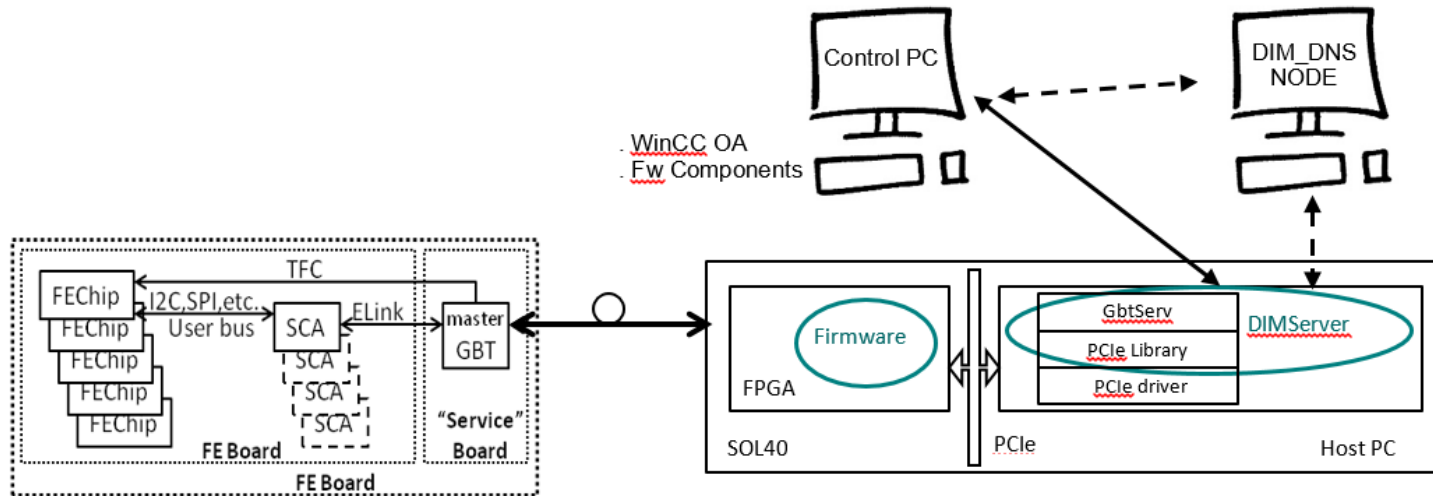




CONTROL SYSTEM FOR THE LHCb UPGRADE

LHCb Upgrade Meeting
21.04.2016

CONTROL SYSTEM

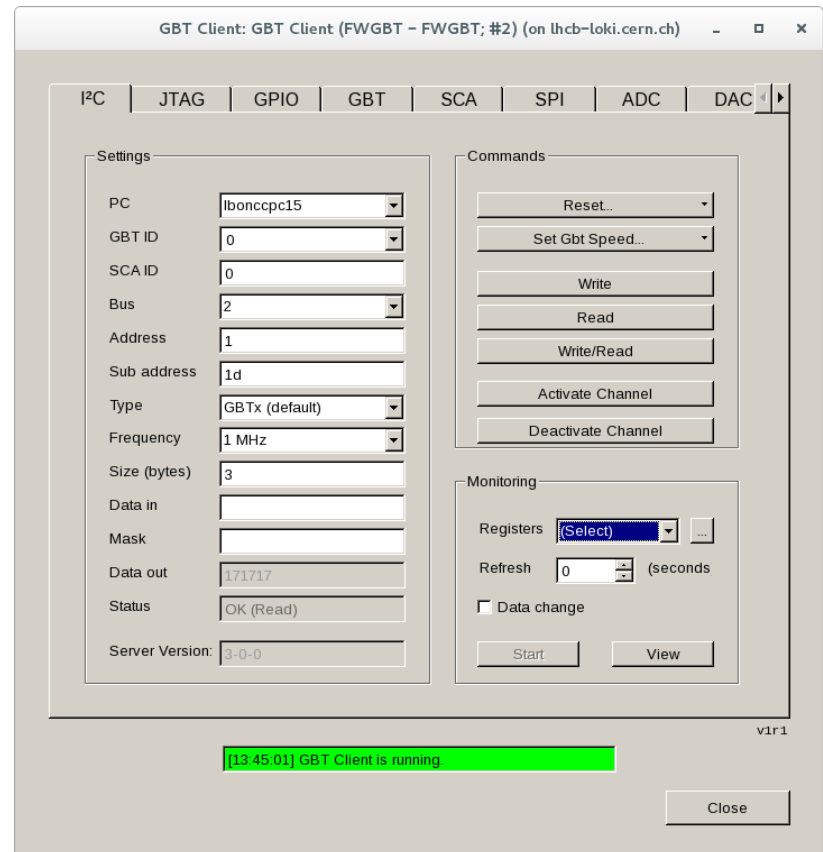


Main Components	Status
GbtServer (DIM Server)	✓
fwGbt (GBT Client)	✓
fwHw	✓

GBT SERVER

Most of the protocols implemented

GBTx	✓
SCA	✓
Local Bus	✓
I2C	✓
GPIO	✓
ADC	✓
DAC	✓
SPI	✓
JTAG	✗
Local I2C	✗
Local SPI	✗



