

CESAR User Guide

Introduction

The CESAR graphical user interface is the beam control software for experimental areas. It is in use since June 2006, replacing the old NODAL based physicist TREE programs.

CESAR is based on java and constructed around an ORACLE database.

For the M2 beam-line, CESAR is running on a M\$ Windows based PC (CWO-HNB411-M2A) located in the COMPASS control room. That PC is configured such that it starts automatically the CESAR GUI with the right privileges and properties. If you ever leave the CESAR GUI, you may restart it by double-clicking the CESAR icon on the desktop.

CESAR appears as a large window provided with (starting from the top):

- A main menu (Status, Files, Tune, Detectors, Access, EA, View, Window);
- A horizontal bar containing items corresponding to frequently used tasks;
- A bar with two tabs: EA and M2.
M2 is the default Workspace and should never be changed to EA.

Through CESAR you can monitor and control all elements belonging to the M2 Beam-line. Additionally, CESAR manages the Access to the experimental area.

Monitoring the M2 Beam-line

The most important elements which the shift crew might need to check or control are Magnets and Rectifiers (magnets power supplies), T6 Target, Tax, Experimental Scalers. Moreover, CESAR can provide a general status window giving an updated overview of the current Beam-line conditions.

Magnets (Status / Magnet Status)

By clicking on *Status / Magnet Status*, the complete list of the M2 magnets (Bends, MIBS, Quadrupoles, Scrapers and Trims) will pop up.

Note that BEND10 corresponds to SM1 and BEND11 to SM2.

In the bottom left corner of the window you have the possibility of clicking on either *run* or *hold*. In the first case all currents values are updated at each spill, while on *hold* all values are frozen to the last spill. Make sure that you are in *run* mode if you intend to check the actual status of the magnets!

You also have the possibility of a manual update by clicking on *Refresh (All or Selected)*.

If the area is closed, all currents must be at beam reference (BeamRef) and displayed in black color.

Here follows a list of the most common operations and problems involving magnets.

Changing a magnet current:

- Select the desired magnet by a mouse click;
- Click on *Set Current* and enter the requested value;
- Normally you do not need to change the BeamRef, therefore make sure the option *update Beam Reference* is disabled;
- Click on OK;
- During the time when the current will be changing, the field corresponding to the selected magnet will turn yellow.

Before Changing current in SM1 (BEND10):

- Run the script *protectMicroMegas SM1* on a DAQ machine;
- When SM1 is ramped, run *unprotectMicroMegas SM1*.

Before Changing current in SM2 (BEND11):

- Switch off GEM High Voltage (DCS terminal).

One magnet is not at Beam Reference (Orange):

If one readout current differs by more than 0.2 A from the BeamRef, then the corresponding values will be displayed in orange color. Should this happen, check that this is not just a temporary fluctuation (usually by a fraction of Ampere) and, in such a case, try to set the current to BeamRef as described above.

One magnet is faulty (Red):

If a magnet values are displayed in red color, than either the magnet itself or the corresponding power supply (rectifier) can be faulty. In such a case:

- Select the magnet;
- Click on *Rectifier Status*;
- Select the Rectifier by clicking on it;
- Click on *Reset*;
- Wait up to 30 seconds and then click on *Refresh* to update the status;
- Check whether the fault disappeared;
- If this does not help, then notify immediately the problem to the SPS Control Room.

Communication problems (Blue):

If CESAR can not communicate with one server (either because of network problems or because the server itself is down), than one or more magnets will be displayed in blue. This problem can happen rather frequently and it usually disappears within some

minutes. Should the problem persist, try to exit from CESAR and restart it by double clicking on the desktop icon. If this does not help, then contact the SPS control room. ___

T6 Target (Status / Obstacle Status)

By clicking on *Status / Obstacle Status*, you will get the list of beam obstacles including the T6 Target (last but one element in the list).

Different target thicknesses are available (500, 100, 40 mm beryllium and air). During normal data taking, the 500 mm beryllium target is used. For special purposes other targets can be employed.

