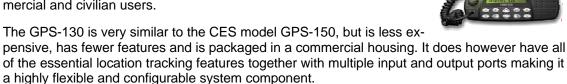# GPS-130 LOCATION INTELLIGENCE/ ASSET TRACKING

The GPS-130 is a commercial, low cost asset and vehicle location device compatible with conventional and Trunking radio systems. Radio specific interface cables are available for most popular radio brands.

Using pioneering techniques, the GPS-130 utilizes the most sophisticated form of Automatic Vehicle Location (AVL). This is called the Global Positioning System and is a constellation of 24 satellites developed by the U.S. Department of Defense, and made available for use without charge to commercial and civilian users.

The GPS-130 is very similar to the CES model GPS-150, but is less expensive, has fewer features and is packaged in a commercial housing. It does however have all of the essential location tracking features together with multiple input and output ports making it a highly flexible and configurable system component.

The GPS-130 operates in conjunction with the CES Wireless software package POWER-trak, or FLEET-control. These affordable and advanced software systems provide for multiple channel, multiple protocol and multiple dispatcher solutions. Please refer to the separate software brochures for these products for detailed information.

- 12 Channel GPS Receiver
- Provides timed or exception GPS location updates
- Integral RF Modem
- Conventional Radio Compatible
- Smart Trunking Radio Compatible
- Radio Channel Steering
- Automatic Acknowledgment
- Automatic Message Retry
- Message Management and Memory
- Quadtec™ Digital Signaling
- Track on Poll
- Track on Interval
- Track on Exception
- Track on Auxiliary Input Change
- Emergency Tracking
- MOTION-trak™ Intelligent Reporting
- Command Outputs x 3
- Sensor/Control Inputs x 8
- Geo-ZONES

Intelligent Fleet Management with GPS Tracking

Location Updates
Vehicle devices can be programmed to provide the dispatch center with timed updates, e.g. every 5 minutes. The time period is programmable, which is dependant on needs, and wireless capacity to handle the data generated.

Exception Reporting
Products have auxiliary inputs (e.g. ignition or meter on/off) that report vehicle position on a change of state, e.g. door open.

Data Logging
The GPS-130 has the capability of automatically storing vehicle activity and location for temporary periods of time. This may be required when the vehicle is outside the wireless geographical coverage area or indeed a faulty antenna. Once the vehicle returns to the wireless coverage area, all of the data stored in memory is downloaded to the dispatch center.

Geo-ZONES
The GPS-130 can be programmed with geographical zones and when the vehicle travels in or out of these zones, the dispatch center is alerted.

MOTION-trak
Movement Intelligence: MOTION-trak™ is a movement-based algorithm that compares previous vehicle GPS samplings to new ones and then reacts to preprogrammed instructions. For example, this technology limits location updates if the vehicle has not moved between samples. This keeps the wireless infrastructure from becoming cluttered with redundant data (e.g. Instead of 12 samples of GPS data an hour for a sitting truck, there will only be one sample).

But, what will happen if the mobile unit is in stop and go heavy traffic? In order to provide reliable reporting, the unit can be programmed to log and send the data 10 seconds (programmable) after the unit has stopped or begun to move.

MOTION-trak™ also reacts to Auxiliary Input 1, to change the reporting interval. When a police car turns on the emergency siren and auxiliary 1 changes polarity, the product can be programmed to change its reporting interval from say every 10 minutes to every 5 seconds (programmable).

Poll
The dispatcher can send a command to the vehicle device at any time and receive its current location automatically.

Vehicle Management

Stun & Revive
The dispatcher can send a command to the vehicle and 'stun" the unit. This can be reversed by sending a 'revive" command. This can be linked to ignition to stop the vehicle when stolen.

ANI
When using a two-way radio system, every time the radio 'press to talk' is activated, the unit identity and the geographical location is sent to the dispatcher.

Auxiliary Inputs and Outputs
In vehicle units have inputs and outputs to monitor and control vehicle activities. Inputs can be connected to ignition, doors, siren, seat belt indicator, money shoot etc. When a state changes (open or close) the exception is reported back to the dispatch center. Auxiliary outputs allow the dispatcher to control the vehicle, e.g. honk horn, turn lights on, kill ignition.

Base Software

Single Dispatcher Systems
The CES Wireless POWER-trak mapping and dispatch software provides the single user with a host of features to manage their fleet. The software ships on a CD and in the USA, Canada, Puerto Rico, Guam and the Virgin islands, with detailed local maps. For other markets, maps of the local area are available on a case-by-case basis. Please contact CES Wireless.

Multiple Dispatcher Systems
The CES Wireless POWER-trak mapping and dispatch software is also available as a network version, providing the user with a host of features to manage their fleet with multiple dispatch positions.

Remote Dispatcher Systems
The CES Wireless POWER-trak mapping and dispatch software can operate over a TCP/IP network connection affording company's with an internal network a remote dispatch capability. The software ships in the USA, Canada, Puerto Rico, Guam and the Virgin islands, with detailed local maps. For other markets, maps of the local area are available on a case-by-case basis. Please contact CES Wireless.

