

# MiniDAQ2 setup

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*On behalf of the MiniDAQ developers*

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MiniDAQ2 training workshop





**MiniDAQ2** = PCIe40 + ASUS server  
firmware: LLI + SODIN + SOL40 + TELL40

**SODIN** = PCIe40 final design + X server  
firmware: LLI + SODIN

**SOL40** = PCIe40 final design + X server  
firmware: LLI + SOL40

**TELL40** = PCIe40 final design + X server  
firmware: LLI + TELL40



There 3 options to configure the FPGA:

- Through the PCIe interface (not working yet)
- Through the internal blaster (not working yet)
- With an external blaster ← this option is used for now

Issue #135; message #6; explains how to setup this option.

<https://lbredmine.cern.ch/issues/135>

A usb blaster and an home made adaptor and fibers will be sent soon to the groups.

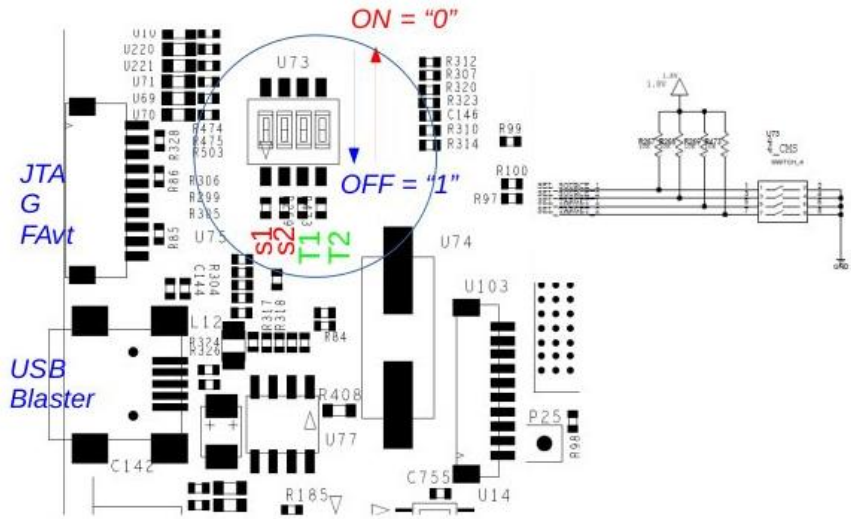
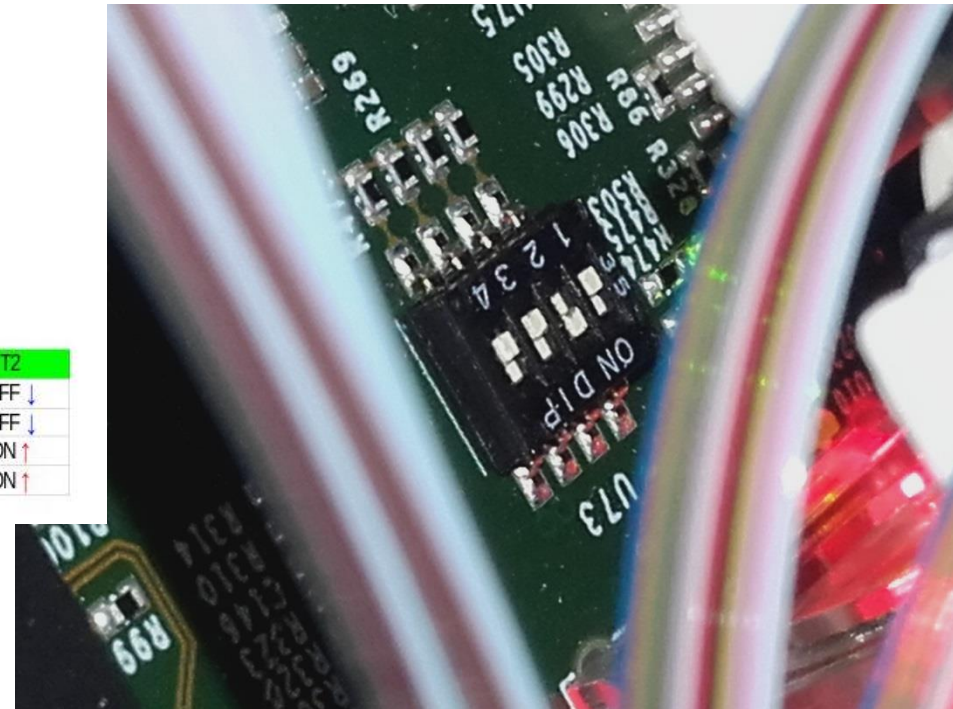


