a

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

ALICE 2006
Internal Document/PHOS
Draft 1.0
21 August 2006
(revised 29 October 2007)

README: HOW TO RUN THE PHOS LED-MONITOR

M.Yu.Bogolyubsky[1)]

Abstract

This document describes how to run the LED-monitoring program on the PHOS spectrometer.

[1)] *Institute for High Energy Physics, Protvino, Russia*

1 Mounting of the **LED**-monitoring system

Install MM-block, shaper 4F-15 and controller K331 into the LED-monitoring crate. Mount trigger and pretrigger cables correspondently to Fig. 1. Pay attention that the flat cable from MM-block is connected to the PHOS through black-box near PHOS as shown in Fig. 2. Finally, connect K331 to the expansion card on computer (pcphos09.cern.ch) of the LED-monitoring system.

2 General description of the led-monitoring program

The led-monitoring program can work in grid- and fix-amplitude options which are defined by setting amplitude and grid-step S ($S = 0$ for fix-amplitude mode) from files led.conf and ledfire.conf. Grid option is used for LED calibration while fix-amplitude option is often runing for time stability measurements.

The operation of led-monitoring program is controlled by three configuring files: led.conf, ledtrig.conf and ledfire.conf.

File led.conf is main cofiguration file, it containes dimensions of the PHOS matrix, position of MM-block in crate, position of led-trigger block, default value of brightness and step-grid, etc.

File ledtrig.conf may be absent, but if it exists it replaces trigger information from file led.conf — position of led-trigger block in CAMAC crate and period of fiering (in μs) for auto-triggering mode. The LED MS goes to auto-triggering mode if user sets negative address of led-trigger module.

File ledfire.conf can be also absent. It is responsible for individual tuning of such parameters as brightnes of LED's and grid-step. If channel is not included in file ledfire.conf (or file ledfire.conf is absent) the default value of brightnes and grid-step will be applied from file led.conf. Individual tuning of amplitude is possible only for modes of firing 2 and 3, mode 1 is used common setting of brightness and grid-step from file led.conf. The existing prototypes of files led.conf and ledtrig.conf are listed in Table 1 and Table 2 correspondently.

The LED-monitor system can operate in 3 modes of firing of LED-diodes.

1. Firing maximum possible channels per event that is 512 with common setting of LED brightness from file led.conf. This mode does not use the amplitude memory of LED MS.
2. Firing 8 channels per event with individual tuning of LED brighness from file ledfire.conf. This mode does not use the amplitude memory of LED MS.
3. Firing 8-128 channels per event with individual tuning of LED brightness from file ledfire.conf. This mode uses the amplitude memory of LED MS.

Currently only one prototype exists for file ledfire.conf, the prototype name is ledfire.equalcalib.conf. It is valid for data 2006 only !!

```
Example of file ledfire.conf is as follows:
##############################################
#
# ledfire.conf - led fire configuration file
#                (control LED intensity)
##############################################
#    set comment sign '#' in the 1st colum,
#    allways begin "end" label of the end-file from the 1st column
#    never begin data from the 1st column
#
```

```
#-----------------------------------------------------------
#  Initial amplitude and step, used only for meth. 2,3
#-----------------------------------------------------------
#  Number of data in every line are fixed 6.
#    geoflag=0 - hardware MS-addressing
#    geoflag=1 - geographycal MS addressing   X,Y
#    geoflag=2 - geographycal PHOS addressing X,Z
#
# format of file:
# geoflag=1,2   module=0,1..   x=0..(group=0..)  y/z=0..(diode=0-7)  A1  step
# ----------    ----------     ---------------  -----------------  --  ----
#
   2  2  0  28  250 0  # -- line with negatibe geoflag to be ignored
   2  2  14  2  252 0  # -- negative amplitude and step to be ignored
   2  2  62 54   54 0
   2  2  62 53   53 0
   2  2   0 55   56 0
   2  2   1 55  156 0
end of block - end label, don't comment this line, begin "end" from the 1st col.
############## end of file ledfire.conf
```

3 Booting of computer and runing of led-monitoring program

Switch on the CAMAC crate with master module MM of the MS-system. Check connection of the Ethernet if this connection is needed for you (usually this progam is work to the Ethernet). After that switch on the computer pcphcs09.cern.ch. Sometimes you need put on botton F1 on booting time. Then do:

```
root                    // user_name
led_123                 // password

xset s 0                // switch out screen-saver
xset -dpms              // switch out Display Power Managment Syst.
```

The following actions depend on mode of firing, which you select.