Integration to Existing Software
CES Wireless base software can be integrated to third party (non-CES) CAD software systems. To facilitate this, CES Wireless supplies gateway software and has published an Application Program Interface (API). This interface affords fast real time data exchange (non web based). The list of current software providers that support the CES Wireless protocol includes medical transportation, public safety, 911, readymix, taxi, air conditioning, heating, plumbing, construction and service software company's. Please check with your CES Wireless representative for more specific information. A list of current partners serving various market segments can be found at www.ceswireless.com

Reports
CES Wireless products provide detailed built in reports, or with our ReportWriter software you can construct your own style reports. While ReportWriter does require certain database skills, any local software resource will be able to construct the report template for you and provide you with customized reports.

Using your own Maps
CES Wireless supports both the ESRI shapefile and Mapinfo international standard. Geographical Information Specialists (GIS) specialists are on staff to assist your needs if required.

Custom Solutions
CES Wireless products are supplied with multiple features. With our own in house engineering group, we can, subject to review and quotation, provide enhanced or customized features. As an example, a public water department wanted to have various landmarks and land parcels shown on their dispatch map screens. We were able to import their own house map data into the CES Wireless dispatch/mapping application providing their dispatchers with an enhanced product that offers tremendous convenience.

GPS-130-/GPS-150 COMPARISON CHART

	GPS-130	GPS-150
GPS Module—Channels	12	12
Conventional Radio Compatible	Yes	Yes
Smart Trunking Radio Compatible	Yes	Yes
Radio Channel Steering	Yes	Yes
Automatic Message Acknowledgment	Yes	Yes
Automatic Message Retry	Yes	Yes
Message Memory	Yes	Yes
Quadtec™ Digital Signaling	Yes	Yes
Track on Poll	Yes	Yes
Track on Interval	Yes	Yes
Track on Exception	Yes	Yes
Emergency Tracking	Yes	Yes
MOTION-trak™ - Intelligent Movement Reporting	Yes	Yes
Geo-ZONES	Yes	Yes
Command Outputs	3	3
Sensor/Control Inputs	8	8
Available RS-232 ports	0	2
Packaging	Commercial	Industrial
External Memory Card (Flash-BOX)	No	Yes
Automatic geo-STATUS™ Reporting	No	Yes
Interfaces to TRK-230 Display Terminal	No	Yes
Data Encryption	No	Yes
Compressed Mode Sending (DACT)	No	Yes

Other Options from CES Wireless

Wireless
GPRS, CDMA and CDPD cellular products are also available from CES Wireless.

Web Based Systems
FLEET-linc is an associated company of CES Wireless and provides a web based fleet management system. Please refer to: www.fleetlinc.com

Non-Wireless Tracking Systems
FLEET-aide is passive system that provides data logging, and then rapid wireless download to the base software when the vehicle returns to the base control area. Please refer to: www.fleetaide.com

General

- Dimensions: 9.5 x 1.38 x 5.5 (25 x 3.5 x 14cm)
- Weight: 28.00 oz (0.75Kg)
- Cabinet: Polycarbonate
- Interface Cable: Shielded factory cable

Electrical

- Voltage: 7-16 V DC
- Current: <200mA
- Microphone Muting: Open collector
- PTT Output: Open collector
- Speaker Mute Output: Open collector
- Horn Alert Output: Open collector
- Auxiliary Inputs: Z=100K -35 to +35V
- Auxiliary Outputs: Open collector
- Emergency input: 0-5V connect to ground via switch
- Ignition Sense: Z=100K -35 to +35V
- Encode Tone Out Imp.: Z=47K or 10K cap coupled
- Encode Tone Out Level: 1 Volt RMS (variable)
- Signal Input Sensitivity: 100-1000mv RMS (variable)
- Signal Input Impedance: Z=67K or 20K cap coupled
- Alert Tone Out Impedance: Z=67K or 20K cap coupled
- Alert Tone Output Level: 1.5V RMS (variable)

Data Signaling

- Format: MSK 600/1200/2400/3600/4800 baud

Programming

- Software: GPS-130S Windows software

Temperature

- Operating temperature: -10 to + 60 deg. C
- Storage temperature: -55 to + 100 deg.

GPS Receiver

- Tracking Capability 12 satellites simultaneously
- Reacquisition < 1 sec typical
- Datums 189 standard, 5 user defined
- Accuracy Horizontal < 6 meters (CEP)
  DGPS < 1 meter (CEP)

Wireless Compatibility

- Conventional Radio Systems
- Multi Channel Radio Systems
- Remote Base Stations
- Community Repeaters/Base Stations
- Passport Trunking Networks
- 220MHZ Networks
- Analog trunking —
        EFJohnson LTR™
        Motorola Smartnet™
        Motorola Privacy Plus™

Radio Interface

- Power 7-16v
- PTT in
- Ground
- PTT out
- Receive audio
- Transmit audio
- Busy/trunk
- Speaker enable
- Alert
- Microphone mute
- Speaker mute
- Ch. change out
- Ch. change in

Controls

- Serial 1 GPS receiver
- Serial 2 Programming
- Auxiliary out 1 Sensor out, e.g. activate lights
- Auxiliary out 2 Sensor out, e.g. deactivate ignition
- Auxiliary out 3 Sensor out, e.g. activate siren
- Auxiliary in 1 Sensor in, e.g. emergency input
- Auxiliary in 2 Sensor in, e.g. ignition input
- Auxiliary in 3 Sensor in, e.g. trunk open
- Auxiliary in 4 Sensor in, e.g. drum active
- Auxiliary in 5 Sensor in, e.g. door open
- Auxiliary in 6 Sensor in, e.g. meter on
- Auxiliary in 7 Sensor in, e.g. status
- Auxiliary in 8 Sensor in, e.g. status