# PHOS POWER SUPPLY INSTRUCTION FOR 3 PHOS MODULES. 18.01.2008, ALEXANDER MAMONOV

http://aliceinfo.cern.ch/Collaboration/ALICE\_Project/PHOS/Documents/Manuals/PHOS\_Power\_Supply\_Instruction.pdf

## 1. Devices controlled by PHOS DCS

Into the list of devices comprised in a system of slow control (DCS - Detector Control System) of PHOS detector there are included:

1. Four low-voltage power sources of WIENER PL512 mark with network names lvphoswiener, lvphoswiener2, lvphoswiener3, lvphoswiener4;



Figure 1 - Low-voltage power sources WIENER PL512

2. High-voltage power source ISEG ECH 238-UPS as well as three modules ISEG EHQ 8605p-F;



Figure 2 - High-voltage power source ISEG with 2 established modules

# 2. How to start and stop power supply system

### 2.1 Start of DCS system

Before start of project PVSS it is necessary to be convinced in the fact that all power devices of the detector are switched on (the crates are switched on). If necessary switch them on.

Switch-on of low-voltage crates WIENER PL512 can be realized only in a manual mode. For this purpose it is necessary to press the power-supply button in the left top part of the crate front panel (figure 3). Check the water cooling of each Wiener crate.



Figure 3 - The switched on low-voltage power sources WIENER

The switch-on of high-voltage crate ISEG can be carried out both in manual, and in an automatic mode. Before the beginning of work one should manually press the power-supply button in the right part of the crate front panel for correct start of an OPC-server (OPC – OLE for process control) of the device (figure 4).



Figure 4 - Switched on high-voltage source ISEG

In case of independent work before starting the system on a computer with a name pcvniief-dcs one should open DNS (DNS – Distributed Name Server) file which is in the root catalog of the project (by default - D:\PVSS\_Projects\phs\_pws\_fw\bin\DNS.exe).



Figure 5 - DNS start

To receive the opportunity of operating ISEG device it is necessary to start manually its OPC-server (by default - Start\Programs\isegOPC\isegHVOPCServer). In case of successful start the user should see a window similar to figure 6. If the issued messages differ from those shown in the figure, it is necessary to check up whether the ISEG crate is switched on.

In case of problems with the source OPC-server start it is necessary to close ISEG OPC window to switch off ISEG device and repeat the procedure of switch-on.



Figure 6 - Successful start of OPC-server ISEG

OPC-servers of Wiener mark devices are started automatically.

To initiate PVSS project it is necessary to start manually PVSS Control Panel (by default - Start\Programs\ETM PVSS II 3.6\PVSS II Console). In the opened window one should choose phs\_pws project and press the button of a green light signal for start (in the right top part of panel PVSS II Console).

PVSS	5 3.6: Console			
Ŀ	& 🖄 🎡 📾	-	0 🤣	
Pro	ject			
Pho	os_PowerSupply		- 8	8 💁
	(Dresses Manita			
Ma	nager – (Process Monito	r. vvai	iting for command	18)
St	Description	No	Options .	<b>▲</b> ①
2	Process Monitor	1		
0	Database Manager	0		
	Archive Manager	0	-num O	
	Archive Manager	1	-num 1	w.
	Archive Manager	2	-num 2	12
	Archive Manager	3	-num 3	
	Archive Manager	4	-num 4	<u>, 5</u> 4
0	Archive Manager	5	-num 5	
0	Event Manager	0		
	Control Manager	1	-f pvss_scripts.l:	
0	Distribution Manager	1		- *-
0	User Interface	1	-m gedi	
0	User Interface	1	-m para	
0	Control Manager	10	-num 10 -f fwlns	
U	Control Manager	1	-f fwScripts.lst	
U	OPC DA Client	11	-num 11	X
U	Simulation Driver	11	-num 11	
1	NPC DA Client	14	-num 14	_
			ك	

Figure 7 - Start of PVSS project

If all is made correctly the start of processes will begin and depending on a condition their color will change (green - successfully started, red - stopped). So, in figure 7 only the process responsible for PVSS Console display is started (Process Monitor).

