APD Camera on FILD 2

25. November. 2015

- ***How to Access the APD camera computer?***

  The new server already arrived and was installed by S.Martinov (19.11.2015)

  -Computer name: **lxfild.aug.ipp.mpg.de ;**

  IP address has been changed to 130.183.56.226. To get the information about the internet connection of your computer type (in UNIX):

  > /sbin/ifconfig

  -User: **fild**
  -Password: **fildcamera**

- **Turning on the APD camera.**

  The APD camera can be powered locally (in the FILD2 rack in the torus hall, socket 5), or remotely (using FILD2 manipulator controller software). The APD camera sometimes does not switch on at the first try. In this case just keep trying turning the switch on and off until communication is achieved. To see wether the camera is communicating or not you can ping its IP: 10.123.13.101
  Also, you should see 2 green lights in the fiber converter in the FILD rack of the control room.

- **Using the IDL GUI**

  The routine used to control the APD camera operation is under /opt/FILD/Measurement. Here just open idl and run

  - **aug_fild_gui**

  There is a configuration file for the default values (AUG_FILD.cfg)
  The procedure to run a shot measurement is the following:

  1. Run aug_fild_gui
  2. Set the shutter open
  3. Enable HV > HV ON (In order to polarize the diodes to the high voltage)
  4. Shot mode: NORMAL
  5. Set the auto button (it will recognize the shot number automatically every time the new shot number is delivered)
  6. Press START. Now the camera waits for the trigger (TS06). When the measurement has ended it will wait for the next TS06.
  7. Press STOP to stop the acquisition loop.
  8. HV OFF> Disable HV

The procedure to run a test shot is the same but:

4. Shot mode : TEST

5. Introduce the fake shot number (i.e: <1000)
6. Press START to send the trigger directly

When performing a test shot it can be usefull to use the LEDs of the APD cam (for alignment purposes for instance). Remember to set it to 0 for real measurements.

IMPORTANT: Check that the external clock is working. IF not, set the internal clock ON (See Sandor's Report), otherwise the measurement wont be carried out.

- **Data analysis with IDL**

Some IDL routines are already implemented (by S. Zoletnik), under the directories /opt/FILD/Software/IDL. Here I highlight some of the most important ones. One can execute them directly by running IDL.

- Show_all_apdcam : calling sequence:
  - > show_all_apdcam,datapath='<datapath>'

  Some keywords are implemented such as yrange=[].

  For full info search for this routine under /Software/IDL/APDCAM_common/

- Get_rawsignal: calling sequence:
  - > get_rawsignal,0,'APD-<X>-<Y>',t,d,datapath=`<datapath>`

    X and Y are the number of the pixel coordinate (i.e. 2,4). Data is stored under d, while time vector is stored in t.

OBSERVATIONS:
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25.11.2015
New server for the APD camera was installed by S. Martinov (19.11.2015). The computer is located in the control room in the rack where the other FILD computers are. Therefore, there are currently 3 computers over there:
1. FILD MOV: The one we use to move the manipulators
2. lnxcamfild2 : The one we use to control the PCO cameras of FILD2 and 3
3. lxfild: This server to control the APD camera.
Since there is only one switch, the screen, mouse and keyboard are currently being shared by 1 and 2. This is, lxfild has no screen, keyboard or mouse. However, in principle there is no need for it.
The computer name remains the same: lxfild.aug.ipp.mpg.de

The IP address has changed from 130.183.204.117 to 130.183.56.226
Username: fild ; Password: fildcamera

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25.11.2015

After the installation of the new server, when running aug_fild_gui, during the compilation of the modules an error appears:

- **libGL error: No matching fbConfigs or visuals found**
- **libGL error: failed to load driver: swrast**

In principle these two errors should not affect the behaviour of the GUI. They are errors related to the drivers of the graphic card. However, the GUI is actually being built.
I did not test it yet since the GUI automatically closes if the camera is switched OFF.

25.02.2016

The power source of the APD is now independent from FILD 2 CCD power source. P. de Marne arranged this. Both of them are now remotely controlled using the FILD2 manipulator software.

I turned on the APD camera. The remote control works, camera is powered. However, communication with the camera is not achieved. I tried, as Sandor and I did before, to reset the camera several times. It did not work.

There was missing the Ethernet cable needed to communicate with the lnxfild server. The optical output coming from the APD cam in the torus hall (labelled as 2765 and 2766) reach the control room in the fild rack. There is a module that converts the optical signal into electrical signal which goes into the computer (just as the CCD cameras). This Ethernet cable is the one missing. Why ¿??

The Ethernet cable has been connected to Ethernet port 1. At first the camera wasnt communicating. There was a problema with the IP configuration. S. Martinov configured the IP address for the camera. It is working now.

26.02.2016

After achieving communication with the camera, we perform the first try on a test shot. When running the IDL GUI, we find out that the external clock is not working:

- **APDCAM did not lock on external clock**

We had to change the configuration file (AUG_FILD.cfg) from external clock to internal. Now the camera is working.

1.03.2016

It is again impossible to communicate with the camera. I have recycled the power several times but this does not solve the problem.

2.03.2016

I tried to solve the problem with the help of Sven. We looked carefully at all the elements of the system: cables, D-LINK converters, etc… and finally isolated the problem. The Gbit LED of the camera is not lighting. We tried to communicate directly to the camera using a laptop and no communication is achieved. Therefore, it is the camera which is not providing any information to the outside.

The D-LINK modules were, however not behaving correctly and have been substituted by new ones. They were tested between 2 computers and there was no way to achieve communication between them. They have an internal set-up in their motherboard which consists in 2 switches which can be turned ON an OFF. Both of the modules must be set-up correctly and accordingly to avoid problems. We followed the instructions given by the DLINK user´s guide but we couldn't make them work. This is why we decided to substitute them for new ones. The new ones show communication between them.

I asked G. Birkenmaier if he had experienced similar problems, since they have an APD camera in their diagnostic. Surprisingly, he experienced a very similar problem 4 weeks ago. They had the same symptoms: could not communicate with the camera by any means. To solve the problem they contacted the Hungarians and had to open the camera. There was a shortcut in a certain part of the circuit related to the Ethernet communication. They had to 'cut' some parts of this board in order to avoid contacts and solved the problems.

I have now contacted S. Zoletnik to see what he thinks we should do the next.

14.03.2016

Sandor is on site to take a look at the camera. He found out that the camera had the same problems that Gregor's camera had. It is a design flaw. He had temporarily solved it although he thinks it would be better to change the whole backplate, which is the one giving troubles due to shortcuts, at the end of the campaign. I will test the camera this afternoon.

30.3.2016

When first tried to test the camera, the communication between the APD and the computer was enabled and working, but no data was being transferred from the camera to the computer. All the data from the signals were zeros. The configuration of the computer had to be changed in order to enable the data transfer. Sven took a look at this and solved it temporarily. This is, he changed the settings but these would go back to the old settings if

the computer is rebooted. He promised to change the settings permanently as soon as he can.

After this, I tested the camera using the FILD2 lamp and it is working perfectly.