

CMS ME CSC HV system

Slice test shift operator instructions.

Alex Madorsky, University of Florida/Physics
madorsky@phys.ufl.edu

Scope of the document

The scope of this document is shown below:

1. Powering the system up
2. Preparing the system for power cut
3. Emergency high voltage shutdown

The actual HV system control (setting the voltages, trip levels, monitoring the parameters) is done via the DCS software. The instructions can be found in the DCS software manual.

People to contact in case of problems:

Alex Madorsky (madorsky@phys.ufl.edu, +1-352-392-9849)

Petr Levchenko (160537)

Sergei Vavilov (163122)

System components

The HV system components that the shift operator has access to are listed below:

1. **Primary High-Voltage power supplies** (Figure 1).
Each of these modules provides high voltage for one of the Distribution racks located on disks.
2. **Control computer** (Figure 2).
The software running on that computer controls all components of the system.
3. **Low Voltage power supply** (Figure 3).
Provides low voltage power for distribution boards.
4. **Primary HV power supply control module** (Figure 4).
An interface from computer to Primary HV power supplies.

Powering the system up

1. Turn on Primary HV power supplies with front panel switches. The voltage and current indicators should light up, and show 0.00 KV and 0.00 mA
2. Turn on Control computer with front panel switch. The green power LED above the switch should light up. If it does not, check that the additional power switch on the rear panel of the computer is in the ON position.
3. Turn on Primary HV power supply control module. The power switch is located on the rear panel of the module

The system is ready to work. Use the DCS software manual to turn on all voltages on chambers.

Actions on trips

Event	Action
Single trip in any chamber, any channel	Wait 1 minute and attempt to raise voltage to nominal on the tripped channel again
Second trip in the same chamber and same channel within 1 hour from first	Do not attempt recovery, leave the channel in tripped state
Three or more trips in the same chamber on different channels within 1 hour	Turn the entire CSC off, call experts
Three or more CSC are turned off due to trips within 1 hour	Turn off the entire HV system, call experts

Preparing the system for power cut

1. Using DCS software, remove voltages from all chambers, wait until it is close to 0V (see DCS software instructions)
2. Using the DCS software, turn off the outputs of Primary power supplies (see DCS software instructions)
3. Using DCS software, turn off the outputs of the LV power supplies
4. Turn off Primary power supplies with power switches on the front panels
5. Turn off Primary power supply control module (switch on the rear panel)
6. On Low voltage power supply, select channel U11 with “Mode” switch, then press the power switch down and hold it until the display shows “U11 OFF”. Then release the power switch and press it down again, hold until display becomes blank. The LV power supply is off .
7. Control computer requires proper shutdown procedure:
 - a. From any computer with ssh installed, connect to the control computer with the following command: `ssh hvuser@ufcmshv1--cms` for Z- (`ufcmshv2--cms` for Z+)
 - b. Password: UFdqm_04

- c. Issue this command: `sudo /sbin/shutdown -h now`
- d. Wait for 2 min, and shut down the power of the computer with front panel switch.

The system is ready for power cut.

Emergency high voltage shutdown

Just put front panel switches on 8 Primary HV power supplies into OFF position (see Figure 1)



Figure 1. Primary High-Voltage power supplies

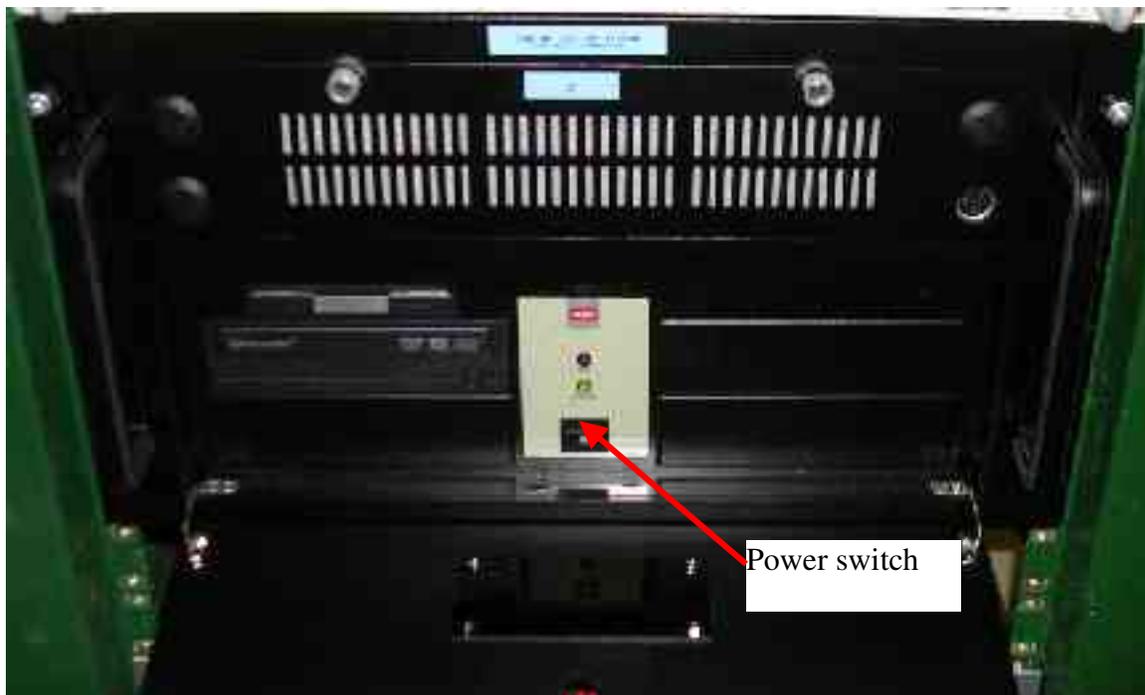


Figure 2. Control computer

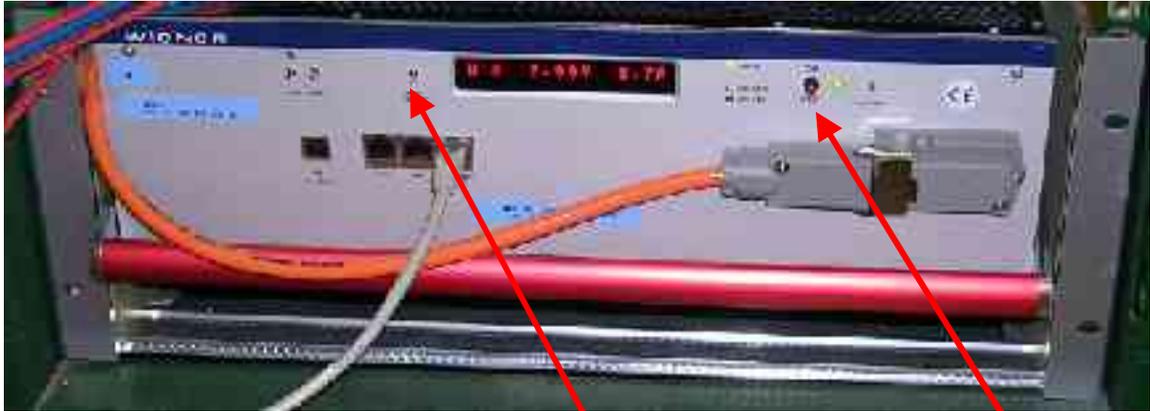


Figure 3. Low Voltage power supply

Mode switch

Power switch



Figure 4 Primary HV power supply control module (power switch on rear panel)