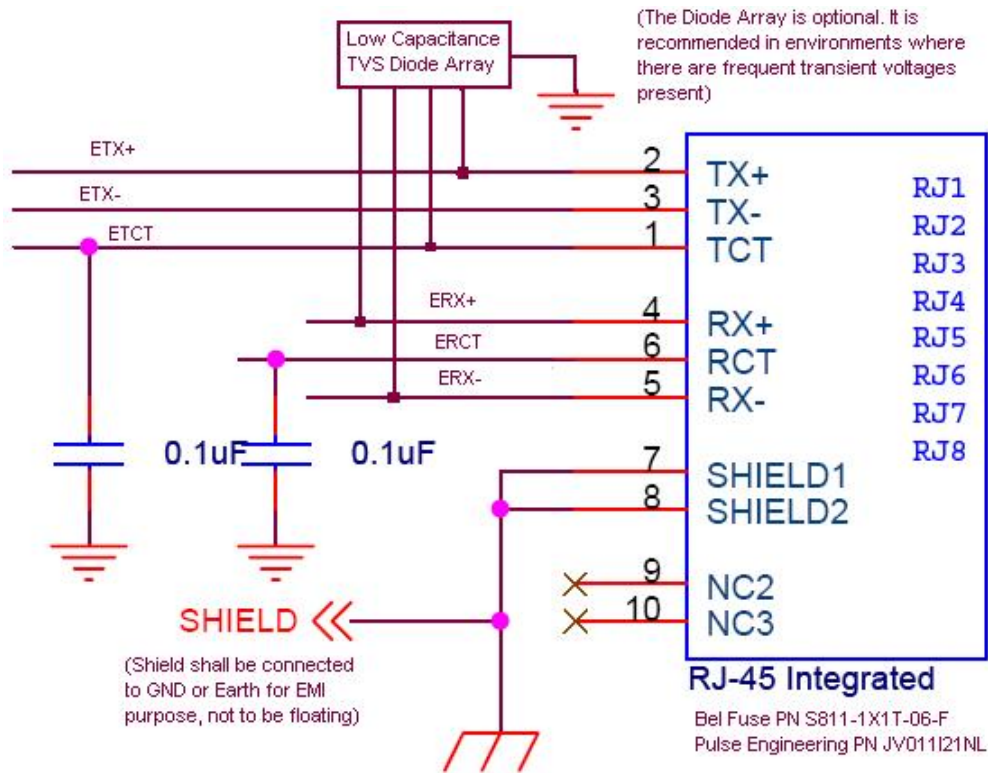
We recommend a low capacitance TVS diode array such as a Semtech SRV05-4 at ETX+, ETX-, ERX+, ERX- if frequent transient voltages are present.

Ethernet LED Connections

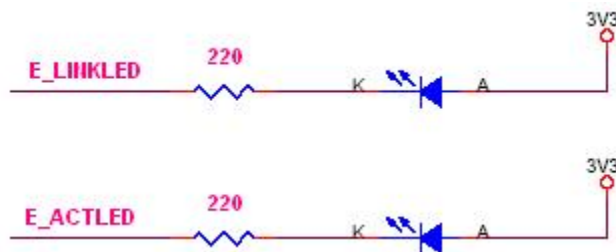The E_LINKLED and E_ACTLED signals are driven by the PHY. They are active low. Recommended connections on the target board are shown below.

Figure 2-3. Recommended LED Connections

> *Warning: The MatchPort b/g Pro has two 4.7K pull-ups on the E_LINKLED and E_ACTLED signals to set up the PHY's LED Indicator Mode as Ethernet Link and Activities at Power On Reset (POR). Do not connect these two signals with any pull-down resistors as they may corrupt the logic level on these two signals at POR, causing undesired operation.*

Wireless LED Connections

The W_LINKLED is driven by the Radio Module. It is active low. Recommended connections on the target board are shown below.

Figure TBD. Recommended LED Connections

Output W_LINKLED can be used to drive an external LED to monitor the activity of the radio. The output is active when the receiver and or transmitter are on. The output is active low and can drive an LED with 10mA max.

If WLAN Power Management is disabled, and when the unit is associated with a network, the receiver will always be on and thus any LED output, that indicates the receiver or transmitter being on will be active continuously.

Antenna Mating Connector

An antenna connection is made via the U.FL style connector on the MatchPort. Lantronix offers two cable options, reverse-SMA to U.FL (P/N 500-180-R) or U.FL to U.FL (P/N 500-181-R).

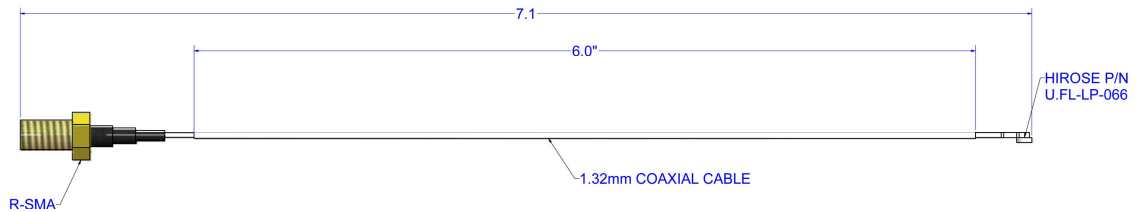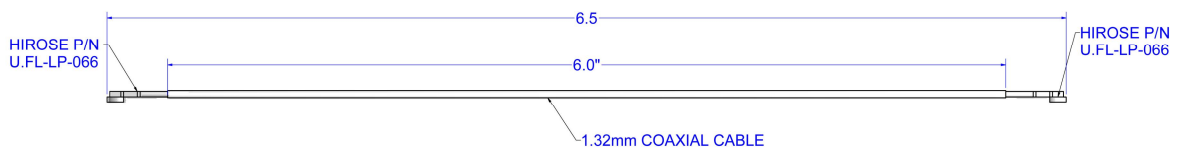**Figure 2-4. Reverse-SMA to U.FL (P/N 500-180-R)**

Figure 2-5. U.FL to U.FL Cable (P/N 500-181-R)

Note: The antenna cable is included in the MatchPort b/g Pro sample. For production, it can be purchased from Lantronix or a cable supplier.

Figure 2-6. R-SMA Antenna Connector Dimensions (not to scale)
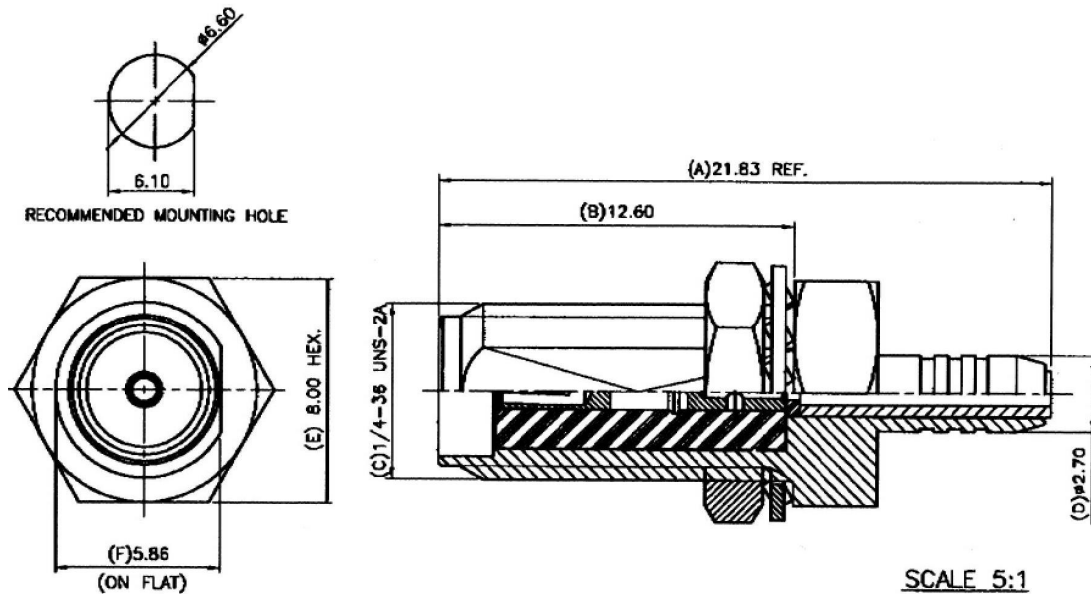
Antenna

