Epsilon*Pi*

### Great ideas need great tools

➤ TECHNOLOGY

EpsilonPi is an advanced *IoT* platform born to be the core of *scientific instrumentation*

- ✔ *Powerful,* by a fast Ethernet interface and dedicated software libraries
- ✔ *Reliable,* with the wedding between RaspberryPi and a DSP-based controller with real-time performances
- ✔ *Flexible,* thanks to task-specific companion cards

➤ ARCHITECTURE

EpsilonPi is organized as a modular network of microcomputers addressed and programmed over Ethernet by a command-based software interface.

Issued commands are managed and serially forwarded to a DSP-based controller directly interfaced to task-specific companion boards and capable to perfom feedback control loops. Our architecture is the result of a nice team-work with researchers of the Italian National Research Council.
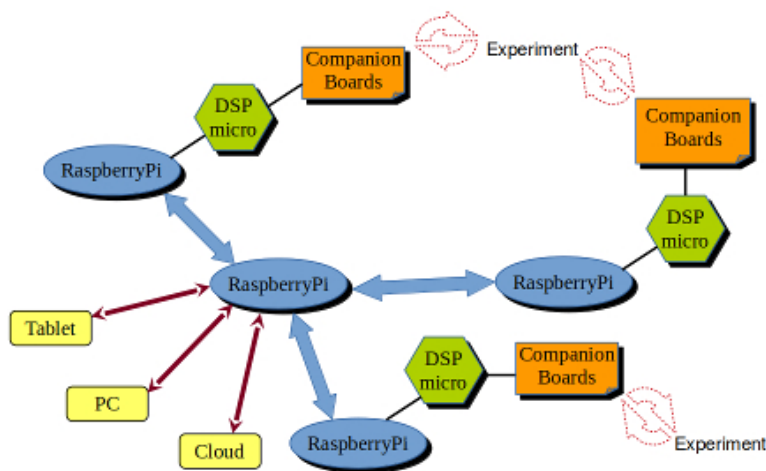
➤ HARDWARE

End-point cards feature sophisticated fast analog-to-digital, digital-to-analog converters, digital input-output, servo controllers, waveform generators, analog multiplexing, sensor drivers, trigger boards and much more. Custom task-specific boards can be further added to fit specific requirements.

➤ SOFTWARE

EpsilonPi is accessed over the Ethernet using ZeroMQ, probably the most powerful communication protocol available today (http://zeromq.org).
User transparent, fast low-level data and command interfaces automatically address the received commands to the DSP side, also providing accurate data transfers.

➤ RUNNING EXAMPLES

- Quartz Crystal Microbalance
- Optical Tweezers
- Atomic Force Microscopy controller
- Trans-epithelial cell membrane reader
- Calcium analyzer

plus a series of other applications where EpsilonPi was integrated as a flexible brick.

➤ Epsilon*Pi* CUSTOMERS

REFERENCES:
√ Flexible control for Atomic-level observation, Microsolutions, Jan-Feb 2016, pag 25.
√ A Quartz Crystal Microbalance Based on a dsPIC Digital Signal Controller, Microsolutions, Mar-Apr 2018, pag 22.