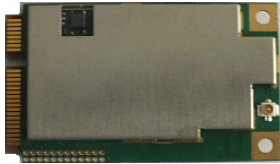**CONEXTOP**
Net embed & Device Networking

WiBoard™ Overview

The WiBoard™ is the most compact, integrated solution available to **WiFi-enable** any device with an RS-232/485 serial interface. By simply adding WiBoard to a product design, device manufacturers cut their design cycle by as much as 80% and are able to offer Ethernet connectivity in record time.

The WiBoard offers the highest performance level of 802.11b/g features available in a single board, which provide one 10/100Mbps Ethernet interface, flexible WiFi networking modes with AP/AP client/Bridge/Repeater. For serial device networking, WiBoard offer up to 4 high speed serial ports with baudrate up to 921600bps, especially, WiBoard also support Ethernet-wifi bridge mode which can be involved to simple wired-wireless connective.

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

Where there's a need for custom user interfaces and a desire to use common and familiar tools, the WiBoard can serve web pages to a web browser. The WiBoard becomes a conduit between you and your device over the network or Internet.

The Windows™-based configuration software, DeviceInstaller, simplifies installation and setup. The WiBoard can also be set up locally through its serial port, or remotely over a network using Telnet or a web browser. Flash memory provides for maintenance-free nonvolatile storage of web pages, and allows future system software upgrades.
Using our highly integrated hardware and software platform, you will add profit to your bottom line by significantly reducing product development time, risk, and cost.

Key Features

- The most flexible WiFi modes: AP/Client/Bridge*/Repeater*.
- **802.11*b/g/h***, High speed 150M/300Mbps.
- RS-232/485/422 support
- Embedded web server
- 10/100Mbit Ethernet – Auto-Sensing
- Stable, field proven TCP/IP protocol suite and web based application framework
- Easy configuration through a web interface
- Easy customization of HTML web pages and configuration screens
- Interactive web pages through the use of Java applets
- E-mail alerts
- FTP server / client for file transmission
- SD/MMC card as local/remote file storage
- SSL/TLS support 128-, 192-, 256-bit AES or Tri - DES encryption (Optional)
- EMI tested and compliant
- Extended operating temperature: -20 to +70û C Industrial Model 0 to +75û C Commercial Model
- High-performance processor (495MIPS on 32bits RISC)
- Network overhead handled by WiBoard
- Password protection
- Upgrade WiBoard's bootloader and firmware over the network and Serial port
- 5V power
- Serial-to-10/100 Ethernet + WiFi conversion Offer 1/2/3/4 serial ports, baud rate up to 921,600bps
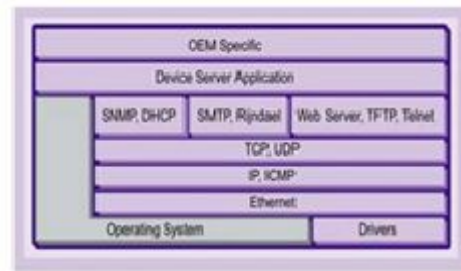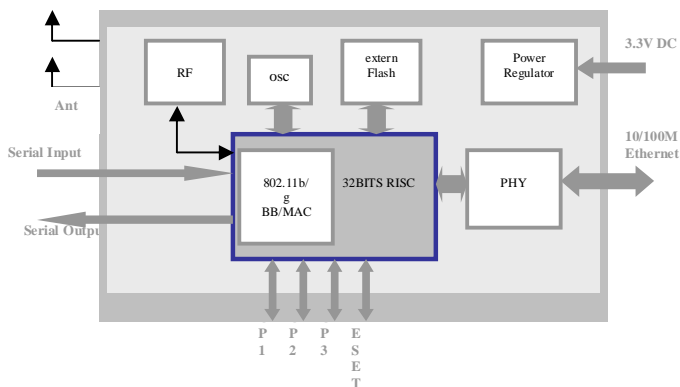
Protocol and application

- With robust RTOS embedded in a 32bits RISC
- ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, for network communications.
- TCP, UDP, and Telnet for connections to the serial port.
- TFTP for firmware updates.(E version)
- FTP for file transmission
- 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.
- More details of protocol support see the WiBoard user guide.