The detailed information on the PVSS system working process can always be received in automatically opening window PVSS Log Viewer.

http://www.com/action/a	
File View	
🔟 🗉 💥 🚯 🖉 🖑 👯 🛛 🗰	
PVSS00pmon         (1)         2007.09.04         10:15:13.860, SYS,           PVSS00pmon         (1)         2007.09.04         10:15:13.876, SYS,           PVSS00data         (0)         2007.09.04         10:15:13.876, SYS,           PVSS00data         (0)         2007.09.04         10:15:13.985, SYS,           PVSS00data         (0)         2007.09.04         10:15:14.079, SYS,           PVSS00data         (0)         2007.09.04         10:15:14.079, SYS,           PVSS00data         (0)         2007.09.04         10:15:14.845, SYS,           PVSS00data         (0)         2007.09.04         10:15:14.845, SYS,           PVSS00data         (0)         2007.09.04         10:15:14.806, SYS,           PVSS00data         (0)         2007.09.04         10:15:14.806, SYS,           PVSS00data         (0)         2007.09.04         10:15:15.407, SYS,	INFO, 20/pmon, Got START_ALL command from 127.0.0.1, starting the project INFO, 1, Manager Start, C:\ETM\PVSS2\3.6\bin\PVSS00data.exe -PROJ Phos_PoverSupply -pmonIndex 1 INFO, 1, Manager Start, PROJ. Phos_PoverSupply, V 3.6 - 3.6 P005 linked at Nov 24 2006 13:02:37 INFO, 0, (Re)Opening databases INFO, 0, Initialize archive smoothing INFO, 0, Initialize archive smoothing INFO, 0, Loading Dpldentification INFO, 0, Initializing last value cache

Figure 8 - PVSS Log Viewer

One of automatically opened windows is the window named as Device Editor & Navigator. After successful start of subsystems and receipt of connection between them it is necessary to start the system of final states FSM (FSM - Finite State Machine) on each of computers, having pressed button Start/Restart All in FSM inlay, Navigator mode of Device Editor & Navigator panel.

🖇 ¥ision_1: fwDeviceEditorNavigator\fwD 💶 💌
Device Editor & Navigator 🛛 🔗
Running on: phs_pws
Hardware Logical FSM
PHS PWS
B PHS PWS MODULE1
PHS_PWS_LV_MOD
PHS_PWS_HV_ISEG
PHS_PWS_MODULE2
PHS_PWS_LV_MOD
B-D PHS_PWS_MODULE3
Start/Restart All Stop All
DIM_DNS_NODE: pcvniief-dcs
Navigator mode Go to Editor
Close

Figure 9 - Device Editor & Navigator, FSM stop

There is a funny bug with opening of Device Editor & Navigator. If you don't see the window after project start, press the right button of your mouse on Vision1: fwDeviceEditorNavogator on Windows panel, choose Move in opened window (figure 10) and then press once right button on your keyboard. Move opened window on visible part of your desktop.



Figure 10 – Opening Device Editor & Navigator

#### 2.2 Stop of DCS system

To stop the project it is necessary to open Device Editor & Navigator window (figure 9), choose FSM inlay, Navigator mode, and press the Stop All button to stop FSM of the project.

Then, it is necessary to press the red light signal button in PVSS Control Panel (see figure 7) to close windows DNS.exe and OPC-server ISEG, switch off all power supplies by pressing the button of power supply switch-off on the panel of each device (by analogy to switch-on, see above) disconnect water delivery to cool WIENER devices.

## 3. How to work with power supply for PHOS modules

#### 3.1 Main power supply window

Click right button of your mouse on PHS\_PWS (PHS\_PWS - PHOS Power Supply) inlay in Device Editor & Navigator. Choose "View" and next window will be opened:

