Libera
Electron Beam Position Processor
Rok Uršič
Instrumentation Technologies
Slovenia

All-In-One
Customizable
Feedback-Ready
Libera Family

- Common to all members
  - Digital Board
  - Core Software
- Specific for each Member
  - Analog Board
  - Member specific Virtex II Pro embedded software
    - Member and user specific Virtex II Pro embedded software
  - Member specific SBC software
    - Member and user specific SBC software
- Electron beam position processor is the first member (see references for details)

Programming Modules

```
ADCs

SBC
Virtex II Pro
FPGA
PPC
PPC
Rocket IO

Communication Ports

RAM

3 x Ethernet
8 x Fast Serial Links (Fibre Channel)
```

rok@i-tech.si ; www.i-tech.si  Rok Uršič
SBC Software Architecture

**Functional Block Diagram**

Electron beam position proc.
Feedback Building

- Rich connectivity
  - Public network (3 x Ethernet)
  - Private Network (8 x reconfigurable Rocket IO via front panel SFP connectors)
- A variety of architectures possible
  - Soleil
  - Diamond
  - ... your choice

Performance Results

- The results that follow are preliminary with no signal conditioning
- Final performance results will be:
  - Based on statistics of 100+ modules,
  - with signal conditioning.
- CE certified
  - LVD
  - EMC
    - Emission
    - Immunity, test level: special 50 V/m up to 1 GHz
Resolution - CW

![Resolution CW Graph]

Beam current dependence - absolute

![Beam Current Graph]
Beam current dependence - relative

Temperature stability

\( f_{RF} = 352.202 \text{ MHz CW} \)
\( f_{sampling} = 108.369 \text{ MHz} \)
\( k_y = 11.4 \text{ mm} \)

\[ Y = 0.0033x^2 - 0.2849x - 129.5 \]

rok@i-tech.si ; www.i-tech.si
Rok Uršič
Summary

- Libera is a product family
- Most of performance requirements of electron beam position processor already met without signal conditioning including EM immunity
- Feedback building block with rich connectivity – variety of architectures possible
- 100 + production units fabricated and tested
  - Very good manufacturing yield
  - Excellent module to module reproducibility
- First deliveries to clients
  - 150 units: Dec 2004
  - First round of Tryouts: Jan 2005