The Gigabit Link Interface Board (GLIB)

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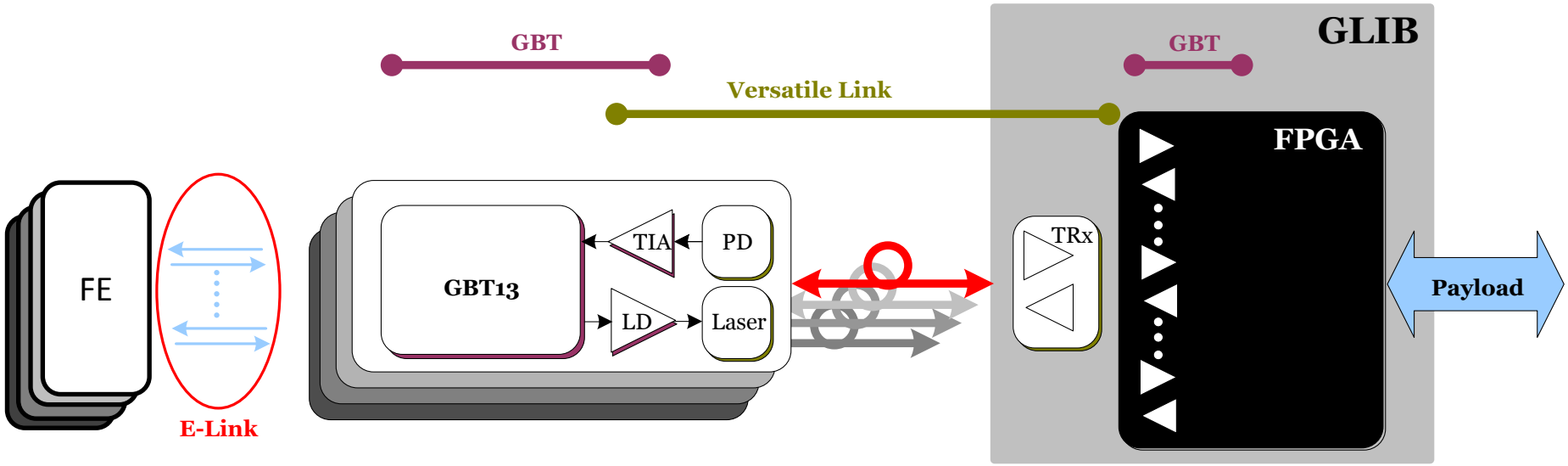
Opto Working Group Mini Workshop, 2012.06.08

CONCEPT

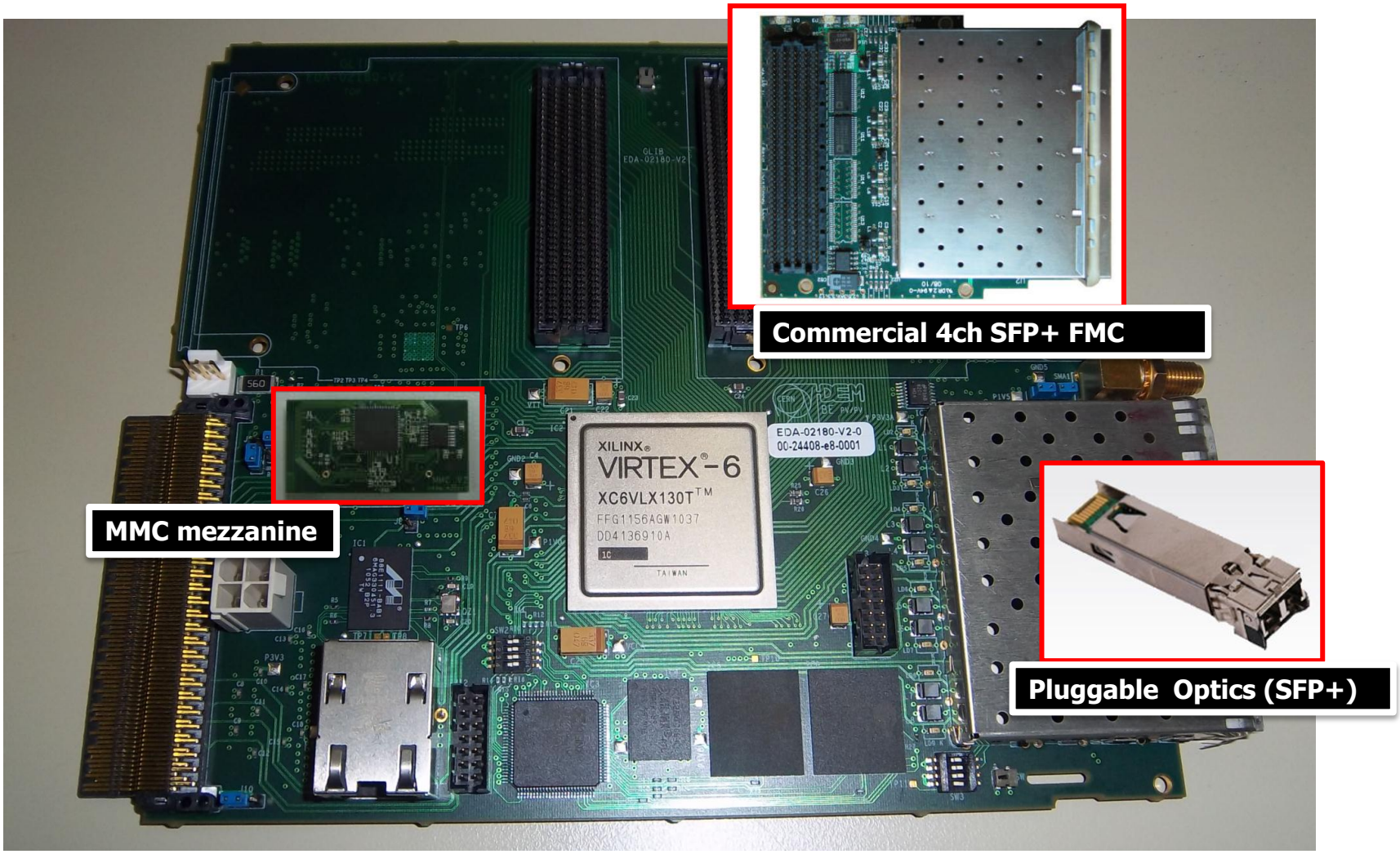
THE GLIB IS: an evaluation platform and an easy entry point for users of high speed optical links

THE GLIB IS TARGETED FOR:

