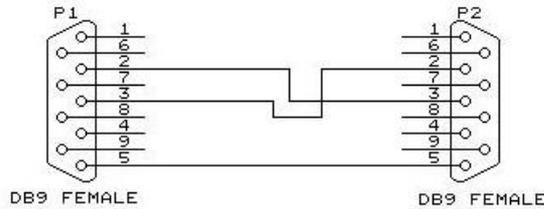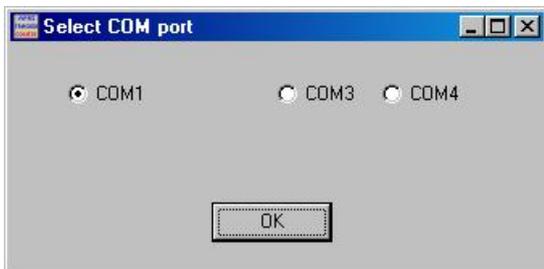# Configuration Program for OZ4HZ Version 2 Tracker (rev. 2008-12-08).

The tracker is configured with a Windows program witch can be downloaded from the website.
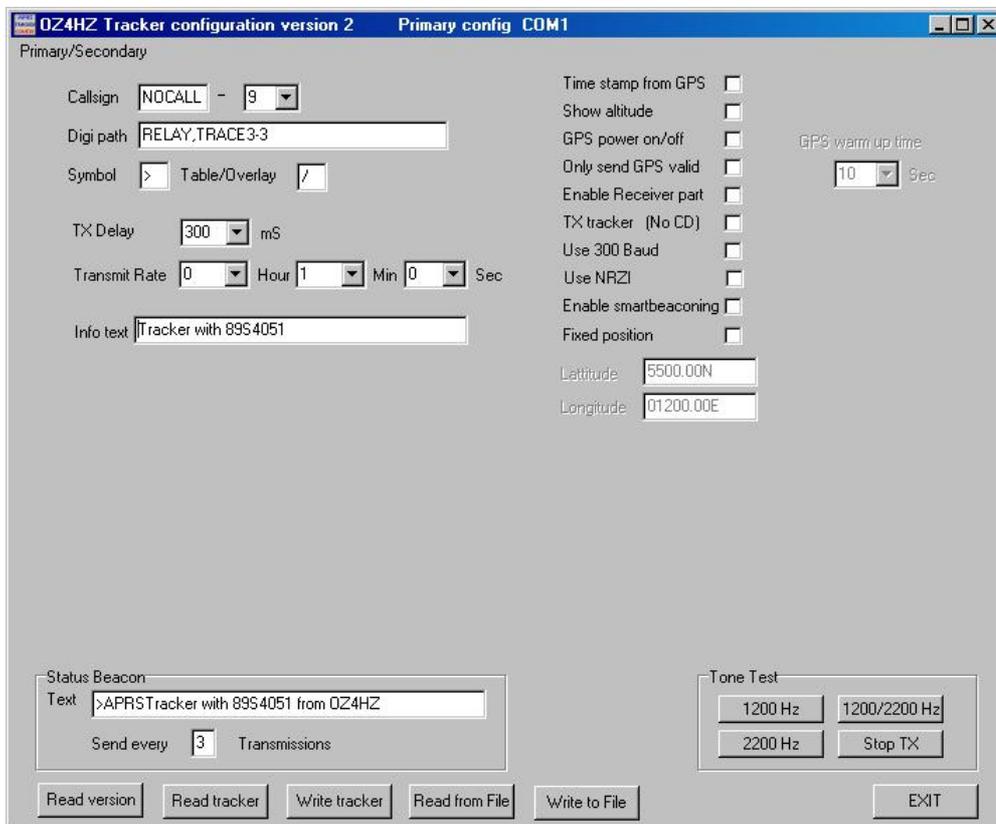www.aargang64.dk/aprs

Use a standard null-modem cable (or make one as shown) to connect the tracker to the PC.
Switch the tracker on (if battery operated) or connect external power to it. When the tracker is connected start the configuration program (aprstrack_2.exe). The first window shows all available COM ports.

Select the COM port the tracker is connected to and click OK. The next screen is just a warning – The program works only with version 2 software. Just click OK and the next window shows the configuration program.
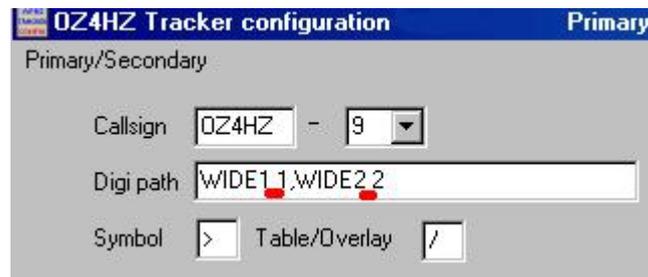
Configuration options.