3.1 MODE 1

```
cd ~/led/2006_cern
cp led_A167_f20Hz.conf led.conf // loading led-configuring file
          // comment: you may not use this instruction if proper
          //   file led.conf which you need already exists
rm ledtrig.conf (or: cp ledtrig_f20Hz.conf ledtrig.conf)
```

Then you can use one of two options of continuation:

3.1.1 Hand continuation

```
./daq      // run program
0 96 -1 -1 // selection of primary controlled region on the detector plane
1          // (this is small letter "1") set "Led-monitor" mode of
           //                            program operation
1          // set the 1st mode of fire of LED's
<ctr/c>    // stop the program
```

3.1.2 Macro continuation

```
./ledmacro
<ctr/c>    // stop the program
```

3.2 MODE 2

```
cd ~/led/2006_cern
cp led_indiv8_f20Hz.conf led.conf // loading of led-cofiguring file
             // comment: you may not use this instruction if proper
             //   file led.conf which you need already exists.
rm ledtrig.conf (or: cp ledtrig_f20Hz.conf ledtrig.conf)
cp ledfire_equalcalib.conf ledfire.conf // loading led-brightness-file
             // comment: you may not use this instruction if proper
             //   file ledfire.conf which you need already exists
```

Then you can use one of two options of continuation:

3.2.1 Hand continuation

```
./daq        // run program
X1 X2 Z1 Z2  // selection of controlled region on the detector plane
             // where X1,X2=0,1 ... 63 and Z1,Z2=0,1 .. 55 are limits
             //   of the region which you want to fire on the PHOS
1            // (this is small letter "l") set "Led-monitor" mode of
             //                            program operation
2            // set the 2nd mode of fire of LED's
<ctr/c>      // stop the program
```

3.2.2 Macro continuation

```
./ledmacro2  // corresponds to X1=0, X2=63 and Z1=0, Z2=55
<ctr/c>      // stop the program
```

3.3 MODE 3

This example of runing of the led-monitoring program corresponds to loading of led.conf file with firing 128 chan./ev. You may select any file valid for this mode from Table 1. Do as follows:

```
cd ~/led/2006_cern
cp led_indiv_f20Hz.conf led.conf // loading led-configuring file
             // comment: you may not use this instruction if proper
             //   file led.conf which you need already exists.
rm ledtrig.conf (or: cp ledtrig_f20Hz.conf ledtrig.conf)
cp ledfire_equalcalib.conf ledfire.conf // loading led-brighness-file
             // comment: you may not use this instruction if proper
             //   ledfire.conf which you need already exists
```

Then you can use one of two options of continuation:

3.3.1 Hand continuation

```
./daq        // run program
X1 X2 Z1 Z2  // where X1,X2=0,1 ... 63 and Z1,Z2=0,1 .. 55 are limits
             //   of the region which you want to fire on the PHOS
```

```
1            // (this is small letter "l") set "Led-monitor" mode of
             //                            program operation
3            // set the 3rd mode of fire of LED's
<ctr/c>      // stop the program
```

3.3.2 Macro continuation

```
./ledmacro3  // corresponds to X1=0, X2=63 and Z1=0, Z2=55
<ctr/c>      // stop the program
```

4 Expert addresses

Coordinates of IHEP group:

Bogolyubsky Mikhail, St.Genis, Foyer, ap. 143 (ph. 77190 - office)
E-mail: Mikhail.Bogolioubski@cern.ch
Kharlov Yuri , (ph. 77190, 76305 - office)

Table 1: List of existing led.conf file prototypes (extension conf is omitted in file names, all files are tuning to the led auto-triggering mode with flashing frequency f).

file name	Possible firing mode	Number of firing chan. per event	default ampl.	default grid step	default f, Hz
led_A144_f20Hz	1 small brightness	512	144	0	20
led_A167_f20Hz	1 average brightness	512	167	0	20
led_A180_f20Hz	1	512	180	0	20
led_A200_f20Hz	1	512	200	0	20
led_A254_f20Hz	1 maximal brightness	512	254	0	20
led_A254_f1KHz_seen_all	1	512	254	0	1000
led_A254_f1KHz_seen_lines	1	512	254	0	1000
led_calib_step3_f20Hz	1	512	143	3	20
led_calib_step6_f20Hz	1	512	143	6	20
led_indiv8_f20Hz	2,3	8	167	0	20
led_indiv32_f20Hz	3	32	167	0	20
led_indiv64_f20Hz	3	64	167	0	20
led_indiv_f20Hz	3	128	167	0	20

Table 2: List of existing ledtrig.conf file prototypes (extension conf is omitted in file names).

