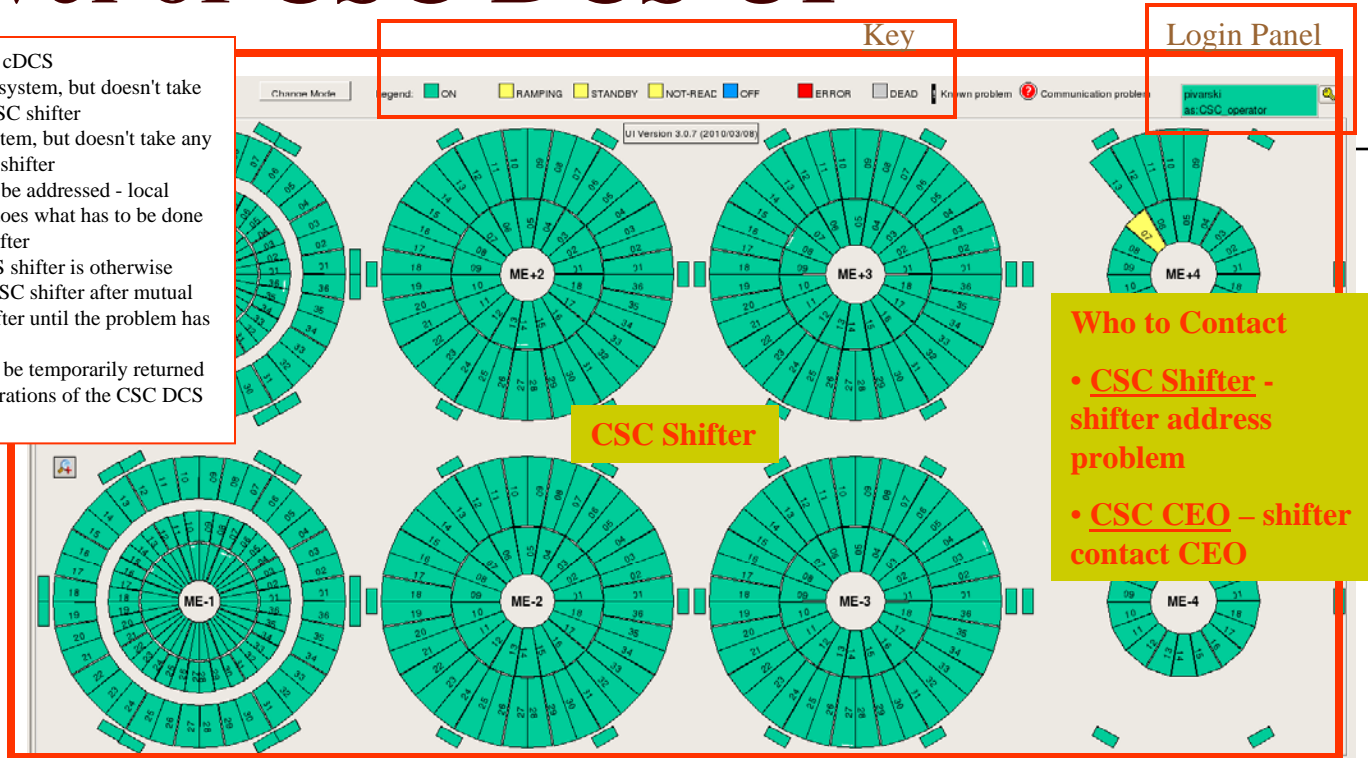


# Top Level of CSC DCS UI

- CSC normally in central DCS **control** - cDCS
- Central DCS shifter **monitors** the CSC system, but doesn't take any action without consulting with the CSC shifter
- CSC Shifter also **monitors** the CSC system, but doesn't take any action without consulting with the cDCS shifter
  - o When there is a problem that needs to be addressed - local shifter goes to central DCS console and does what has to be done from there, together with central DCS shifter
  - o For major problems or when the cDCS shifter is otherwise occupied, control may be shifted to the CSC shifter after mutual consent of the cDCS shifter and CSC shifter until the problem has been corrected.
- The CSC CEO may request that control be temporarily returned to the CSC shift station when special operations of the CSC DCS are planned and underway

## CSC End View

- \* CSC
- \* PCrates



## Communication Status



## Subsystem Panel

CSC CEO



## Majority Logic



# Top Level Procedures for CSC DCS

## CEO Level Alarms

- Subsystem Panel
  - Alarm <RED> indicates problem in all or one end of CSC
  - **Contact CEO 16 1972**
  - Check if cDCS has infrastructure alarms
- Majority Logic
  - Alarm <RED> indicates that a significant percentage of CSC devices are in alarm
  - **Contact CEO 16 1972**
- HV, LV, FEDS
  - Alarm <RED> indicates that a major component of the HV, LV or FEDS is in alarm
  - **Contact CEO 16 1972**
  - **Do NOT turn these back on** – ONLY expert should correct

## Shifter Level Alarms

- End View
  - Multiple chambers or crates in Alarm <RED> – indicates there may be a major problem – check bottom of the display – **Contact CEO 16 1972**
  - Single chamber or crate in Alarm <RED> indicates chamber or crate has a single device in error – CSC Shifter follow detailed procedure
- Communication Status
  - Alarm <RED> monitor, if it does not clear itself after 5 minutes contact CEO 16 1972
  - NOTE: Question marks ‘?’ will also appear on End View
- Value Monitor
  - This is a diagnostic panel
  - Shifter hourly cycle through displays and follow detailed procedures

# Outline of Procedures for CSC DCS

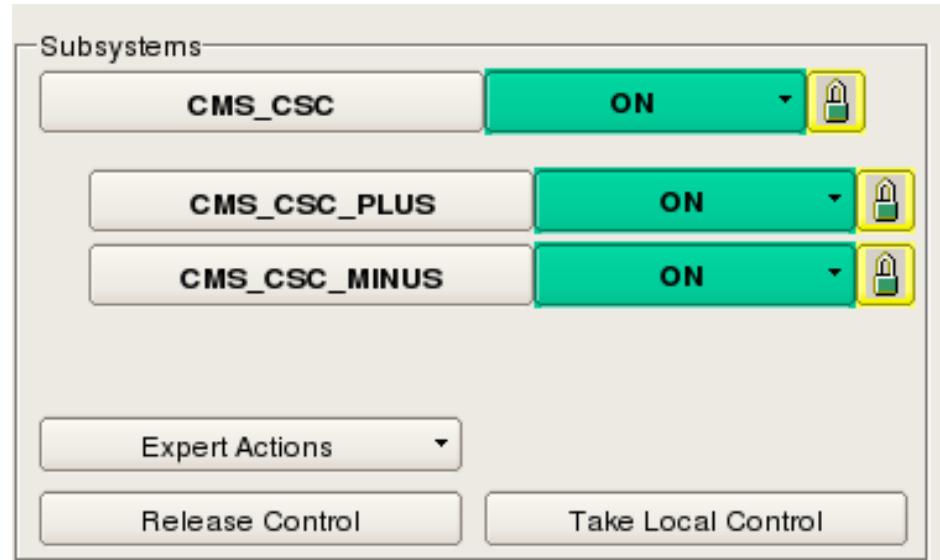
## Outline on entire document

- Subsystem Panel
  - System Control
  - Expert Actions
    - Lock out / acknowledge
    - List acknowledged devices
  - Operator Release / Take Control
- Majority Logic
- HV, LV, FEDS
  - HV Primary – all but ME1/1
  - HV Primary – ME1/1
  - Maraton LV
  - Maraton
- End View
  - Chambers
    - HV alarms
    - LV alarms
    - Temperature alarms
  - pCrates
    - LV alarms
    - Temperature alarms
- Communication Status
- Value Monitor
- Operation Instructions
  - Log In / Out
  - Change display MODE
- STANDBY state – HV Operation
  - OUTER ON
  - INNER ON
  - ALL ON
- Terminology