	System	State				Sun 20/01/20	008 11:59
	PHS_PWS_TOP	OFF ★ 🗗					
Sub-System	State						
PHS_PWS_MODULE1	OFF 🔻 🕻	P					
PHS_PWS_MODULE2	OFF 🔻	Wiener 1 Crate	OFF				
PHS_PWS_MODULE3	OFF 🔻	9	Status		Status		Status
		Channel 0 (13.5V)	OFF	Channel 2 (13.5V)	OFF	Channel 4 (13.5V)	OFF
		Wiener 2 Crate	OFF	Wiener 3 Crate	OFF	Wiener 4 Crate	OFF
			Status		Status		Status
		Channel 0 (4.2V)	OFF	Channel 0 (4.2V)	OFF	Channel 0 (4.2V)	OFF
		Channel 2 (3.3V)	OFF	Channel 2 (3.3V)	OFF	Channel 2 (3.3V)	OFF
		Channel 4 (4V)	OFF	Channel 4 (4V)	OFF	Channel 4 (4V)	OFF
		Channel 6 (-6V)	OFF	Channel 6 (-6V)	OFF	Channel 6 (-6V)	OFF
		Channel 8 (6V)	OFF	Channel 8 (6V)	OFF	Channel 8 (6V)	OFF
		M1 LV Current	M1 LV Temper.	M2 LV Current	M2 LV Temper.	M3 LV Current	M3 LV Ten
		Iseg Crate	OFF				
			Status		Status		Status
		Channel 0	OFF	Channel 0	OFF	Channel 0	OFF
		Channel 1	OFF	Channel 1	OFF	Channel 1	OFF
		Channel 2	OFF	Channel 2	OFF	Channel 2	OFF
		Channel 3	OFF	Channel 3	OFF	Channel 3	OFF
		Channel 4	OFF	Channel 4	OFF	Channel 4	OFF
		Channel 5	OFF	Channel 5	OFF	Channel 5	OFF
		Channel 6	OFF	Channel 6	OFF	Channel 6	OFF
		Channel 7	OFF	Channel7	OFF	Channel 7	OFF
			M1 HV Current		M2 HV Current		M3 HV Cu
ooayes							-

Figure 11 – Main power supply FSM window

Left side of this window shows the list of available modules, which you can supply.

PHS\_PWS\_MODULE1 controls low voltage channel 0 (and channel 2 as temporary solution until new 13V Wiener is not delivered) for Wiener1, channels 0, 2, 4, 6, 8 for Wiener 2 and Iseg high voltage module 1.

PHS\_PWS\_MODULE2 controls channel 2 for Wiener1, channels 0, 2, 4, 6, 8 for Wiener 3 and Iseg module 2.

PHS\_PWS\_MODULE3 controls channel 4 for Wiener1, channels 0, 2, 4, 6, 8 for Wiener 4 and Iseg module 3.

On the right side of this screen there is a summary of states of each channel. Each cell can shows OFF, ON, RAMPING status.

"M1 LV Current" button opens Current over time curve for all low voltage channels of PHOS module 1.

"M1 LV Temper." button opens Temperature over time curve for all low voltage channels of PHOS module 1.

"M2 LV Current" button opens Current over time curve for all low voltage channels of PHOS module 2.

"M2 LV Temper." button opens Temperature over time curve for all low voltage channels of PHOS module 2.

"M3 LV Current" button opens Current over time curve for all low voltage channels of PHOS module 3.

"M3 LV Temper." button opens Temperature over time curve for all low voltage

channels of PHOS module 3.

"M1 HV Current" button opens Current over time curve for all low voltage channels of PHOS module 1.

"M2 HV Current" button opens Current over time curve for all low voltage channels of PHOS module 2.

"M3 HV Current" button opens Current over time curve for all low voltage channels of PHOS module 3.

Some of curve buttons you can find on screens which showed below.

#### 3.2 Low voltage control

Choose your PHOS module and click double left button of your mouse.