The MatchPort b/g Pro has been FCC certified with a 5dBi gain antenna for wireless 802.11b/g. It is for applications with antennas of equal gain or less. The following are two of the recommended antennas with 2.15dBi gain and a link to their vendor. They are available from Lantronix as well.

◆ Wanshih WSS003 (Lantronix part number 930-029-R)
◆ Wanshih WSS002 (Lantronix part number 930-033-R)

www.wanshih.com

Serial Input/Output

The unit has two serial ports compatible with RS232 serial standards at data rates up to 230 Kbps. Serial Port 1 can also be configured as RS422/485, but Serial Port 2 cannot. The serial I/O signals are 3.3V CMOS logic level. Serial signals can be connected to the OEM CPU/UART or RS232/422/485 serial transceivers. For evaluation and prototype work, it is convenient to have an external RS232 interface that can connect to the serial port on a PC. The MatchPort Demo Board has RS232/422/485 transceivers to implement this external interface. If desired, use the CPs to create a DTE or DCE-style interface using any available CPs. To create these interfaces, connect the signals according to the tables below.

Note: CPx and CPy are any of the available CPs.

Table 2-1. RS232 Connections

MatchPort b/g Pro		DCE Connector			DTE Connector		
Signal (Logic)	Description	DB9	DB25	Signal	DB9	DB25	Signal
RXD1	Data In	2	3	RXD1	3	2	TXD1
TXD1	Data Out	3	2	TXD1	2	3	RXD1
RTS1	H/W Flow Control Output	7	4	RTS1	8	5	CTS1
CTS1	H/W Flow Control Input	8	5	CTS1	7	4	RTS1
CPx	Modem Control Input	1	8	DCD	4	20	DTR
CPy	Modem Control Output	4	20	DTR	1	8	DCD

Table 2-2. JP6 RS422/485 Connections on Demo board

MatchPort b/g Pro Signal (logic)	Description	RS485 Signal	JP6 Pin	DB25 4 Wire	DB25 2 Wire	DB9 4 wire	DB9 2 wire
TXD1	Data Out	TX+485	4	14	14	7	7
TXD1	Data Out	TX-485	3	15	15	3	3
RXD1	Data In	RX+485	2	21	14	2	7
RXD1	Data In	RX-485	1	22	15	8	3
RTS1	TX Enable						
CP3	RS485 Select						
CP4	RS485 2-wire						

Sample Layouts for RS485 Connectivity

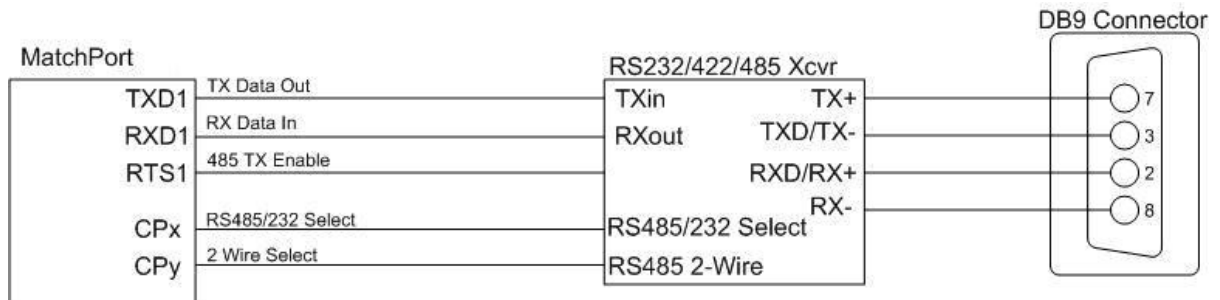**Figure 2-7. Combined RS232/422 Transceiver**
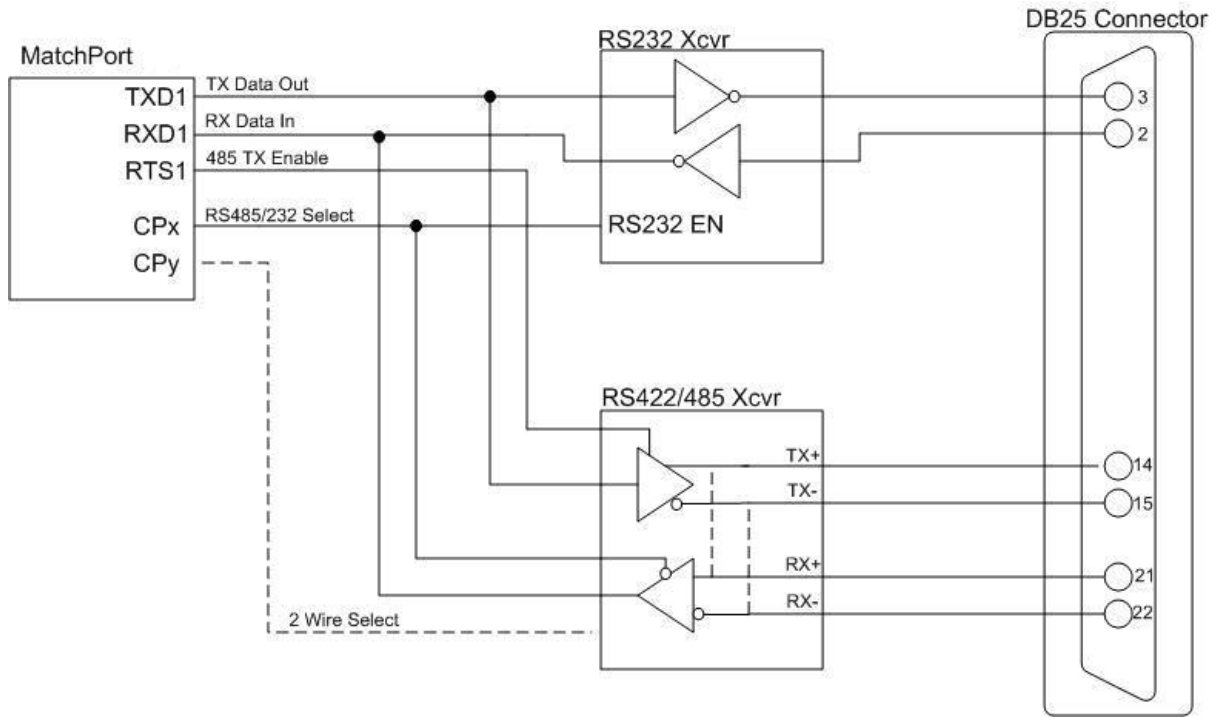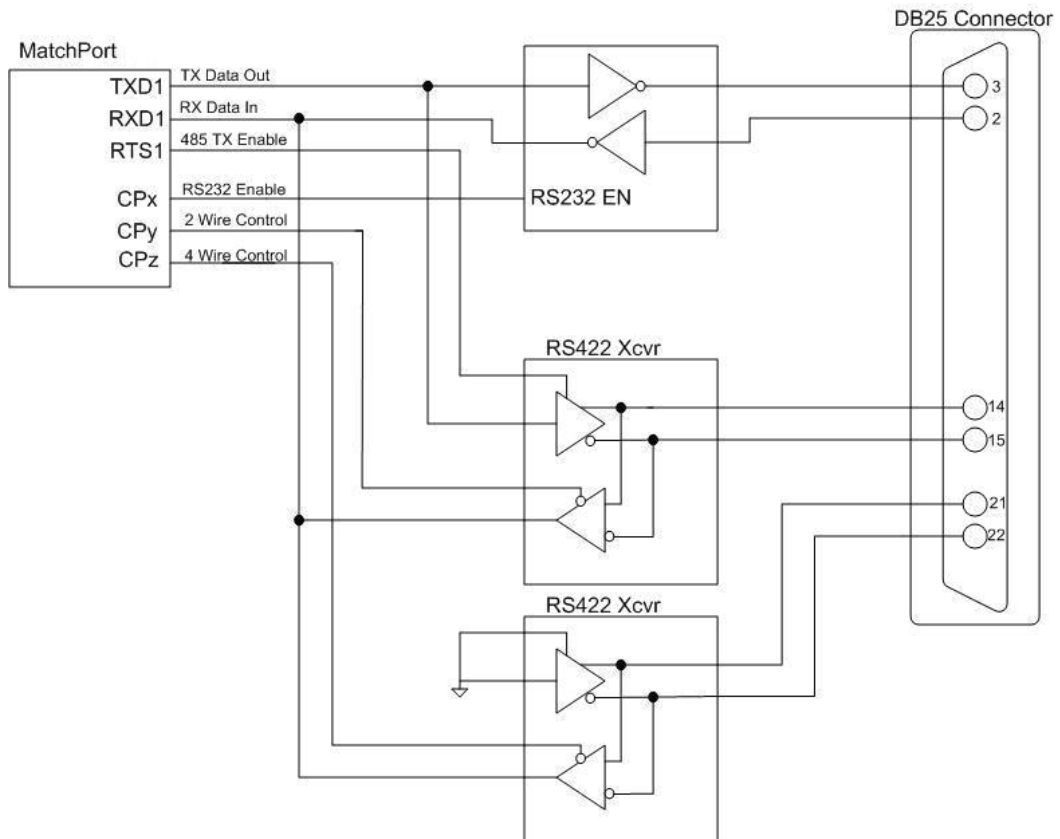
Figure 2-8. Separate RS232/422 Transceivers