# Subsystems Panel

## CEO Level Alarms

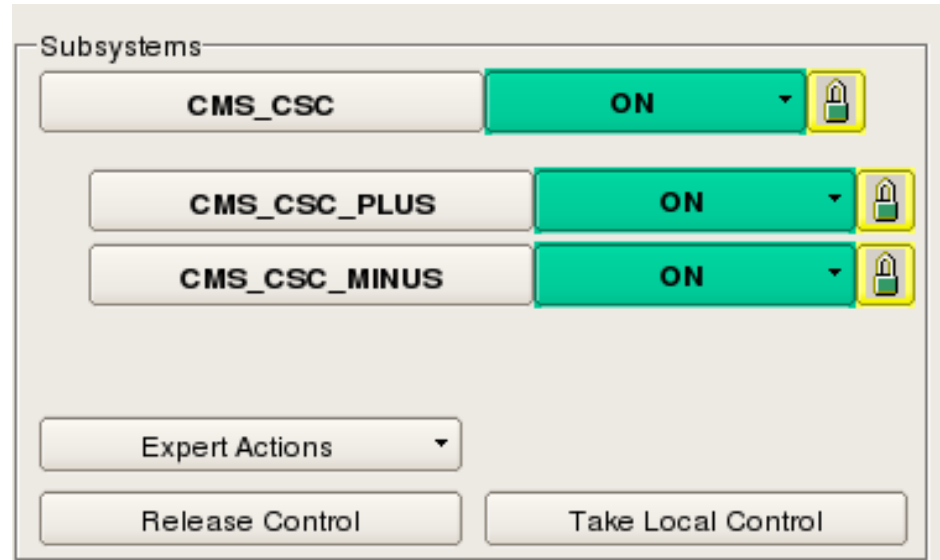
- CMS\_CSC
  - Control all of CSC
  - ON / STANDBY / OUTER ON/ OFF
- CMS\_CSC\_PLUS
- CMS\_CSC\_MINUS
- Expert Actions
- Release Control
- Take Control



# Subsystems Panel – System Control

## CEO Level Alarms

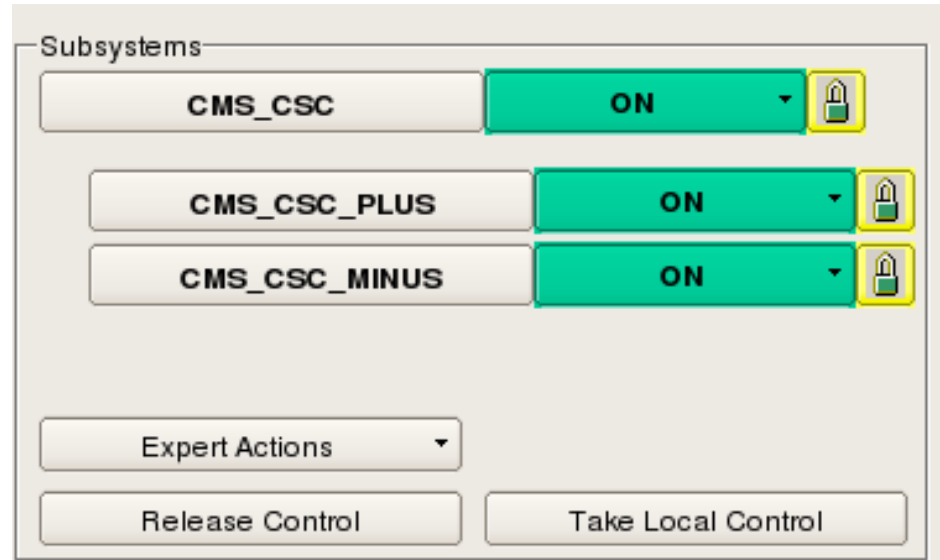
- CMS\_CSC
  - Control all of CSC
  - ON / STANDBY / OUTER ON/ OFF
- CMS\_CSC\_PLUS
- CMS\_CSC\_MINUS



# Subsystems Panel – Expert Actions

CEO Level

- Expert Actions
- Need pictures
- Need directions



# Lock Out

- ❑ 1<sup>st</sup> Turn Device OFF (shown after turn off)
- ❑ 2<sup>nd</sup> click on check mark
- ❑ 3<sup>rd</sup> click on “Disable”
- ❑ Record in ELOG

Device: ME\_P1\_PC3A\_CRB/Mid 6/Id 7 State: OFF

Modes: CRB/CSC\_ME\_P1\_PC3A\_LV\_CRE

Is Enabled: Disable

Channel	0.00	0.00	0.01	OFF	ON	isEnbl	DMB T	isEnbl
ch01	0.00	0.00	0.01	OFF	ON	isEnbl	21.79	isEnbl
ch02	0.00	0.00	0.03	OFF	ON	isEnbl	20.59	isEnbl
ch03	0.00	0.00	0.03	OFF	ON	isEnbl	20.64	isEnbl
ch04	0.03	0.00	0.03	OFF	ON	isEnbl	20.61	isEnbl
ch05	0.03	0.00	0.03	OFF	ON	isEnbl	20.97	isEnbl
ch06	0.03	0.00	0.03	OFF	ON	isEnbl	20.86	isEnbl
ch07	0.04	0.00	0.03	OFF	ON	isEnbl	21.37	isEnbl
ch08	0.03	0.00	0.00	OFF	ON	isEnbl	21.59	isEnbl
ch09	0.03	0.00	0.00	OFF	ON	isEnbl	20.95	isEnbl

errors: 3V(1) #1

isCrbEnabled:

ccb: 0.00 0.00 OFF ON  isEnabled

vcc: 0.00 0.00 OFF ON  isEnabled

1.5: 0.00 0.00 OFF ON  isEnabled

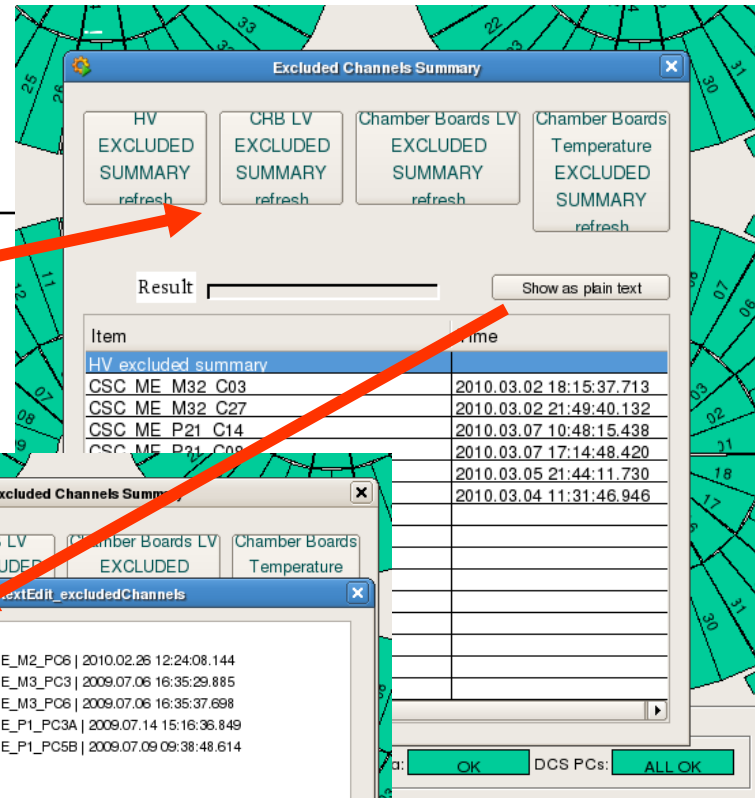
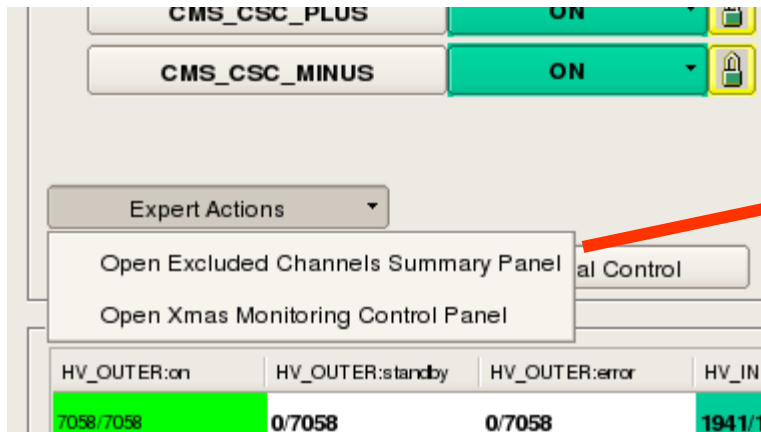
switch with no delay

