CUBESATCAM

IMAGE ACQUISITION SYSTEM FOR CubeSat Kit™ FORM FACTOR

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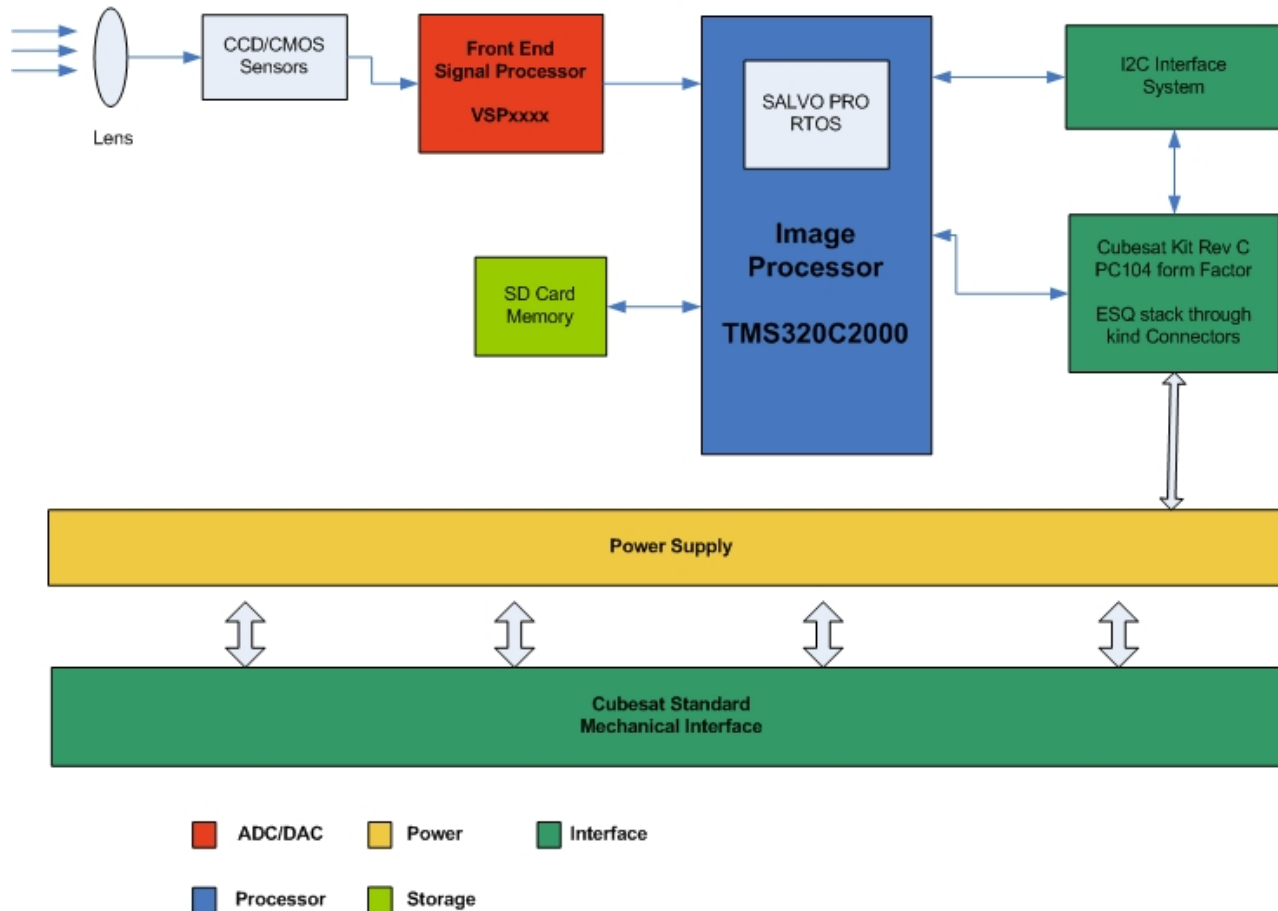Bogota, Colombia**

SUMMARY

OBJECTIVES

• Develop an image acquisition system for cubesatkit form factor with features for connecting and setting up easily.

• Purposes related with researching around cubesat payloads.

•Increase SAUSL knowlegde level status in CubeSat development.

SYSTEMS CHARACTERISTICS

- I^2C compatible.

- Low power consumption.

- Temperature range.

- PC-104 form factor.