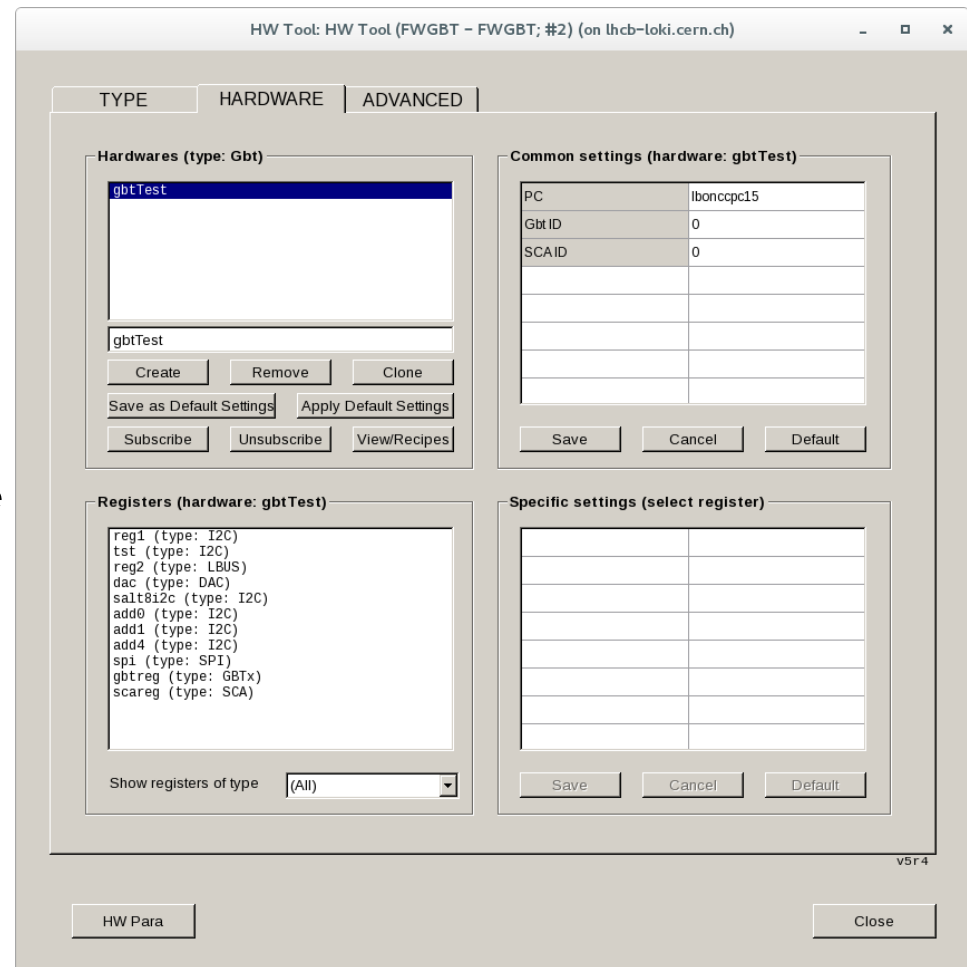
HW TOOL

GBT Device type integrated

All the SCA available protocols integrated

Can model your GBT controlled devices with all the SCA available field buses

Create your model in XML and import it



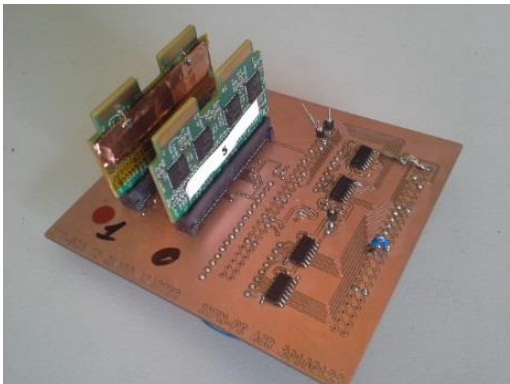
TESTED BOARDS/CHIPS



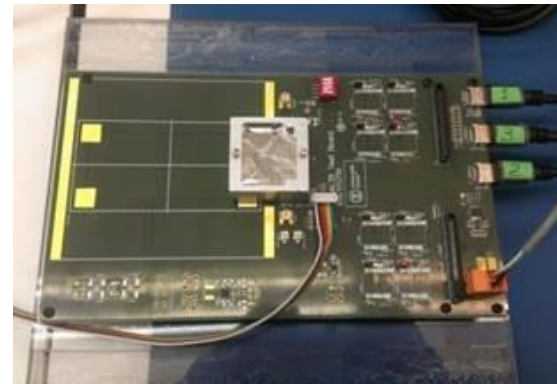
VELO OPB (I2C + GPIO)



GBTx slave (I2C 16bit reg add, 7 bit chip add)