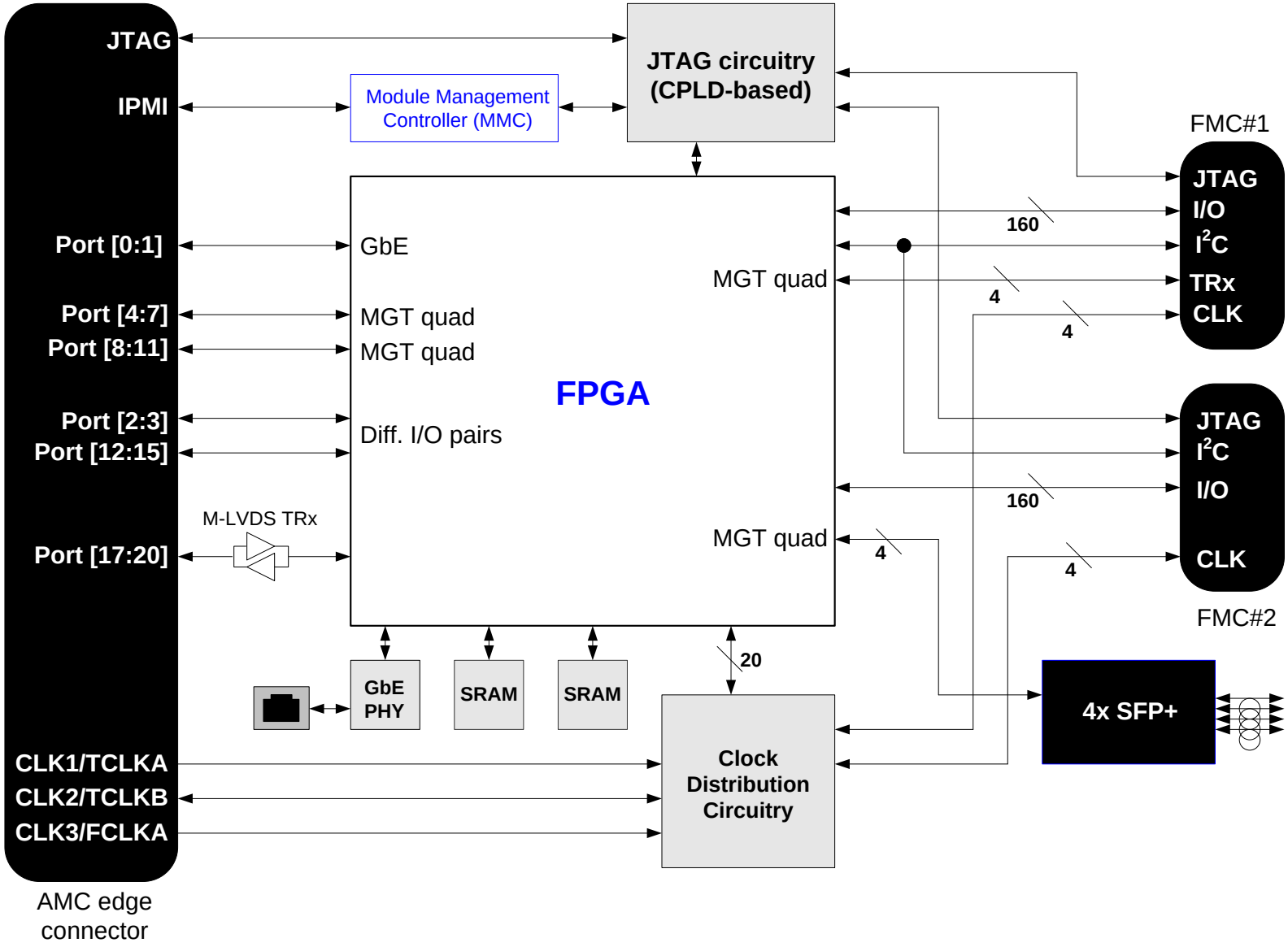
- optical link evaluation in the laboratory
- control, triggering and data acquisition from remote modules in beam or irradiation tests



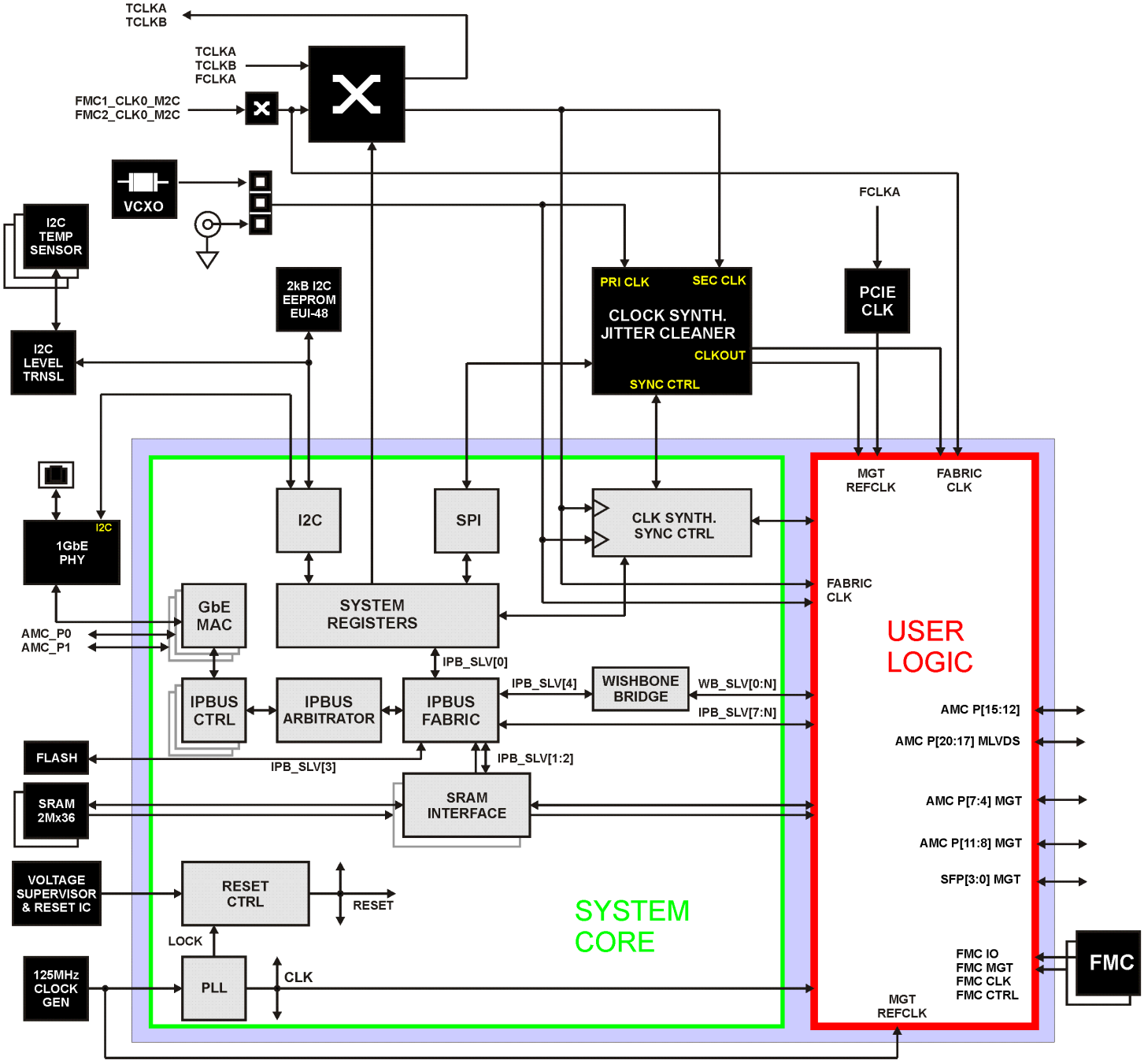
OVERVIEW


Commercial 4ch SFP+ FMC
MMC mezzanine
Pluggable Optics (SFP+)
XILINX
VIRTEX-6
XC6VLX130T
EDA-02180-V2-0
00-24408-e8-0001

