

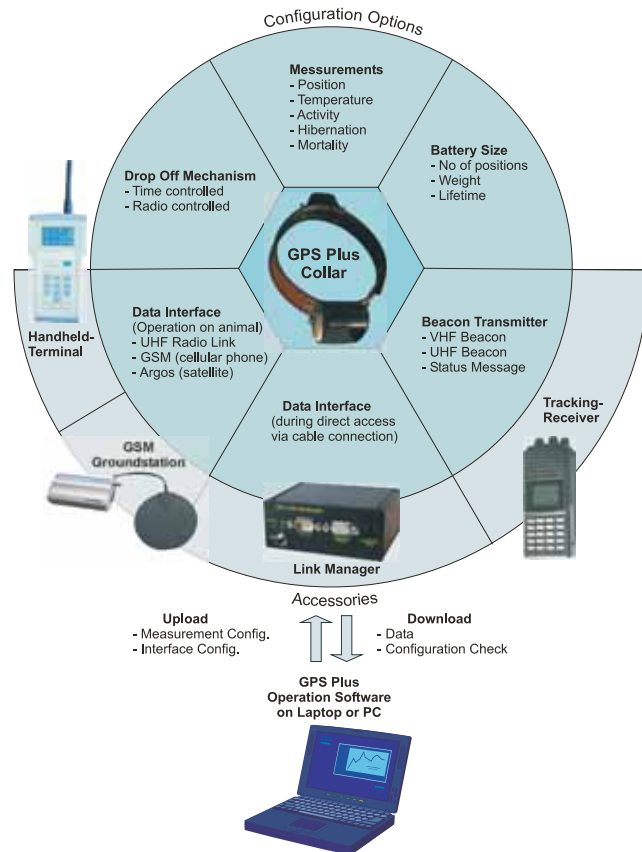
GPS PLUS Collar

VECTRONIC Aerospace offers with the GPS PLUS Collar series a versatile equipment for tracking animals. The success story of this collar is based on its impressive reliability and the various number of user definable options which allow scientists to work with a wide range of species.

The GPS Plus system has been designed to give scientists the most flexible solution for all kind of wildlife studies.

The GPS Plus collars provides:

- GPS position
- Fine scale ambient temperature information
- Fine scale Activity information
- Other sensor data ideally suited for wildlife studies



Communication options

One of the most important features is the flexible wireless data communication in both directions on demand. At any time scientists have wireless access to the collar for downloading positions, temperature, activity and mortality data, or uploading new GPS or beacon schedules. This capability is a valuable tool when instant access to the collar is required. Not enough to have UHF two-way communication the GPS PLUS collar can be equipped additionally with a GSM modem (850/900/1800/1900 MHz) or with an ARGOS transmitter.

UHF bi-directional communication

The GPS PLUS collar comes with an integrated UHF radio transceiver to download data on demand or to receive new schedules while the collar is still on your animal. Depending on country regulations different frequencies and power levels are available. The UHF radio transceiver is available from 420 - 460 MHz and 860 - 925 MHz, the output power is adjustable from 10mW to 2 Watt.

GSM bi-directional communication

In addition to the UHF transceiver the GPS PLUS collar can be equipped with a GSM Modem which sends the GPS and mortality data as single or multiple SMS to your office. In case of no GSM coverage the data will be re-sent later when the collar is back in GSM coverage. New schedules or advanced configurations might be uploaded to the collar via SMS too.

ARGOS Transmitter (available Spring 2006)

Another communication option is the internal ARGOS transmitter for uploading GPS position data to the ARGOS satellites. ARGOS collars without GPS will be available in Spring 2006 too.

Sensor options

In addition to the GPS position the GPS PLUS system offers the possibility to measure and store different kind of data. Sensors can be added without increasing size and weight of the collar:

- Ambient Temperature
- Activity of the animal
- Mortality events
- Hibernation Sensor
- Virtual Fences
- Wireless interaction monitoring between different GPS PLUS collars or external tags.

Ambient temperature monitoring

The GPS PLUS collar stores every five minute the ambient temperature with a resolution of 1°C over a period of up to 3.5 years.