Claro (SPI + GPIO)



Salt8 (I2C 8bit reg add, 7 bit chip add + GPIO)

WINCC COMPONENT FOR MINIDAQ (FWMINIDAQ)

Released on 13th April:

- Documentation here: <https://lbredmine.cern.ch/documents/14>

Provides control to:

- TFC
 - Super ODIN
 - SOL40
- TELL40
- 10G Interface

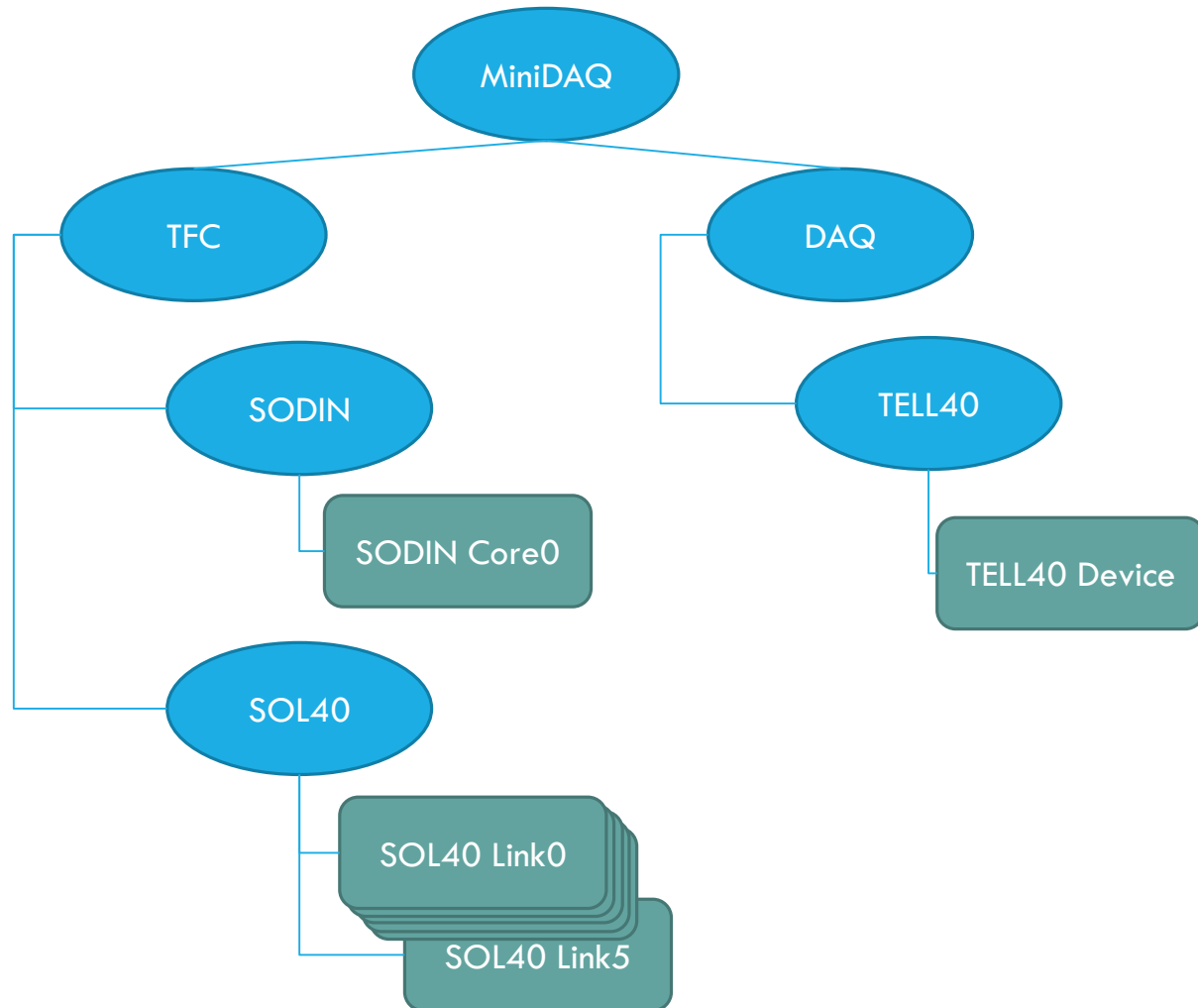
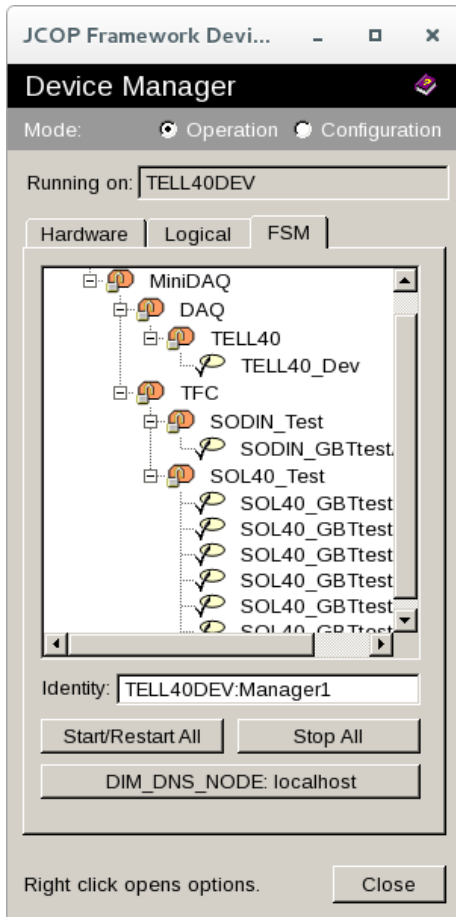
Ready to use component