	System PHS_PWS_MOD	ULE2	:	State off → P						Sun 20/01/2	008 12:12:4
Sub-System	Stat	e									
HS_PWS_LV_MODULE	2 OFF	•	8								
HS_PWS_HV_MODULI	E2 OFF	•	8	Wiener 1 Cra	te OF	F		keg	Crate	OFF	
				Ch 2 (135V)	Status OFF	Voltage [V] 0.000	Current [A] 0.000	Uset Settings	395.0 ∨ Ramp Status	0.2 %	
				Wiener 3 Cra	te OF	F			Status	Voltage [V]	Current [m/
					itatus	Voltage [V]	Current [A]	ChO	OFF	0.0	0.000
				Ch 0 (4.2V)	OFF	0.000	0.000	Ch 1	OFF	0.0	0.000
				Ch 2 (3.3V)	OFF	000.0	0.000	Ch 2	OFF	0.0	0.000
				Ch 4 (4V)	OFF	000.0	0.000	Ch 3	OFF	0.0	0.000
				Ch 6 (-6V)	OFF	000.0	0.000	Ch 4	OFF	0.0	0.000
				Ch 8 (6V)	OFF	000.0	0.000	Ch 5	OFF	0.0	0.000
							· · · · · ·	Ch 6	OFF	0.0	0.000
						M2 LV Current	M2 LV Temper.	Ch 7	OFF	0.0	0.000
											M2 HV Curre
ssages											-

Figure 12 – PHS\_PWS\_MODULE2 window

Push the lock button to unlock your window and access the control of the device.



Figure 13 – Getting control over PHS\_PWS\_MODULE 2 FSM

If you get control, the color of cells will change.

	System PHS_PWS_MODULE2	S	State						Sun 20/01/2	008 12:17:1
Sub-System	State									
PHS_PWS_LV_MODU	LE2 OFF 🔻	8								
HS_PWS_HV_MODU	LE2 OFF 🔹	4	Wiener 1 Crate	OF	7		keg	Cirate 🗌	OFF	
			Ch 2 (135V)	Status OFF	Voltage [V] 0.000	Current [A] 0.000	Uset Settings	395.0 ∨ Ramp	0.2 %	
			Wiener 3 Crate	OF				Status	Voltage [V]	Current [m.
				. texture	Valtara IVI	Current [A]	Ch 0	OFF	0.0	000.0
			Ch 0 (4.2V)	OFF	0.000	000.0	Ch 1	OFF	0.0	000.0
			Ch 2 (3.3V)	OFF	0.000	000.0	Ch 2	OFF	0.0	000.0
			Ch 4 (4V)	OFF	000.0	000.0	Ch 3	OFF	0.0	000.0
			Ch6(-6V)	OFF	0.000	0.000	Ch 4	OFF	0.0	000.0
			Ch 8 (6V)	OFF	0.000	000.0	Ch 5	OFF	0.0	000.0
					<u> ''</u>	· · · · · · ·	Ch 6	OFF	0.0	000.0
					M2 LV Current	M2LV Temper.	Ch 7	OFF	0.0	000.0
										M2 HV Currer
ssages										_

Figure 14 – PHS\_PWS\_MODULE2 under user control

Now user get power supply control of PHOS Module 2. You must do the same operation for the second and third PHOS module. Click double PHS\_PWS\_LV\_MODULE2 to get an access to LV control window.

In control area of the screen press must be NOT\_READY state power button on the front panel of Wiener devices are in ON mode. Press GO\_READY button to move low voltage power system in ON mode.

S	System			State	
PHS_PW	S_LV_MODU	LE2	1	IOT_READY	- 8 1
			s	WITCH_OFF	
	State		G	O_READY	
:R1	OFF	•	×	_	
_CH2	OFF	-	×	Wien	er 1 Crate

Figure 15 – Switching on low voltage channels

You can always check status of each channel in the right side of the window. When all channels be ready, their colors become green and status will change to ON.

		System			State		Thu 17/01/	2008 12:52:4
CERN	PHS_P	WS_LV_MODUL	E2		READY -			
Sub-System	n	State						
PHS_PWS_LV_WIE	NER1	OFF	-	×				
PHS_PWS_LV_WIENE	R1_CH2	OFF	•	×	Wiener 1 Cra	nte O	FF	
PHS_PWS_LV_WIE	INER3	OII		1		Status	Voltage [V]	Current [Å]
PHS_PWS_LV_WIENE	R3_CH0	OII	٠	1	Ch 2 (135V)	OFF	0.000	000.0
PHS_PWS_LV_WIENE	R3_CH2	OH	•	1	Wiener 3 Cr	ate C	IN	
PHS_PWS_LV_WIENE	R3_CH4	ON		1				C
PHS_PWS_LV_WIENE	R3_CH6	ON		1	Ch 0 (4.2V)	ON	- Voltage [V]	Current [A]
PHS_PWS_LV_WIENE	R3_CH8	OII		1	(1) 2 (3 33)	ON	3.914	0.152
					Ch4(4V)		4.676	0.148
					Ch 6 (-6V)	ON	6.542	0.270
					Ch 8 (6V)	ON	6.526	0.047
							M2 LV Current	M2 LV Temper
Vlessages								