ARCHITECTURE



FIRMWARE



INCLUDES

IPbus f/w

COMPATIBLE

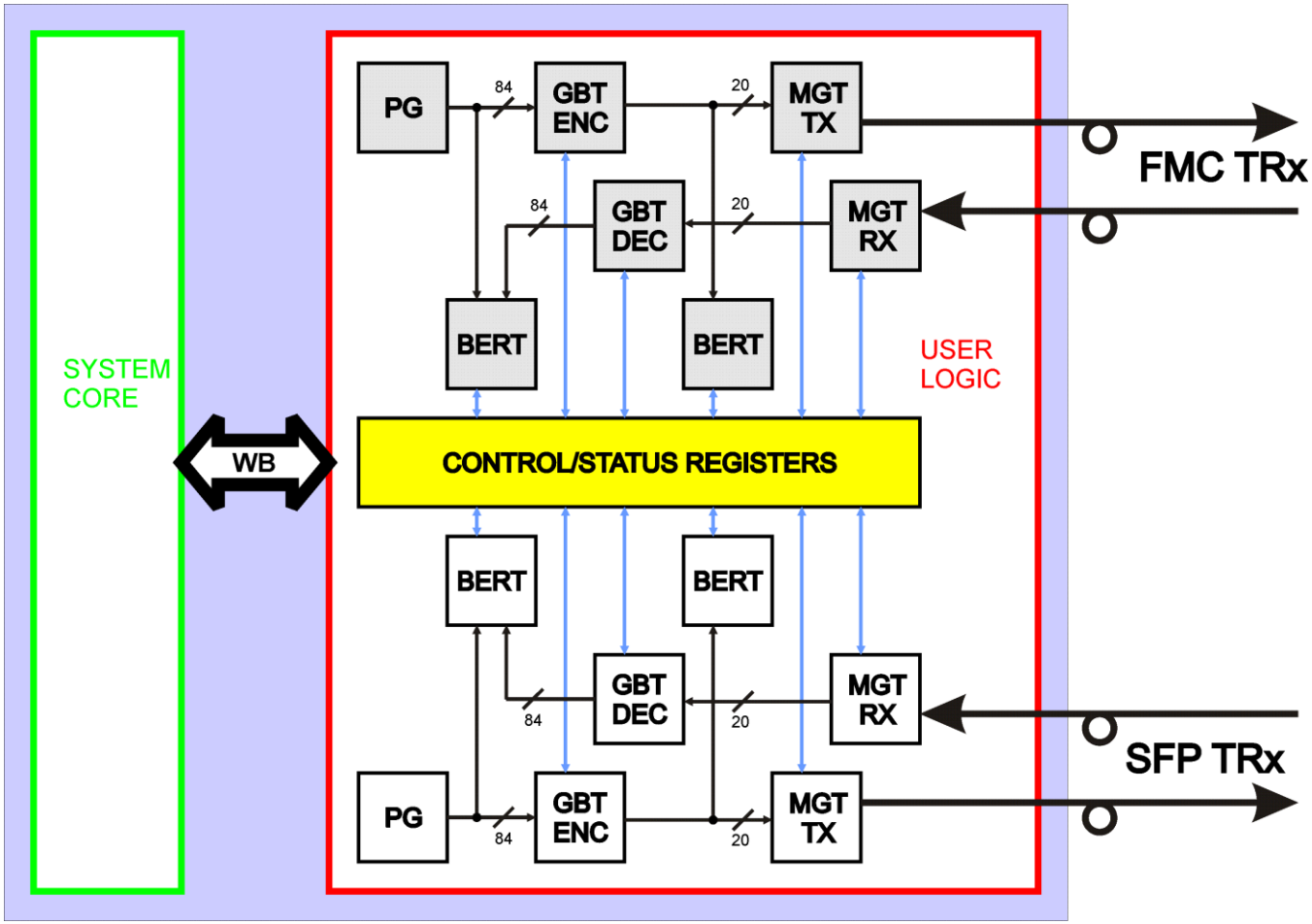
PyChips

microHAL IPbus Hardware Access Library

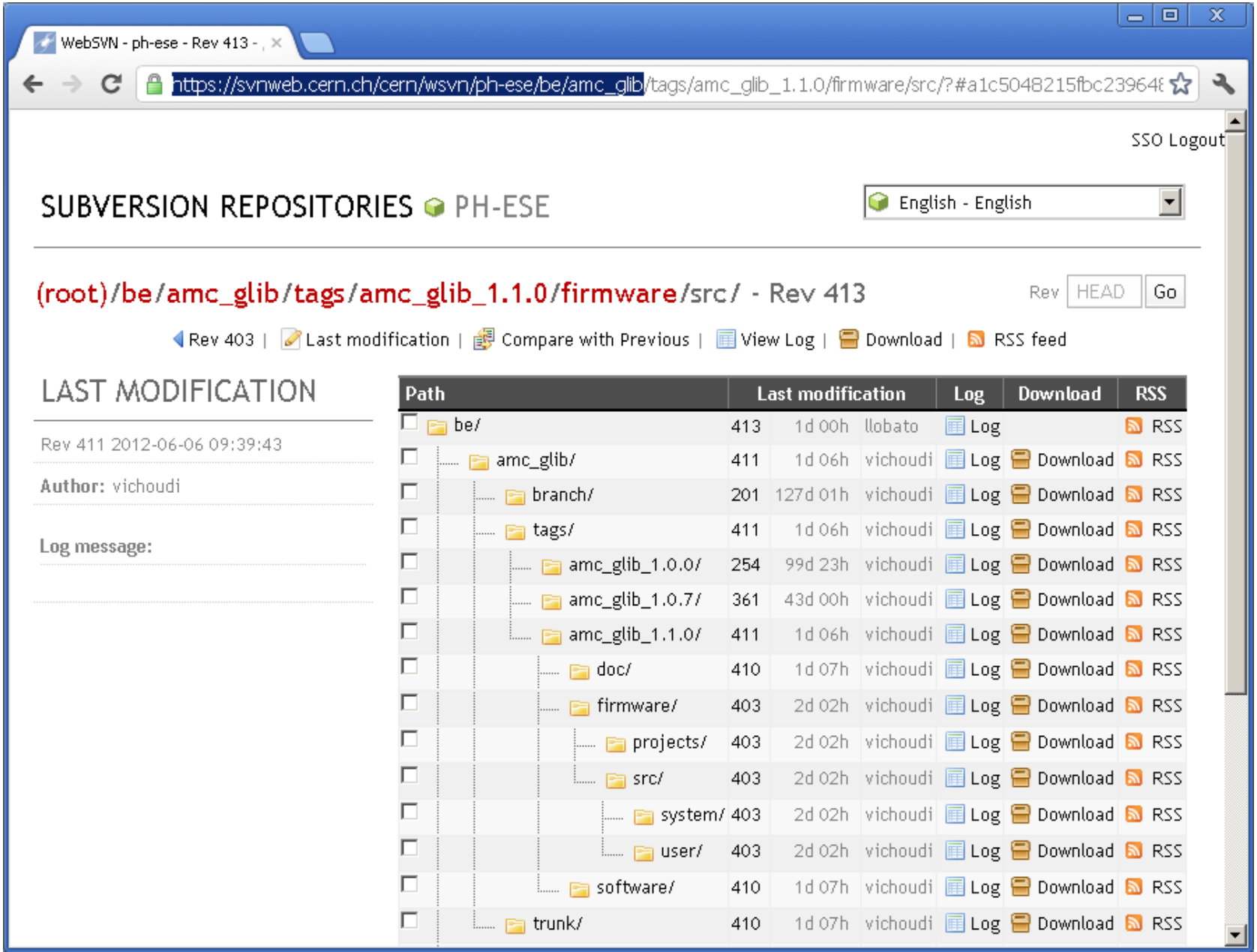
CONTROL hub

more info

USER LOGIC EXAMPLE



SVN REPOSITORY



MAJOR ACHIEVEMENTS

- **GBT FPGA HDL core improvements**
  - Minimized the latency (20-bit MGT interface instead of 40)
  - Adapted the HDL core to Virtex-6 features for deterministic operation

- **Demonstration of GBT communication**
  - between a GLIB and the GBT evaluation board
  - between two GLIB cards with unrelated clocks

