

Zynq ROS25 DAQ

INFN Padova

By Lorenzo Castellani

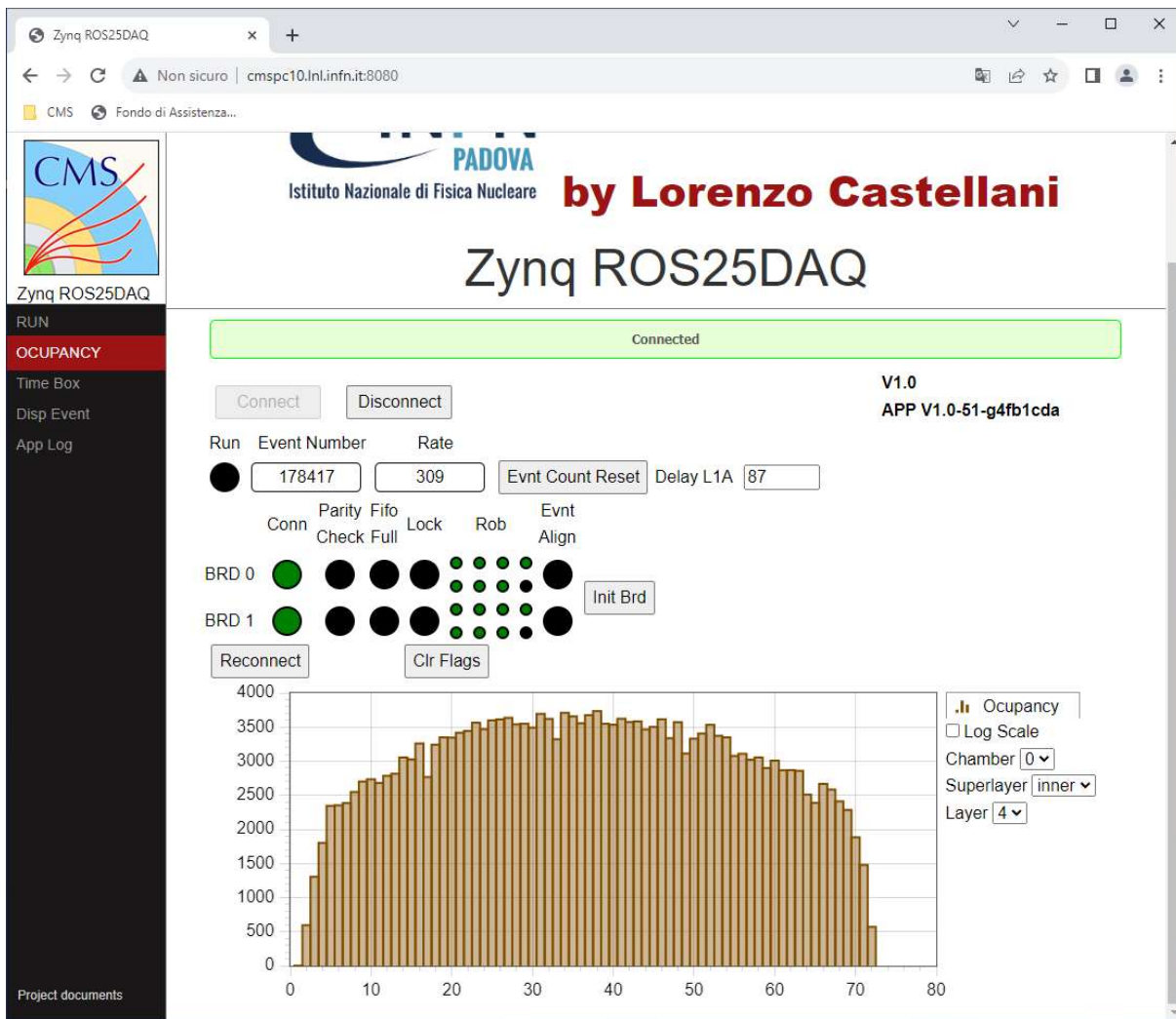
The application for data acquisition from multiple boards Zynq CMS has been implemented to be compiled on both Linux and Windows operating systems, the user interface based on WEB page allows both local and remote use, so a simple WEB server has been implemented in the same application for the transfer of http files, a WebSocket server for the control of the cards and the visualization of the acquired data.

When the application starts, if the configuration file is not specified in the argument, the file is searched first in the folder where the program is installed, then in the local folder.

