Clever Devices IVN®
GPS Broadcast over Ethernet
Interface Control Document

Version 1.0
June 15, 2015

Revision History

Date	Version	Description	Author
6/15/2015	1.0	Initial Release	G. Glogowski

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1   Purpose

This document outlines how the Clever Devices' IVN® system transmits GPS information over Ethernet for third party components.

2   Terminology and acronyms

IODE   Issue of Data Ephemeris—Particularly important for differential GPS use, this identifies the ephemeris edition (usually updated every hour) in use at the satellite. It is important that both the receiver and the differential reference station are using the same IODE.

IVN®   Intelligent Vehicle Network. The Clever Devices' onboard computer.

GPS   Global Positioning System

LN   Long Navigation Message

SV   Space Vehicle – A code unique to each satellite

TAIP   Trimble ASCII Interface Protocol—A protocol common for vehicle monitoring which uses printable ASCII data exclusively.

WGS-84   World Geodetic System—1984

3   Overview

The IVN® utilizes the standard Trimble ASCII Interface Protocol (TAIP) Long Navigation (LN) Message to provide third parties with GPS information

3.1   Trimble ASCII Interface Protocol (TAIP)

Trimble ASCII Interface Protocol (TAIP) is a Trimble-specified digital communication interface based on printable ASCII characters over a serial data link. TAIP was designed for vehicle tracking applications but has become common in a number of other applications because of its ease of use. TAIP supports both scheduled and polled responses. TAIP messages can be scheduled for output at a user specified rate starting on a given epoch from top of the hour. For communication robustness, the protocol optionally supports checksums on all messages. It also provides you with the option of tagging all messages with the unit's user specified identification number (ID). This greatly enhances the functional capability of the unit in a network environment.

Additionally, given the printable ASCII format of all communication, TAIP is ideal for use with mobile data terminals, seven bit modems and portable computers. Although, receivers incorporating this protocol are shipped from the factory with a specific serial port setting, the port characteristics are fully programmable through TAIP messages.

3.2 Long Navigation – LN

This message reports the latitude/longitude/altitude, the horizontal speed and vertical speed and the heading.

3.2.1 Data String Format

AAAAABBBCCCDDDDDDDEEEEFFFFFFFFGGGGGGGGHHIIIJKKKKLMMMNOO{PPQQ}RRRRRR
RRRRST

3.2.2 Data String Details

Item	# of Char	Units	Format	Value
GPS Time of Day	8	Sec	AAAAA.BBB	
Latitude	10	Deg	CCC.DDDDDDD	
Longitude	11	Deg	EEEE.FFFFFFF	
Altitude above MSL	9	Ft	GGGGGGG.HH	
Horizontal Speed	4	MPH	III.J	
Vertical Speed	5	MPH	KKKK.L	
Heading	4	Deg	MMM.N	
Number of SVs used	2	N/A	OO	
SV Id (see note)	2	N/A	PP	
IODE (see note)	2	N/A	QQ	
Reserved	10	N/A	RRRRRRRRRR	
Source	1	N/A	S	0 = 2D GPS 1 = 3D GPS 2 = 2D DGPS 3 = 3D DGPS 6 = DR 8 = Degraded DR 9 = Unknown
Age of Data Indicator	1	N/A	T	2 = Fresh, 10 sec 1 = Old, >10 sec 0 = Not available
Total number of characters is 65+4x(number of SV's used)				

Note: At least 2 satellites are required to get the LN Message.

Position is in Degrees, minutes, decimal minutes, and latitude is (positive north) and longitude (positive east) WGS-84. Heading is in degrees from True North increasing eastwardly. The GPS time of day is the time of fix rounded to the nearest second.

Note 2: The data in this message is to be considered invalid and should not be used, if the Age of Data Indicator is equal to 0 (signifying data not available).

3.3 Message Transmission

The IVN® will send the TAIP message as a UDP message. The message will be broadcasted at a frequency of once per second. The port of broadcast is configurable using BusTools/CleverWorks. The IVN® will transmit data on the broadcast IP of 255.255.255.255.

4 Reference

- MP 3G Modems, TAIP Reference, Sierra Wireless, Rev 1.1
- Trimble, Messenger Ins & Ops. Manual, Rev C