Figure 16 – LV control of PHOS module 2

You can also include or exclude separate low voltage channels by pressing the button opposite their names (on figure 15 first two channels are uncontrolled and do not change they states after commands). In ON state press GO\_NR to switch off all channels. If you need to switch off separate channel press GO\_OFF opposite the name of this channel. If some channels are ON and

some are OFF control level will be in NOT\_READY state. Press SWITCH\_OFF to switch off all channels and GO\_ON start channels, which are in OFF mode.

If you need to change channel configuration press double on interested channel and input new settings in opened window. If new settings applied, they will appear in gray window. You can change all setting except maximum power. In case you need to change maximum power please contact DCS experts.

/iener/lvphoswiener	3/Channel0: TOP					
	Device PHS_PWS_LV_WIENER3	_сно	State OFF ▼ ✓		Sun 20/01/200	08 12:
Marathon Cha	nnel Operation	A	larm Summary :		Action	
hannel Name: ph	s_pws:Wiener/lvphoswier	er3/Channe	elO	Model: PL	.512 Channel (TCF	P/IP)
Jescription: ph	s_pws:Wiener/lvphoswier	ner3/Channe	e10.	Position: 0		
Channel Info: UC						
Status			- Settings			
Power OFF	STABLE VOLTAGE	_	Nominal Voltage:	0.000	4.400	
Channel Inhi	ait: INACTIVE		Current Limit:	0.000	33.000	
Ever Elege			Voltage Rise Rate	0.000	0.000	
Sense Volta	ge: OK		Voltage Fall Rate:	0.000	0.000	
Terminal Vol	tage 🔵 Power Outj	put				
Current	Communic	ation	- Limit Settings Minimum	0.000	0.000	
Temperature	Timeout		Sense Voltage: Maximum	10.000	13.000	
Maaguramante			Sense Voltage:	0.000	4.900	
Sense Voltage:	0.000	Details	Terminal Voltage	0.000	5.000	
Terminal Voltage:	0.000	Details	Maximum Current:	0.000	33.000	
Current:	0.000	Details	Maximum Power:	0.000	150.000	
Temperature:	27	Details	Sup	ervision Beha	wiour	
Commands			Grouping			
Power: On	Off		Channel Group:	0	1 (1	127)

Figure 16 – Changing settings for Wiener device channel

You can always check status of each Wiener typing lvphoswiener (or lvphoswiener2) in the command line of any web browser.

Ø	PL512 - Windows Ir	nternet Explorer provi	ided by CERN		_		6	PL512 - Windows Ir	nternet Explorer provi	ded by CERN			- 🗆 🗙
G	💽 🗸 🙋 http:	//lvphoswiener/	• • •	Google		<b>P</b> -		💽 🗸 🙋 http:	//lvphoswiener2/	• •,	Google		<b>P</b> •
File	Edit View Fav	vorites Tools Help					F	le Edit View Fa	vorites Tools Help				
☆	🅸 🄏 PL512			🏠 • 🗟 • 🖶 •	🔂 Page 👻 🍥 Tools	- 🌼	2	🕈 🏟 🄏 PL512			🟠 • 🗟 • 🖶 •	🔂 Page 🔹 🎯 Too	ls • 🌼
	<u>PL512</u>		Global Status	V	V-IE-NE-R	*		<u>PL512</u>		Global Status	7	V-IE-NE-R	×
	Power Supply S	Status		ON		1		Power Supply	Status		ON		1
			Output Voltages			'			(	Output Voltage	s		-
	Channel	Sense Voltage	Current	Terminal Voltage	Status			Channel	Sense Voltage	Current	Terminal Voltage	Status	
	U0	6.711V	18.398A	6.791V	ON	1		U0	4.374V	17.851A	4.509V	ON	
	U2	6.752V	18.402A	6.824V	ON	1		U2	3.555V	34.61A	3.831V	ON	
	U4	5.963V	11.867A	6.060V	ON	1		U4	4.246V	42.43A	4.591V	ON	
	U6	0.000V	0.000A	0.000V	OFF	1		U6	0.000V	0.000A	0.000V	OFF	
	U8	0.000V	0.000A	0.000V	OFF	1		U8	3.058V	30.167A	3.199V	ON	
	U10	0.000V	0.000A	0.000V	OFF	1		U10	3.161V	30.019A	3.304V	ON	
Dop				N Local intranet	100%		Do	ne			Nocal intranet	€ 100°	× //