- **Successful implementation of GLIB PC interface**
  - Gigabit Ethernet in Stand alone mode and in a µTCA crate

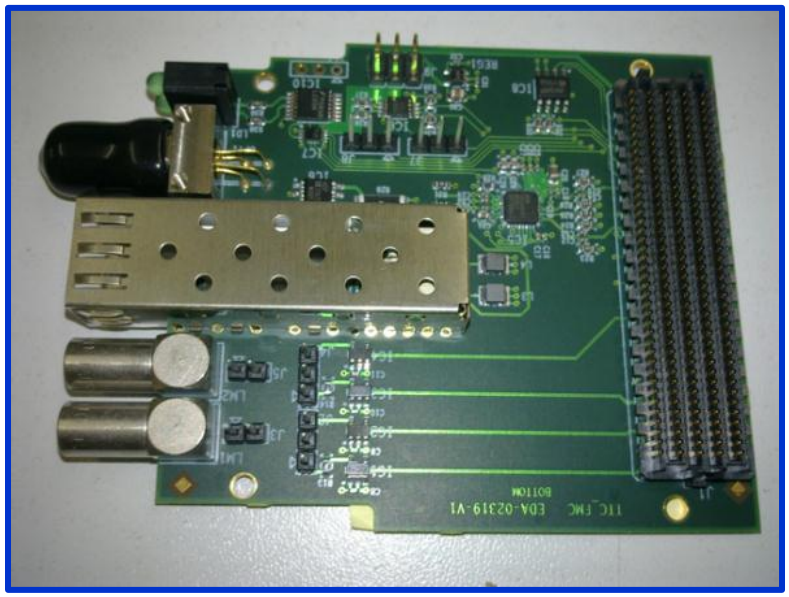
- **Successful integration of FMC modules for I/O expansion**

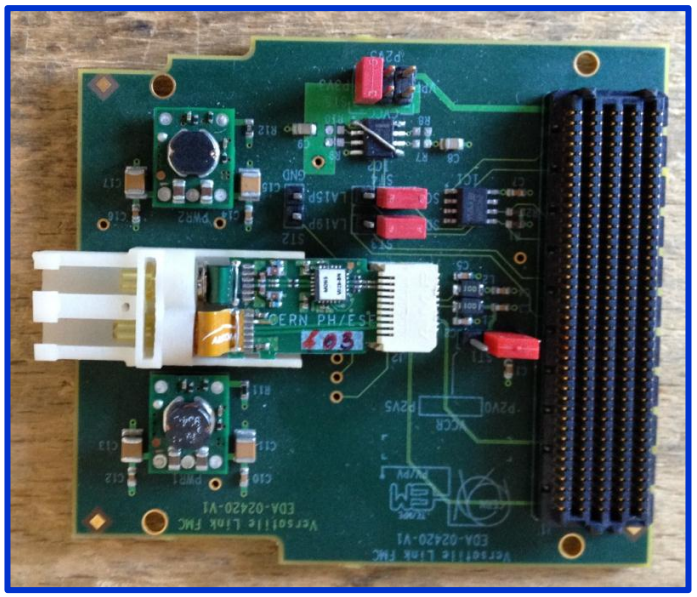
- **Firmware architecture for facilitating user development**
  - Separated system/user parts
  - All complexity interfacing/controlling on-board circuitry transparent for user

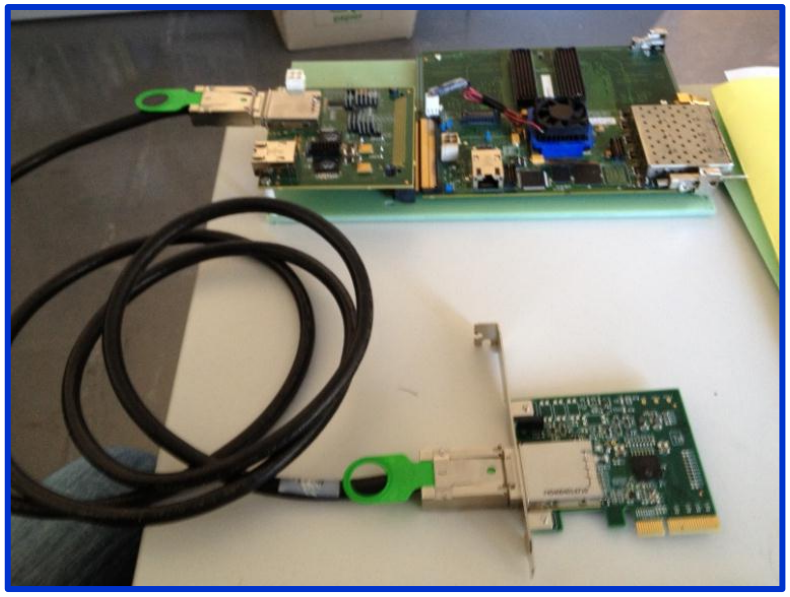
- **Delivery to beta users**
  - GLIB HW/FW/SW/doc to CMS, ATLAS & ALICE
  - continuous support

