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WiPort™ Data Sheet

General Description

The WiPort is the most compact, integrated solution available to add 802.11b wireless networking to any edge device with a serial interface. Using our highly integrated hardware and software platform, you will add to your bottom line by significantly reducing product development time, risk, and cost.

The WiPort offers the highest level of integration available in a device server. Within a compact package is a DSTni x86 controller, memory, 802.11b transceiver, a 10/100 Ethernet transceiver, and dual high-speed serial ports. All of this combines to give you a complete networking solution. The WiPort is the first product in a line of embedded wireless device servers, designed with flexibility to support additional wireless standards without requiring redesign.

To enable access to a local network or the Internet, the WiPort integrates a fully developed TCP/IP network stack and OS. The WiPort also includes an embedded web server that can be used to remotely configure, monitor, or troubleshoot the attached device.

WiPort serves web pages to a web browser when there is a need to gather information or communicate with networked devices. The WiPort becomes a conduit between you and your device over the network or Internet.

The Windows™-based configuration software, Device Installer, simplifies installation and setup. The WiPort can also be configured locally through its serial port, or remotely over a network using Telnet (password-protected) or a web browser. Flash memory provides for maintenance-free, nonvolatile storage of web pages, and allows future system software upgrades.

Hardware & Software Description

The WiPort functions independently of a PC, providing a complete hardware and software solution for adding wireless connectivity to your edge devices. Within a single package this powerful device server comes with an 802.11b wireless connection, a 10/100 Ethernet transceiver, a reliable and proven operating system stored in flash memory, an embedded web server, a full TCP/IP protocol stack, and WEP security.

The WiPort software runs on a Lantronix DSTni controller which has 256 KB of internal SRAM, and 16 KB of boot ROM. The WiPort communicates to the edge device through a 3.3V logic level interface. 2 MB of flash memory is included for storing firmware and web pages.

Key Features

- Complete integrated solution
- Supports WLAN or Ethernet connectivity
- Serial to 802.11b conversion
- Stable, field proven TCP/IP protocol suite and web-based application framework
- Easy configuration through a web interface
- Easy installation of customized web pages
- Embedded web server
- 802.11b wireless interface
- E-mail alerts
- Password protection
- Upgradeable firmware via the network or serial port
- Dual serial ports
- 128 bit WEP encryption
- WPA security upgradeable
- High performance data throughput

A larger memory option is available that includes 4 MB of flash memory, and an additional 1 MB of SRAM. The WiPort runs on a single 3.3V supply, and has a built-in voltage supervisory circuit.

The WiPort will connect through a coaxial cable "pigtail" to a panel-mounted external antenna, which makes the electro-mechanical integration very simple.

Protocol Support

The WiPort uses the widely accepted 802.11b protocol to connect to a wireless access point or ad-hoc network. It uses the Transmission Control Protocol (TCP) to assure that no data is lost or duplicated and that everything sent to the connection arrives correctly at the target.
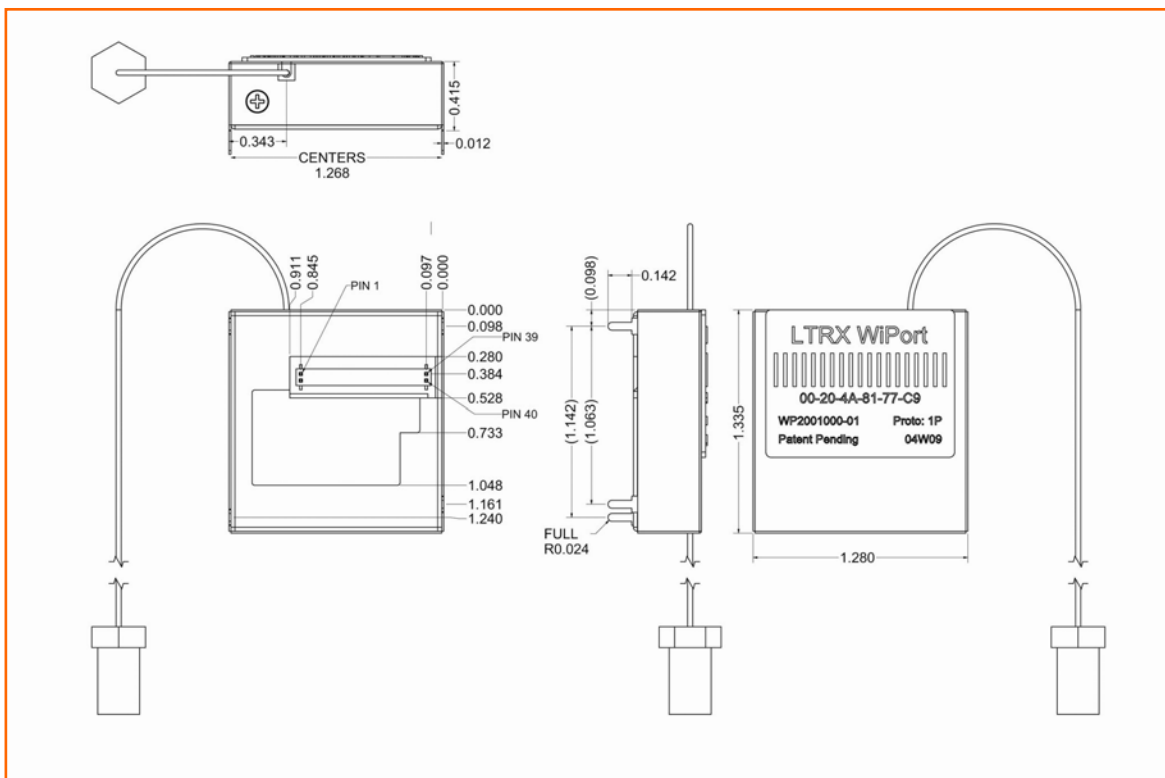
Other supported protocols are listed below:

- ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, and SNMP for network communications.
- TCP, UDP, and Telnet for connections to the serial port.
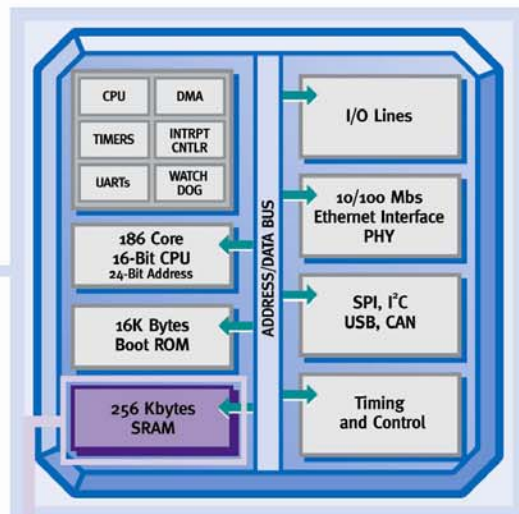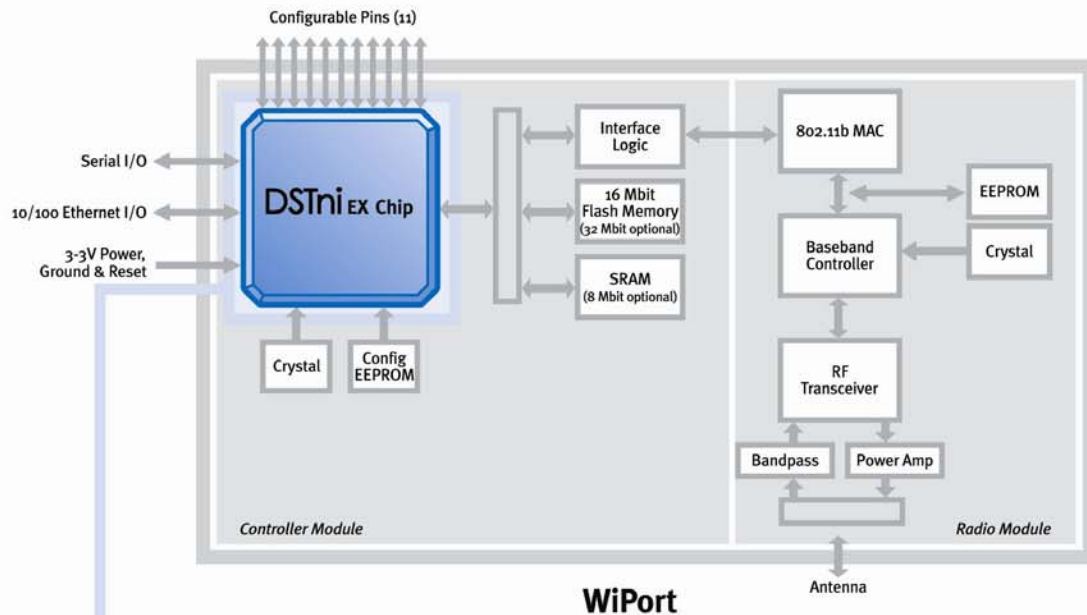- TFTP for firmware updates.

- IP for addressing, routing, and data block handling over the network.
- User Datagram Protocol (UDP) for typical datagram applications in which devices interact with other devices without maintaining a point-to-point connection.