**TO SWITCH ON**

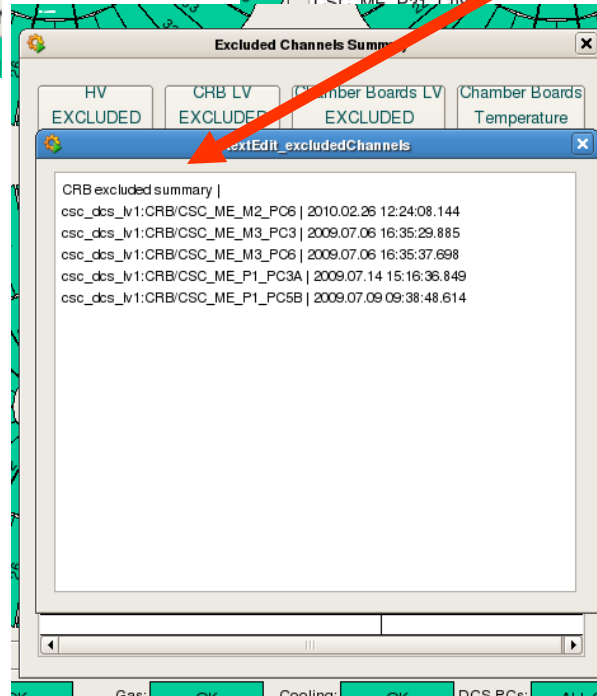
Messages

Close

# Expert Actions 1



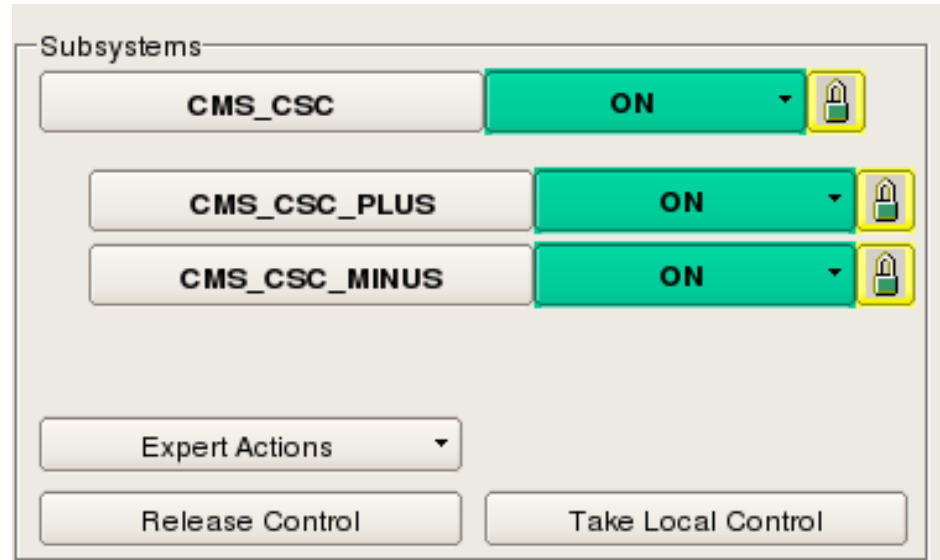
- ❑ Click on 'Expert Actions'
- ❑ Click on 'Open Excluded Channels Summary Panel'
- ❑ Click on one of the four categories to show the list of devices (NOTE this will take a while)
- ❑ Click on 'Show in plain text' to get ascii text to copy and paste



# Subsystems Panel – Release / Take Control

CEO Level

- Release / Take Control
- Need pictures
- Need directions



# Majority Logic

## CEO Level Alarms

- **These alarms are a Summary of alarms that appear elsewhere in the top panel**
- The counts are  $\gg$  (in-state)/(total-number of devices)
- A few (in-state) in error should be addressed by the shifter -- ~1%
- More than ~2%
  - Consult infrastructure with cDCS
  - Consult 'HV, LV, FEDS' section and contract CEO 16 1972

- **HV High Voltage**
  - HV Outer > HV status for outer chamber – Rings 1/2, 1/3, 2/2, 3/2, 4/2
  - HV Inner
    - HV status for inner chambers – Rings 2/1, 3/1, 4/1
  - HV ME1/1
    - HV status or ME1/1 (inner)
- **LV Low Voltage**
  - LV > LV read back for all LV in UXC
  - Temperature > Temperature read back for all temperatures in UXC

Majority Summary								
HV_OUTER:on	HV_OUTER:standby	HV_OUTER:error	HV_INNER:on	HV_INNER:standby	HV_INNER:error	HV_ME11:on	HV_ME11:standby	HV_ME11:error
7058/7058	0/7058	0/7058	1941/1942	1/1942	0/1942	1720/1720	0/1720	0/1720

LV:on	LV:error	LV:no comm.	TEMP:ok	TEMP:alert	TEMP:no comm.
8704/8704	0/8704	0/8704	3238/3238	0/3238	0/3238

# HV LV FEDS

## CEO Level Alarms

- **HV > in alarm <RED> contact CEO 16 1972**
- **LV > in alarm <RED> contact CEO – DO NOT TURN ON – expert only**
- **FEDS > in alarm <RED>**
  - consult S1 Rack Status with cDCS
  - Racks can be turned back on at nay time with cDCS
  - Crates need to be turned on manually
- **HV Primaries – all HV except for ME1/1**
  - Located in S1A08
  - Power trip will stop CSC Triggers / not cDAQ
- **LV > LV Supplies for chambers and Pcrates**
  - In UXC racks X2mnn, and X4mnn
  - Fed from OPFC modules in X4F04
  - Power trip will stop cDAQ
- **FEDS > Power status for FED crates in S1G06/08**
  - CMS standard VME crates
  - Power trip will stop cDAQ

High Voltage Primary Supplies		
	-Z	+Z
Station 1	ON	ON
St.2,3 -X	ON	ON
St.2,3 +X	ON	ON
Station 4	ON	ON

Maratons					
YE-3	YE-2	YE-1	YE+1	YE+2	YE+3
ON	ON	ON	ON	ON	ON
ON	ON	ON	ON	ON	ON
	ON	ON	ON	ON	ON
	ON	ON	ON	ON	
	ON	ON	ON	ON	
	ON	ON	ON	ON	
	ON	ON	ON	ON	
	ON	ON	ON	ON	

FED Crates			
#4(-Z)	#3(-Z)	#1(+Z)	#2(+Z)
ON	ON	ON	ON
ON	ON	ON	ON
ON	ON	ON	ON
ON	ON	ON	ON
ON	ON	ON	ON
ON	ON	ON	ON
ON	ON	ON	ON
ON	ON	ON	ON
ON	ON	ON	ON

# HV Primary - UF

- This panel shows the Primary HV setting
- This panel is used to control the HV value during beam operations

The screenshot displays a control interface for High Voltage Primary Supplies and Maratons. It includes a table for station status and a detailed view for Station 1.

