# µSmartDigi™ Digipeater Getting Started Guide

The µSmartDigi requires no assembly itself but must be installed in a TNC-X that contains an LM7805 voltage regulator. TNC-X kits are available from Coastal ChipWorks (http://www.tnc-x.com) and come with a low-current LM78L05 voltage regulator that must be replaced to use the µSmartDigi. Caution- the µSmartDigi draws 100-200 mA that will damage the low-current regulator!  You **must** use the LM7805!

You will need to decide whether you will use a GPS unit, an ASCII Monitor, like HyperTerminal, or none of these. This use dictates how the µSmartDigi Serial Configuration Jumpers (J3) will be configured.  J3 provides means to connect the µSmartDigi serial port to the TNC-X Main serial connector (DB-9R) or optional USB, the Aux serial connector (3.5 mm stereo jack), or split between them.  Your TNC-X may have an optional USB module that is configured to replace the Main serial connector. The following table shows how to select the jumpers. An abbreviated table can be found near J3 on the µSmartDigi PCB.

**Serial Port Configuration**

| Function | µSmartDigi Receive | µSmartDigi Transmit |
|---|---|---|
| GPS or Monitor on Main/USB connector | Jumper J3 Pin 1 to Pin 2 | Jumper J3 Pin 4 to Pin 5 |
| GPS or Monitor on Aux connector | Jumper J3 Pin 2 to Pin 3 | Jumper J3 Pin 5 to Pin 6 |
| Monitor on Main/USB connector and GPS on Aux connector (split) | Jumper J3 Pin 2 to Pin 3 | Jumper J3 Pin 4 to Pin 5 |
| GPS on Main connector and Monitor on Aux connector (split) | Jumper J3 Pin 1 to Pin 2 | Jumper J3 Pin 5 to Pin 6 |

To download Configurations, Rules or Firmware from a PC or laptop you can use any of the 3 connectors but the Main offers a standard DB-9R to connect to a standard RS-232 serial PC cable and the USB directly connects to the computer with a USB cable. The Main DB-9R is DCE and requires a "straight" PC cable.

The PC or laptop Configuration Utility software, as well as µSmartDigi firmware updates and documentation, can be downloaded from http://usmartdigi.com. The Configuration Utility is a Windows (95,98,98SE,ME,2000,XP) console program requiring no installer.  Simply download this program and execute it. You can use the µSmartDigi without any Configuration or Rules being configured by relying on the defaults.

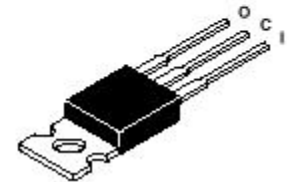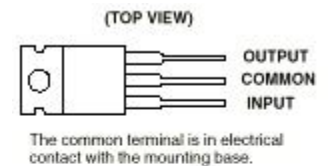## Step-by-Step Instructions

1.  Remove all power to the TNC-X.

2.  If you have already assembled your TNC-X with the original LM78L05 regulator you will need to replace it with the LM7805.  Remove the PCB from its enclosure. Desolder and remove LM78L05 (U6).  Clean out the holes, insert and solder the LM7805 with the same pin assignment. Reassemble the PCB into the enclosure. See the LM7805 diagram following the instructions.

3.  Remove both jumpers from the Expansion Header of the TNC-X. On older TNC-X this is J1, on Version 2 it is JP5. Jumper the TNC-X to 19200 baud (remove JP1 and JP2).

4.  Remove the protective tape from the foam adhesive on the bottom of the µSmartDigi PCB. Install the PCB aligning the TNC-X 8-pin Expansion Header with the 8-pin socket on the bottom of the µSmartDigi. The µSmartDigi only fits one way without extending outside the TNC-X PCB. Press on the µSmartDigi PCB to set the foam adhesive.

5.  Install the 2 jumpers removed in Step 3 into the µSmartDigi at J3 according to the Serial Port Configuration Table.

6.  Connect an ASCII Terminal, PC or laptop serial cable using HyperTerminal or similar interactive device to test and configure µSmartDigi. Make sure your terminal or terminal emulator is ready and set it to 57600 baud, 8 bits, no parity and 1 stop bit (8N1), Send line ends with LF (nl), Local Echo, No Flow Control. This terminal will be referred to as the µSmartDigi Monitor.

7. Apply power to the µSmartDigi/TNC-X. You should see the following prompt:

```
uSmartDigi            Version 2.1          by Rich Painter, ab0vo
Copyright 2004-2006 Painter Engineering, Inc.   usmartdigi.com
Enter <ctrl>-c for Host mode or Enter nothing for Monitor mode.
Waiting for 20 seconds...
```

8. Type a <ctrl>-c (hold the CTRL key down while typing a c). You should see the following prompt:

```
No GPS and TNC Port is disabled!
Connected 57600
uSmart>
```

9. Commands are terminated with the Enter key. Type a ? to display the help.

10. Connect the TNC-X to your radio system. On the µSmartDigi Monitor enter the command *tnc* to enable the TNC operation and continue monitoring the µSmartDigi operation. When the TNC-X receives a packet it should be displayed on the µSmartDigi Monitor with its *Pass* or *Drop* repeater disposition. A *Pass* should result in the TNC-X repeating this packet.

11. Typing *dconf* will display the default configuration.

12. Modify your Configuration and Rules as needed.

## Default Configuration

| Parameter | Setting | Meaning |
|---|---|---|
| call & SSID | notset & 0 | No call or SSID are set |
| position Lat | 39.028084 | Latitude |
| position Lon | -104.66900 | Longitude |
| havegps | no | No GPS is expected to be connected |
| log | yes | Logging is enabled to Monitor port |
| host baud | 57600 | Initial baud rate |
| gps baud | 4800 | Initial baud rate |
| tnc baud | 19200 | Initial baud rate |
| widemax | 3 | Maximum WIDEn: $n \le 3$ |
| widetotal | 6 | Total WIDEn: Sum of $n \le 6$ |
| dupewin | 28 | Dupe check window is 28 seconds |
| relay | yes | Allow RELAY in path |
| implicit rule | pass | Pass with no other rules configured |



(TOP VIEW)

OUTPUT
COMMON
INPUT

The common terminal is in electrical contact with the mounting base.

LM7805 Regulator

I is pin 1

C is pin 2

O is pin 3

Please visit http://usmartdigi.com for more information and product updates. Send product suggestions and bug reports to painter@usmartdigi.com.

Thanks for purchasing a µSmartDigi!

Rich Painter, AB0VO
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