Activity monitoring

The powerful activity sensor measures the true acceleration of the animal 6 - 8 times per second. The accumulated value is stored like the temperature information every 5 minutes over a period of up to 3.5 years.

Mortality detection

The collar detects and stores up to 132 possible mortality events (time and date). In case of an event, the repetition rate of the VHF beacon transmitter will switch from 48 to 96 bpm.

Hibernation sensor

The collar switches automatically to hibernation mode, saving battery power if the animal's movement and activity schemes are quite low (GPS receiver will be switched off) and will re-enter normal operation if the animal is moving again.

Virtual Fences (only with GSM option)

The collar sends an SMS when it has entered or left user definable polygons. The polygons can be updated via SMS (Short Message Service).

Handheld Terminal LM1 Link Manager

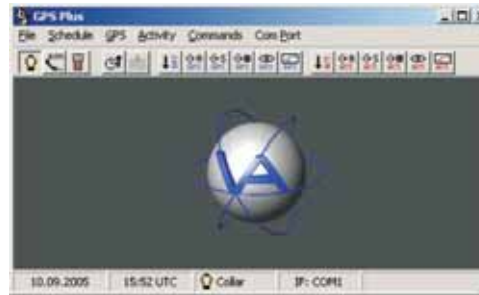
GPS PLUS Software

The GPS Plus Handheld Terminal provides the wireless UHF radio interface between a PC and the GPS-Plus collar while the collar is still on the animal.

- Download GPS data from the GPS PLUS collar on demand
- Download high resolution activity and temperature data from a collar
- Download mortality data
- Download telemetry (status) information from the collar
- Upload UTC time and date to the GPS PLUS collar
- Upload new GPS schedule to the GPS PLUS collar
- Upload new UHF beacon schedule to the GPS PLUS collar
- Upload new VHF beacon schedule to the GPS PLUS collar
- Activate the powerful UHF beacon
- Integrated GPS receiver and electronic compass
- USB and RS232 serial interfaces



- All in One Software
- Control and configure collar, Handheld Terminal and GSM Ground Station
- Powerful GPS, UHF, VHF and ARGOS scheduler options
- Export data to ASCII, Spreadsheet or DBASE format
- Graphical presentation of GPS and Activity data
- Export GPS data into more than 100 different worldwide coordinate / grid systems
- Automatic email support for GPS and mortality data (GSM collars only)



GPS PLUS Collars for wildlife

Multiple Sensor Options:

- GPS Position
- Activity sensor (acceleration)
- Temperature
- Mortality
- Hibernation
- Wireless interaction monitoring between GPS PLUS Collars or GPS PLUS Collar and external Ear Tags
- Virtual Fences (GSM Collars only)

Multiple Communication Options:

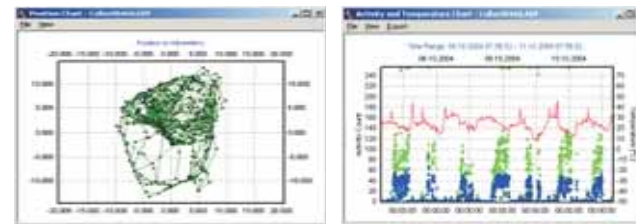
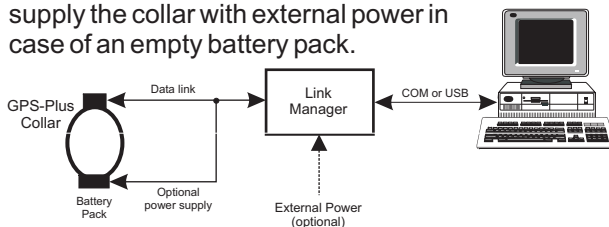
- UHF 2-Way Communication for data download and collar reprogramming
- GSM 2-Way Communication for GPS data download and collar reprogramming
- ARGOS Transmitter



The LM1 Link Manager provides the interface between your PC and the GPS-Plus collar or a handheld terminal.

It is used to exchange data and to upgrade new firmware in your

GPS-Plus collar or handheld terminal. With its own internal rechargeable battery, it can be used very easy to access the collar with an external PC and to supply the collar with external power in case of an empty battery pack.



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