High Voltage Primary Supplies			Maratons					
	-Z	+Z	YE-3	YE-2	YE-1	YE+1	YE+2	YE+3
Station 1	ON	ON	ON	ON	ON	ON	ON	ON
Station 2	ON		ON	ON	ON	ON	ON	ON
Station 3	ON		ON	ON	ON	ON	ON	ON
Station 4	ON		ON	ON	ON	ON	ON	ON

**HV Primary PSU for station -1** ON  ✓ N ON ERROR

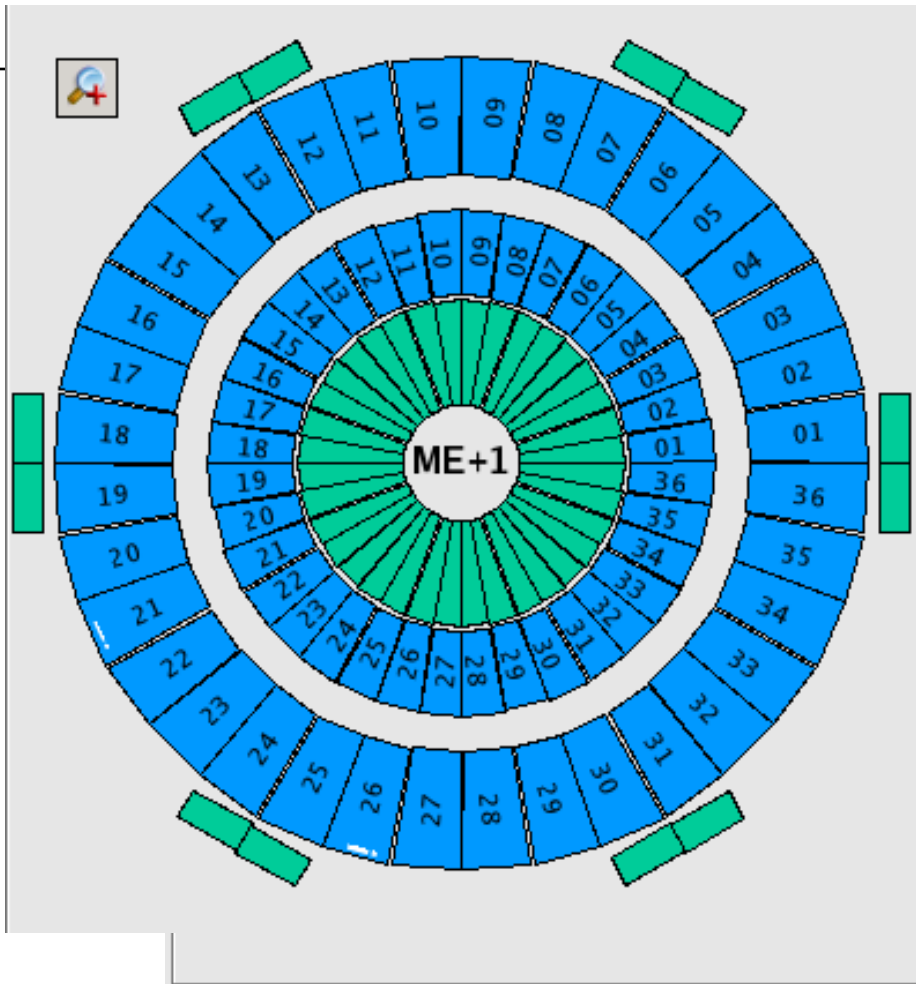
Status: ON Last update: 2009.07.24 09:52

Voltage Reading: 3691 V Current Reading: 5098 uA

Voltage Setting: 3700 V Max CurrentSetting: 50000 uA

Double click for control and more information

# HV Primary Error



- If a **HV Primary Supply** is in error, this is what the system will look like.
- Call the CEO 1972

High Voltage Primary Supplies

	-Z	+Z
Station 1	ON	ERROR
St.2,3 -X	ON	ON
St.2,3 +X	ON	ON
Station 4	ON	ON



# Maraton

- The control panel for a Maraton is shown
- **Do NOT turn on a tripped or OFF Maraton!**  
– Expert Operation ONLY!

The screenshot displays the 'PL508 Power Supply Operation' control panel. At the top, the object is identified as 'ME\_M1\_CR1\_MR1N/d 21' and is in an 'ON' state. A table lists sub-systems: 'Crate21' and seven channels (0-7), all of which are 'ON'. The main control area includes a 'Status' section with 'Power ON' selected, 'Output Channels' set to 'OK', and 'Up Time' of 0 days 00:02:54. Below this, 'Power Supply Operating Time' is 0 days 03:02:42. A 'Commands' section has 'Power' set to 'On'. A 'Channels' table provides detailed data for each channel, including voltage, current, and status. At the bottom, a 'Messages' area is visible. The interface also shows other system components like 'CMS\_CSC' (STANDBY), 'High Voltage Primary Supplies' (Stator 1-4), and 'Maratons' (YE 1-3).

Sub-System	State
Crate21	ON
Channel0	ON
Channel1	ON
Channel3	ON
Channel4	ON
Channel5	ON
Channel7	ON

Channel Name	Voltage	Unit	Current	Unit	Status
Channel0	5.490		41.980		
Channel1	5.480		42.440		
Channel3	6.960		10.160		
Channel4	5.460		42.490		
Channel5	6.980		10.000		
Channel7	6.960		10.090		

# End View

- Have MULTIPLE chambers AND/OR pcrates Alarmed?
- HV Trips of CSC

- LV Alarms
- CSC Chamber Board Alarms

# Multiple Chambers or pCrates

## Have **MULTIPLE** chambers **AND/OR** pcrates Alarmed?

- Multiple chambers in **HV alarm** may indicate a cooling water leak
  - If 3 chambers have a HV trip within 30 minutes
    - contact the CEO (16-1972) and inform him of the situation and suggest it 'may' be a water leak.
    - contact the global safety shifter and give him the same information
    - contact the global Shift Leader, when in global operations, and give him the same information
    - contact the CSC Field Technical coordinator - Armando - 16 4257
  - if more chambers trip during the above turn OFF ALL HV immediately.

- Multiple chambers in **Temperature alarm** may indicate loss of cooling pumps
  - if 3 chambers have a temperature alarm within 30 minutes
    - Open the 'cooling' page in DCS and note the information
    - contact the CEO (16-1972) and inform him of the situation and suggest it 'may' be a pump failure
    - contact the global safety shifter and give him the same information
    - contact the global Shift Leader, when in global operations, and give him the same information
    - contact the CSC Field Technical coordinator - Armando - 16 4257
  - if more chambers trip during the above turn OFF ALL LV immediately.
- Multiple chambers in **LV alarm**
  - Have **MULTIPLE** chambers but only **ONE** pcrate Alarmed?
    - The pcrate LV has probably tripped, go to that trouble shooting section below
    - Many chambers but no pcrate, the Maraton probably tripped, look at the Maraton display on the DCS UI bottom of top page and follow the Maraton trouble shooting section below.

# HV Trips of CSC

## Dubna HV Alarm Action (ME1/1)

- **In case of a HV trip in the [ME1/1](#) chambers, do the following in DCS:**
- Select the chamber in error from the summary panel
- From the HV panel set the STATE to "OFF"
- Once it has turned off, set the STATE back to "ON". (It may take a few minutes to see the state change.)
- **If the chamber HV must be masked (after repeated trips)**
- From the chamber's HV panel, click on the check-mark next to the STATE button
- Select 'Disable'
- Notify the CEO (16-1972) that the channel has been disabled.
- Log the disabled chamber in the ELOG and on the [Whiteboard Twiki Page](#).