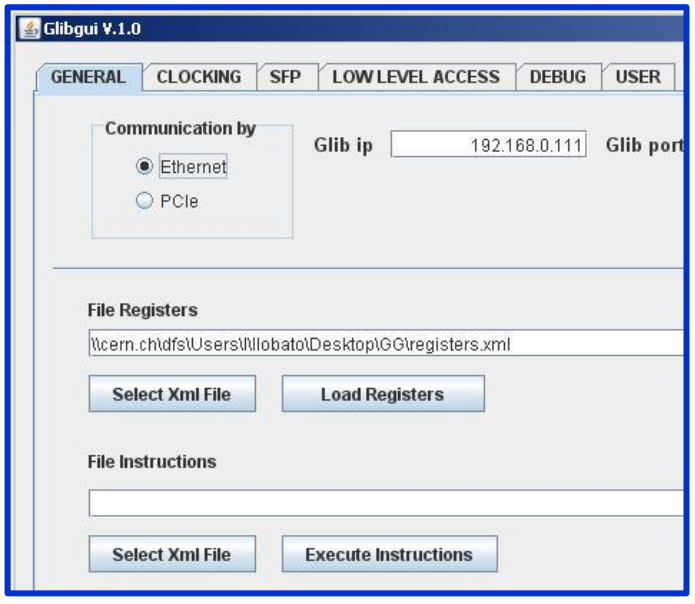
- **Big interest from the community**
  - 4 experiments, 10 projects, 20 users, 30 GLIB by end 2012

