

# **Embedded Serial Web Server**

## **User Manual**



**LinkSprite Technologies, Inc**

**July, 2009**

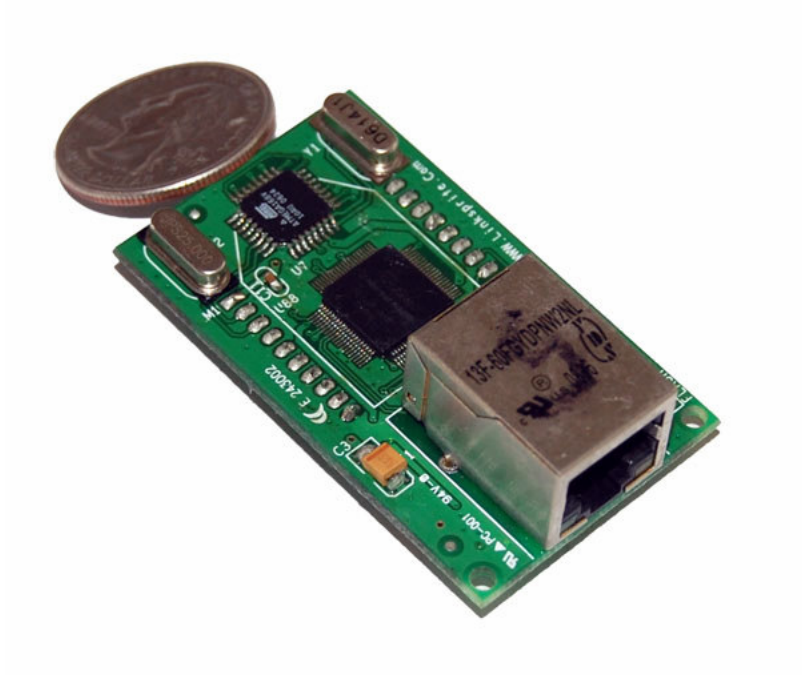
**[www.linksprite.com](http://www.linksprite.com)**

## 1. Introduction

LinkSprite embedded serial web server module is designed to provide a TCP/IP access to the serial data. The output pin uses a 20-pin 2mm spacing layout, which is pin-compatible with Xbee module from Digi ([www.digi.com](http://www.digi.com)). The LinkSprite embedded serial web server module can also be plugged directly on LinkSprite PLC-UART power line communication module to act as a powerline to web server bridge. Because it's a serial server, a configurable static IP address is used to prevent IP address being changed. The module is configurable through the convenient AT commands.

The evaluation board for the serial web server module is LinkSprite UART-UART evaluation board (Part number: LS-UART-UART).

## 2 Features



LinkSprite Serial web server module

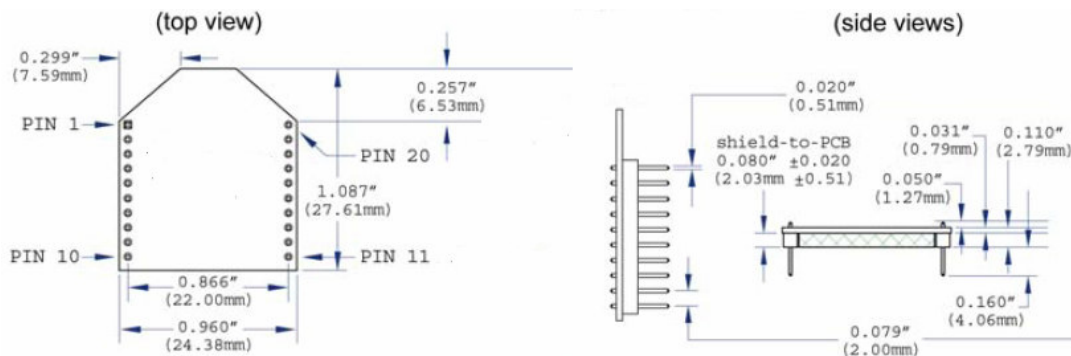
- Fully transparent mode, plug and play coming out of the box without the need to do any programming.
- Static IP address
- 10BaseT/100BaseTX Ethernet PHY
- TCP/IP Protocols
- Support Auto Negotiation (Full-duplex and half duplex)
- AT commands used for advanced configuration.
- 3.3V TTL UART
- Low power
- RoHS

### 3 Specifications

<b>Product name</b>	Embedded serial web server module
<b>Interface</b>	3.3V TTL UART, Xbee compatible 20-pin
<b>Supply Voltages</b>	3.3 V Peak Current During Transmission < 200mA Standby current < 30mA

### 4 Pin Definition and Layout

The pin layout of the module is compatible with Xbee module from Digi ([www.digi.com](http://www.digi.com)).