Figure 2-9. Separate RS422 Transceivers for 2-Wire and 4-Wire Setups

To protect the MatchPort b/g Pro and circuitry on the target board against ESD at serial ports, the selected transceiver(s) should have RS232/422/485 bus-pin ESD protection (typically around 15 KV) either on-chip or by external diode arrays.

IO Configurable Pins (CPs)

There are up to seven CPs if no DTR or DCD is used on the serial ports. Any CP can be configured as DTR or DCD as described above. CPs can be configured (see the User Guide). All CPs have a pull-up.

PIN #	NAME	FUNCTION
P1.13	CP1	IO Configurable Pin 1
P1.15	CP2	IO Configurable Pin 2
P1.17	CP3	IO Configurable Pin 3
P1.19	CP4	IO Configurable Pin 4
P1.29	CP5	IO Configurable Pin 5
P1.31	CP6	IO Configurable Pin 6
P1.33	CP7	IO Configurable Pin 7

BOOTP_EN#

The BOOTP_EN# pin performs two functions simultaneously. It drives an optional external diagnostics LED to indicate the status of the bootloader. It also serves as input to enable booting from the network when no valid FW image is found in FLASH.

BOOTP enable

Holding BOOTP_EN# low (via switch or jumper) during and up to 10 seconds after a reset allows booting the device with a FW image on a TFTP server only in case no valid image is present on FLASH.

The MatchPort b/g Pro will issue a BOOTP request to acquire an IP address for itself, the IP address of a TFTP server, and the filename of the FW image on the TFTP server. Then it will fetch that file via TFTP, verify, and execute it.

Diagnostics LED

After supplying power to the unit or pressing and releasing the reset button, the diagnostics LED turns on and stays on while the bootloader is running and does not encounter any errors. After the bootloader loads firmware from serial, network or FLASH, it turns off the LED right before handing over execution.

In case an error occurs during the bootloader operation, it will flash the LED. The pattern will be pause, X * long flashes, Y * short flashes, pause, X long flashes, etc.

X is the first digit of the error number and Y the second.

Following are the currently implemented errors:

INVALID_BOOTLOADER_CHECKSUM	11
NO_FLASH_IMAGE_FOUND	12
BAD_FLASH_IMAGE_FOUND	13
BAD_COMMAND_PARAMETER	14
NO_BOOTP_RESPONSE	15
BAD_BOOTP_RESPONSE	16
NO_BOOTP_TFTP_IMAGE	17
RECEPTION_TIMEOUT	18
RECEPTION_OVERRUN	19

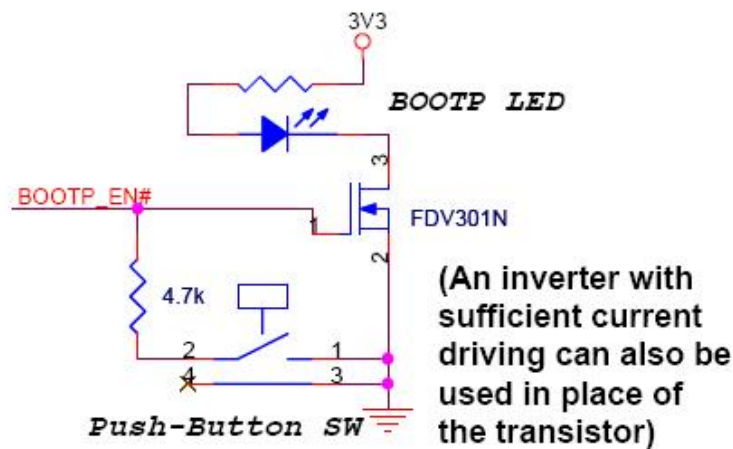|	
IMAGE_OVERSIZE	21
BAD_IMAGE_CHECKSUM	22
BAD_IMAGE_DESTINATION	23
INTERNAL_CODING_PROBLEM	24

Pin Connection Options

The circuit below is an example on how to correctly connect a switch (or permanent jumper) and an LED to the BOOTP_EN# pin. The customer has the option of implementing either the switch/resistor or the driver/LED or both or none.

The switch can be replaced by a jumper or hardwire. Having the hardwire in place means that if the firmware image in FLASH becomes corrupt, the MatchPort b/g Pro will automatically send out BOOTP requests over the network. This could be a security risk. The switch or jumper allows BOOTP requests to be sent only after manual intervention.