## HV Alarm Action (non-ME1/1)

- **[HV Channel Trip \(first or second time\)](#)**
  - Double-click on the chamber in error on the top [DCS](#) panel
  - Double-click on HV "Sub-System" box showing error state
  - Click "force on"
  - The state should become "Ramping"
- **[HV Channel Trip \(~third time\)](#)**
  - Mask out the channel by following these steps:
    - Double-click on the chamber in error on the top [DCS](#) panel
    - Double-click on HV "Sub-System" box showing error state
      - Select the tripped channel
      - Uncheck "isEnabled" (note- the check is nearly invisible, but the button is green if enabled, gray if disabled)
      - "force on"
    - The tripped channel should now be disabled (the 'isEnabled' button should be gray)
    - Notify the CEO (16-1972) that the channel has been disabled.
    - Log the disabled channel in the ELOG and on the [Whiteboard Twiki Page](#)
- **[Chamber HV Trip \(no single tripped channel\)](#)**
  - Check the boxes:
    - "Module Status" (bottom-right of the panel)
    - "MS\_STATUS" (status of the master board. Bottom of the panel)
    - Click "Force on"
  - If the chamber HV must be masked (after repeated trips)
    - From the chamber's HV panel, click on the check-mark next to the STATE button
    - Select 'Disable'
    - Notify the CEO (16-1972) that the HV for this chamber has been disabled.
    - Log the disabled chamber in the ELOG and on the [Whiteboard Twiki Page](#).

# HV Trip ME1/1 (Action)

- Our inner ring of chambers on Station 1 have a different interface
- If you see this screen instead, select the drop down menu of the sub-system in error and select **Off**
- After 10 minutes in the same menu select **On**

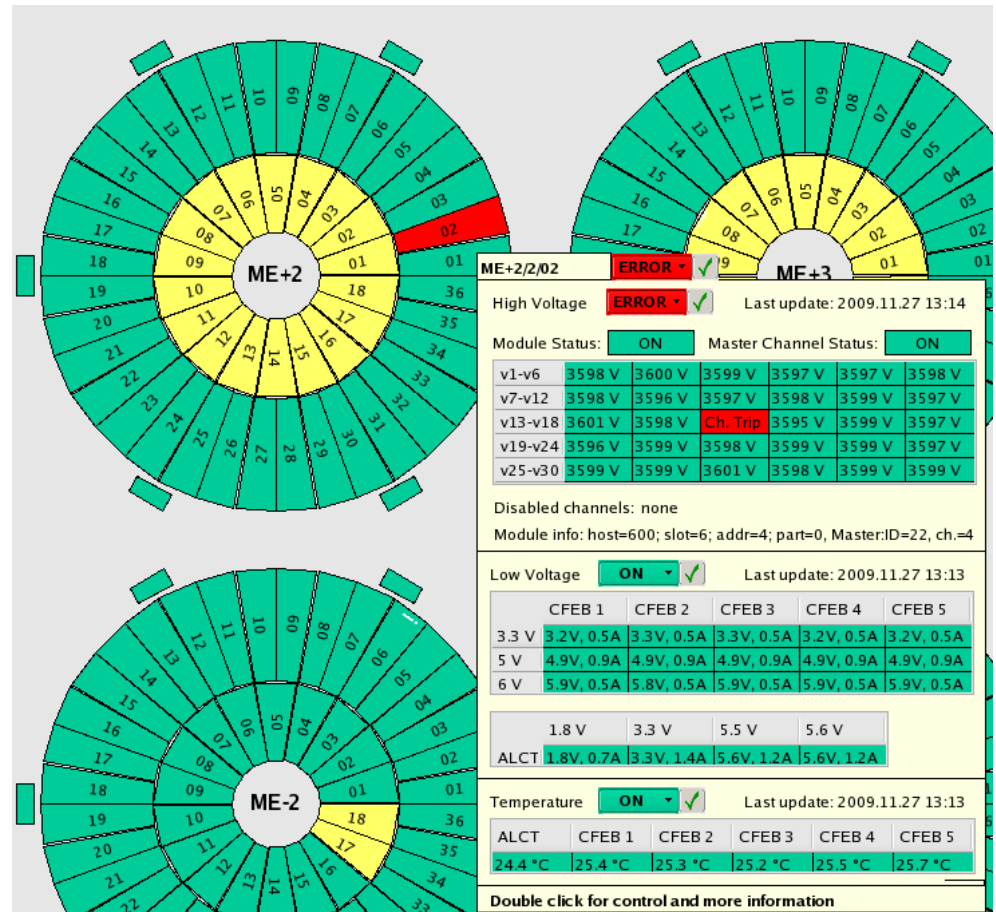
The screenshot displays the CSC DCS interface for the sub-system 'CSC\_ME\_P11\_C33\_HV'. The main object state is 'ERROR'. A table lists sub-systems with their states, and a circular diagram shows the chamber status. An arrow points from the 'OFF' dropdown in the table to the corresponding chamber in the diagram.

Sub-System	State
CSC_ME_P11_C33_HV/P1	OFF
CSC_ME_P11_C33_HV/P2	OFF
CSC_ME_P11_C33_HV/P3	OFF
CSC_ME_P11_C33_HV/P4	OFF
CSC_ME_P11_C33_HV/P5	ERROR
CSC_ME_P11_C33_HV/P6	OFF

The circular diagram shows 37 chambers numbered 01 to 37. Chamber 33 is highlighted in grey, indicating an error state, and is pointed to by an arrow from the 'OFF' dropdown in the table above.


# High Voltage Trip (Diagnosis)

- If a single chamber goes into error, and the high voltage is in error, the HV in the chamber has tripped.
- Double click on the chamber, then double click on box ending in “\_HV” then go to the next slide



# HV Trip (Action)

- ❑ Select the channel with Ch\_Trip for status
- ❑ Press **FORCE ON**
- ❑ If a chamber trips three or more times in a shift, call the CSC Expert (161972)



**Device** ME\_P22\_C02\_HV **State** ERROR

Fri 27-Nov-2009 13:19

NO USER  
as: <no role>

**gBrowser**

ch#	vmon	imon	vset	vcur	rmpU	rmpD	vmax	imax	vTrip	iTrip(u/	tripCr	tripDl	relay	fuse	state	status
3599	0	3598	3598	5	98	4000	1	0	0	0	500	0	0	0	ON	ON
3600	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	0	ON	ON
3599	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	0	ON	ON
3598	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	0	ON	ON
3598	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	0	ON	ON
3599	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	0	ON	ON
3596	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	0	ON	ON
3598	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	0	ON	ON
0	3598	0	3599	3599	5	99	4000	1	0	0	500	0	0	0	ON	ON
1	3599	0	3599	3599	5	99	4000	1	0	0	500	0	0	0	ON	ON
2	3598	0	3598	3598	5	98	4000	1	0	0	500	0	0	0	ON	ON
3	3601	0	3599	3599	5	98	4000	1	0	0	500	0	0	0	ON	ON
4	3597	0	3599	3599	5	99	4000	1	0	0	500	0	0	0	ON	ON
5	2531	0	3598	0	5	98	4000	1	3599	1	0	500	0	0	ON	Ch_Trip
6	3597	0	3598	3598	5	98	4000	1	0	0	500	0	0	0	ON	ON
7	3600	0	3599	3599	5	99	4000	1	0	0	500	0	0	0	ON	ON
8	3598	0	3599	3599	5	99	4000	1	0	0	500	0	0	0	ON	ON

ch#	vset	rampUp	rampDn	vmax	imax	state	TripDl	<input checked="" type="checkbox"/> isDeviceEnabled	<input checked="" type="checkbox"/> isEnabled
15	3598	5	98	4000	1	ON	500	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

TO SWITCH OFF refresh data

<input checked="" type="checkbox"/> Trend	ME+2/2/2	<input type="checkbox"/> force on
---	----------	-----------------------------------

click here to refresh the chamber state after switching off a tripped channel

MS_STATUS	ms_tdly	ms_id	ms_chan
ON	2000	22	4

host=600 slot=6 addr=4 part=0

**Messages**

27-Nov-2009 13:18:27 - Access Control: User Logged Out, CSC\_ME\_P2 Released.