Figure 6: localisation - JTAG switch

source	S1	S2	Target	T1	T2
USB Blaster FAVt	OFF ↓	OFF ↓	Aria10 + MAX5_Flash	OFF ↓	OFF ↓
PCIe ITAG	ON ↑	OFF ↓	MAX5_Flash	ON ↑	OFF ↓
Connecteur JTAG FAVt	OFF ↓	ON ↑	Aria10	OFF ↓	ON ↑
Pas de connexion	ON ↑	ON ↑	Pas de connexion	ON ↑	ON ↑





To compile a firmware for the MiniDAQ 2, follow the instructions already provided in the MiniDAQ Handbook.

<https://lbredmine.cern.ch/documents/8>

The only thing to change is one constant:

```
----- Type of MiniDAQ -----  
constant MiniDAQ_version           : integer := 1;  
-- 1 : for MiniDAQ 1  
-- 2 : for MiniDAQ 2
```



## To load the firmware

On the MiniDAQ2 server, it's required to create a file named "51-usbblaster.rules" in the folder: /etc/udev/rules.d with the following content:

```
#USB-Blaster
#BUS=="usb", SYSFS{idVendor}=="09fb", SYSFS{idProduct}=="6001", MODE="0666"
#BUS=="usb", SYSFS{idVendor}=="09fb", SYSFS{idProduct}=="6002", MODE="0666"
#BUS=="usb", SYSFS{idVendor}=="09fb", SYSFS{idProduct}=="6003", MODE="0666"
SUBSYSTEM=="usb", ATTRS{idVendor}=="09fb", ATTRS{idProduct}=="6001", MODE="0666"
SUBSYSTEM=="usb", ATTRS{idVendor}=="09fb", ATTRS{idProduct}=="6002", MODE="0666"
SUBSYSTEM=="usb", ATTRS{idVendor}=="09fb", ATTRS{idProduct}=="6003", MODE="0666"
#USB-Blaster II
#BUS=="usb", SYSFS{idVendor}=="09fb", SYSFS{idProduct}=="6010", MODE="0666"
#BUS=="usb", SYSFS{idVendor}=="09fb", SYSFS{idProduct}=="6810", MODE="0666"
SUBSYSTEM=="usb", ATTRS{idVendor}=="09fb", ATTRS{idProduct}=="6010", MODE="0666"
SUBSYSTEM=="usb", ATTRS{idVendor}=="09fb", ATTRS{idProduct}=="6810", MODE="0666"
```

- The USB blaster should be seen now in the Quartus programmer tool
- Click on "Auto Detect" and select any of the listed FPGA devices.
- 3 lines should appear for 2 devices, do click right on the first one and select change file. Choose then your .sof firmware file to load in the FPGA. Quartus might notice you about the wrong FPGA device, in this case just click on yes to change to the right one. The programming should now proceed successfully.