file name	type of trigger	default f, Hz
ledtrig_external	external	—
ledtrig_f01Hz	auto	0.1
ledtrig_f02Hz	auto	0.2
ledtrig_f05Hz	auto	0.5
ledtrig_f1Hz	auto	1
ledtrig_f2Hz	auto	2
ledtrig_f5Hz	auto	5
ledtrig_f10Hz	auto	10
ledtrig_f20Hz	auto	20
ledtrig_f50Hz	auto	50
ledtrig_f100Hz	auto	100
ledtrig_f200Hz	auto	200
ledtrig_f500Hz	auto	500
ledtrig_f1KHz	auto	1000
ledtrig_f2KHz	auto	2000

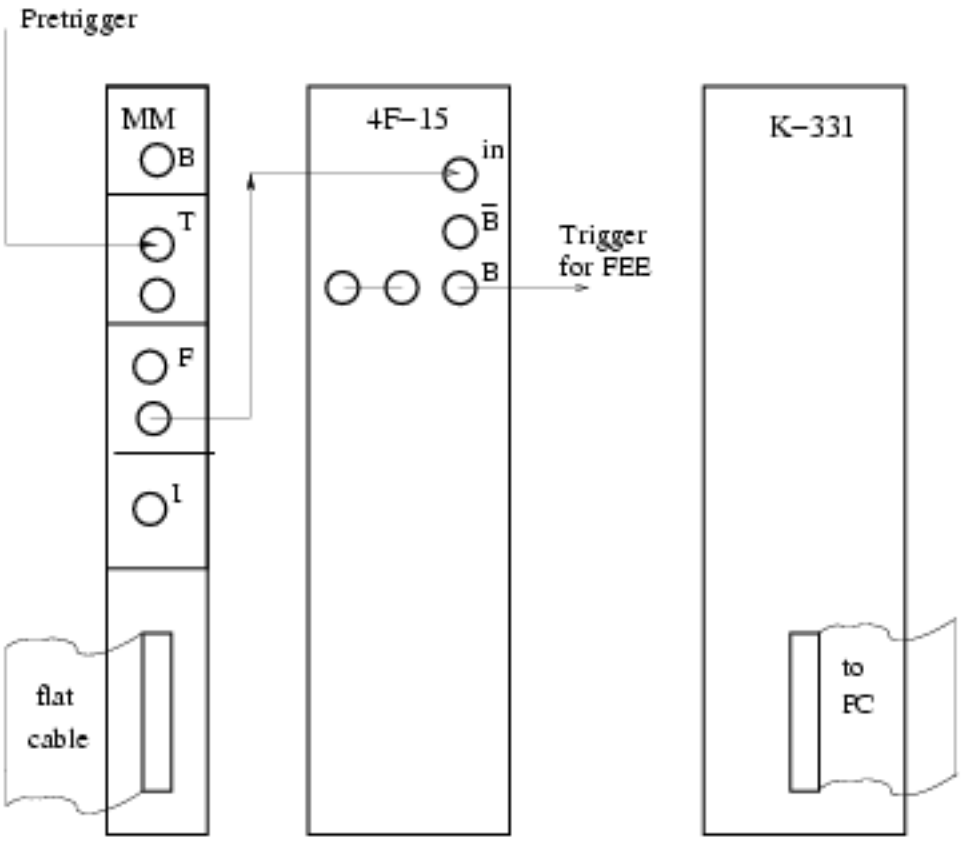

Figure 1: LED-monitor mounting scheme.

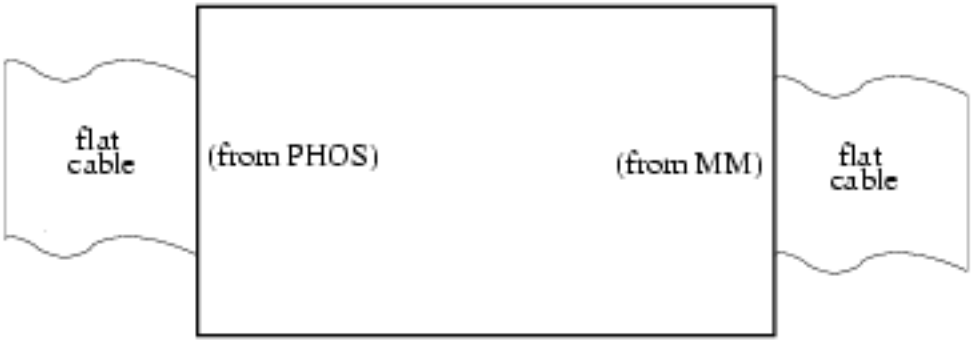

Figure 2: Black-box connection.