If you need to change the target thickness:

- Select T6 by clicking on it;
- Click on Move;
- Select a position;
- Click on OK.

TAX Dump (Status / Tax Status)

By clicking on *Status / Tax Status*, you will get the positions of the two tax dumps present in the M2 Beam-line.

The relevant dump for the muon run is TAX02.

TAX02 can be moved to two different positions, depending on whether the beam has to reach COMPASS experimental area or not:

- Beam on: TAX02 = -140mm;
- Access: TAX02 = +140mm.

Normally the movement of TAX02 is automatically carried out by the access commands *OPEN* and *BEAM ON* (see *Access Command* section), so that the shift crew does not need to use the Tax Status command.

Nevertheless, sometimes it might be necessary to move the Tax manually (for example if the automatic procedure does not work because of communication problems).

The manual movement can be performed this way:

- Select TAX02 by clicking on it;
- Click on *Move*;
- Select the desired position and then *Ok*;
- Click on Refresh to check that the movement really takes place.

Experimental Scalers (Detectors / Experimental Scalers Status)

By clicking on Detectors / Experimental Scalers Status, you will get a list of rates belonging to different detectors placed in the Beam-line. Among them, the most important are:

- ION02 (ion chamber), measuring the muon intensity;
- M2A_EXPT02 (inner veto counter), measuring the inner beam halo;
- M2A_EXPT03 (outer veto counter), measuring the outer beam halo.

All measurements are integrated over a spill. As for all other values displayed by CESAR, they can be updated at each spill (clicking on *run*) or frozen to the last spill (*hold*).

For a T6 intensity of $140E11$ protons per second and 500 mm T6 target, typical figures for the above scalers are:

- ION02 ~ $2.3E08$;
- M2A_EXPT02 ~ $3.0E07$;
- M2A_EXPT03 ~ $1.4E07$.

In case of data taking, you should check those values a couple of times during the shift and notify any substantial deviation to the beam coordinator.

General Beam-line Status (Status / General Status)

By clicking on *Status / General Status*, a window providing a glimpse of the M2 Beam-line status will appear. The general status contains information about T6 target thickness, TAX position, muon rate, collimators positions and spectrometer magnets currents.

Managing the Access to the Experimental Area

By clicking on *Access / Access Command*, a window will pop up which allows you to manage the access to the experimental area, in particular to switch between data taking conditions (*Beam on*) and key access (*Open*).

In the upper left field you can choose the door to be controlled: PPE211 (access to the tunnel), PPE221 (access to the experiment, upstream end) and PPE231 (access to the experiment, downstream end).

The *Status* field provides information about the status of the selected door, while the upper right field contains the values of the three Beam-line elements controlled by the access command: BEND2 (SFE_NR21-006-M2) and BEND3 (SFE_NR22-023-M2) currents and TAX02 (SFE_TAX-02-M2) position. These values can be updated by clicking on *STATUS*.

Opening the experimental area to key access:

- Select door 221 (pay attention! Default door is 211!);
- Click on *OPEN* and enter your family name;
- Wait ~300 seconds for the Tax to be moved into the beam (from -140mm to 140mm);
- Wait ~60 seconds for the two bending magnets to be switched off;
- If within the given times one (or more) of the above three elements does not reach the nominal value, then click again on *OPEN* and enter your name once more;
- If necessary, repeat this procedure a few times (if this does not help, call the SPS control room and notify the problem);
- If everything goes right, you will get the messages *Command Succeeded* in the logging Console and *Granted* in the Status field.

Going from key access to beam on:

- Select door 221;
- Click on *BEAM ON* and enter your family name;
- Follow the same procedure described above for going to key access;
- If everything goes right, you will get the messages *command succeeded* in the logging

Console and *Closed* in the Status field.

Useful Phone Numbers

SPS Control Room: 77500 or 70475

Beam Coordinator: 160539