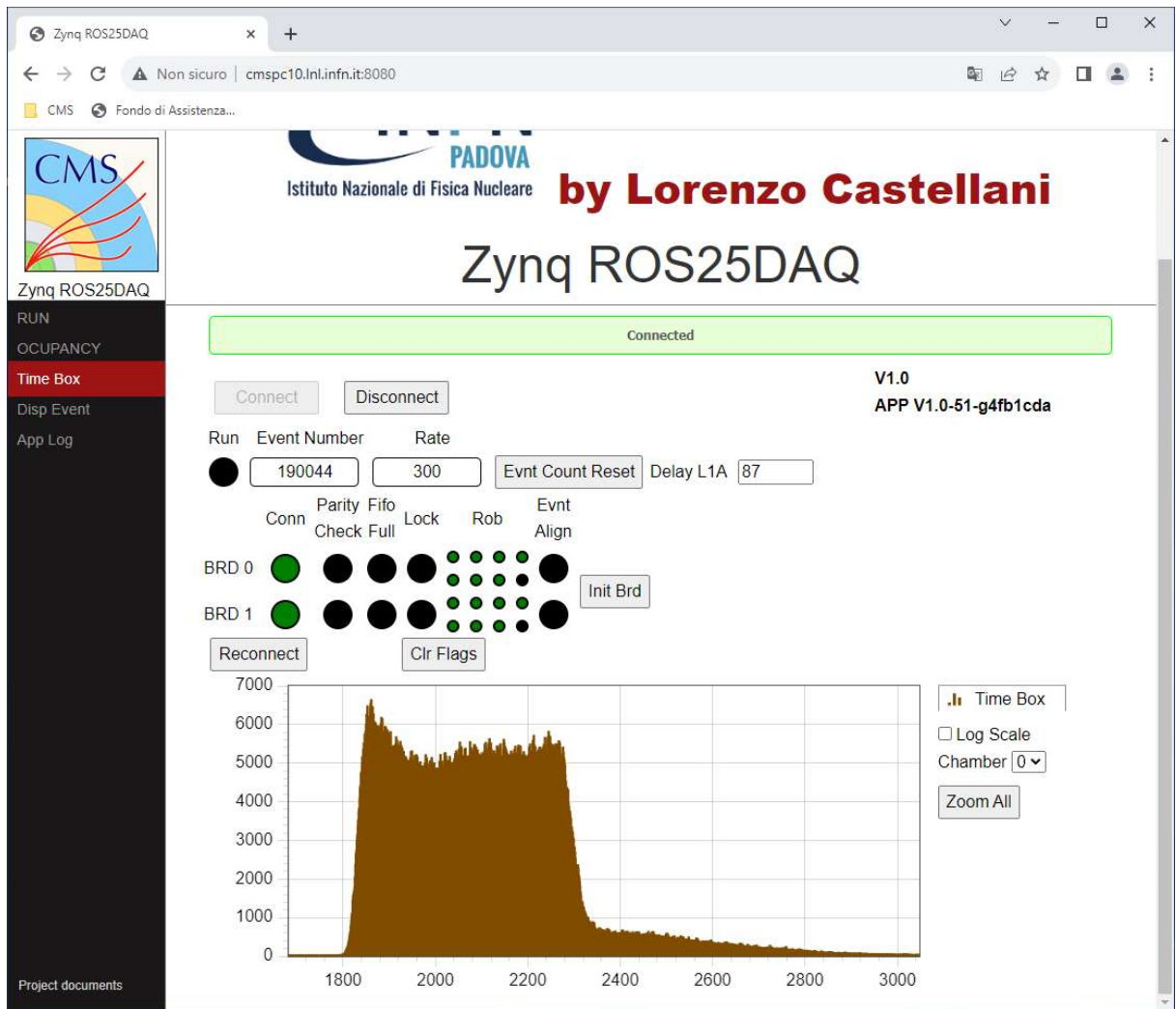
the various pages of the user interface all have in common the display of the status of the ZYNQ cards, and shows the status LEDs, the event number, the event rate, the L1A delay (editable) the "Evtnt Cout Reset" button to reset and align the event counter of the ROB cards, the "Reconnect" button that reconnects the application to the data flow coming from the ZYNQ cards, and the button to clear the error flags seen in the data stream.

The screenshot displays the Zynq ROS25 DAQ web interface. The browser window shows the URL 'cmspc10.Infn.it:8080'. The page header includes the CMS logo and the INFN Padova logo, along with the text 'Istituto Nazionale di Fisica Nucleare by Lorenzo Castellani Zynq ROS25DAQ'. A green bar at the top indicates 'Connected'. Below this are 'Connect' and 'Disconnect' buttons. The main control area includes a 'Run' indicator (black circle), 'Event Number' (158894), 'Rate' (316), 'Evtnt Count Reset' button, and 'Delay L1A' (87). There are status LEDs for 'Conn', 'Parity Check', 'Fifo Full', 'Lock', 'Rob', and 'Evtnt Align' for two boards, BRD 0 and BRD 1. An 'Init Brd' button is present. At the bottom, there are 'Reconnect' and 'Clr Flags' buttons, and a section for 'Run Number' (16), 'Run Stop', 'Stop Event' (0), 'Split Size' (0), 'Split Number' (0), and 'Actual Size' (0.000B). A 'File Name' field contains 'Run'.