If no switch/jumper/hardwire is installed, network recovery is only possible by issuing a `!NL` command over the serial port.

Figure 2-10. BOOTP_EN# APPLICATION CIRCUIT

Electrical Specifications

Caution: Stressing the device above the rating listed in this table may cause permanent damage to the MatchPort b/g Pro. Exposure to Absolute Maximum Rating conditions for extended periods may affect the MatchPort b/g Pro's reliability.

Table 2-3. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units
Supply Voltage	V_{CC}	0	3.6	Vdc
CP Voltage	V_{CP}	-0.3	V_{CC} +0.05	Vdc
Ethernet ETX+, ETX-, ERX+, ERX- Voltage	V_{ETH}	0	V_{CC} +0.3	Vdc
Operating Temperature		-40	70	^{o}C
Storage Temperature		-40	85	^{o}C

Table 2-4. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units
Supply Voltage	V_{CC}	3.15	3.3	3.46	Vdc
Supply Voltage Ripples	V_{CC_PP}			2	%
Supply Current _ Power Management enabled	I_{CC}		245		mA
Supply Current _ Power Management disabled			260		mA
Supply Current (Peak)			350		mA
Supply Reset Threshold	V_{RST}	2.85	2.93	3.00	Vdc
CP Pull-ups, except CP5	R_{PU}		100		Kohm
CP5 Pull-up	R_{PU}		20		Kohm
CP, RX, CTS, BOOTP_EN# Input Low Voltage	V_{CP_IL}			0.8	Vdc
CP, RX, CTS, BOOTP_EN# Input High Voltage	V_{CP_IH}	2			Vdc (see note below)
CP, TX, RTS Output Low Voltage (I_{OL} = 4 mA)	V_{CP_OL}			0.4	Vdc
CP, TX, RTS Output High Voltage (I_{OH} = -4 mA)	V_{CP_OH}	V_{CC} - 0.4			Vdc (see note below)
E_LINKLED, E_ACTLED Current Drive (sink)	I_{ELED}		12		mA (see note below)
W_LINKLED				10	mA

Notes:

◆ Do not connect a pull-down resistor on E_LINKLED and E_ACTLED.
◆ All pins are not 5V-tolerant

Wireless Specifications

Refer to the following table for the MatchPort b/g Pro's wireless specifications:

Table 2-5. Wireless Specifications

Category		IEEE 802.11b/g
Frequency Range		2.400 . 2.484 GHz
Output Power		14 +2.0/- 1.5 dBm 1, 2, 5.5, 11 Mbps 12 +/- 1.5 dBm 6, 9, ⁻ 12 Mbps
Antenna Connector		RF, U-FL TYPE HIROSE PN = U_FL-R-SMT-10
Data Rates		1,2,5.5,11,6,9,12,18,24,36,48,54 Mbps
Radio	Number of Selectable Subchannels	US 1-11 CA 1-11 JP 1-14 FR 10-13 SP 10-11 OT 1-13 (OT=Others)
	Modulation	DSSS,DBPSK,DQPSK,CCK, OFDM, 16QAM, 64QAM
Security		WEP, WPA, WPA2/802.11i, EAP-TTLS, PEAP, LEAP
Maximum Receive Level		-10 dBm (with PER < 8%)

Receiver Sensitivity	-69 dBm for 54 Mbps
	-88 dBm for 11 Mbps
	-85 dBm for 6 Mbps
	-91 dBm for 1.0 Mbps
W_LINKLED Current	Max 10 mA

Technical Specifications

Table 2-6. Specifications

Category	MatchPort b/g Pro
CPU	Lantronix DSTni-FX 32-bit Microprocessor, 166 MHz internal bus, 83 MHz external bus
Memory	64 Mbits Flash and 64 Mbits SDRAM
Firmware	Upgradeable via TFTP, FTP, and the Web
Configuration Pins	Up to 7 pins if no DTR or DCD is used on serial ports.
Reset Circuit	RESETIN# is low active and push-button type. Minimum RESETIN# pulse width is 2 ms at IIL = -500 µA. Reset is also triggered if 3.3V at pin P1.37 drops below 2.93V typically.
Serial Interface	CMOS (Asynchronous) 3.3V - level signals Speed software selectable and customizable (300 bps to 230400 bps)
Serial Line Formats	7 or 8 data bits, 1-2 Stop bits, Parity: odd, even, none
Modem Control	DTR, DCD using CPs
Flow Control	XON/XOFF (software), CTS/RTS (hardware), none
Network Interface	Ethernet 10/100 base TX with Auto Negotiation, and HP Auto MDIX
Protocols Supported	ARP, UDP, TCP, Telnet, ICMP, SNMP, DHCP, BOOTP, Auto IP, HTTP, HTTPS, SMTP, TFTP, FTP
Management	Internal web server, SNMP Serial login, Telnet login, DeviceInstaller software, SSH
Internal Web Server	Serves web pages WEB storage capacity: approx. 2.5 MB
Security	Password protection, locking features
Average Power Consumption (at 3.3V)	0.8 W with Power Management enabled 0.85 W with Power Management disabled
Weight	1 oz (28 g)
Cover Material	ABS
Temperature	Operating range: -40°C to +70°C (-40°F to +158°F) Storage range: -40°C to +85°C (-40°F to 185°F)
Warranty	2-year limited warranty
Included Software	Windowsï 98/NT/2000/XP-based Device Installer configuration software and Windowsï -based Com Port Redirector and Secure Com Port Redirector, DeviceInstaller, and Web-Manager.

Dimensions

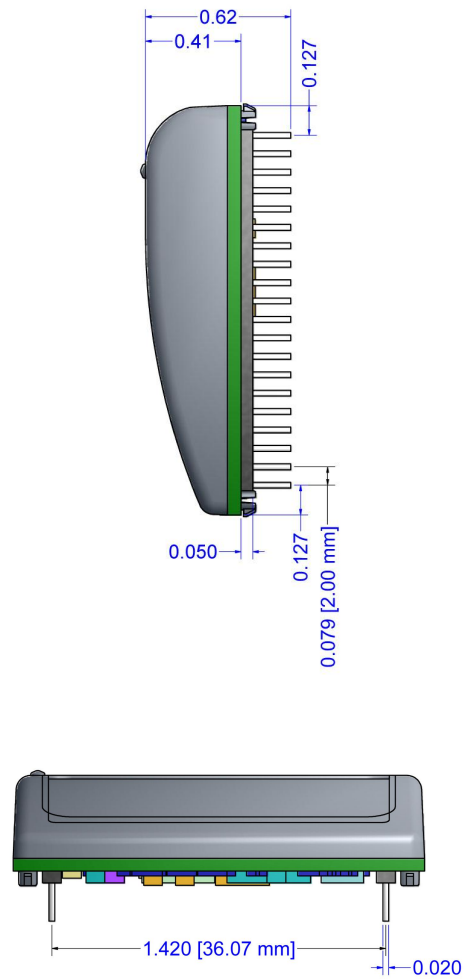The MatchPort b/g Pro dimensions are shown in the following diagrams:

Figure 2-11. Side Views
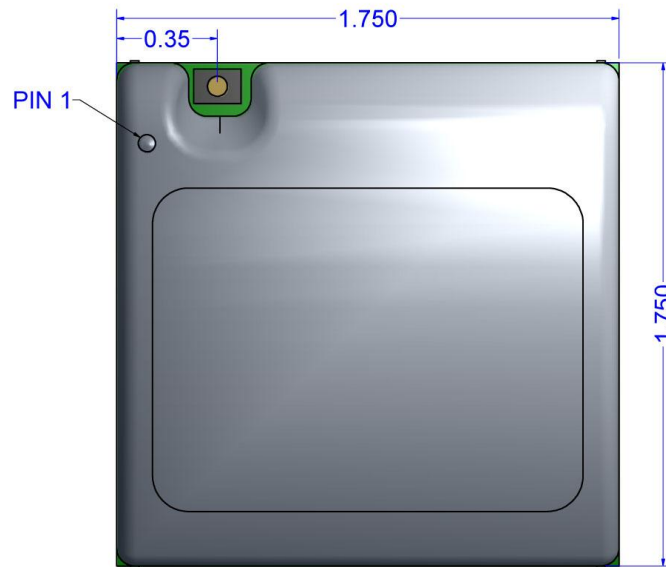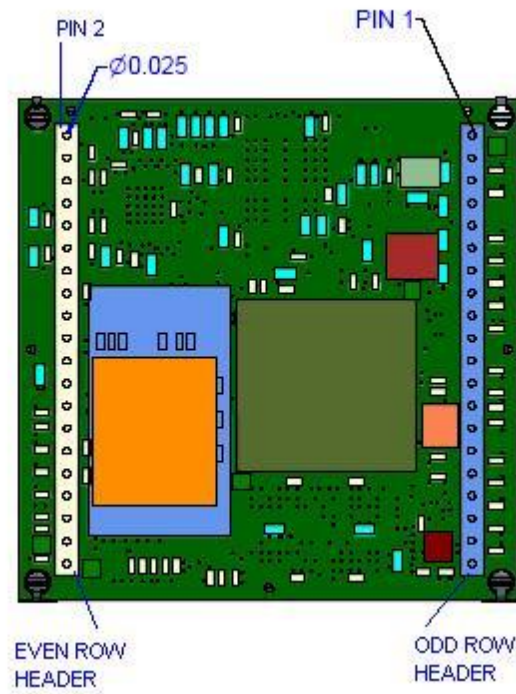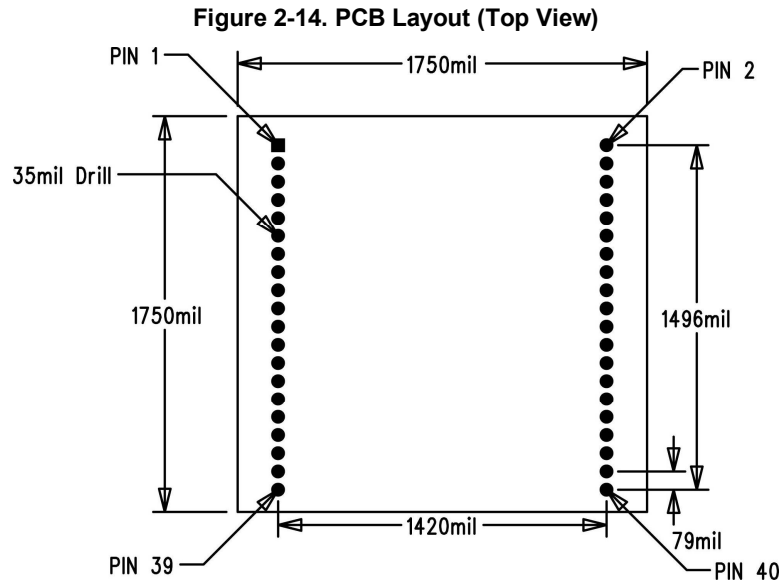
Figure 2-12. Top View

Figure 2-13. Bottom View

Recommended PCB Layout

The hole pattern and mounting dimensions for the MatchPort b/g Pro device server are shown in the following drawing:

Figure 2-14. PCB Layout (Top View)

Note: If a socket is used for product development purpose only, two 2-mm, 20-pin sockets spaced 1.42" apart can be used (e.g., Samtec P/N SMM-120-02-S-S-TR).

◆ To optimize noise and cross-talk reduction, noise immunity, and impedance matching on ETX+, ETX-, ERX+, ERX-, follow these guidelines when routing traces on the target PCB:

– Route (ETX+, ETX-) pair as close to each other as possible, and far away from ERX+, ERX- and other signals

– Route (ERX+, ERX-) pair as close to each other as possible, and far away from ETX+, ETX- and other signals

– Set up PCB routing properties on each pair (ETX+, ETX-) and (ERX+, ERX-) to achieve 100-ohm impedance.

– For EMI purposes, connect the metal housing (shield) of the RJ45 jack to Power Ground or Earth Ground and do not allow floating.

If power ground and earth ground are to be separated, add ceramic capacitors in the range of 1000 pF to 0.1 uF in a stitching pattern between the two grounds to provide low impedance paths at high frequencies. The voltage rating on the ceramic capacitors should be much higher than the required isolation voltage between the two grounds.

◆ Connect 3.3V and ground on the MatchPort b/g Pro directly to 3.3V power and ground planes of the target board in place of heavy trace routing. This will minimize noises as well as voltage drops due to the trace.

◆ Make the RESETIN# trace on the target board as short as possible to avoid reset occurrences when transient voltages such as those caused by ESD are present.

Product Information Label

The product information label contains important information about your specific unit, such as its product ID (name), bar code, part number, and MAC address.

Figure 2-15. Product Label

3: Demonstration Kit

Using a MatchPort b/g Pro sample and the MatchPort Demonstration Kit, you can get familiar with the product and understand how to integrate the MatchPort b/g Pro into a given product design.

Contents of the Kit

The MatchPort Demonstration Kit contains the following items:

◆ MatchPort Demo Board
◆ 3.3V wall adaptor
◆ RS-232 cable, DB9F/F, null modem
◆ RJ45 Ethernet cable
◆ Antenna 2.15 dBi gain

You must obtain a MatchPort b/g Pro sample separately for use with this Demonstration Kit.

Note: For developing application firmware on the MatchPort b/g Pro, Lantronix offers a MatchPort Plus Development board with a Background Debug Mode (BDM) connector. Please contact Lantronix for more details.

Demo Board Description

The MatchPort Demo Board provides a test platform for the Lantronix MatchPort device server products, including MatchPort b/g Pro. The demo board uses 3.3V power from the wall adaptor same as that of MatchPort. The demo board has the following features

◆ 2 serial ports with an RS232/RS422/RS485 Maxim MAX3160 transceiver on each. The ports have DB9M connectors CON1and CON2.
◆ 1 RJ45 with integrated magnetics 1:1 for Ethernet connection; auto-MDIX compatible.
◆ Access to all signals on the MatchPort via header pins for measurements and connections to other places.

Serial Interfaces

The demo board has RS-232/422/485 transceivers, one per port. However, note that only Serial Port 1 supports RS232/RS422/485 on MatchPort b/g Pro. The table below lists the RS232 signals and corresponding pins on the demo board. All signals are level-shifted by the transceivers.

