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# Portable Telemedicine Station

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# Focus

- Our concept supposes that a portable unit based on computer motherboard could be developed, with physiological programmable data acquisition devices

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# Functionalities

- Mobile Intensive Care Unit
- Clinical Lab Station
- Central Management Telemedicine Station

# Functionalities

- One hardware platform for the requirements of the three suggested applications
- Booting configurable device
- Patient interface hardware remotely configurable
- “Real” portability: less possible weight and maximum energy support.

# Basic Design

- Intel chipset motherboard with a 1 GB pen-drive booting device, 512 MB RAM, TFT 17” monitor and USB Bluetooth communication system. The energy necessary for the station was provided for a PC power supply modified to support a 24 volt battery input. All the components placed in an aluminum case.

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# Mobile Intensive Care Unit Cnf.

- Booting device
- Bluetooth communication
- Patient modules ( developed with a DSP chip and a Bluetooth interface . FPGA in progress……)

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# Clinical Lab Station Cnf.

- Booting device
- USB analytical modules
- Necessary chemical stuff
- Calibration procedures

# Central Management Telemedicine Station

- Booting device
- USB communication system
- VoIP communication system
- Radio interface
- GPS
- Videoconference system

# Preliminary Results

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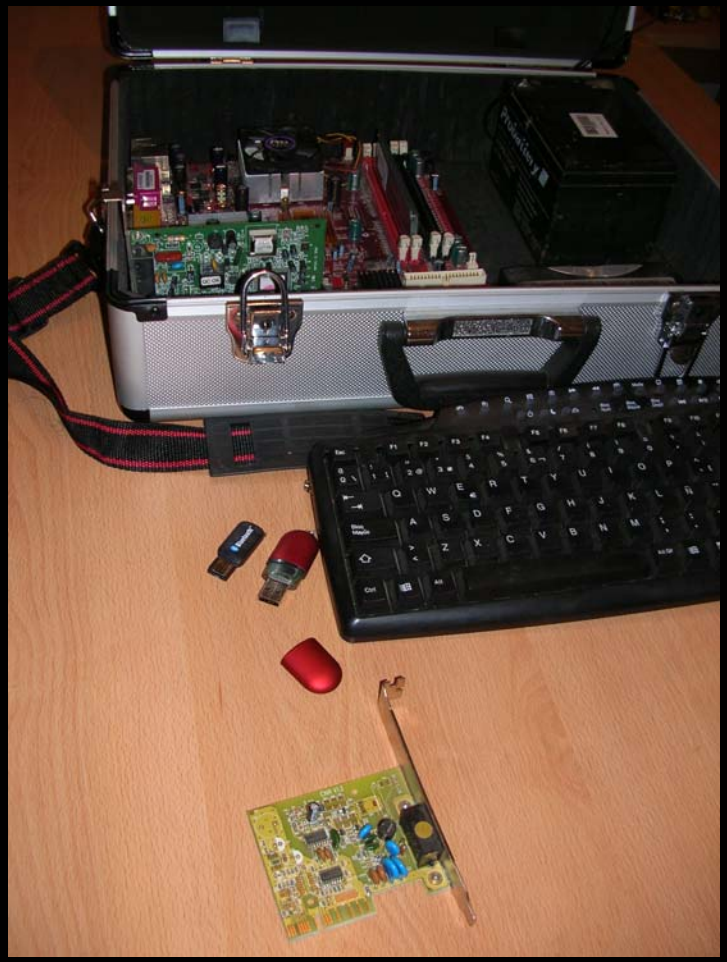
# Design I



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# Design II

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# Mobile Intensive Care Unit

- 11 channels digital acquisition of physiological variables and a Bluetooth communication system. In the prototype 4 measures were implemented:  ECG, Temperature, FR and FC

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# Mobile Intensive Care Unit Test

- The system start and then try to link and identified each patient monitor. After this operation, measurements taken and processed by the devices, was displayed in each patient window in the central unit. No interferences or any other success was detected in a room with fluorescent lamp, two AC motors and a air conditioning system working at the same time.

# Clinical Lab Station

- With the same hardware mentioned before, we have programmed a basic center of clinical analysis.  For it, we used a coulter blood analyzer with measurement of hemoglobine concentration, a PH-meter (temperature compensated) and a 340 nm absorption meter

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# Clinical Lab Station

- The microprocessor captures the data output of each measurement system, conform a first processing and then send it to the USB port, that is connected to the main computer.

# Clinical Lab Station

- Practical results show us that we have some software incidences in the microprocessor, that will be corrected in the future. Could be using FPGA technologies…….

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# Central Management Telemedicine Station

- This application was developed thinking about offering a solution of technical support in telemedicine in a catastrophe zone

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# Central Management Telemedicine Station

- The idea is to do a central telemedical system with:
  - GPS positioning
  - Multi-platform medical data management
  - Full videoconference features
  - Redundat communication system

# Central Management Telemedicine Station

- We provide fully programable FPGA MODEM: interface to Radio VHF-UHF 12.5 kbps data rate capable, Celular Phone, Regular Phone, and Satellital ( in test ) too ( our development).
- GPS interface, with digital mapa integration ( capture a map, place two points with GPS, and the navegate it. )
- USB Digital Camera, to online reports..and videoconference ( and to acquire a maps )
- Basic HL7 interface software and bluetooth connectivity to handheld devices

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# Central Management Telemedicine Station

- The handheld devices “working in the field”, provide instant acces to each patient condition, and  they will allow to centralize the health data to perform a “global” patient management in direct contact whit the Central Emergency Administration

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# Conclusions

- With the same hardware core and a system configuration installed in a USB pen-drive, the portable medicine station was demonstrated a flexible configuration and it allowed us to validate the design concepts. Numerical results and validation data are being obtained at the time of writing this article.

# Conclusions

- We wish to interchange opinions about the design aspect in our work, to be able to optimize the performance and functionality of the station.

# THANKS
# The Dream Team


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