uNetSerial Development Board
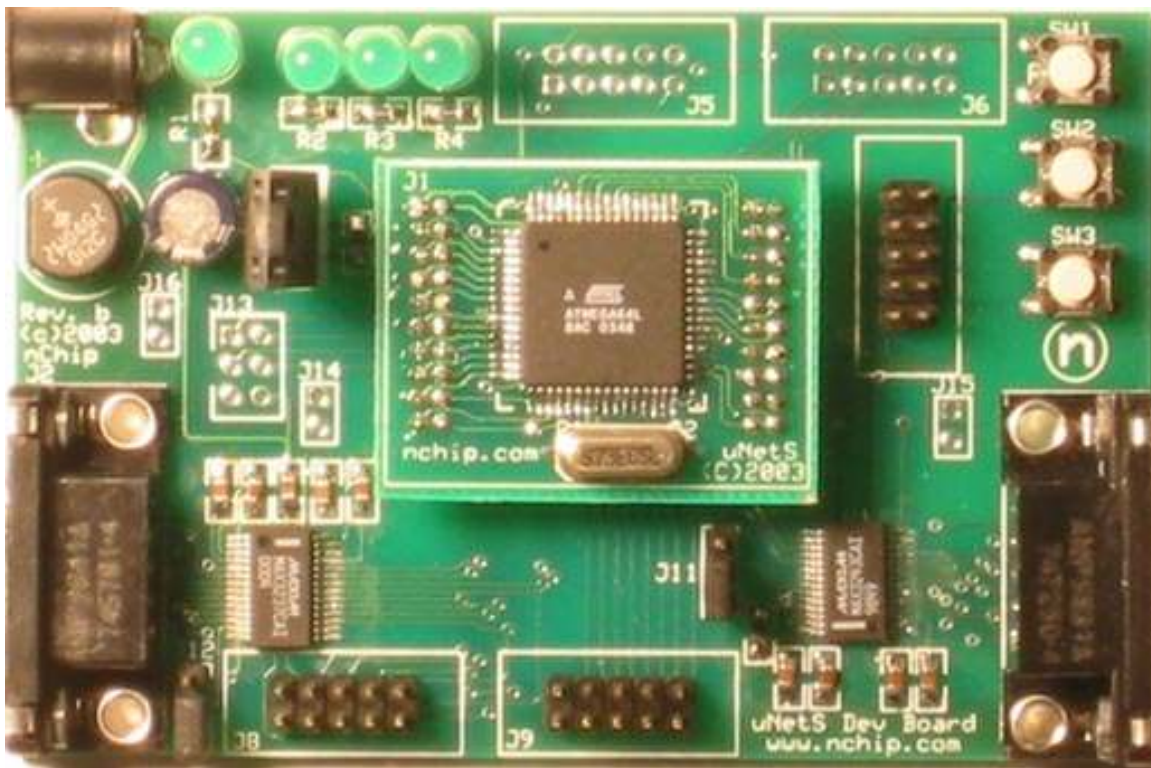## Users Guide

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Version 0.1
Preliminary

January 17, 2004

Introduction

The uNetSerial development board is a development and evaluation vehicle for the uNetSerial Module. The uNetSerial Module is a Internet Processor that enables simple devices to connect to the internet via dialup or wireless phone infrastructure. The uNetSerial development board allows easy and flexible evaluation and prototyping of the uNetSerial Module. It supports both standard RS232 and TTL level serial ports.

The uNetSerial development board contains a regulated power supply requiring a 6.5 to 15 Volt DC filtered input via a 2.1 mm power jack, polarity not important

The uNetSerial module is based on the advanced IR command processor which offers simple but powerful extensions to the AT modem command set. These IR commands offer powerful Internet functionality including the innovative Streaming Socket Technology that allows multiple TCP connections to be effectively managed over a single serial port.

uNetSerial's processor can negotiate a PPP (Point to Point Protocol, the standard way to connect by modem or wireless phone) connection using the standard PAP or script authentication methods. It will negotiate nameserver addresses and supports full name resolution. TCP and UPD sockets can be created and communicated over. Full non-volatile configuration support for serial port speeds, flow control methods, Internet stack parameters and many other features is supported.

uNetSerial and its related products are one of the simplest ways to get a device talking on the Internet. Please go to the website www.nchip.com for up to date info on innovative Internet products.

Getting Started

The fastest way to get started it to hook the console RS232 serial port to a Windows or Linux computer and to run a terminal emulator like hyperterminal. A modem or wireless phone can be hooked directly to the Modem port. Finally apply 7 to 15 volts DC to the power jack.