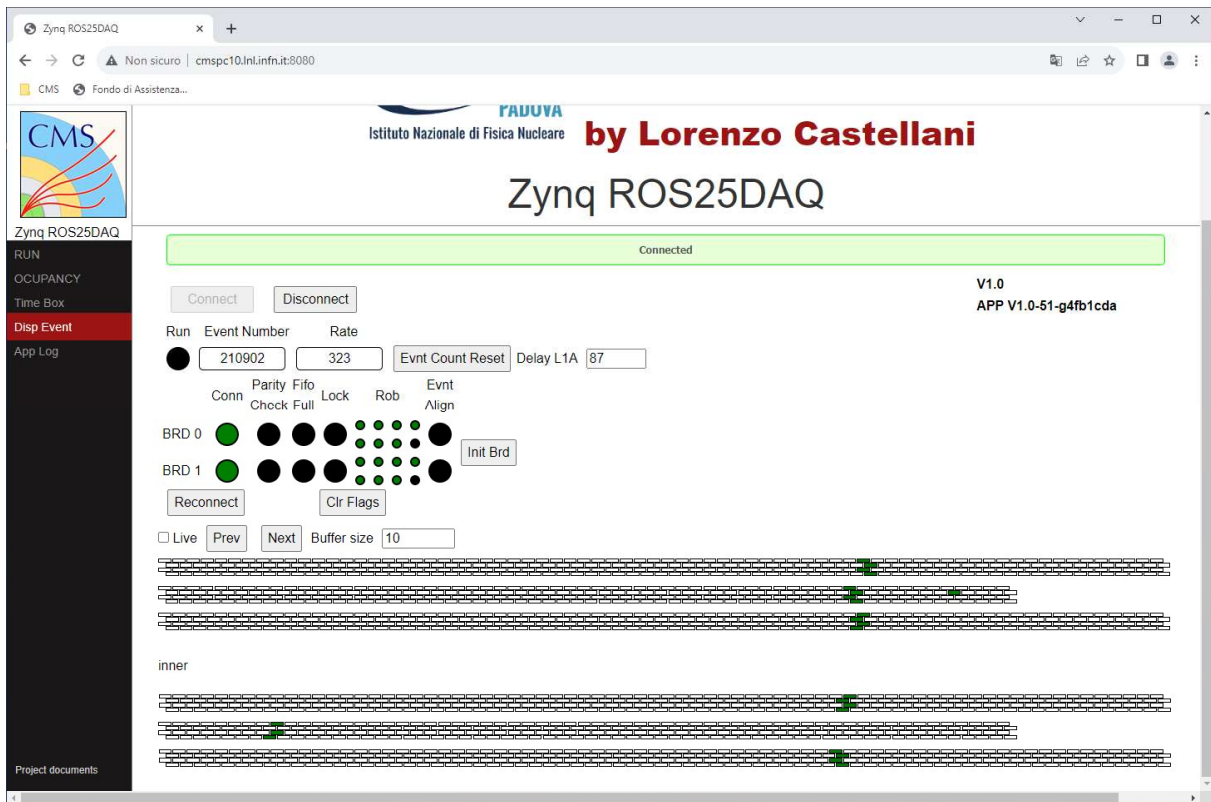
- 1) The RUN page contains the buttons for starting and stopping data acquisition on disk, the filename, the number of events to be acquired (0 = infinity) and the maximum size of the files on which to divide the saved data (0 = infinity).



- 2) The OCCUPANCY page shows the number of hits per channels divided into CAMERA, SUPERLAYER and LAYER



3) The TIMEBOX page shows the distribution of HIT in the TDC window (limited to 8192)



- 4) The "Dips Event" window shows individual events captured with a rate of 0.5seconds. The web page maintains an editable size buffer of the last events shown.

The configuration file in addition to the parameters of the board contains the following parameters:

WebRootDir: specifies the location of HTML files (use the character / in the path also on Windows operating system) you can use environment variables with the notation of the operating system (example: %HOME% for Windows and \$HOME for linux).

httpport: specifies the port used by the server WEB (on Linux port 80 cannot be used)

wsport: Specifies the port used by the WebSocket server

localhostonly: specifies whether or not servers accept a connection from a remote PC

AcceptHosts: if localhostonly is false it specifies from which remote PCs it accepts a connection, if the list is empty it accepts connections from any PC.

DataFolder: specifies where to save the scanned files (use the character in the path / also on Windows operating system) you can use the environment variables with the notation of the operating system (example: %HOME% for Windows and \$HOME for linux).

Example configuration file:

```
{
  "WebRootDir": ".. /www",
  "httpport": 80,
  "wsport": 4443,
  "localhostonly": true,
  "AcceptHosts": [
    "wxlecastellani.pd.infn.it"
  ],
  "DataFolder": ".. /data",
  "boards": [
    {
      "master" : true,
      "datahostport": "192.168.1.20:3333:proxy:localhost:3080",
      "cmdhostport": "192.168.1.20:4444:proxy:localhost:3080",
      "robid_map" : [0,1,2,6,3,4,5,-1]
    },
    {
      "master" : false,
      "datahostport": "192.168.1.10:3333:proxy:localhost:3080",
      "cmdhostport": "192.168.1.10:4444:proxy:localhost:3080",
      "robid_map" : [12,13,14,24,15,16,17,-1]
    }
  ]
}
```