Figure 17 - Checking Wiener status from web browser

If you want to finish your work with low voltage power supply don't forget to press the power button on the front panel of Wiener device.

In case of Error of any sub-sytem control cells become red. Press RESET button reset the status of the power channel which functions improperly.

#### 3.3 High voltage control

In figure 14 press twice on PHS\_PWS\_HV\_ISEG\_MODULE1 to get the access to Iseg high voltage channels. Next window will be opened:

	PHS_PW	S_HV_MODULE2	NO	T_READY			
Sub-System		State					
HS_PWS_HV_ISEG_MO	D2_CH	OFF 🔫	1				
HS_PWS_HV_ISEG_MO	D2_CH	OFF 🔻	1	keg (	Trate	ON	
HS_PWS_HV_ISEG_MO	D2_CH	OFF 🔻	1	ma02	395.0 V. Ramp	0.2 %	
HS_PWS_HV_ISEG_MO	D2_CH	OFF 🔻	1	Settings	Status	2	
HS_PWS_HV_ISEG_MO	D2_CH	OFF 👻	1		Status	Voltage [V]	Current ImAl
HS_PWS_HV_ISEG_MO	D2_CH	OFF 💌	1	Ch 0	OFF	0.0	000.0
HS_PWS_HV_ISEG_MO	D2_CH	OFF 🔻	1	Ch 1	OFF	0.0	0.000
HS_PWS_HV_ISEG_MO	D2_CH	OFF 🔻	1	Ch 2	OFF	0.0	0.000
				Ch 3	OFF	0.0	0.000
				Ch 4	OFF	0.0	0.000
				Ch 5	OFF	0.0	000.0
				Ch6	OFF	0.0	0.000
				Ch 7	OFF	0.0	0.000
						,	M2 HV Current
Messages							

Figure 18 – HV control of PHOS module 2

Press SWITCH\_ON to switch on Iseg high voltage crate. You can always check the status of the crate in the right side of user window. If crate is on, system will go to NOT\_READY state.

Press GO\_READY button to start ramping of all channels. If you need to start only few channels press GO\_ON button opposite the name of this channel. Default ramping speed of each channel is 0,5 Volts per second. Wait while all channels become green and change they status to ON. You can always find the current of each channel in the right part of your window.

If you need to switch off all channels press GO\_OFF button from READY state. It is also possible to make emergency reset of high voltage system pressing EMERG\_RESET in each state (except OFF). It increase ramping speed to maximum value -50 Volts per second and switch off all channels.

Press SWITCH\_OFF in NOT\_READY stare to switch off high voltage crate (be careful, if another modules are on, you will switch them off as well).

In case of Error of any sub-sytem control cells become red. Press RESET button reset the status of the power channel which functions improperly. Don't forget that it is not allowed to keep high voltage on while low voltage is off.

### 4. Conclusion

To control another PHOS modules return back to figure 11 and choose another module. Repeat the same steps for new module.

In case of bugs or unusual behavior of power supply system please contact Alexander Mamonov (PHOS DCS) or Lionel Wallet (ALICE DCS).

You can also find answers in PHOS DCS Manual (old version): http://aliceinfo.cern.ch/Collaboration/ALICE\_Project/PHOS/Documents/Manuals/PHOS\_DCS\_ma nual.pdf

Previous version of this instruction is here:

http://aliceinfo.cern.ch/Collaboration/ALICE\_Project/PHOS/Documents/Manuals/PowerSystem\_M anual.pdf