The terminal emulator should show the uNetSerial welcome banner as follows:

> **uNetSerial, Embedded internet TCP/IP stack over PPP, Beta - Version 0.7b**
> **-Beta Version build on Jan 6 2004 at 09:33:28**
> **-Bootloader Version 0104**

Once the welcome banner is show the uNetSerial device is ready to receive IR commands. The complete command set and command usage examples are described in the uNetSerial data sheet included with this package.

By default the uNetSerial console port will operate at 19200bps at 8 bits no parity and one stop bit. The modem port defaults to 9600bps at 8 bits no parity and one stop bit. Both serial ports can be configured to different serial speeds through the IR command s-registers as shown in the uNetSerial data sheet. These and other configurations like serial hardware flow control can be saved into the EEPROM to be preserved through power cycles and device resets.

Board Layout

The following diagram shows all the important Connectors and Items on the Development Board. Each item shown in the diagram is described in more detail below.
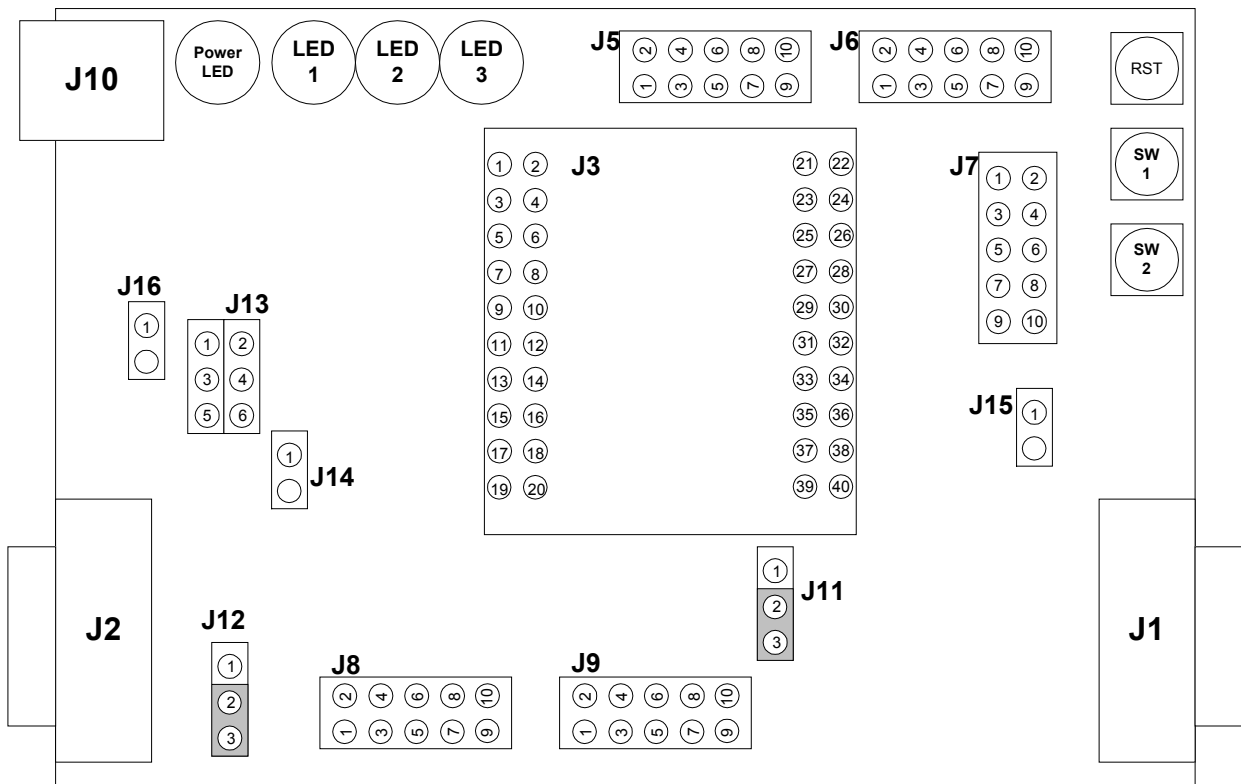
J1

Modem Port. This is a standard DTE male 9 pin RS232 level serial port. It can be connected to a dialup modem, wireless phone, or other DCE device. Jumper J11 selects this port or the TTL serial output at J9.

J2

Console Port. This is a standard DCE female 9 pin RS232 level serial port. It can be connected to a terminal emulator like hyperterm, a microcontroller or any other DTE device.. Jumper J12 selects this port or the TTL serial output at J8.