Hardware & Software Description

The WiBoard is a complete solution (hardware and software) for web-enabling your edge devices. Packed with standard mini-pcie interface, this powerful Serial-Wifi server comes with 150m/300M 802.11n and dual 10BASE-T/100BASE-TX Ethernet connection, a reliable and proven operating system stored in flash memory, an embedded web server, a full TCP/IP protocol stack, and standards-based (AES) encryption.

The WiBoard software runs on a 32bits RISC which has 16MB of SRAM, 32 KB of boot ROM, and a MAC with dual integrated 10/100BASE-TX PHY and 802.11b/g/n BB+PHY. The WiBoard communicates to the device through a 3.3V serial interface and three general-purpose programmable I/O pins. 512 KB of flash memory is included for storing firmware and web pages. The WiBoard runs on 5V, and has a built-in voltage supervisory circuit that will trigger a reset if the supply voltage drops to unreliable levels (2.7V).

The WiBoard was designed to meet class B emissions levels, which makes the electromechanical integration very simple.

WiBoard SW structure

Protocol Support

The WiBoard uses Internet Protocol (IP) for network communications and Transmission Control Protocol (TCP) to assure that no data is lost or duplicated, and that everything sent arrives correctly at the target.

Other supported protocols are listed below:
- ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, for network communications.
- TCP, UDP, and Telnet for connections to the serial port.
- TFTP for firmware updates.(EN version)
- 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.
- For a complete discussion of protocol support, see the WiBoard user guide.

Ethernet Interface

The 10/100 Ethernet magnetics, network status LEDs, and RJ45 connector are required in user's board.

Ethernet Interface Signals

Signal Name	DIR	Contact	Primary Function
TX+	Out	1	Transmit Data +
TX-	Out	2	Transmit Data –
RX+	In	3	Receive Data +
RX-	In	6	Receive Data –

WiBoard Technical Data

Category	Description
CPU, Memory	32bits RISC(495MIPS), 8/16M/B SRAM 2/4M B Flash, 32 KB Boot ROM
Network interface	WiFi: 802.11b/g/n 150/300Mbps Ethernet One/Dual 10/10M Ethernet interface
Serial Interface	CMOS (Asynchronous) 3.3V-level signals Rate is software selectable (110 bps to 921600 bps) Offer 1-4 high speed serial ports
Serial Line Formats	7 or 8 data bits, 1-2 Stop bits, Parity: odd, even, mark, space, none
Modem Control	CTS, RTS
Flow Control	XON/XOFF (software), CTS/RTS (hardware), none
Programmable I/O	2 PIO pins (software selectable) sink or source 4mA max.
Network Interface	Ethernet 10BASE-T or 100BASE-TX (auto-sensing)
Compatibility Protocols Supported	Ethernet: Version 2.0/IEEE 802.3 ARP, UDP/IP, TCP/IP, PING/ICMP, DHCP, BOOTP, Auto IP,TFTP, SNTP ,TELNET ,HTTP, DNS,SMTP, PPP, LCP, PAP, CHAP, IPCP, PPPoE SSL/TLS,HTTPS ,SNMP(Optional) FTP Server/Client (Optional)
LEDs	10BASE-T & 100BASE-TX Link Activity, Full/half duplex.
Management	Internal web server, Serial login, Telnet login, Device manager(PC tool)
Security	Password protection, locking features, optional Rijndael 128-, 192-, 256-, or Tri - DES encryption
Internal Web Server	Serves web pages Storage capacity: 2Mb – 8Mb Huge memory space for user web. (user can update the web online, support the web embedded java-script or java applet)
Weight	9.6 grams (0.34 oz)
Material	Metal shell, thermoplastic case
Temperature	Operating range: -20℃ to +70℃ (-40℉ to 185℉) Industrial Model 0℃ to +70℃ (-40℉ to 167℉) Commercial Model Storage range: -40℃ to +85℃ (-40℉ to 185℉)
Relative Humidity	Operating: 5% to 95% non-condensing
Shock/Vibration	Non-operational shock: 500 g's, Non-operational vibration: 30 g's
Warranty Included Software EMI Compliance	1-year limited warranty Windows™ 98/NT/2000/XP-based DeviceInstaller configuration software and Windows™ based virtual com Radiated & conducted emissions - complies with Class B limits of EN 55022:1998 Direct & Indirect ESD - complies with EN55024:1998 RF Electromagnetic Field Immunity - complies with EN55024:1998 Electrical Fast Transient/Burst Immunity - complies with EN55024:1998 Power Frequency Magnetic Field Immunity - complies with EN55024:1998 RF Common Mode Conducted Susceptibility - complies with EN55024:1998