Dimensions

- The WiPort dimensions are shown in the following drawing:

WiPort – Embedded Web Server

Configurable Pins (11)

Serial I/O

10/100 Ethernet I/O

3-3V Power,
Ground & Reset

DSTni EX Chip

Interface
Logic

16 Mbit
Flash Memory
(32 Mbit optional)

SRAM
(8 Mbit optional)

Crystal

Config
EEPROM

802.11b MAC

EEPROM

Crystal

Baseband
Controller

RF
Transceiver

Bandpass

Power Amp

Controller Module

Radio Module

Antenna

WiPort

CPU | DMA

TIMERS | INTRPT
CNTLR

UARTs | WATCH
DOG

186 Core
16-Bit CPU
24-Bit Address

16K Bytes
Boot ROM

256 Kbytes
SRAM

ADDRESS/DATA BUS

I/O Lines

10/100 Mbs
Ethernet Interface
PHY

SPI, I²C
USB, CAN

Timing
and Control

EX Chip Hardware Diagram

OEM Specific		
Device Server Application		
SNMP, DHCP	SMTP, WEP	Web Server, TFTP, Telnet
TCP, UDP		
IP, ICMP		
Drivers		
Ethernet	Wireless	

Operating
System
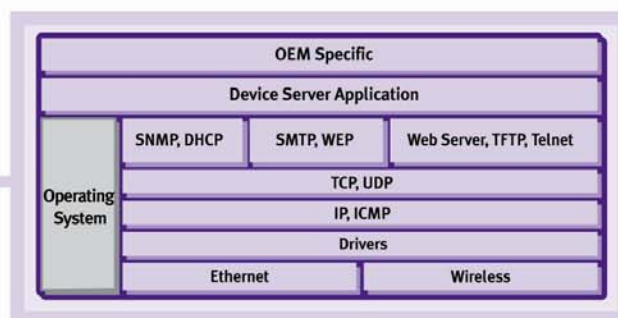
Internal Software Portfolio

WiPort Pin Functionality

Pin Number	WiPort Pin Function	Pin Number	WiPort Pin Function
1	3.3V Power	21	Reserved
2	3.3V Power	22	Reserved
3	RTS0	23	Signal Ground
4	TXD0	24	Signal Ground
5	RXD0	25	Reserved
6	Configurable Pin 2	26	Reserved
7	Configurable Pin 3	27	Ethernet Status LED2
8	CTS0	28	Ethernet Status LED1
9	Configurable Pin 10	29	Ethernet TX-
10	Configurable Pin 8	30	Ethernet TX+
11	Signal Ground	31	Ethernet RX Center Tap
12	Signal Ground	32	Ethernet TX Center Tap
13	Reset In	33	Ethernet RX-
14	Configurable Pin 0	34	Ethernet RX+
15	RTS1	35	Configurable Pin 1
16	TXD1	36	WLAN Power LED
17	RXD1	37	Configurable Pin 6
18	Configurable Pin 9	38	Configurable Pin 5
19	Configurable Pin 4	39	WLAN Activity LED
20	CTS1	40	Configurable Pin 7

Mating Connector	Description
Recommended: Samtec FTMH-120-03-F-DV-ES (shrouded header)	The mating connector is a 1mm micro header, 40 pins, 2 x 20.
Alternative: Samtec FTMH-120-03-F-DV (not shrouded)	
Alternative: Oupiin 2411-2X20GDN/017 (not shrouded)	

WiPort Wireless Specifications

Category		Description
Network Standard		IEEE 802.11b
Frequency Range		2.412 – 2.484 GHz
Output Power		14 dBm +/- 1.0 dBm
Antenna Connector		1, no diversity supported.
Data Rates		1,2,5.5,11Mbps(802.11b HR)
Radio	Number of Selectable Subchannels	14 channels
	Modulation	DSSS, DBPSK, DQPSK, CCK
	Antenna Connector	1
Security		WEP 64/128, TKIP
Maximum Receive Level		-10 dBm (with PER < 8%)
Receiver Sensitivity		-82 dBm for 11Mbps -87 dBm for 5.5Mbps -89 dBm for 2.0Mbps -93 dBm for 1.0Mbps
WLAN Power and Link LED Current		Max: 4mA