J3

This is the module socket. The uNetSerial module plugs into this socket. The pinout is shown below.

```
        VCC  (1)  (2)  GND          GPIO0 (21) (22) GPIO1
        TX0o (3)  (4)  RX0i         GPIO2 (23) (24) GPIO3
       CTS0o (5)  (6)  DSR0o        GPIO4 (25) (26) GPIO5
       DCD0o (7)  (8)  DTR0i        GPIO6 (27) (28) GPIO7
       RTS0i (9) (10)  RI0o          SW5  (29) (30) SW4
          SS (11) (12) SCK           SW3  (31) (32) SW2
          SI (13) (14) SO            RX1i (33) (34) TX1o
        IND1 (15) (16) IND2         CTS1i (35) (36) RTS1o
        IND3 (17) (18) IND4          RI1i (37) (38) DTR1o
         SW1 (19) (20) RST          DCD1i (39) (40) DSR1i
```

J5

This is a standard AVR ISP port. It is compatible with the Kanda and Atmel ST300 development board ISP dongle. For normal operation this is not to be used with uNetSerial modules as reprogramming the modules with a ISP programmer will destroy the nChip uNetSerial operating system. This connector maybe used in the future in other designs or by users that wish to use this development system for other designs.

J6

This is a standard AVR JTAG port. It is compatible with the standard Atmel JTAG emulator. As with J5 this is not to be used with the uNetSerial Module as JTAG functionality is disabled. . This connector maybe used in the future in other designs or by users that wish to use this development system for other designs.

J7

This port is used to allow users to access the general-purpose input/output (GPIO) pins and Switch 4 and 5 of the uNetSerial Module. The pinout is shown below.

```
J7   (1)  (2)      1 . GPIO0
                   2 . GPIO1
     (3)  (4)      3 . GPIO2
                   4 . GPIO3
     (5)  (6)      5 . GPIO4
                   6 . GPIO5
     (7)  (8)      7 . GPIO6
                   8 . GPIO7
     (9) (10)      9 . Switch 5
                  10. Switch 4
```

J8

Console Port. This is a TTL level DCE serial port. It can be connected to a microcontroller or other DTE TTL level device. Jumper J12 selects this port or the RS232 serial port at J2. The pinout for this port is below.

J8 Console Serial Port

```
 ┌─────────┐
 │ (1) (2) │   1 . Ground
 │         │   2 . +V Out
 │ (3) (4) │   3 . CTS Out
 │         │   4 . RTS In
 │ (5) (6) │   5 . TX Out
 │         │   6 . DCD Out
 │ (7) (8) │   7 . RX In
 │         │   8 . RI Out
 │ (9) (10)│   9 . DTR In
 └─────────┘  10. DSR Out
```

J9

Modem Port. This is a TTL level DTE serial port. It can be connected to a TTL level serial port on a wireless phone, a modem chipset, or other TTL level DCE device. Jumper J11 selects this port or the RS232 serial port at J1. The pinout for this port is shown below.
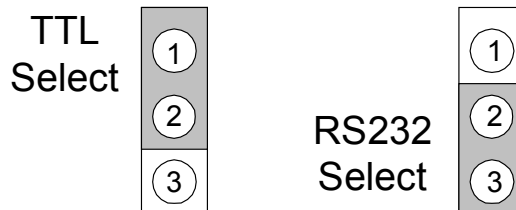
J9 Data Serial Port

```
 ┌─────────┐
 │ (1) (2) │   1 . Ground
 │         │   2 . +V Out
 │ (3) (4) │   3 . CTS In
 │         │   4 . RTS Out
 │ (5) (6) │   5 . RX In
 │         │   6 . DCD In
 │ (7) (8) │   7 . TX Out
 │         │   8 . RI In
 │ (9) (10)│   9 . DTR Out
 └─────────┘  10. DSR In
```

J10

This is a standard 2.1mm power jack. It will accept a 7-12 volt DC filtered power supply. Polarity can be any direction as the uNetSerial development board contains a full wave bridge.
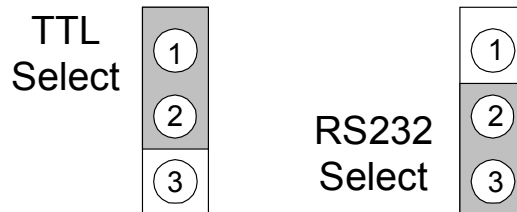
J11

TTL or RS232 level select jumper. This jumper selects for the Modem DTE serial port either J1 or J9.

```
TTL        ┌─────┐              ┌─────┐
Select     │ (1) │              │ (1) │
           │     │              │     │
           │ (2) │   RS232      │ (2) │
           │     │   Select     │     │
           │ (3) │              │ (3) │
           └─────┘              └─────┘
```

J12

TTL or RS232 level select jumper. This jumper selects for the Console DCE serial port either J2 or J8.

TTL Select — pins 1, 2, 3

RS232 Select — pins 1, 2, 3

J13

SPI port. This port is for future revisions of the uNetSerial code that can be controlled by a SPI interface.

J14

This port exposes the indicator 4 pin at Pin 1 of J14, and the Switch 1 pin at Pin 2 of J14.