Close

# LV Alarms

## PCrate LV Alarm Action

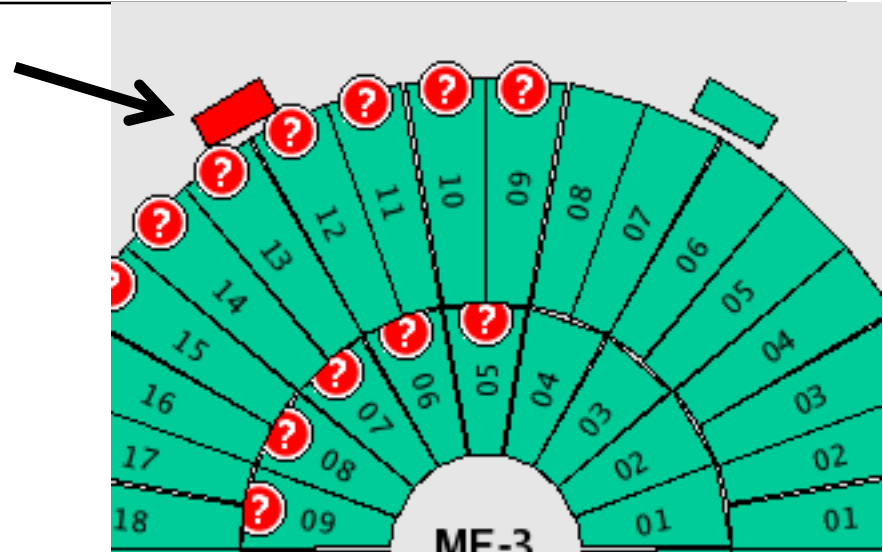
- **These occasionally occur as spurious errors in DCS. Wait to see if it goes away on its own. To confirm if it is a 'real' error, check to see if the TMB counters incrementing:**  
(To find the counters, go to Page 1 and click the 'PCrate Monitor Plus/Minus' heading to open the Cyan Page, then select 'TMB Counter View')
- **Yes:**
  - DCS might be wrong. Log the error and contact the CEO (16-1972)
- **No:**
  - You may have lost communication with the crate, and need to power-cycle the crate controllers.
    - **DO NOT POWER CYCLE THE ENTIRE PCRATE.**
  - If you don't know how to do this, **don't**. Call the CEO (16-1972)
  - If that didn't help, Call the CEO (16-1972) . Wait for CEO or Expert instructions

## LV Primary (Maraton) Alarm Action

- **A Maraton trip is a serious problem. Each Maraton supplies LV Power for up to 3 Trigger Sectors (TS).**
- Check how many Maratons have tripped:
  - **If more than 2**, call the CEO (16-1972) and inform the Shift Leader.
  - **If there are two in the same UXC Rack**, it's possible that the AC breaker in S4 has tripped. Call the CEO (16-1972) and inform the Shift Leader.
  - **If a single Maraton has tripped**, either the OPFC in S4F04 or the Maraton itself has tripped. If DCS can communicate with the Maraton, the Maraton itself has tripped. If not, the OPFC is probably tripped. Call the CEO (161972) and inform the Shift Leader.
- **Action -- after reporting the trip take this action**
  - From DCS, turn OFF the 3 PCrates in the 3 trigger sectors fed by this Maraton (see table below)
  - From DCS, turn OFF the Maraton.
    - If the PFC itself tripped, DCS cannot communicate directly with the Maraton. Turn it off with DCS anyway.
  - Leave the Maraton and PCrates off, and wait for CEO or expert instructions.

# Peripheral Crate Loses LV (Diagnosis)

- ❑ If a Peripheral Crate is in error AND it's corresponding chambers have lost communication,
- ❑ the Peripheral Crate has lost Low Voltage going to it.
- ❑ Check if LV Primary Supplies are also in error
- ❑ Double click on the Peripheral Crate in error and proceed to the next slide



# Peripheral Crate Loses LV (Action)

- Turn OFF the LV so that it does not come back on by itself
- Single Click the TO SWITCH OFF button
- Call the CEO at 161972
- NOTE > a PCrate must be turned back on by an expert at a higher level of DCS for safety and operational reasons

CRB/CSC\_ME\_P2\_PC2\_LV\_CRB: ematnUI\_v24r0

Device: ME\_P2\_PC2\_CRB/Mid 11/M 14 State: OK

BUS#1(count from 0) position:X5R41/top;2: ELMB\_0e(hex)  
ME\_P2\_PC2\_CRB/Mid 11/M 14

Channel	3.34	3.32	5.12	OFF	ON	isEnabled
ch01	3.34	3.32	5.12	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch02	3.35	3.34	5.08	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch03	3.31	3.36	5.01	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch04	3.33	3.34	5.07	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch05	3.35	3.34	5.07	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch06	3.36	3.35	5.08	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch07	3.36	3.35	5.07	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch08	3.35	3.35	5.07	OFF	ON	<input checked="" type="checkbox"/> isEnabled
ch09	3.31	3.33	5.04	OFF	ON	<input checked="" type="checkbox"/> isEnabled

isCrbEnabled

errors

Trend

switch with no delay

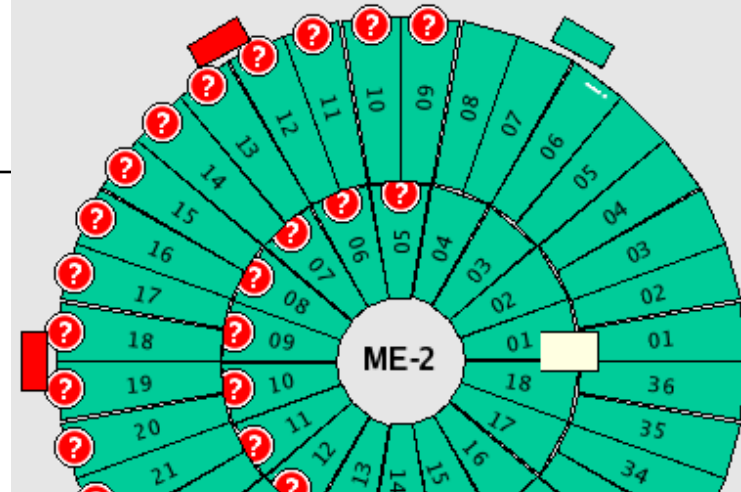
**TO SWITCH OFF**

Messages

Close

# Low Voltage Primary Trip

- When a pCrate Loses LV, check the Low Voltage Primaries (Maratons)
- If a Maraton goes into error, double click the Maraton in error and then in the top drop-down menu select “Off”
- Call the CEO (161972) after turning off the Maraton
- NOTE > a Maraton must be turned back on by an expert at a higher level of DCS for safety and operational reasons



Maratons

YE-3	YE-2	YE-1	YE+1	YE+2	YE+3
ON	ON	ON	ON	ON	ON
ON	ON	ON	ON	ON	ON
ERROR	ON	ON	ON	ON	ON
OFF	ON	ON	ON	ON	ON
ERROR	ON	ON	ON	ON	ON
ERROR	ON	ON	ON	ON	ON
ON	ON	ON	ON	ON	ON
ON	ON	ON	ON	ON	ON

# CSC Chamber Board Alarms

## Chamber Boards LV Alarm Action

- **These occasionally occur as spurious errors in DCS. Wait to see if it goes away on its own.**  
**To confirm if it is a 'real' error, check to see if the TMB counters incrementing:**  
(To find the counters, go to Page 1 and click the 'PCrate Monitor Plus/Minus' heading to open the Cyan Page, then select 'TMB Counter View')
- **Yes:**
  - DCS might be wrong. Log the error and contact the CEO (16-1972)
- **No:**
  - You may have lost communication with the crate, and need to power-cycle the crate controllers.
    - **DO NOT POWER CYCLE THE ENTIRE PCRATE.**
  - If you don't know how to do this, **don't**. Call the CEO (16-1972)
  - If that didn't help, Call the CEO (16-1972) .  
Wait for CEO or Expert instructions