Primary/Secondary menu selects whether the config program sets or shows the primary or secondary parameters. All parameters (except the Status beacon) can be set independently in the 2 configurations. Primary configuration is used if switch S1 is open and secondary configuration is used when S1 is closed.

Callsign The radio callsign of the transmitting station with max 6 characters excluding SSID. The SSID can be selected with the drop down box right to the callsign.

Digipath Specifies the digipeater path to use. For normal APRS operation in Denmark we now (in 2008) uses WIDE1-1,WIDE3-3 for mobiles but it is of course possible to use other paths i.e.callsigns.
There is a small "bug" in the configuration program. If you are using WIDEx-x you must replace "-" with a space " " i.e. "WIDE1 1" and NOT "WIDE1-1". See picture below.

Symbol & Table/Overlay
Specifies the symbol most APRS programs will display when data from the tracker is received.
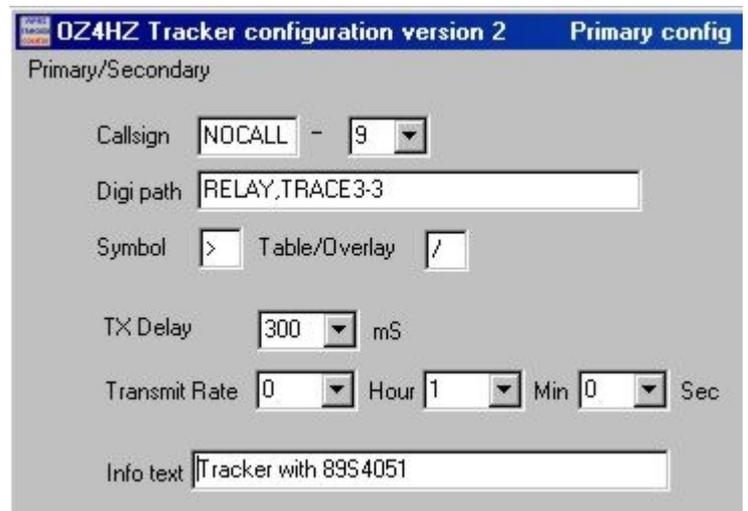Use "/" for primary symbols or "\" for alternate symbols.
In the table are shown some symbol examples.
(this table is copied from the TinyTrak manual)

Symbol	Table/Overlay	Icon
>	/	
j	/	
<	/	
[	/	
k	/	
S	\	

TXDelay From the dropdown box you can select the delay in mS after the transmitter is keyed and the data transmission starts. During this time there will only be transmitted flags with the bit sequence 0x7e (01111110 in binary). Range is from 25 mS to 1000 mS with a step of 25 mS.

Transmit rate If the Enable smartbeacon box has not been checked select the transmit rate from the dropdown box.
Range is approx. from 5 seconds to 18 hours.

Info text A short text sent with every transmission.

Status Beacon Text beacon to be transmitted after "normal" position transmissions
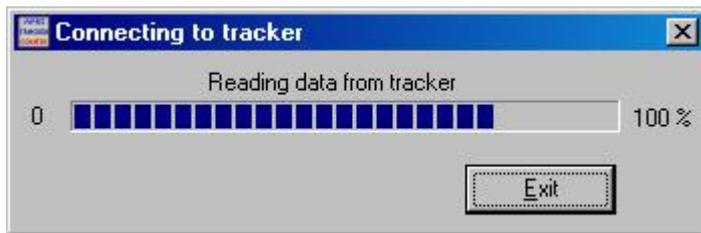The status becon text is the same in both primary and secondary configuration.

Status Beacon Send every Controls how often a status beacon will be sent. If set to 3 the status beacon text will be transmitted after 3 position transmission

Tone Test These buttons is used to transmit either a 1200Hz a 2200Hz tone or alternate between the two at 1200 Baud. This could be used to check the frequency deviation of the transmitter.
Deviation is set by a variable resistor in the tracker.