Table 3-1. RS-232 Signals on Serial Port 1

MatchPort Demo PIN FUNCTION	DB9 Pin #
Serial Port 1	CON1
TX1_232 (Data Out)	3
RX1_232 (Data In)	2
CTS1_232 (HW Flow Control Input)	8
RTS1_232 (HW Flow Control Output)	7
DCD1_232 (Modem Control Input)	1
DTR1_232 (Modem Control Output)	4
GND (Ground)	5

Table 3-x. RS-232 Signals on Serial Port 2

MatchPort Demo PIN FUNCTION	DB9 Pin #
Serial Port 2	CON2
TX2_232 (Data Out)	3
RX2_232(Data In)	2
CTS2_232 (HW Flow Control Input)	8
RTS2_232 (HW Flow Control Output)	7
DCD2_232 (Modem Control Input)	1
DTR2_232 (Modem Control Output)	4
GND (Ground)	5

Table 3-2. RS-422 4-Wire Connector on Serial Port 1

MatchPort Demo PIN FUNCTION	DB9 Pin #
Serial Port 1	CON1
TX+485 (Data Out)	7
TX-485 (Data Out)	3
RX+485 (Data In)	2
RX-485 (Data In)	8
GND (Ground)	5

Power Supply

The demo board uses an external 3.3V regulated supply (included with kit).

General Control

The following tables denote the configuration of the demo board. Configuring the jumpers re-routes signals on the demo board to drive LEDs (general purpose outputs), to use as Serial control signals, or to connect to other places on target board as General Purpose IO (GPIO).

Configuration Switch Bank

Table 3-3. Demo Board JP1 Jumper Configuration

JP1 pin/Signal	JP1 pin/Signal	Function
1/CP1	2/LED12	Jumper 1-2, CP1 Controls LED12
3/CP2	4/LED11	Jumper 3-4, CP2 Controls LED11
5/CP3	6/LED10	Jumper 5-6, CP3 Controls LED10
7/CP4	8/LED9	Jumper 7-8, CP4 Controls LED9
9/CP5	10/LED8	Jumper 9-10, CP5 Controls LED8
11/CP6	12/LED7	Jumper 11-12, CP6 Controls LED7
13/CP7	14/LED6	Jumper 13-14, CP7 Controls LED6

Table 3-4. Demo Board JP7 Jumper Configuration for CON1

JP7 pin/Signal	JP7 pin/Signal	Function
1/TXD1	2/TXA	Jumper 1-2, Send TXD to RS232/485 transceiver.
3/RTS1	4/RTSA	Jumper 3-4, Send RTS to RS232/485 transceiver. In 485 mode RTS controls transmit enable.
5/CP3	6/SEL4XXA	Jumper 5-6, CP3 high selects 485 mode, low 232 mode. Pin at transceiver is pulled down to default to 232 mode.
7/RXD1	8/RXA	Jumper 7-8, Receive RXD from RS232/485 transceiver.
9/CTS1	10/CTSA	Jumper 9-10, Receive CTS from RS232 transceiver.
11/CP4	12/HDPX4XXA	Jumper 11-12. In 485 mode, CP4 selects full duplex when low and half duplex when high. Pin at transceiver is pulled down to default to full duplex.
13/CP1	14/DTRA	Jumper 13-14, CP1 drives DTR to RS232 transceiver.
15/CP2	16/DCDA	Jumper 15-16, CP2 receives DCD from RS232 transceiver.

Table 3-xx. Demo Board JP8 Jumper Configuration for CON2

JP7 pin/Signal	JP7 pin/Signal	Function
1/TXD2	2/TXB	Jumper 1-2, Send TXD to RS232 transceiver.
3/RTS2	4/RTSB	Jumper 3-4, Send RTS to RS232 transceiver.
5/CP7	6/SEL4XXB	Do **not** add jumper since only RS232 is supported. Pin at transceiver is pulled down to default to 232 mode.
7/RXD2	8/RXB	Jumper 7-8, Receive RXD from RS232 transceiver.
9/CTS2	10/CTSB	Jumper 9-10, Receive CTS from RS232 transceiver.
11/RESERVED on MatchPort b/g Pro	12/HDPX4XXB	Do **not** add jumper since only RS232 is supported. Pin at transceiver is pulled down to default to 232 mode.
13/CP5	14/DTRB	Jumper 13-14, CP5 drives DTR to RS232 transceiver.
15/CP6	16/DCDB	Jumper 15-16, CP6 receives DCD from RS232 transceiver.

Note: CP arrangement in the tables above is for demonstration purpose only. In customers' applications, any CP can be assigned as a function of DTR or DCD. All CPs can be used as GPIOs.

Table 3-5. Demo Board JP5 Jumper Configuration

| Pin/Signal	Pin/Signal	Function
1/3V3	2/3V3_UUT	MatchPort UUT power input jumper for current measurement. Jumper 1-2 must be installed to provide power to UUT.

If using CPs for any combination of the demo board configurations above, please use the appropriate CP function selection as shown in Table 3-5. If assigning a CP for any function other than the serial port, remove the jumper for the associated CP pin from JP7 to avoid conflict with the serial port function.

Table 3-5. Demo Board Configurable Pin Jumper Configurations.

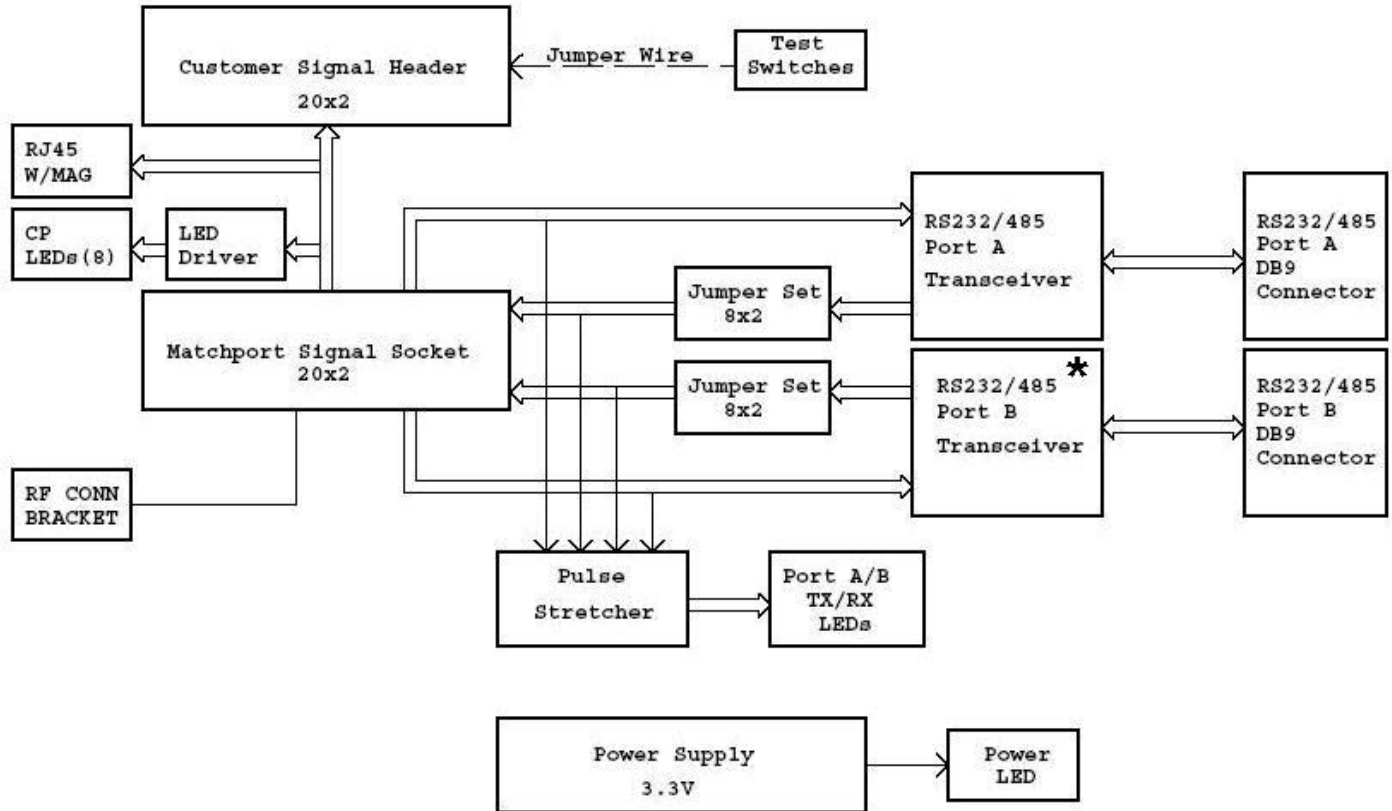| Configurable Pin	JP1 Function	JP7,JP8 Function
CP1	LED12	JP7, CON1 DTR
CP2	LED11	JP7, CON1 DCD
CP3	LED10	JP7, CON1 RS485/232 Select
CP4	LED9	JP7, CON1 RS485 Duplex Select
CP5	LED8	JP8, CON2 DTR
CP6	LED7	JP8, CON2 DCD
CP7	LED6	JP8, leave open