## Chamber Boards Temperature Alarm Action

- **Wait a few minutes to see if the error goes away on its own**  
**What is the nature of the error?**
- **Unreasonable:** If the temperature is, ie, -50 or 290, this is probably a bug and the error can be safely ignored. Call the CEO (16-1972) to be sure.
- **No Reading:** You may have lost communication with a crate.
  - Power cycle the crate controller
  - **DO NOT POWER CYCLE THE ENTIRE PCRATE.**
  - If you don't know how to do this, **don't**. Call the CEO (16-1972)
- **High Temperature:** Check the COOLING status from the top-panel of DCS. Call the CEO.(16-1972)

# LV for Single Chamber Out

- If Low Voltage currents or voltages are zero for a single chamber, the chamber has lost its firmware
- This can be ignored when not running
- Otherwise call the CEO (16 1972)

**ME+4/1/10** ERROR ✓ 36

High Voltage **STANDBY** ✓ Last update: 2009.11.27 14:12

Module Status: **ON** Master Channel Status: **ON**

v1-v6	2981 V	2981 V	2979 V	2981 V	2980 V	2980 V
v7-v12	2981 V	2979 V	2980 V	2980 V	2981 V	2980 V
v13-v18	2980 V	2980 V	2979 V	2979 V	2980 V	2980 V

Disabled channels: none  
Module info: host=600; slot=13; addr=4; part=1Master:ID=34, ch.=6

Low Voltage **ERROR** ✓ Last update: 2009.11.27 14:17

	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5
3.3 V	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A
5 V	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A
6 V	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A

	1.8 V	3.3 V	5.5 V	5.6 V
ALCT	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A	0.0V, 0.0A

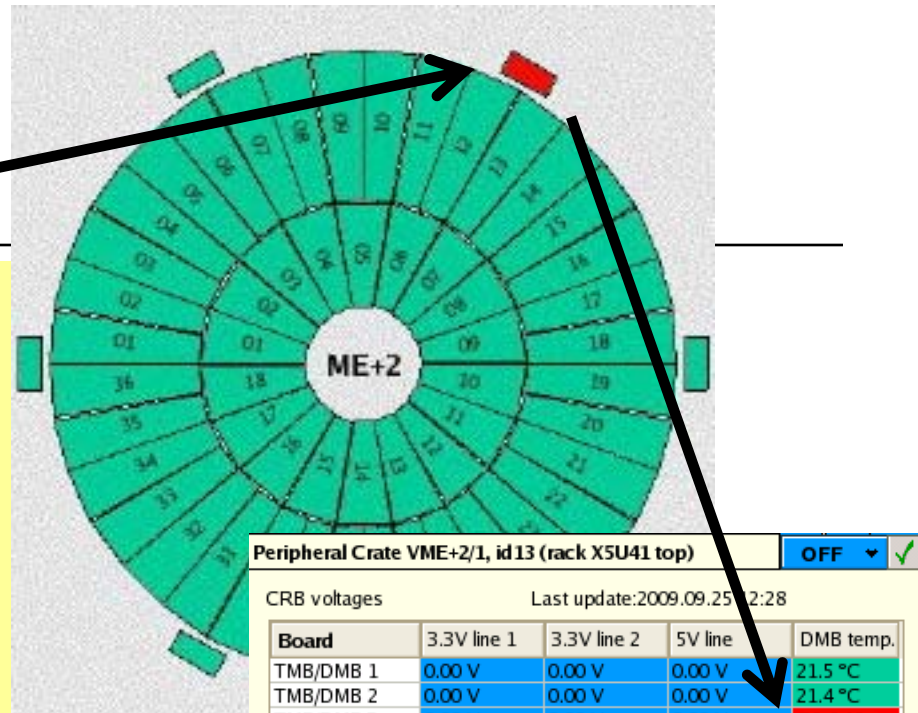
Temperature **ON** ✓ Last update: 2009.11.27 14:17

ALCT	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5
0.0 °C	0.0 °C	0.0 °C	0.0 °C	0.0 °C	0.0 °C

Double click for control and more information

# Peripheral Crate Temperature Alarm (Diagnosis)

- ❑ If a Peripheral Crate is in error while it's Chambers are fine, mouse over the Peripheral Crate
- ❑ Check the DMB temperatures to see if they are too hot
- ❑ Check the UXC Endcap cooling
- ❑ Contact CEO 16 1972
- ❑ If temperature exceeds 45 turn OFF pCrate
- ❑ NOTE this action will kill any ongoing run



Peripheral Crate VME+2/1, id 13 (rack X5U41 top) OFF ✓

CRB voltages Last update: 2009.09.25 12:28

Board	3.3V line 1	3.3V line 2	5V line	DMB temp.
TMB/DMB 1	0.00 V	0.00 V	0.00 V	21.5 °C
TMB/DMB 2	0.00 V	0.00 V	0.00 V	21.4 °C
TMB/DMB 3	0.00 V	0.00 V	0.00 V	38.2 °C
TMB/DMB 4	0.00 V	0.00 V	0.00 V	38.5 °C
TMB/DMB 5	0.00 V	0.00 V	0.00 V	39.0 °C
TMB/DMB 6	0.00 V	0.00 V	0.00 V	21.1 °C
TMB/DMB 7	0.00 V	0.00 V	0.00 V	20.8 °C
TMB/DMB 8	0.00 V	0.00 V	0.00 V	33.7 °C
TMB/DMB 9	0.00 V	0.00 V	0.00 V	21.9 °C
CCB/MPC	0.00 V		0.00 V	
VCC	0.00 V		0.00 V	

1.5V line 1	1.5V line 2
0.00 V	0.00 V

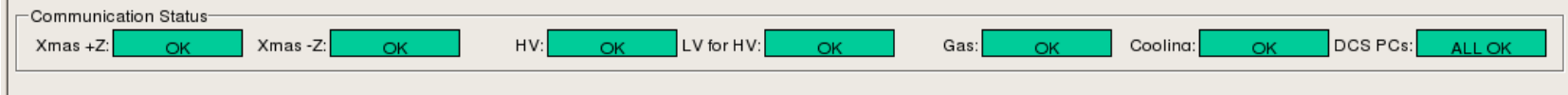
5V Standby 1	5V Standby 2	10V Standby 3
0.32 V	0.00 V	0.00 V

Monitoring Board (ELMB) Status: **DISCONNECTED**

Supplying MARATON (ID=10): OFF ✓

Maraton Info: crate no. 2 on YE+2

# Communication Status



- This area gives a summary of the communication from the FE to the DCS process
- Xmas is the read out and control of the on-chamber and pCrate electronics
- The HV is from the UF HV computer
- Gas and Cooling come from cDCS

# Communication Lost

ME+2/2/07 OFF ✓

High Voltage OFF ✓ Last update: 2009.09.30 10:50

Module Status: OFF Master Channel Status: ON

v1-v6	11 V	10 V	11 V	10 V	12 V	10 V
v7-v12	9 V	11 V	0 V	9 V	13 V	9 V
v13-v18	9 V	10 V	9 V	13 V	10 V	12 V
v19-v24	14 V	13 V	11 V	9 V	15 V	11 V
v25-v30	12 V	9 V	10 V	8 V	10 V	9 V

Disabled channels: none

Module info: host=600; slot=7; addr=8; part=0 Master:ID=20, ch.=5

Low Voltage ON ✓ Last update: 2009.09.04 14:06

	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5
3.3 V	3.2V, 0.5A	3.3V, 0.5A	3.3V, 0.5A	3.3V, 0.5A	3.2V, 0.5A
5 V	4.9V, 1.0A	5.0V, 0.9A	4.9V, 1.0A	5.0V, 1.0A	4.9V, 1.0A
6 V	5.9V, 0.5A	5.9V, 0.5A	5.9V, 0.5A	5.9V, 0.5A	5.8V, 0.5A

