

Trackbox Cell ID Protocol Specification

Version 1.0

2008-02-17

For cellid firmware version 1

Website: <http://www.paralleltrack.co.uk/>

Email: mail@paralleltrack.co.uk

Table of Contents

Table of Contents	2
Introduction	3
Further Reading	3
Ofcom Sitefinder	3
Yahoo – ZoneTag Cell Location API	3
Cell Spotting	3
Geo-information and computational geometry (pdf)	3
GSM Cells	3
Locating without GPS	3
Navizon	3
NavXS	3
Nokia Forums – GSM Cell ID	3
Using GSM CellID Positioning for Place Discovery	3
CellTrack / CellDB	3
Protocol	4
CTBP (CellID Trackbox Protocol)	4
Example	4
Appendices	5
Appendix 1 – Variable format	5
Appendix 2 – Position Report Format	6
Appendix 3 – Cell Data Report Format	7

Introduction

The Cell ID collection firmware for the Trackbox is designed to allow simultaneous collection of GPS positions, GSM cell IDs, and other associated data. This collected data can then be used by devices without a GPS e.g. mobile telephones to triangulate their users approximate location.

Further Reading

Ofcom Sitefinder

<http://www.sitefinder.ofcom.org.uk/>

Yahoo – ZoneTag Cell Location API

<http://developer.yahoo.com/yrb/zonetag/locatecell.html>

Cell Spotting

<http://www.cellspotting.com/>

Geo-information and computational geometry (pdf)

<http://www.ncg.knaw.nl/Publicaties/Groen/pdf/44VanOosterom.pdf>

GSM Cells

<http://client338.lab.telin.nl:8080/wasp/jsp/CellStats.jsp>

Locating without GPS

<http://natalian.org/archives/2007/12/02/location-without-gps/>

Navizon

<http://www.navizon.com/>

NavXS

<http://navxs.com/>

Nokia Forums – GSM Cell ID

<http://discussion.forum.nokia.com/forum/showthread.php?t=19693&page=1>

Using GSM CellID Positioning for Place Discovery

<https://repositorium.sdum.uminho.pt/bitstream/1822/6223/1/Locare%20-%20camera%20ready%20version.pdf>

CellTrack / CellDB

<http://www.spv-developers.com/forum/forumdisplay.php?f=20&page=3&order=desc>

Protocol

The Cell ID protocol is based on the TBP protocol used for regular position reporting.

CTBP (CellID Trackbox Protocol)

CTBP is a custom text based protocol running over TCP. It requires a custom socket server application listening on a specified port. Administrative / root level server access may be required to install such as application.

Sending of authentication, GPS position data, and Cell ID data are handled separately in sequence. Only after a successful authorisation will GPS position data or Cell ID data be sent.

Example

>>> Sent from unit to server

```
a=connect&v=11&i=1111111111111111\r\n
```

See appendix 1 for further information explanation / format of received variables.

<<< Sent from server to unit

```
=OK=\r\n
```

>>> Sent from unit to server

```
183457.999,5126.0247N,00002.8686E,5.2,70.4,3,57.63,32.11,17.32,1  
50507,05\r\n
```

See appendix 2 for further information explanation / format of received variables.

>>> Sent from unit to server

```
S,55,0055,0AEB,798,-60,40,40\r\n  
N1,51,0055,0001,848,-72,35,22\r\n  
N2,53,0055,02D7,764,-62,22,23\r\n  
N3,54,0055,1203,783,-75,20,42\r\n  
N4,53,0055,0EEE,815,-64,19,30\r\n  
N5,52,0006,243E,806,-75,17,4\r\n  
N6,51,0055,0CFA,771,-82,11,3\r\n
```

See appendix 3 for further information explanation / format of received variables.

Note: Each new socket connection established to the server signifies a separate GPS / Cell data report.

Appendices

Appendix 1 – Variable format

Variable	Description
a	<u>A</u> uthentication – the unit password as set via the configuration utility.
v	<u>V</u> ersion – current installed firmware version (as supplied on purchase).
i	<u>I</u> MEI – Unique 15 digit unit hardware identifier (as supplied on purchase).

Appendix 2 – Position Report Format

```
183457.999,5126.0247N,00002.8686E,5.2,70.4,3,57.63,32.11,17.32,150507,05\r\n
```

Note: \r\n signifies a carriage return, followed by a line feed

Data Example	Data Format	Description
183457.999	(\d{6}\.\d{3})	UTC Time (hhmmss.zzz)
5126.0247N	(\d{4}\.\d{4}[NS])	Latitude (ddmm.mmmm)
00002.8686E	(\d{5}\.\d{4}[EW])	Longitude (dddmm.mmmm)
5.2	(\d{1,2}\.\d{1})	Horizontal Dilution of Precision
70.4	((?:\-)\d+(?:\.\d+))	Altitude above mean sea level (meters)
3	([023])	Fix Type (0: Invalid Fix, 2: 2D Fix, 3: 3D Fix)
57.63	(\d{1,3}\.\d{1,2})	Course over ground (direction degrees)
32.11	(\d{1,4}\.\d{1,2})	Speed over ground (Km per hr)
17.32	(\d{1,4}\.\d{1,2})	Speed over ground (knots)
150507	(\d{6})	Date of fix (ddmmyy)
05	(\d{2})	Total satellites in use

Appendix 3 – Cell Data Report Format

```
S,55,0055,0AEB,798,-60,40,40\r\n
N1,51,0055,0001,848,-72,35,22\r\n
N2,53,0055,02D7,764,-62,22,23\r\n
N3,54,0055,1203,783,-75,20,42\r\n
N4,53,0055,0EEE,815,-64,19,30\r\n
N5,52,0006,243E,806,-75,17,4\r\n
N6,51,0055,0CFA,771,-82,11,3\r\n
```

Note: \r\n signifies a carriage return, followed by a line feed

Data Example	Description
N1	Cell No (S = Current Cell, N1-6 = Neighbouring Cell)
55	Base Station Identification Code (BSIC)
0055	Location Area Code (LAC)
0AEB	Cellular Identifier (Cell ID)
798	Assigned Radio Channel (ARFCM)
-60	Received Signal Strength (dBm)
40	Undocumented (C1)
40	Undocumented (C2)