Demo Board Layout

Figure 3-1. MatchPort Demo Board Layout
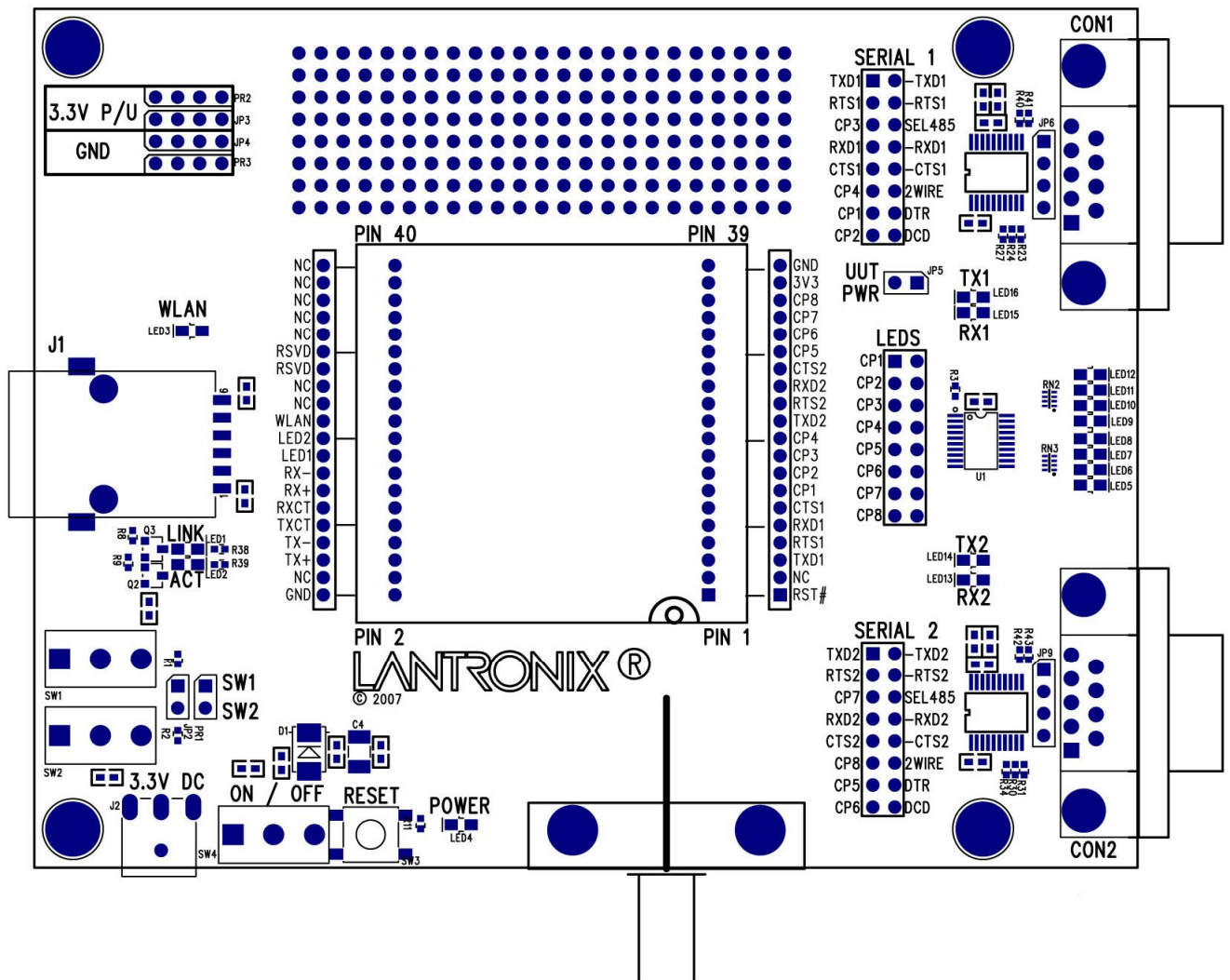
Demo Board Schematics