THE GLIB ECOSYSTEM



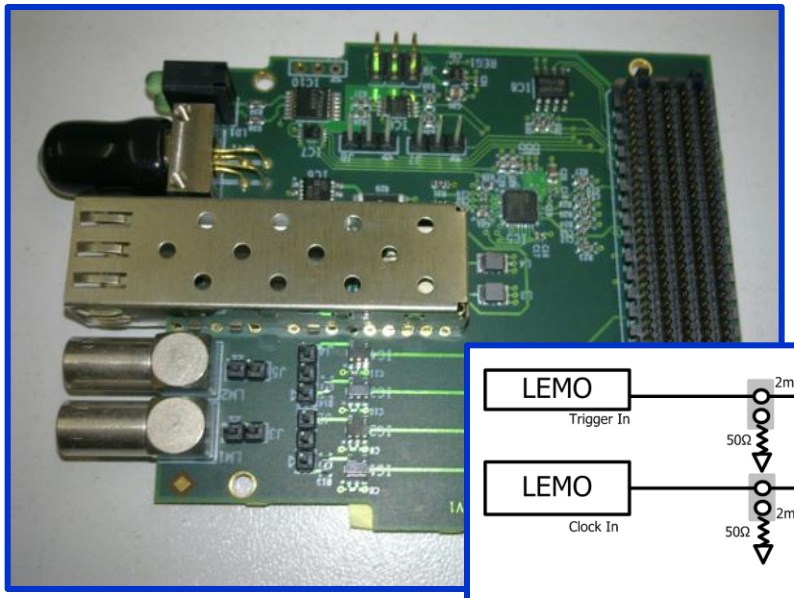


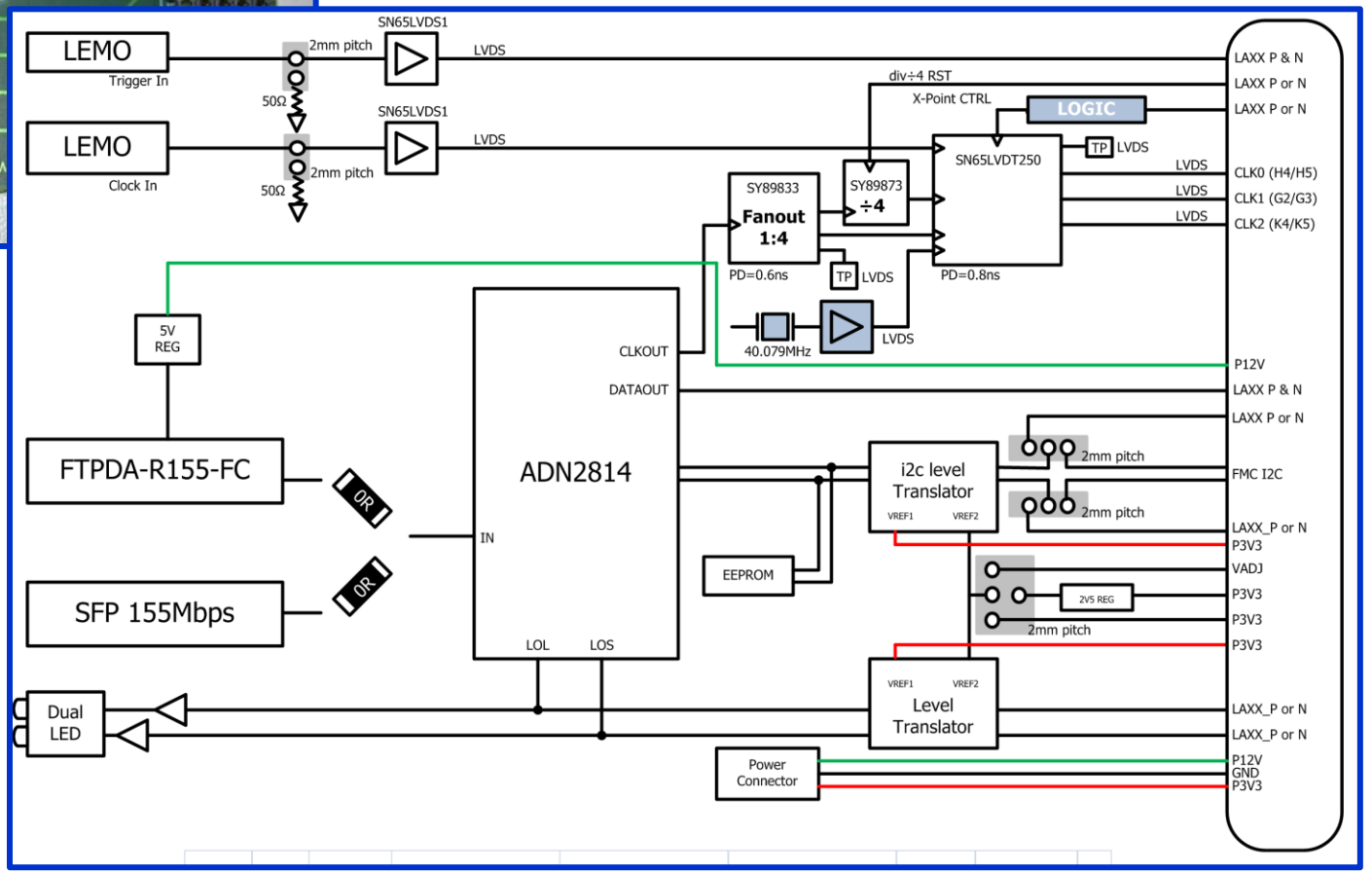




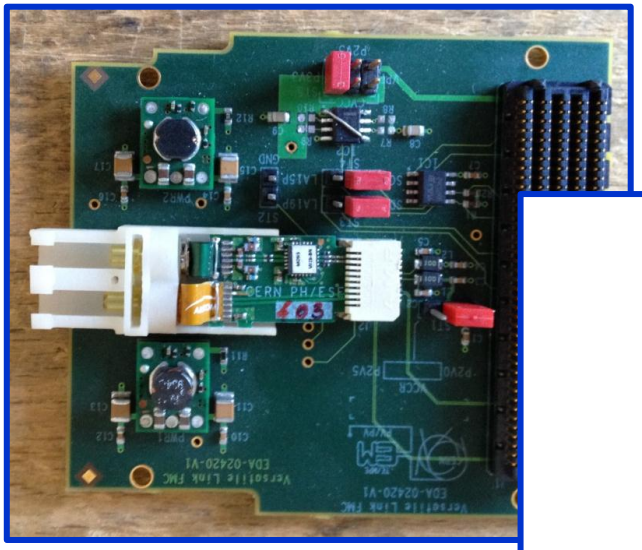
THE GLIB ECOSYSTEM

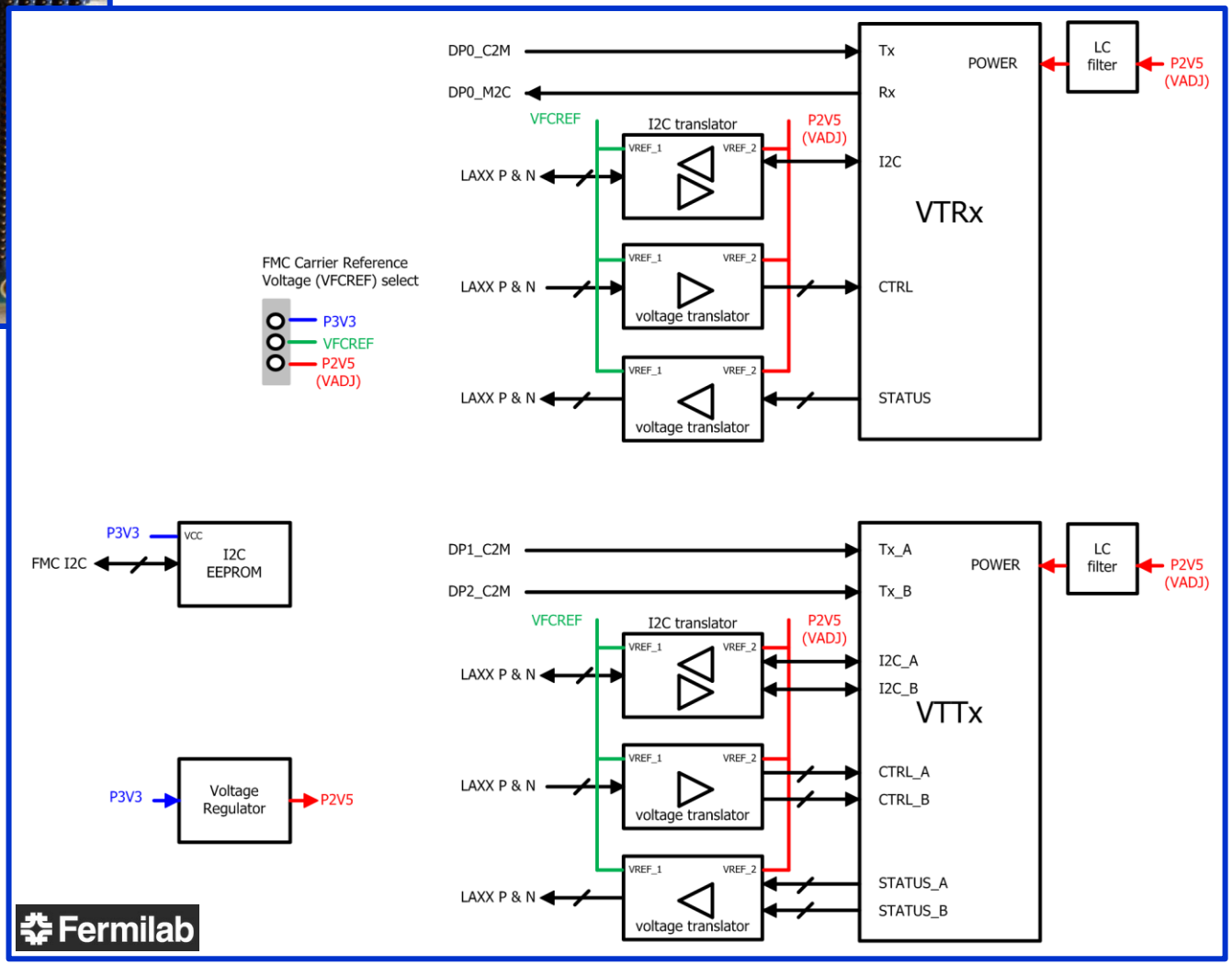
TTC FMC



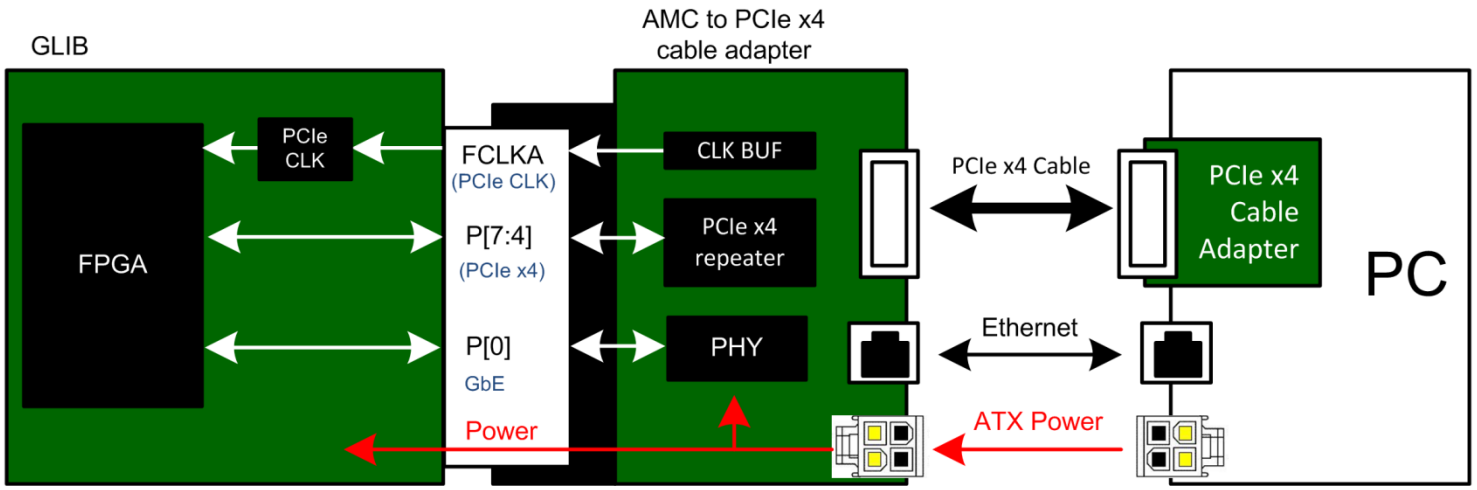


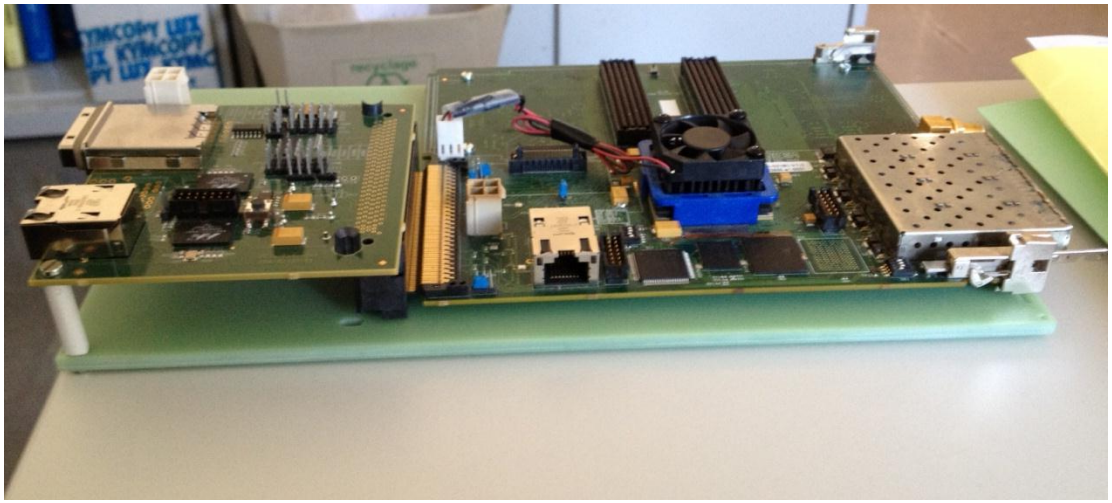