Read version Button   Reads the software version of the tracker.
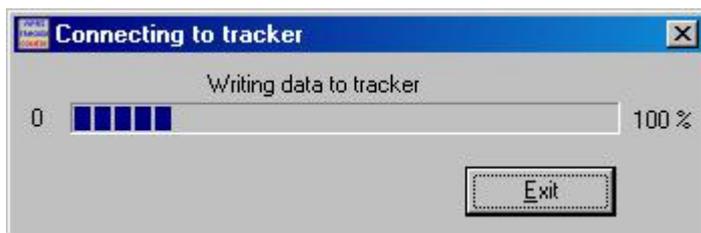

Read tracker Button Read the configuration (both primary and secondary) from the trackers EEPROM

A progress bar will be shown

Write tracker Button Writes the configuration to the trackers EEPROM
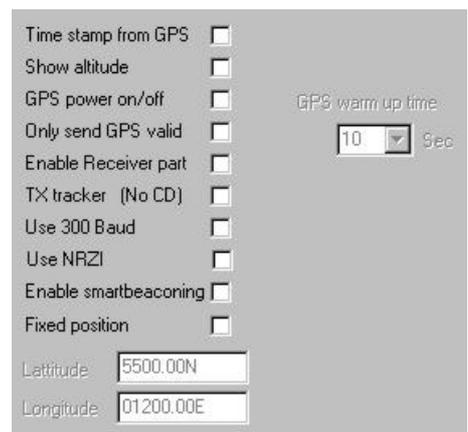

A progress bar will be shown

Read from File / Write to File Read or writes the configuration to a file.

EXIT closes the configuration program.

Checkbox options.

Time stamp from GPS Enables the tracker to send a timestamp with hour, minute and seconds with all position packets.

Show altitude Enables altitude information to be sent. When the tracker receives a correct $GPGGA message from the GPS altitude information will be sent.

GPS power on/off Enables power control of the GPS unit .
From the drop down box to the left you can select a warm up time for the GPS (range 0-255 seconds)

Approx the selected seconds before a transmission takes place power to the GPS unit is switched on. If data is not valid after The warm up period power will stay on the GPS unit until next transmission.If Smartbeacon is enabled it is not possible to use this setting (there will be continuous power on the GPS).

Only send GPS valid Disables the tracker from sending position data when the GPS signal is invalid. Status beacons will continue to be sent.

Enable receiver part Enables the receiver part of the tracker and received data packets will be sent on the RS232 port (Data OUT from the tracker) NO receiver available in smartbeacon mode

TX tracker (No CD) Disables both receiver and check of CD (RX AF) .
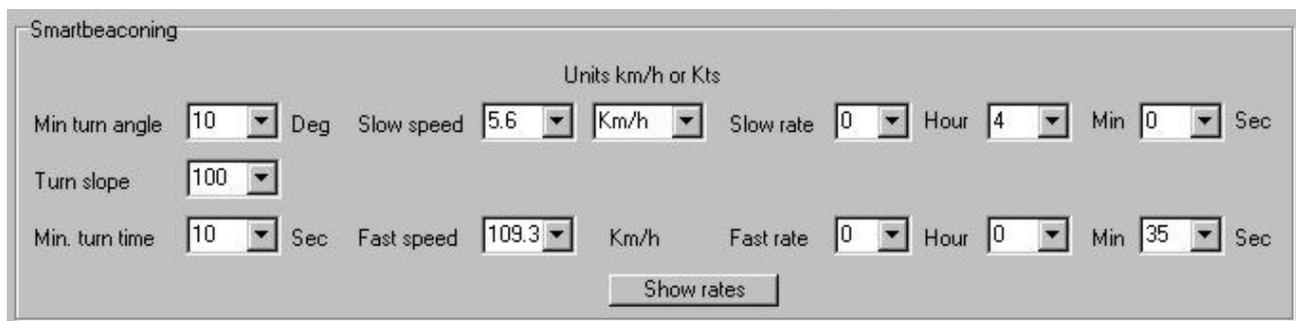Use this setting in the TXtracker (Because of NO receiver present).

Use 300 Baud Enables data to be sent at 300 Baud and the tones will be 1600 Hz and 1800 Hz rather than 1200 Hz and 2200 Hz . The tone test buttons will now send the new tones.

Use NRZI Enables data to be sent at 300 Baud but no tones will be sent and the message box at the left will be shown. Pin 1.7 of the 89S4051 (CPU) are used in this special mode.

Fixed position Enable this setting and you will be able to set a fixed position. This is only possible in the primary configuration . In this mode you will not need to connect a GPS and transmissions will only occur at the Transmit Rate.

Enable smartbecon Enables the smartbeacon mode and shows the smartbeacon panel below but remember – it is not possible to receive packets in this mode (the GPS unit is read every second!)