Figure 3-2. Demo Board Block Diagram

* Depends on module used.
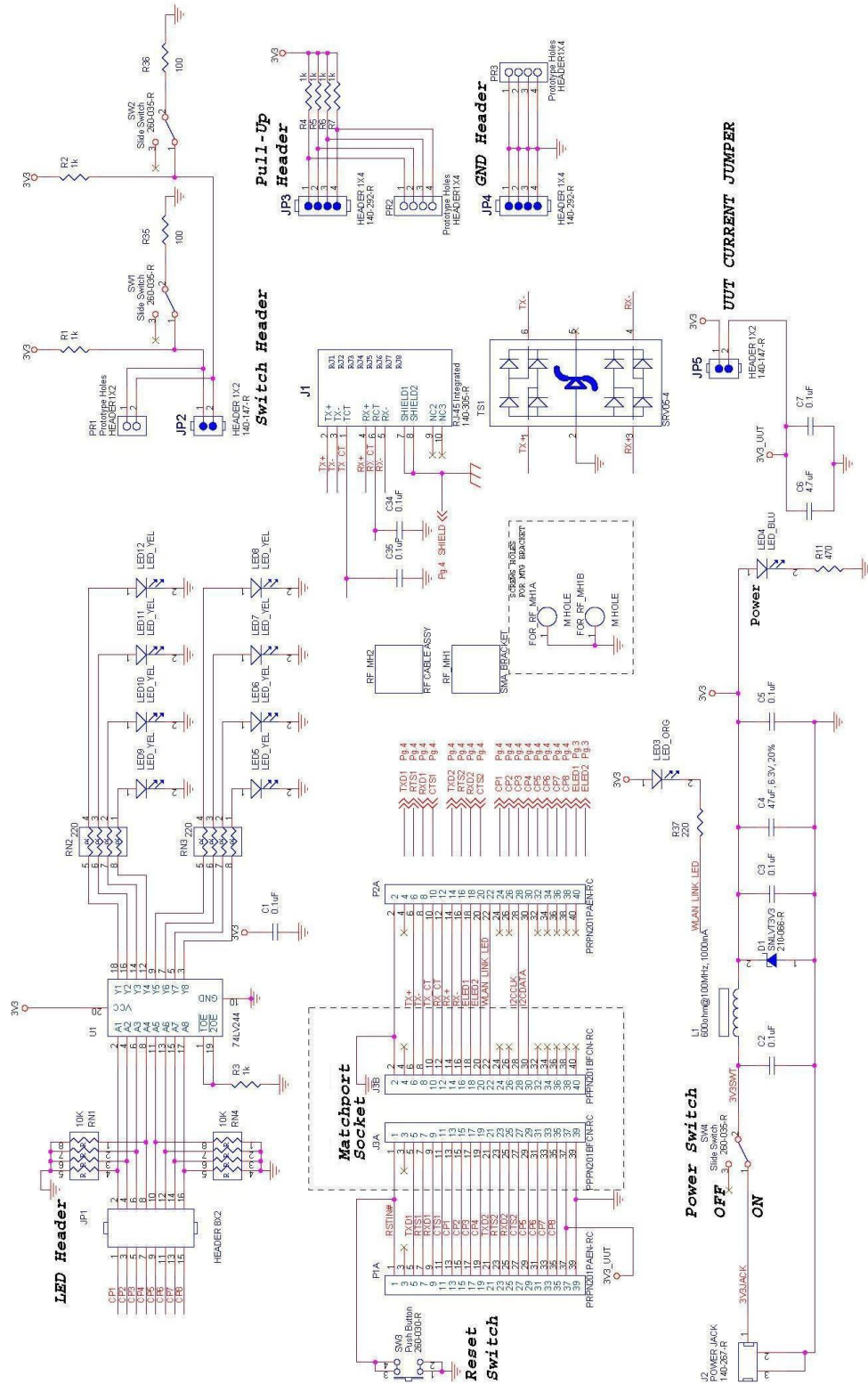
Figure 3-3. Schematic
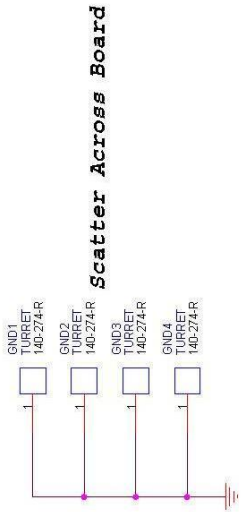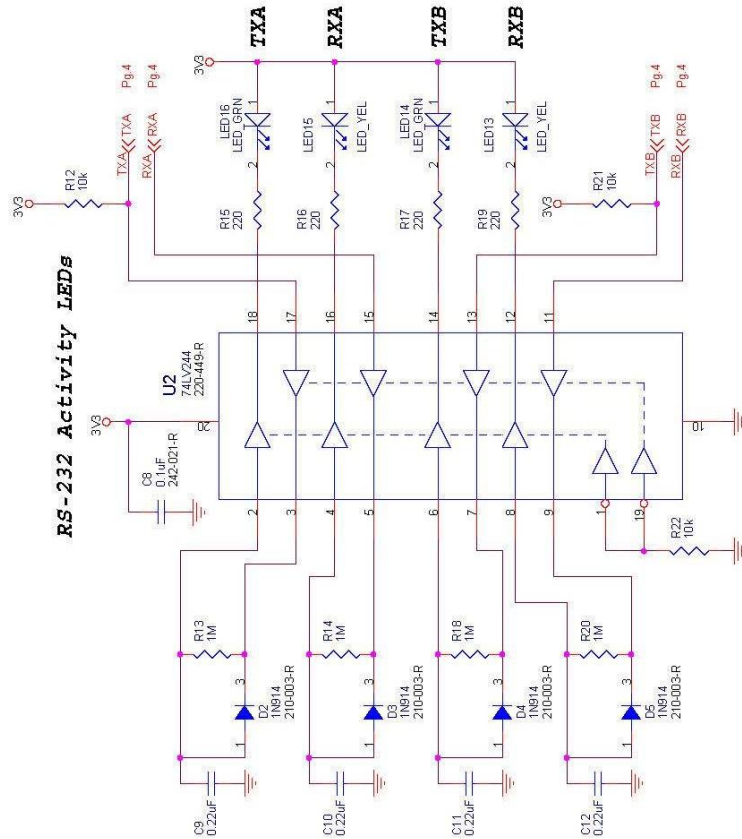
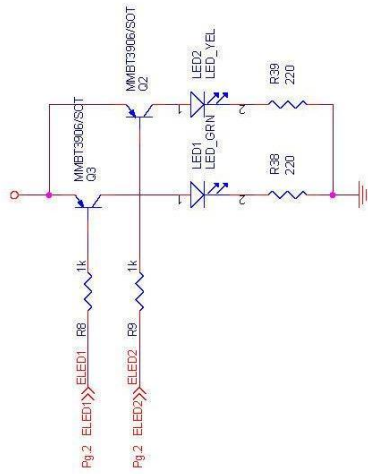**Figure 3-3. Schematic, continued**

Figure 3-3. Schematic, continued

A: Compliance and Warranty Information

Compliance Information

(According to ISO/IEC Guide 17050-1, 17050-2 and EN 45014)

Manufacturer's Name & Address:

Lantronix 15353 Barranca Parkway, Irvine, CA 92618 USA

Product Name Model: MatchPort b/g Pro Embedded Device Server

Conforms to the following standards or other normative documents:
Safety:

UL 60950-1

CAN/CSA-C22.2 No. 60950-1-03

EN 60950-1:2006, Low Voltage Directive (73/23/EEC)

EMC & Radio:

For purposes of certification, the MatchPort b/g pro was tested as a modular device.

CFR Title 47 FCC Part 15, Subpart B and C, Class B

FCC Module Approval

FCC Identifier: R68MPBGPRO

Industry Canada ICES-003 Issue 4 (2004), Class B

Industry Canada RSS-Gen Issue 2 (2007)

Industry Canada RSS-210 Issue 7 (2007)

Industry Canada Module Approval IC: 3867A-MPBGPRO

EN 301 489-1   v1.6.1 (2006-07), EMC Directive (1999/5/EC)

EN 301 489-17 v.1.2.1 (2002-08), EMC Directive (1999/5/EC)

EN 300 328 v1.7.1 (2006-10), R&TTE Directive (1999/5/EC)

Australia / New Zealand AS/NZS CISPR 22 (2006), Class B

Australia / New Zealand AS/NZS 4771 (2000 + A1:2003)

EN55022: 2006

EN55024: 1998 + A1: 2001 + A2: 2003

EN61000-3-2: 2006

EN61000-3-3: 1995 + A1: 2001

Manufacturer's Contact:

Director of Quality Assurance, Lantronix

15353 Barranca Parkway, Irvine, CA 92618 USA

Tel: 949-453-3990

Fax: 949-453-3995

Warranty

For details on the Lantronix warranty replacement policy, go to our web site at www.lantronix.com/support/warranty