VERSATILE LINK FMC





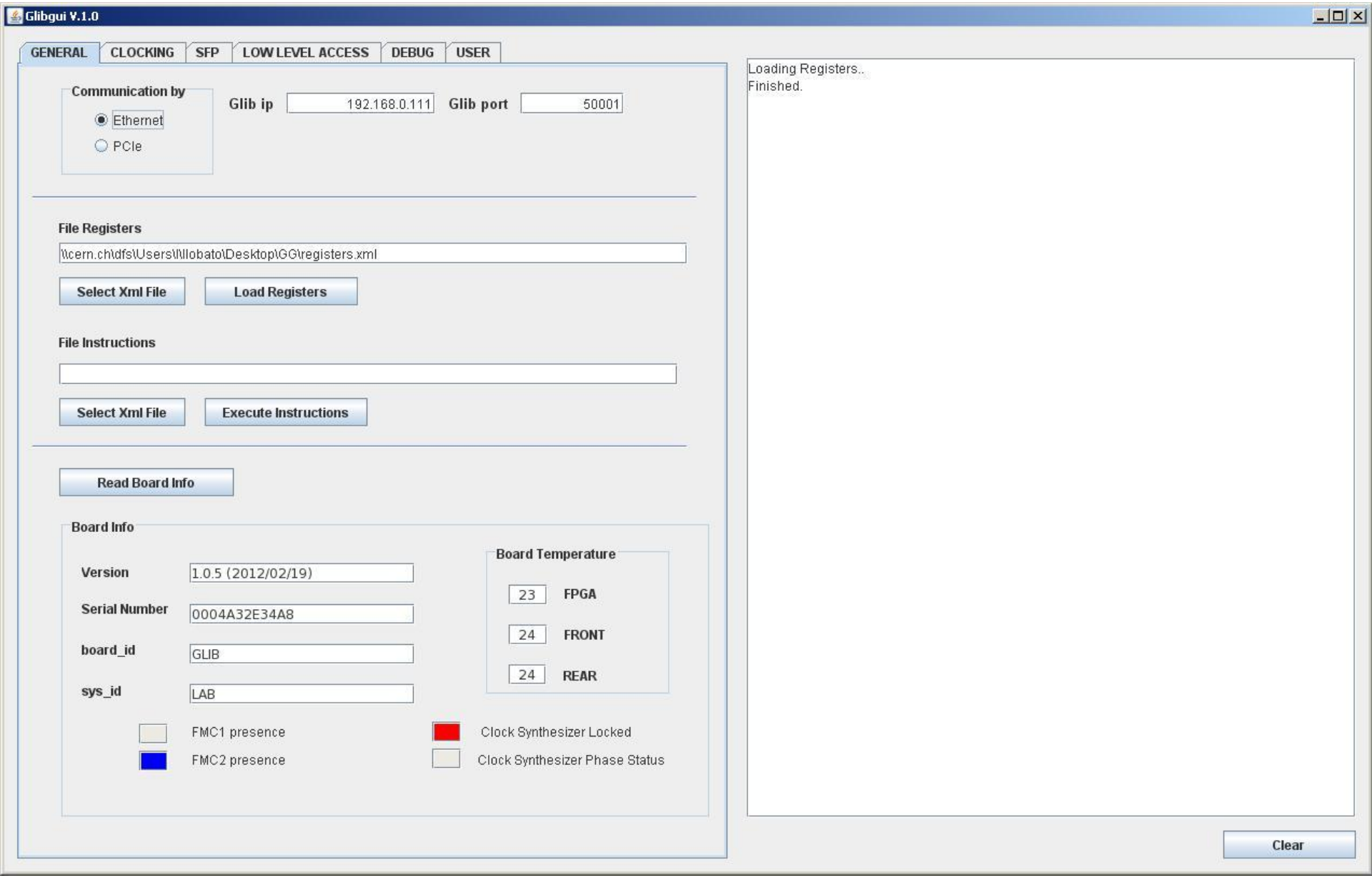
PCIe ADAPTER





THE GLIB ECOSYSTEM

GUI



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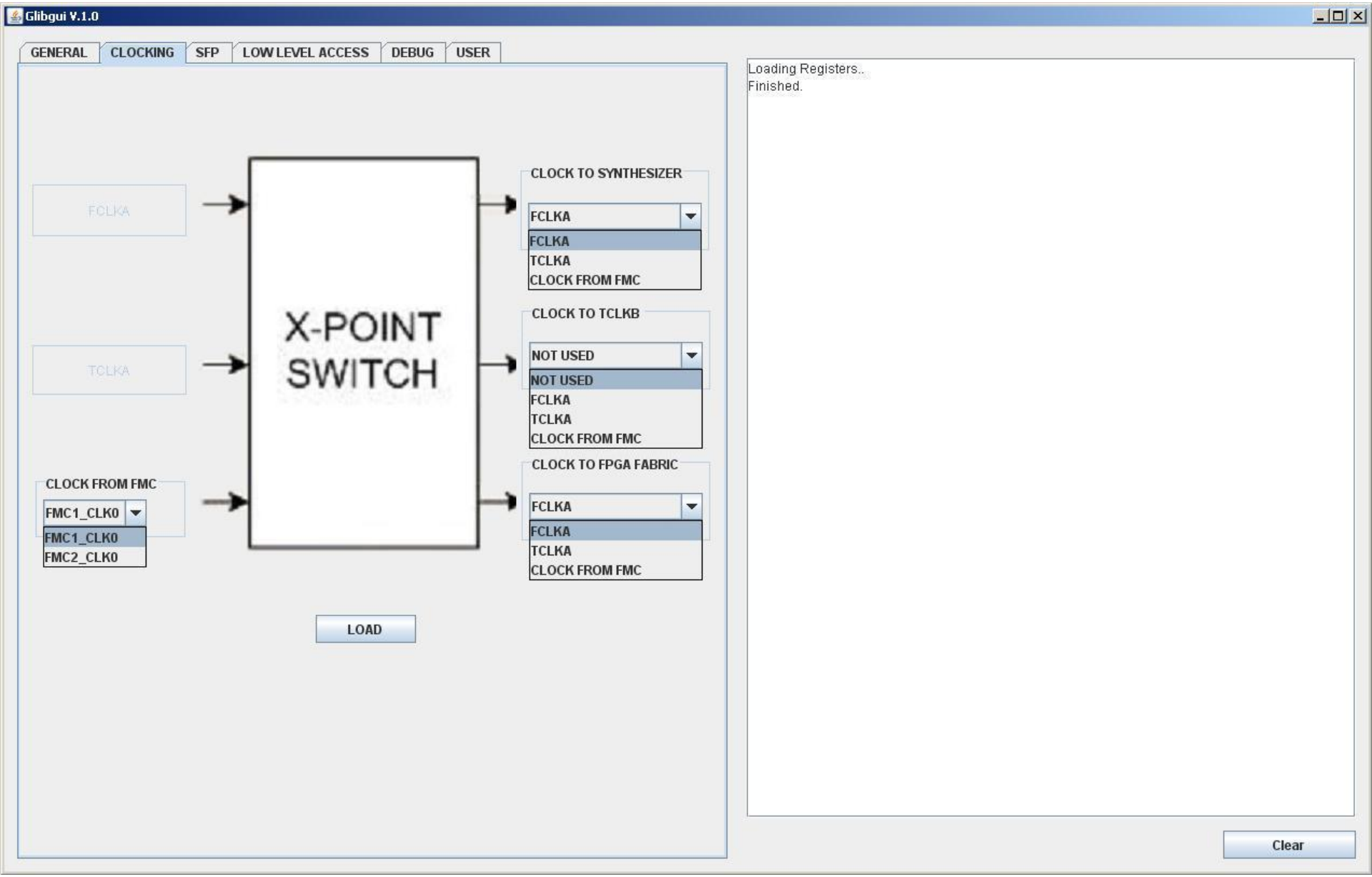

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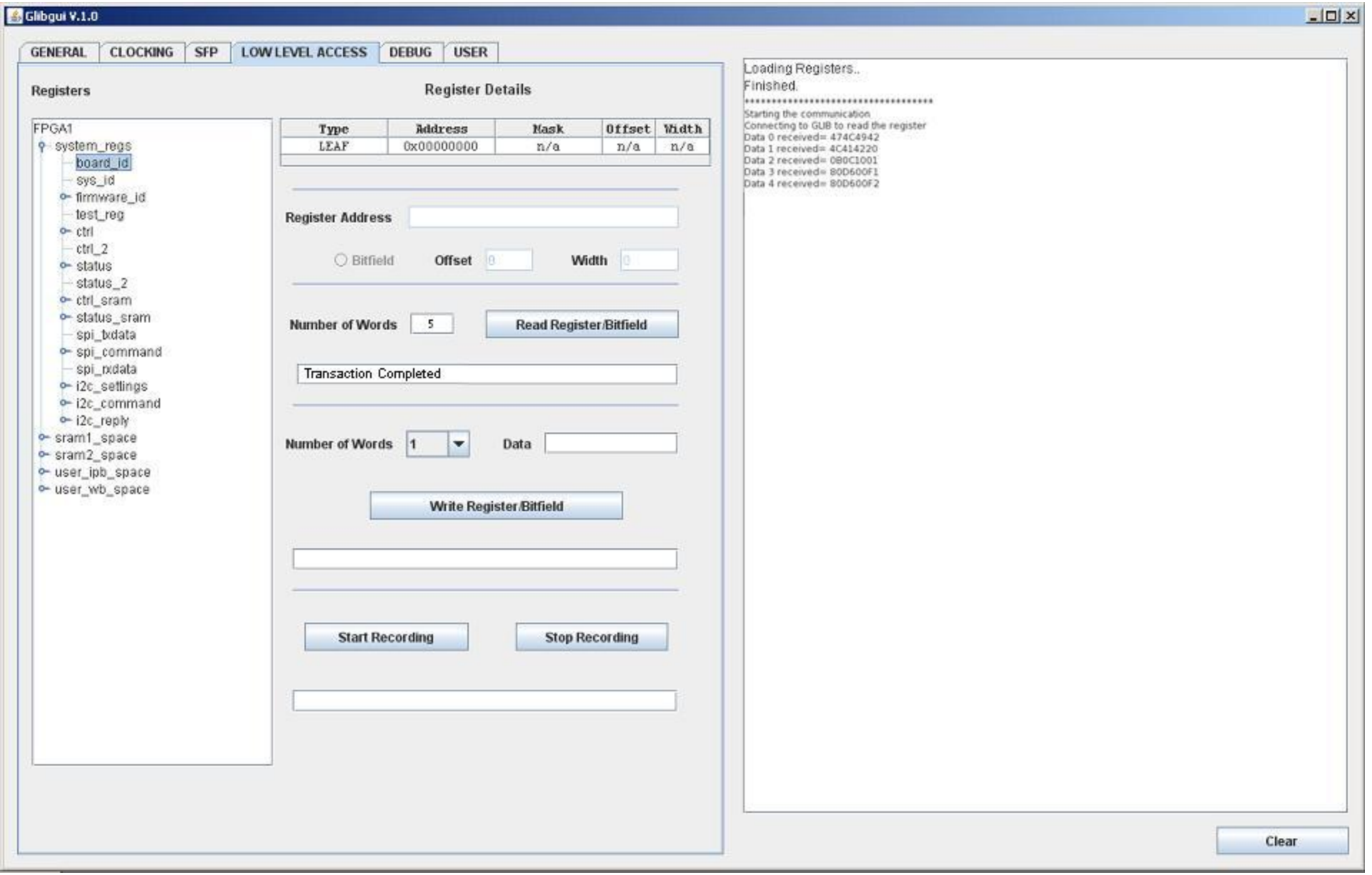

STATUS AND SUMMARY

Very advanced stage: although only 2-year old project

Prototypes are already delivered to beta users: since 2011

Big interest from the community: 4 experiments, 10 projects, 20 users, 30 GLIB

Production: first batch before end 2012

Spin-offs: TTC FMC, improvements of GBT-FPGA HDL core