Pin assignment of the interface card socket:

Pin #	Name	Direction	Description
1	VCC	-	3.3V Power supply
2	DOUT	Output	UART Data Out
3	DIN	Input	UART Data In
4	Unused	-	-
5	Unused	-	-
6	Unused	-	-
7	Unused	-	-
8	Unused	-	-
9	Unused	-	-

10	GND	-	Ground
11	Unused	-	-
12	Unused	-	-
13	RESET	-	Active Low, if not used, need to tired to high
14	Unused	-	-
15	Unused	-	-
16	Unused	-	-
17	Unused	-	-
18	Unused	-	-
19	Unused	-	-
20	Unused	-	-

## 5 AT Commands

### 5.1 Enter command mode

The module can be put into command mode by sending “+++” through serial port. The module will respond with an “ok”. In order to prevent the situation where the user data “+++” mistakenly triggers the command mode, there must be no serial port data input one second before and after the receiving of “+++”. At the same time, the gap between the three “+” should not be more than one second, otherwise, it will be considered as a data rather than a command.

### 5.2 Exit command mode

There are two approaches to exit command mode. One way is to input command “ATEX”. The other is to timeout and automatically exit. In either case, the modules will response "exited". The timeout value can be set by command "ATTO"

### 5.3 Arguments and Responses

#### 5.3.1 Arguments and Responses

For all the commands with arguments: if the parameters are correct, the module will respond with an “ok”. Otherwise, the modules will response with an “invalid para”. If there are no arguments associated with the commands, it will be treated as polling modem and the module will respond with the existing arguments residing in the module.

### 5.3.2 Commands without Arguments

There are four commands without arguments.

- + + +: enter command mode; will directly return “ok”.
- ATEX: exit the command mode, return “exited”.
- ATRS: software reset, will reset the module immediately, no return.

### 5.3.3 Modified arguments

Except for serial arguments, the modified arguments will be immediately saved into eeprom and take effect. The serial arguments won't take effect immediately after being modified to avoid user from modifying PC serial arguments before inputting command. Serial arguments will take effect through automatically resetting module when exiting the command mode.

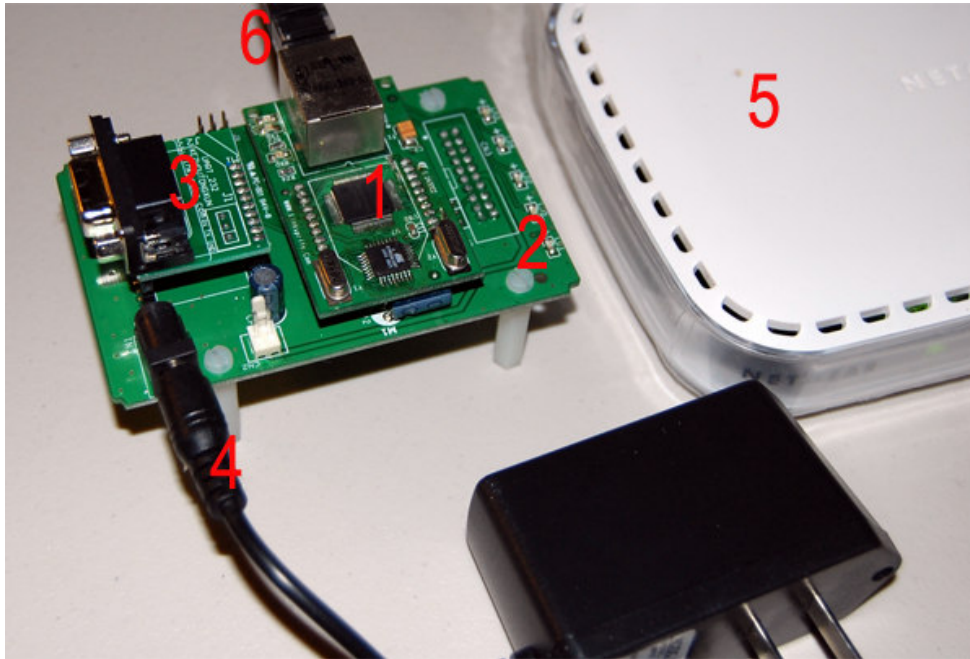
## 5.4 Command List

Command	Description	Arguments	Description	Default
Control Class				
+++		none	Enter command mode	
ATEX	Exit	none	Exit command mode	
ATTO	Time out	1-30	Timeout value, unit: second	5
ATRS	Reset	none	Software reset	
Network class				
ATIP	Static IP Address	X.X.X.X	Static address IP	10.0.0.3
ATPT	IP Port	X	IP Port	5000
ATHA	IEEE MAC Address	X.X.X.X.X.X.X	IEEE Address MAC	Factory Use Only, Don't change
Communication class				