SmartBeaconing is an algorithm originally developed for the HamHUD by Tony Arnerich , KD7TA and Steve Bragg , KA9MVA, the Smartbeaconing ™ algorithm allows the tracker to operate more efficiently by changing how often it transmits depending on speed and heading. If using Smartbeaconing ™ the GPS must sent speed and heading information with the $GPRMC sentence.

When the tracker is moving at a speed at or below the **Slow speed** the tracker will transmit at the **Slow rate** and when it's moving at or faster than the **Fast speed** it will transmit at the **Fast rate** . Between those limits the transmit rate varies between the slow rate and the fast rate. Smartbeaconing ™ also uses heading changes also known as CornerPegging to let transmissions occur when the tracker changes heading.
The parameters used in CornerPegging are :
> **Min. turn angle**
> **Turn slope**
> **Min. turn time**

From these parameters and the actual speed the tracker calculates the Turn threshold from the formula :

   Turn threshold = Min Turn angle + Turn slope/Speed   (Speed = Actual speed)

An example.
Min turn angle = 10
Turn slope   = 100
Min Turn time =   10

1. With a speed of   10 the Turn Threshold is 20 (10+ 100/10)
2. With a speed of   20 the Turn Threshold is 15 (10+ 100/20)
3. With a speed of   50 the Turn Threshold is 12 (10+ 100/50)
4. With a speed of 100 the Turn Threshold is 11 (10+ 100/100)

This means if your heading changes more than the Turn threshold and the time since last transmission is more than the Min Turn time (set to 10 sec in this example) the tracker will transmit a new position beacon.

Click on   [Show rates]   to see the actual smartbeacon setup.

SmartBeacon rates
At 005.6 Km/h Beaconrate : 04 Min 00 Sec and Turnthreshold 43 Deg
At 011.1 Km/h Beaconrate : 04 Min 00 Sec and Turnthreshold 27 Deg
At 016.7 Km/h Beaconrate : 03 Min 46 Sec and Turnthreshold 21 Deg
At 022.2 Km/h Beaconrate : 02 Min 49 Sec and Turnthreshold 18 Deg
At 027.8 Km/h Beaconrate : 02 Min 15 Sec and Turnthreshold 17 Deg
At 033.3 Km/h Beaconrate : 01 Min 53 Sec and Turnthreshold 16 Deg
At 038.9 Km/h Beaconrate : 01 Min 37 Sec and Turnthreshold 15 Deg
At 044.4 Km/h Beaconrate : 01 Min 25 Sec and Turnthreshold 14 Deg
At 050.0 Km/h Beaconrate : 01 Min 15 Sec and Turnthreshold 14 Deg
At 055.6 Km/h Beaconrate : 01 Min 08 Sec and Turnthreshold 13 Deg
At 061.1 Km/h Beaconrate : 01 Min 02 Sec and Turnthreshold 13 Deg
At 066.7 Km/h Beaconrate : 00 Min 56 Sec and Turnthreshold 13 Deg
At 072.2 Km/h Beaconrate : 00 Min 52 Sec and Turnthreshold 13 Deg
At 077.8 Km/h Beaconrate : 00 Min 48 Sec and Turnthreshold 12 Deg
At 083.3 Km/h Beaconrate : 00 Min 45 Sec and Turnthreshold 12 Deg
At 088.9 Km/h Beaconrate : 00 Min 42 Sec and Turnthreshold 12 Deg
At 094.5 Km/h Beaconrate : 00 Min 40 Sec and Turnthreshold 12 Deg
At 100.0 Km/h Beaconrate : 00 Min 38 Sec and Turnthreshold 12 Deg
At 105.6 Km/h Beaconrate : 00 Min 36 Sec and Turnthreshold 12 Deg
At 111.1 Km/h Beaconrate : 00 Min 35 Sec and Turnthreshold 12 Deg
[Exit]

LED functions.

During power up the green and red LED will be flashing. The last LED lit shows the configuration used.

> **Green LED** : configuration 1
> **Red LED** : configuration 2

Normal operation :

Red LED : On for 50mS once every second
On when TX are keyed

Green LED : On with activated carrier detect (receiving packets)
On when TX keyed and data from GPS is OK.

During normal operation you can switch to another configuration with the switch S1.
The LEDs will flash again and show the new configuration

References:

TinyTrack http://www.byonics.com/tinytrak

Hamhud http://www.hamhud.net

OpenTracker http://n1vg.net/opentracker/