- All the devices are already created
 - 1 x SODIN core
 - 6 x SOL40 Links
 - 1 x TELL40
- Just configure CCPC and go

MiniDAQ FSM tree as aggregator for all the devices

- No commands implemented at the moment – only resets
- States DO reflect the state of the devices

FSM TREE



CONFIGURE CCPC AND DIM SUBSCRIPTIONS

The screenshot displays the MiniDAQ control interface. The main window title is "MiniDAQ: TOP (TEST_GBT - TEST_GBT; #1) (on lhcb-loki.cern.ch)". The system status is "MiniDAQ" and "NOT_READY". A table shows sub-systems: DAQ (READY) and TFC (NOT_READY). The "System Status" section includes "GBT Server Connection", "Registers Subscription", and "Ctrl Managers", all with green status indicators. A "Configure Subscriptions..." button is highlighted with a blue arrow pointing to a dialog box. The dialog box, titled "fwMiniDAQ/fwMiniDAQ_GlobalConfigureCCPC.pnl", shows "CCPC Name" as "lbonccpc15" and "Save Settings" button. It lists subscriptions: TELL40, AMC40, SODIN, and SOL40, all with green status indicators. Buttons for "Subscribe Devices" and "Unsubscribe Devices" are present. The "FW Compatibility" section shows "TELL40: v3.00 - OK", "SODIN: v3.00 - OK", and "SOL40: v3.00 - OK".