ATBD	Baud Rate	1200, 2400, 4800, 9600, 19200	Baud Rate	9600
ATDB	Data Bit	5,6,7,8	Data bit	8
ATPA	Parity	N, O, E	Parity bit, N = no, O = odd , E = even	N
ATST	Stop Bit	1,2	Stop bit	1

## 6 Quick Start Guide



### Hardware list:

1. LinkSprite serial web server module
2. LinkSprite UART socket- UART socket evaluation board
3. UART-RS232 board
4. 12V/1A wall adaptor
5. Router (in this example, netgear will be used)
6. Ethernet cables

### Software list:

1. LinkSprite Serial port monitor

Downloadable from:

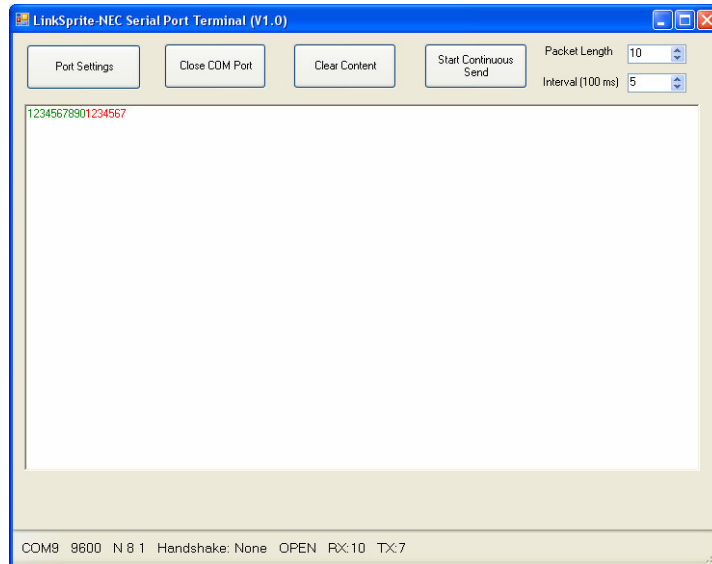
<http://www.linksprite.com/pub/software/LinkSprite-NEC-serial-v1.0.rar>

2. TCP/IP debugger

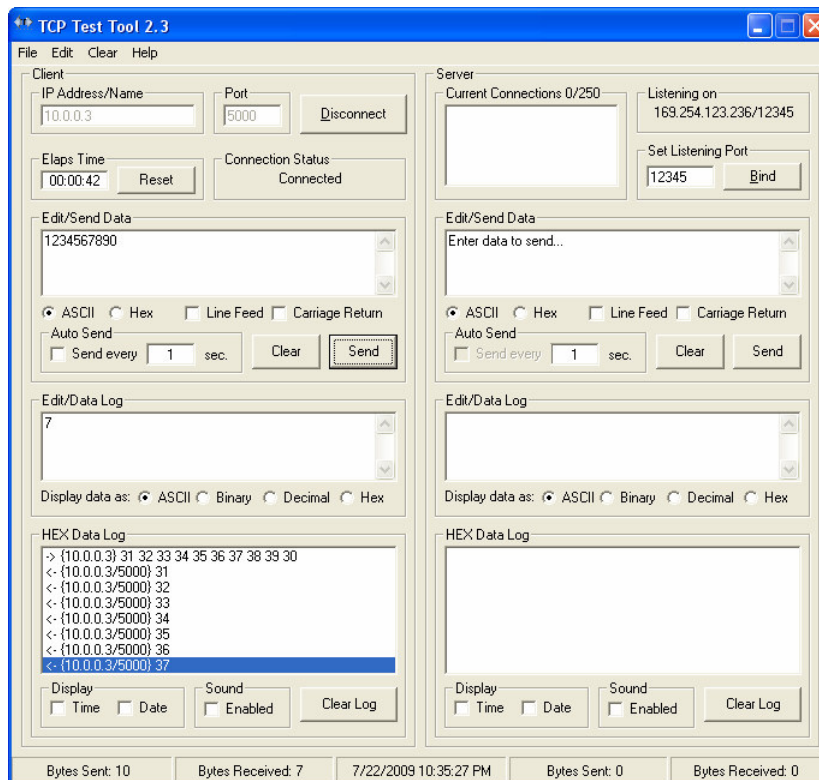
Downloadable from:

<http://www.simplecomtools.com/tcptesttool.html>

The data sent and received from serial port can be viewed using serial port terminal:



and TCP data can be monitored using TCP tool:



LinkSprite Technologies, Inc.  
1410 Cannon Mountain Dr.  
Longmont, CO 80503  
(Voice) 720-9494-932  
(Email) [sales@linksprite.com](mailto:sales@linksprite.com)  
<http://www.linksprite.com>

