µSmartDigi™ D-Gate™ 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 from Coastal ChipWorks (http://www.tnc-x.com) 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 also **must** mount the LM7805 in contact with the TNC-X enclosure to serve as a heat sink!

You will need to decide which TNC-X serial connector you will use to connect to the D-STAR radio. This use dictates how the µSmartDigi Serial Configuration Jumpers at 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 Table

Function	µSmartDigi Receive	µSmartDigi Transmit
Operate D-STAR on Main/USB connector and Monitor on Aux connector	Jumper J3 Pin 1 to Pin 2	Jumper J3 Pin 5 to Pin 6
Operate D-STAR on Aux connector and Monitor on Main/USB connector	Jumper J3 Pin 2 to Pin 3	Jumper J3 Pin 4 to Pin 5
Download using Main/USB connector	Jumper J3 Pin 1 to Pin 2	Jumper J3 Pin 4 to Pin 5
Download using Aux connector	Jumper J3 Pin 2 to Pin 3	Jumper J3 Pin 5 to Pin 6

To select between the Main connector and USB install jumper at JP3 for Main and remove for USB on the TNC-X board. To Download Configurations, Rules or Firmware from a PC or laptop you can use any of the 3 connectors. 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. Jumper according to the Table for Download.

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 Rules configured by relying on the defaults. **You must at least set the CALL and Digi Path Configuration parameters**.

Step-by-Step Instructions

1. TNC-X already assembled- Remove all power to the TNC-X, disconnect all cables and remove the PCB from its enclosure. If you have used the LM78L05 regulator you will need to replace it with the LM7805. Desolder and remove LM78L05 (U6). Clean out the holes.

2. Install the 7805- Drill a $\frac{9}{64}$-inch hole in the enclosure base, 1¼ inch from the front and $\frac{9}{16}$ inch from the left side (looking from the front). Debur the hole on both sides. Cut 3 wires about 3 inches long, remove the insulation from the ends and tin them. Cut 3 short pieces of heat-shrink tubing (or use electrical tape) and place over the wires. Solder the 3 wires to the 7805 and secure the heat shrink over the soldered legs or tape them. Observing the 3 terminal assignments, solder the other wire ends to the 3 holes in the PCB. Apply some silicone heat sink grease to the 7805, reassemble the PCB into the enclosure and secure the 7805 to the TNC-X base with a screw, lock washer and nut.

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). **You must install the TNC-X jumper JP4 on pins 1&2 because the USB cannot supply enough current to power the µSmartDigi**.

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.

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5. Install the 2 jumpers removed in Step 3 on the µSmartDigi at J3 according to the Table for Download.

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 9600 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 D-Gate      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 or
Connect a D-STAR Radio at 9600 baud and turn it on.
Waiting indefinitely...
```

8. Type a <ctrl>-c (hold the CTRL key down while typing a c). You should see the following prompt:
```
D-Gate and TNC Ports are disabled!
Connected 9600
uSmart>
```

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

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

11. Modify your Configuration and Rules as needed.

12. Reconfigure Serial Port jumpers at J3 for Operating according to the Table. Connect the D-STAR radio and cycle the µSmartDigi/TNC-X power.

Default Configuration (partial list)

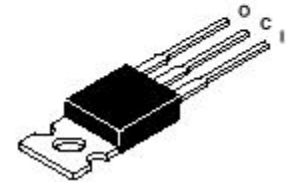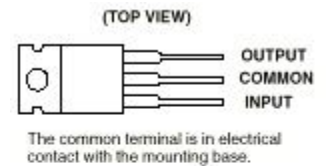| Parameter	Setting	Meaning
call & SSID	**notset & 0**	**No call or SSID are set**
position Lat	39.028084	Latitude
position Lon	-104.66900	Longitude
log	yes	Logging is enabled to Monitor port
fixvalid	Yes	Require valid GPS fix from D-STAR
digipath	**notset**	**No Digi Path is set**
host baud	57600	Initial baud rate
dstar baud	9600	Initial baud rate
tnc baud	19200	Initial baud rate
widemax	3	Maximum WIDEn: n ≤ 3
widetotal	6	Total WIDEn: Sum of n ≤ 6
dupewin	28	Dupe check window is 28 seconds
relay	enabled	Allow RELAY in path
implicit rule	pass	Pass with no other rules configured

CALL and Digi Path must be set for operation!

(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
Painter Engineering, Inc.   Firmware Shipped Version _____