- 100 km x 100 km scene.
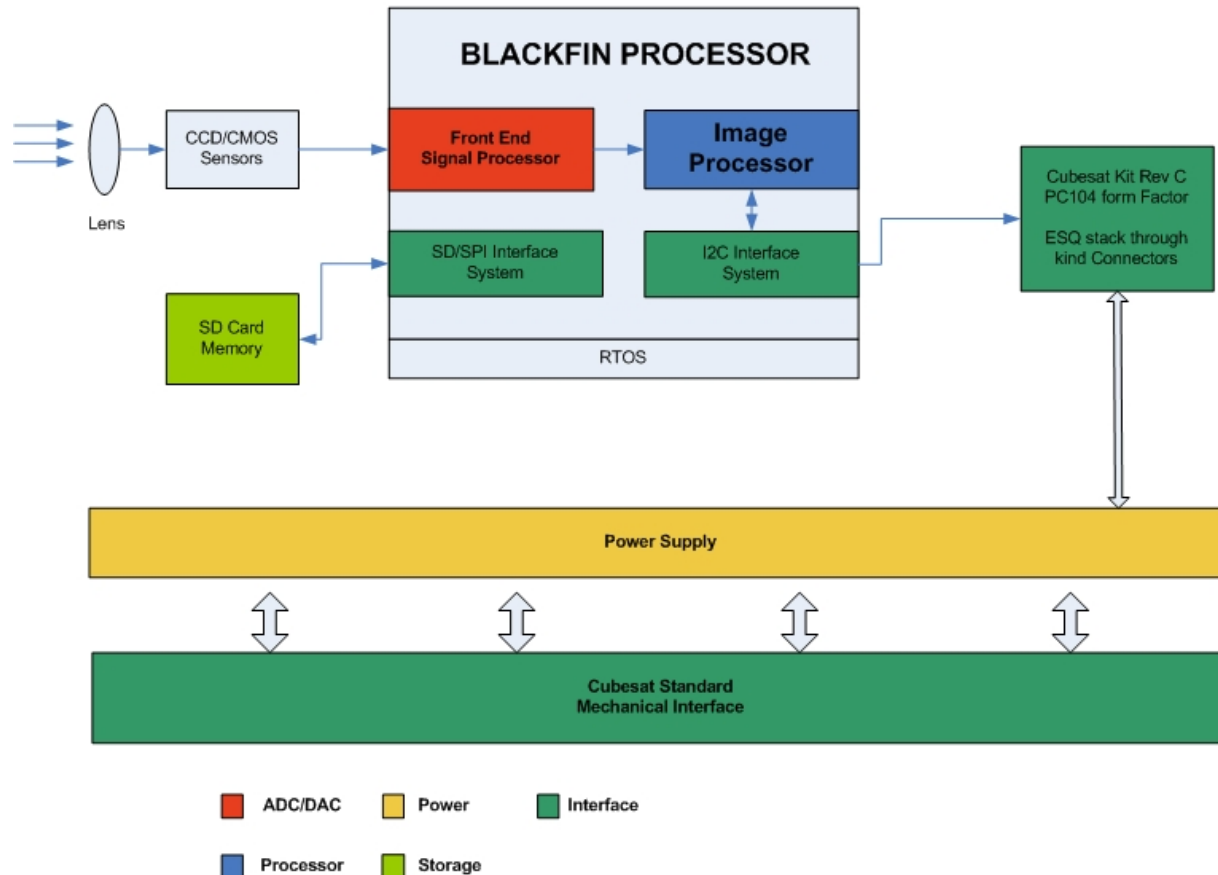
- Low weight < 70 g.

SYSTEM OVERVIEW

TI-TMS System Overview

SYSTEM OVERVIEW

ADI-Blackfin System Overview

CubeSat Kit™ FORM FACTOR

- Wiring-free interconnect Scheme

- PC/104 System Bus

- Standardized 104-pin stackable connectors

CubeSat Kit™ Breakout Board

From www.cubesatkit.com

WHY BLACKFIN?

• **Good balance between high performance and low power consumption**

• **SIMD architecture, including instructions for image processing**

• **Onboard support for pre-processing images.**
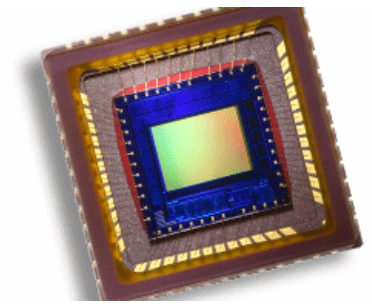
• **Encoder Performance**

SOFTWARE

- **C Language.**

- **VISUAL DSP++ for BF (temporarily)**

- **uCLinux Support**

INTERFACE

- I^{2}C commands
  - Turn on
  - Sleep
  - Download
  - Erase

- Hardware control signals
  - Shutdown by cmos arrange.

THE SENSOR

™	Kodak CDD KAI-0373	Aptina CMOS MT9V032
Temperature	-25⁰ C - +55⁰ C	-30°C to +70°C
Noise	55 e-RMS	25 e-RMS
Power Supply	Additional voltage levels required	3.3 V
System Size	Comparable	Comparable
Flexibility	Easy redesign	Chip changing required

EXPECTED TESTS

Safety Compliance Requirements

1. Vibration Testing
2. Thermal Vacuum

Function and Operation Tests

1. Airplane.
2. Balloon Sat Mission
3. Libertad II.
4. Any one for tennis?

SOME APPLICATIONS

- Land use.
- Snow melting.
- Area resources.
- Vegetation studies.
- Arecife studies.
- Technology demonstration

REFERENCES

1. CCD vs. CMOS.
    http://dalsa.com/markets/ccd_vs_cmos.asp
2. Cubesat Camera payload report from Aalborg University.
    http://www.cubesat.auc.dk/documents/pdr/payload_1.5.pdf
3. Cubesat organization
    http://www.cubesat.org
4. Pumpkin CubeSat Kit^{TM} webpage.
    http://www.cubesatkit.com
5. Sergio Arboleda University SAUSL
    http://www.usa.edu.co/proyecto_espacial

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! THANK YOU !