DC Characteristics for Serial, PIO, and Power Interface

Symbol	Parameter	Min	Nominal	Max	Units
V_{cc}	Supply voltage (typical 5) (+/-5%)	4.75	5	5.25	V
V_{IL}	Low Level Input Voltage	0		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
I_I	Input Leakage Current			1	µA
I_{CC}	Supply Current (10BASE-T activity + 802.11g)		195		mA
I_{CC}	Supply Current (100BASE-T activity + 802.11g)		205		mA

With the purchase of WiBoard, the OEM agrees to an OEM firmware license agreement that grants the OEM a nonexclusive, royalty-free firmware license to use and distribute the binary firmware image provided, only to the extent necessary to use the WiBoard hardware

Ordering Information

Embedded Serial-WiFi series		WB –L Series		WB -R Series		WB Series		WB -EN Series		
802.11n WiBoard Modules		LXN	LXN -485	RXN	RXN -485	SXN	SXN -485	EXHN	EXHN -485	ESXN
Memory and Speed	Flash Code(B)/Boot(KB)	2M /32	2M /32	2M /32	2M /32	2M /32	2M /32	2/4M /32	2/4M /32	2/4M /32
	SRAM(MB)	16	16	16	16	16	16	16/32	16/32	16/32
	Speed (MIPS)	495	495	495	495	495	495	495	495	495
Core and System	ARM9	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Multi-T RTOS	Y	Y	Y	Y	Y	Y	Y	Y	Y
Ethernet	Ethernet Speed Port Number	10/100 1/2*	10/100 1/2*	10/100 1/2*	10/100 1/2*	10/100 2	10/100 2	10/100 2	10/100 2	10/100 2
Camera Channel	Camera: X1	Y(*)	Y(*)	Y(*)	Y(*)	Y(*)	Y(*)	Y(*)	Y(*)	Y(*)
Serial Interfaces	Uart RS232	Y	Y	Y	Y	Y	Y	Y	Y	Y
	RS485/422		Y		Y		Y		Y	Y
	Max-Baudrate(bps)	115200	115200	460800	460800	460800	460800	921600	921600	921600
	Serial port Number	1/2/3/4	1/2/3/4	1/2/3/4	1/2/3/4	1/2/3/4	1/2/3/4	1～8	1～8	1～8
Wireless protocol	802.11 Protocol	b/g/n	b/g/n	b/g/n	b/g/n	b/g/n	b/g/n	b/g/n	b/g/n	b/g/n
Wlan(WiFi) Paramters	AP Client	Y	Y	Y	Y	Y	Y	Y	Y	Y
	AP	Y(*)	Y(*)	Y	Y	Y	Y	Y	Y	Y
	WEP /WPA/WPA2	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Wireless peak speed	150M	150M	150M	150M	150M	150M	150M	150M	150/300M
Network Protocols	ARP/IP/ICMP/DHCP /BOOTP/TCP/UDP	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Http Server	Y(*)	Y(*)	Y	Y	Y	Y	Y	Y	Y
	Telnet Server	Y	Y	Y	Y	Y	Y	Y	Y	Y
	DNS	Y(*)	Y(*)	Y(*)	Y(*)	Y	Y	Y	Y	Y
	SNTP/NTP	--	--	Y(*)	Y(*)	Y(*)	Y(*)	Y	Y	Y
	Smtp (Email Trigger)	--	--	--	--	Y(*)	Y(*)	Y(*)	Y(*)	Y
	PPP/PPPOE	--	--	--	--	Y(*)	Y(*)	Y(*)	Y(*)	Y
Serial Setting	AT	Y(*)	Y(*)	Y	Y	Y	Y	Y	Y	Y
Work Modes	Tcp Server	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Tcp Client	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Udp Uni-cast	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Udp Multicast	Y	Y	Y	Y	Y	Y	Y	Y	Y
Analog parameters	Power suppler(V)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
	I/O Tolerant(V)	5	5	5	5	5	5	5	5	5
Operating temperature arrange C = 0 - +70° C E= - 20 - +70° C		C,E	C,E	C,E	C,E	C,E	C,E	C,E	C,E	C,E
Package Option (Micro Board)		MB	MB	MB	MB	MB	MB	MB	MB	MB