WiPort Technical Data

Category	Description
CPU, Memory	Lantronix DSTni-EX 186 CPU, 256 KB zero wait state SRAM 2048 KB Flash or 4096 KB Flash, 16 KB Boot ROM, 1024 KB SRAM
Firmware	Upgradeable via TFTP and serial port
Reset Circuit	Reset In is low active. Minimum reset pulse width is 2 ms at IIL = -500µA
Serial Interface	CMOS (Asynchronous) 3.3V-level signals Rate is software selectable (300 bps to 921600 bps)
Serial Line Formats	7 or 8 data bits, 1-2 Stop bits, Parity: odd, even, none
Modem Control	DTR, DCD
Flow Control	XON/XOFF (software), CTS/RTS (hardware), none
Network Interface	Wireless 802.11b and 10/100 Ethernet
Protocols Supported	802.11b, ARP, UDP, TCP, Telnet, ICMP, SNMP, DHCP, BOOTP, Auto IP, HTTP, SMTP, TFTP
Data Rates With Automatic Fallback	▪ 11 Mbps ▪ 5.5 Mbps ▪ 2 Mbps ▪ 1 Mbps
Media Access Control	CSMA/CA with ACK
Frequency Range	2.412 – 2.484 GHz
Range	Up to 328 feet indoors
Modulation Techniques	▪ CCK (11 Mbps) ▪ CCK (5.5 Mbps) ▪ DQPSK (2 Mbps) ▪ DBPSK (1 Mbps)
Transmit Output Power	14 dBm ± 1 dBm
Receiver Sensitivity	▪ -82 dBm for 11 Mbps ▪ -87 dBm for 5.5 Mbps ▪ -89 dBm for 2.0 Mbps ▪ -93 dBm for 1.0 Mbps
Average Power Consumption	▪ 1280 mW (WLAN mode; maximum data rate) ▪ 820 mW (WLAN mode; idle) ▪ 710 mW (Ethernet mode)
Peak Supply Current	460 mA
Management	Internal web server, SNMP (read only) Serial login, Telnet login DeviceInstaller software
Security	Password protection, locking features, 64/128 bit WEP
Internal Web Server	Serves web pages and Java applets Storage capacity: 1.8 MB or 3.8 MB (depending on Flash size)
Weight	29 grams
Material	Metal shell
Temperature	Operating range, WLAN: -40°C to +70°C Operating range, Ethernet: -10°C to +75°C Storage range: -40°C to +85°C (-40°F to 185°F)
Warranty	2-year limited warranty
Included Software	Windows™ 98/NT/2000/XP based DeviceInstaller configuration software and Windows™ based Comm Port Redirector, DeviceInstaller, Web-Manager.

Certifications

Description	Country	Certifications
Product Safety	USA/Canada	U.S. and Canadian (Bi-National) Standard for Safety of Information Technology Equipment, CSA-22.2 No. 60950-1-03 * UL 60950-1
	Europe	Standard for Safety of Information Technology Equipment, EN 60950-1
	International	IEC 60950-1

Compliancy

Description	Country	Compliance
Electromagnetic Compatibility	USA	CFR Title 47 FCC Part 15
	Europe	EN 300 328; Data Transmission Equipment Operating in the 2.4GHz ISM Band and Using Spread Spectrum Techniques EN 301 489-17 & EN 301 489-1; EMC Standard for Radio Equipment and Services
	Canada	Industry Canada RSS-210 Low Power License-Exempt Radiocommunication Devices
	Australia /New Zealand	AS/NZS CISPR 22 (EMC) AS/NZS 4771 (Radio)
	Japan	VCCI (EMC)

DC Characteristics for Serial and Power Interface

Symbol	Parameter	Min	Nominal	Max	Units
Vcc	Supply voltage (typical 3.3) (+/-5%)	3.14	3.3	3.46	V
V_{IL}	Low Level Input Voltage	-0.3		0.8	V
V_{IH}	High Level Input Voltage	2.0		5.5	V
V_{OL}	Low Level Output Voltage			0.4	V
V_{OH}	High Level Output Voltage	2.4			V
IL	Input Leakage Current		+/-0.01	+/-1	µA
I_{CC}	Typical Supply Current; WLAN Idle		TBA		
I_{CC}	Typical Supply Current; WLAN Receive		465mA		
I_{CC}	Typical Supply Current; WLANTransmit		505mA		

Development Kit

Introduction

A WiPort development kit is available to provide a simple, quick and cost-effective way to evaluate the WiPort. Use the development kit to connect the WiPort to your product design, and give your newly networked product a test drive.

Features of the Development Kit

- Complete, ready-to-use WiPort and supporting Evaluation Board
- 3.3V power supply
- RS-232 cable, DB9F/F, null modem
- CAT5e UTP RJ45M/M Ethernet cable
- WiPort CD containing complete user documentation, DeviceInstaller, and the Comm Port Redirector
- Antenna

Features of the Evaluation Board

The WiPort evaluation board includes a WiPort integrated with the following features:

- Ready to use – just plug in the WiPort and connect to your system
- Dual high-speed RS-232 transceivers & DB9 connectors for easy connection to a PC
- Complete Ethernet interface, including magnetics, RJ-45 jack, and status LEDs
- Test header for easy access to all 40 of the WiPort power & I/O pins

Ordering Information

Model	Part Number	Description
WiPort	WP2001000-01	Standard WiPort Min. order: 25 units
WiPort SMPL	WP200100S-01	WiPort Sample Case 1 WiPort enclosed
WiPort Dev. Kit	WP200100K-01	WiPort Development Kit
WiPort Antenna	930-029	Accessory Antenna

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