J15

This port exposes the Switch 2 pin at Pin 1 of J15, and the Switch 3 pin at Pin 2 of J15.

J16

This port can be used to power the uNetSerial development board by an alternative 3.3 or 5 Volt regulated power supply, or it can be used as a 5 Volt Regulated output when powered via J10.

RST

This button causes a system reset when pressed.

SW1

This button when held down while the RST button is toggled will cause the uNetSerial device to go into bootloader mode.

SW2

This button is not used currently but may be used in a future version of the uNetSerial code.

Power LED

This LED is lit when power is applied to the uNetSerial Board.

LED 1

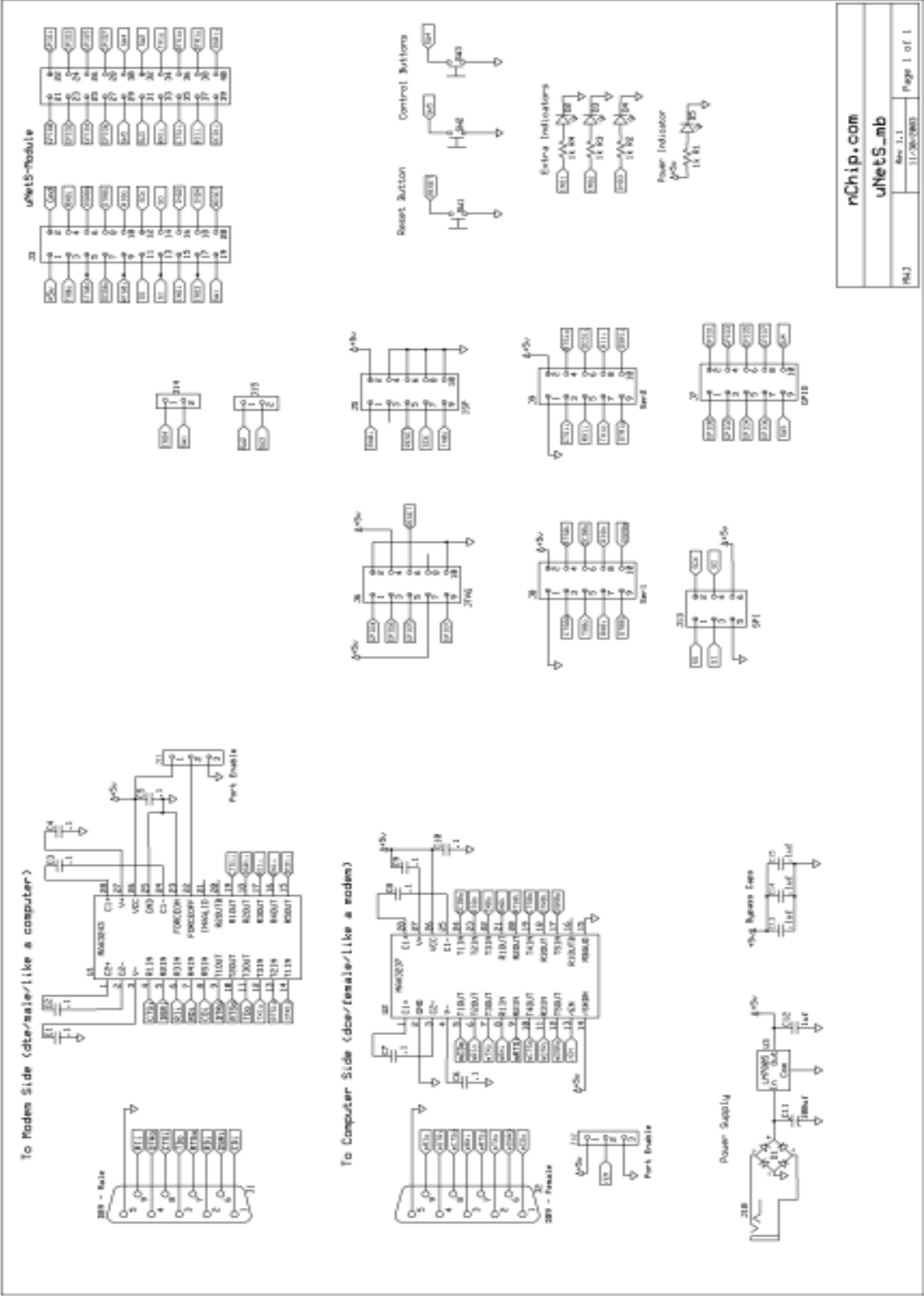This represents the state of the Indicator 3 pin.

LED 2

This LED represents the state of the Indicator 2 pin. This LED should flash when characters are sent out the console serial port.

LED 3

This LED represents the state of the Indicator 1 pin. It should be lit when in bootloader mode or when characters are entered into the console serial port during normal uNetSerial operation.

Development Board Schematic