Quartus Prime Programmer Standard Edition - [C]

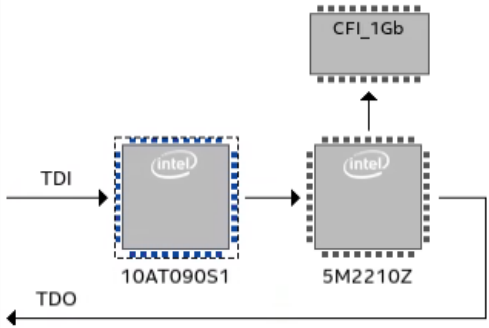
File Edit View Processing Tools Window Help

Hardware Setup... USB-Blaster [3-1]

Enable real-time ISP to allow background programming when available

File	Device	Checksum	Usercode	Program/Configure	Verify	Blank-Check	Examine	Security Bit	Erase	ISP CLAMP
<none>	10AT090S1	00000000	<none>							
<none>	5M2210Z	00000000	000							
<none>	CFI_1Gb									

Start Stop Auto Detect Delete Add File... Change File... Save File Add Device... Up Down



- Delete (Del)
- Select All (Ctrl+A)
- Add File...
- Change File
- Save File
- Add IPS File...
- Change IPS File...
- Delete IPS File
- Add EKP File...
- Change EKP File...
- Delete EKP File
- Add PR Programming File...
- Change PR Programming File...
- Delete PR Programming File
- Attach Flash Device...
- Change Flash Device...
- Delete Flash Device
- Add Device...



## **Default firmware to loaded in the flash.**

The default firmware in the MiniDAQ is just made of a LLI. This forces you to launch a script to reload the PCIe drivers in case of reloading a new firmware after a shutdown to get BAR0 and BAR2 accessible.

To avoid this, a new default firmware can be loaded in a flash memory on the board. If you are interesting in, just contact one of us 😊





# MiniDAQ2 Server Software

- WinCC OA installed
- Framework Components installed: fwCore, fwDim, fwHw, fwGbt

A package containing all the required base components is available as [LHCb HW Framework](#).

- RPMs: <https://gitlab.cern.ch/lhcb-daq40/lhcb-daq40-software>

The screenshot shows the GitLab interface for the repository 'lhcb-amc40software'. The top navigation bar includes 'Project', 'Repository' (selected), 'Registry', 'Issues 0', 'Merge Requests 0', 'Pipelines', and 'Settings'. Below this, there are tabs for 'Files', 'Commits', 'Branches', 'Tags', 'Contributors', 'Graph', 'Compare', and 'Charts'. The main content area shows a commit history table with columns for 'Name', 'Last commit', and 'Last Update'. The most recent commit is by Joao Barbosa, adding version 4.0 of GbtServer and tools. Below the commit history, there are buttons for 'Find file', 'History', and 'Download'.

Name	Last commit	Last Update
daq40	Add installation instructions for DAQ40 packages	a week ago
gbtserv-rpms	Added version 4.0 of GbtServer and tools	a day ago
lli-rpms	Update README	a month ago
wince	Change component version	a week ago



# MiniDAQ2 Server remote control

<http://lbminidaq2-X-ipmi/index.html> (X is the server number of your setup)

Login: root

Password: upgrade4PCle

The screenshot shows a web browser window titled "Megarac SP - Mozilla Firefox (on lxplus042.cern.ch)". The address bar contains "lbminidaq2-08-ipmi/index.html". The page header features the "ASMB8 iKVM" logo and a navigation menu with items: Dashboard, FRU Information, Server Health, Configuration, Remote Control, Auto Video Recording, Maintenance, Firmware Update, and HELP. The user is logged in as "root (Administrator)".

### Power Control and Status

The current server power status is shown below. To perform a power control operation, select one of the options below and press "Perform Action".

- Host is currently on.
- Power button is enabled
- Reset Server
- Power Off Server - Immediate
- Power Off Server - Orderly Shutdown
- Power On Server
- Power Cycle Server

**Fiber - Link**

5	1
6	2
4	3
7	4
3	5
8	6
0	7
9	8
2	9
10	10
1	11
11	12
17	13
18	14
16	15
20	16
15	17
19	18
14	19
21	20
13	21
22	22
12	23
23	24

**Fiber - Link**

29	25
30	26
28	27
31	28
27	29
32	30
26	31
33	32
25	33
34	34
24	35
35	36
36	37
42	38
37	39
43	40
38	41
44	42
39	43
45	44
40	45
46	46
41	47
47	48

You can find it in the Control System documentation