System	State
MiniDAQ	NOT_READY

Sub-System	State
DAQ	READY
TFC	NOT_READY

System Status

- GBT Server Connection ●
- Registers Subscription ●
- Ctrl Managers ●

Test System

Fibers Assignment

TFC:

DAQ:

SOL40 Master is Link: 3

FW Compatibility ●
TELL40: v3.00 - OK;
SODIN: v3.00 - OK;
SOL40: v3.00 - OK;

Reset

Logic Regs

<input type="checkbox"/>	<input type="checkbox"/>	Global
<input type="checkbox"/>	<input type="checkbox"/>	LLI
<input type="checkbox"/>	<input type="checkbox"/>	TELL40
<input type="checkbox"/>	<input type="checkbox"/>	MEP
<input type="checkbox"/>	<input type="checkbox"/>	SOL40

fwMiniDAQ/fwMiniDAQ_GlobalConfigureCCPC.pnl (TEST_GBT - TEST_GBT; #1) (on lhcb-lo...)

CCPC Name

TELL40 Subscriptions ●
AMC40 Subscriptions ●
SODIN Subscriptions ●
SOL40 Subscriptions ●

DEVICE CONTROL PANELS

The image displays three screenshots of device control panels for different components in a control system. Each panel includes a CERN logo, device name, state, and various configuration and monitoring options.

Panel 1: SODIN_GBTtest/Core0: TOP (TEST_GBT - TEST_GBT; #0)
 Device: Core0, State: READY. Includes sections for Statistics and status (Orbits, Bunch IDs, Event ID, etc.), Initialization (Stop RUNNING, Counter Reset, System Reset, Regs Reset, Logic Reset), and Messages.

Panel 2: SOL40_GBTtest/Link3: TOP (TEST_GBT - TEST_GBT; #1)
 Device: Link3, State: READY. Includes sections for Command SM (SOL40 --> SODIN Delay, SOL40 --> TELL40 Delay, etc.), GBTx address (0x1), Commands FIFO flags, Responses FIFO flags, Subdetector Type (Test), FE generator (FE channels enabled, Limit # events), and Messages.

Panel 3: TELL40_Dev: TOP (TEST_GBT - TEST_GBT; #1) (on lhcb-loki.cern.ch)
 Device: TELL40_Dev, State: READY. Includes sections for Data Format (Fixed header / Fixed Length, Data Format Order, FE Data Transmission Protocol), Header Information (Header size, BXID field size, Info field size, Data length field size), Others (SYNC Pattern, Channel size, No of channels, NZS frame size), Active fibers (visual representation of fiber status), and Messages.

PLANS

Integrate Paolo's data checker control in WinCC

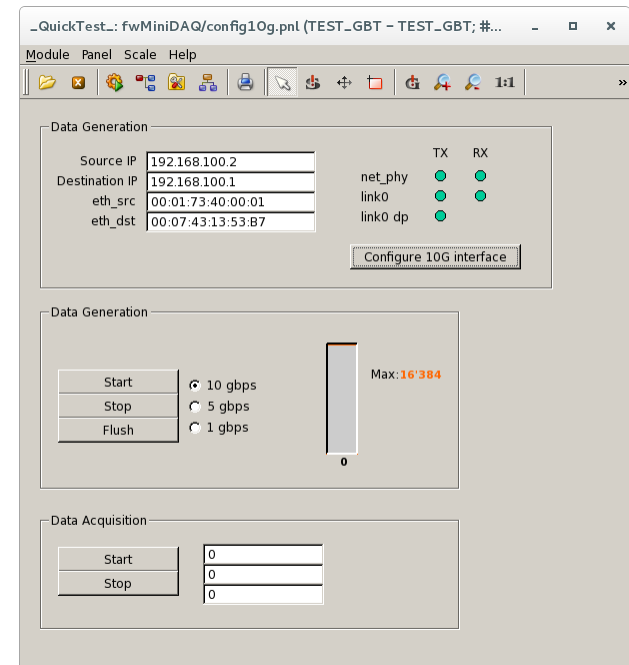
- Data Generation control already integrated
- Some developments on the Data Acquisition control

Implement actions on the FSM

Implement missing protocols on the GbtServer

- Basically JTAG...
- Local I2C and SPI (through FPGA IP Core)

Remote FPGA configuration through GBT-SCA



SUMMARY

Released on 13th April

- fwMiniDAQ (SOL40, SODIN, TELL40, 10G interface, GBT-SCA)
- GbtServ

Provided centrally (by us)

- Tools for SOL40, TELL40, SODIN and Front End control
- Front End control tests
- Simple DAQ

Not provided

- Testing of FEB specific functionalities
- FEB device user panels