

Description of Circuitry of Digital Angel CDPD System

The Digital Angel CDPD System consists of several function blocks, which perform various operations according to the system design:

1 The system operates on CDPD network. It uses GPS for position tracking purpose. It also has built-in fall down sensor and temperature sensor for bio-information purpose. The device communicates locally with the watch unit, which has the temperature sensor and RF transmitter to sense and send the temperature data wirelessly to the pager unit, which has the RF receiver to receive the information sent from the watch unit. The pager unit has a built-in fall down sensor, which can monitor the device carrier's physical body state. It will trigger an alarm if the carrier falls down unexpectedly and in a harm way. The pager unit will trigger an alarm if the temperature runs out of pre-defined temperature range or if the carrier is out of the pre-defined geo-boundary. The carrier can trigger an alarm if he or she pushes the panic button, and the alarm will include the position data, body state data and temperature data. The monitor center can call the unit remotely and configure the unit remotely to get the updated information of the device carrier.

2 The all system function is controlled by its micro-controller. Under its control, CDPD module collects the data from output of the controller, and send the data to the monitor center via CDPD network. The CDPD module also receives the call from the monitor center and sends back to the micro-controller for further data processing. When the controller receives the call from CDPD, it starts searching for the desired information and then make decision according to result of the data processing. GPS module gets position data if it is turned on by the controller, and then sends back to the controller for further data processing. The falldown sensor constantly monitors the physical body state if it is turned on by the controller, and if the alarm condition is met, then it sends the alarm data back to the controller for further data processing.

3 The temperature monitoring function is done through local RF link between the pager unit and the watch unit. The watch monitors its temperature periodically if it is turned on by the carrier. If the alarm condition is met, it sends the alarm data back to the controller for further data processing. It also sends the temperature data back to the controller for normal data request from the monitor center or if the panic button is triggered. All these function is controller by its internal micro-controller.

4 The power management system is controlled by the system micro-controller. GPS receiver module is turned on only during data request. At the same time, CDPD module is turned off to save the power and to reduce the interference between CDPD module and GPS module.