	1.8 V	3.3 V	5.5 V	5.6 V
ALCT	1.8v, 0.6A	3.3V, 1.5A	5.6V, 1.2A	5.6V, 1.3A

**No Communication - check PCrate LV and Xmas monitoring**

Temperature ON ✓ Last update: 2009.09.04 14:06

ALCT	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5
23.8 °C	24.2 °C	24.0 °C	24.9 °C	25.5 °C	25.1 °C

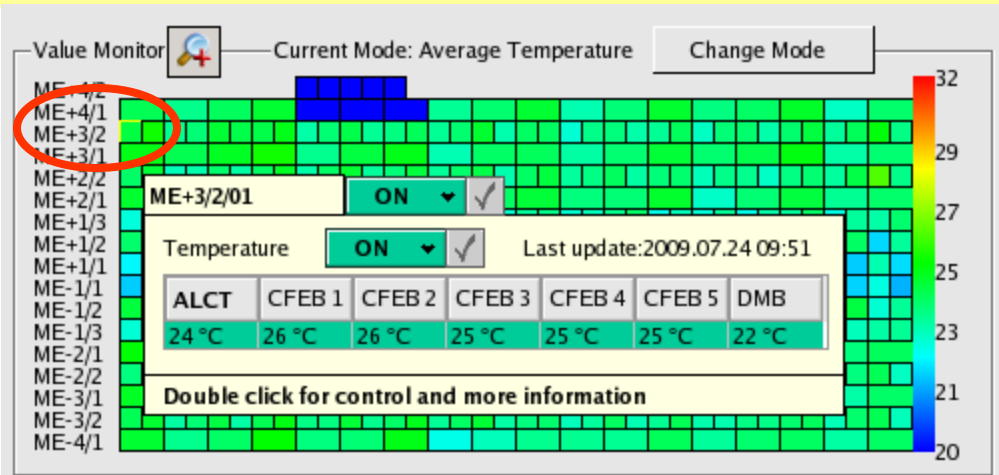
**No Communication - check PCrate LV and Xmas monitoring**

Double click for control and more information

- ❑ When a chamber has a question mark on it, it has lost communication with DCS (Xmas)
- ❑ Mousing over will reveal a No Communication message
- ❑ If a chamber is out of communication for more than 5 minutes, call the CEO (161972)

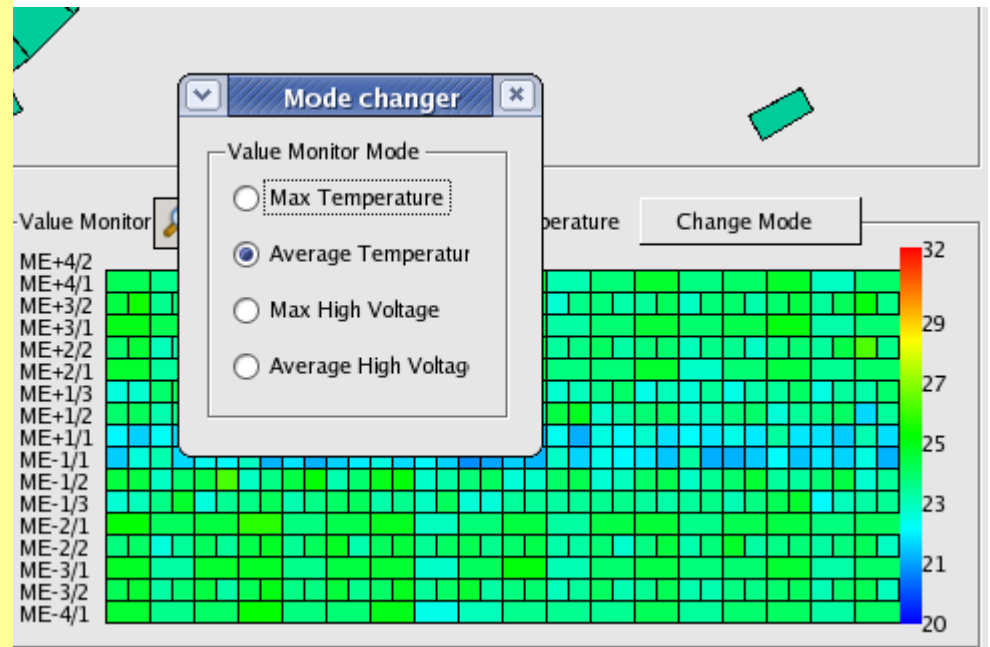
# Value Monitor

- The Value Monitor shows the values in color for all chambers
- Moving the cursor over a chamber brings up the summary panel for that chamber



# Value Monitor

- There are 4 mode options for the value monitor display
  - Max Temperature
  - Average Temperature
  - Max HV
  - Average HV
- Max
  - Maximum value of the N devices in this chamber
- Average
  - Average value of the N devices in this chamber
- In continuous running mode keep monitor on **Average Temperature**
- While voltages are changing put monitor on **Max High Voltage**



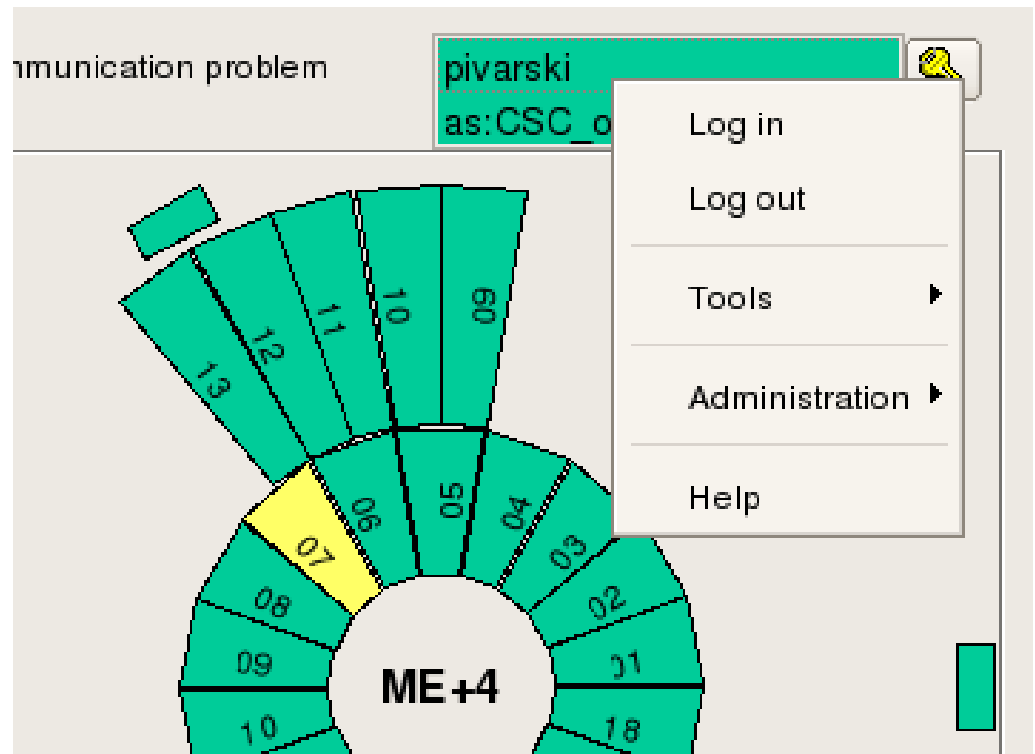


# Operation Instructions

---

# Login Panel

- ❑ Click on Key icon
- ❑ Select 'Log in'
  - Enter your NICE ID and password
- ❑ Select 'Log out'



# Viewing CSC Status

- Move cursor over CSC to view read back values
- NO control
- Displays
  - HV
  - LV
  - Temperature
- NOTE:
  - When entire display not in Generl mode this panel displays only information for the current mode

Vision\_1: CMS Endcap Muon System DCS  
UI Version 1.0.14 (2009/07/23)

ME+2/2/10 ON

High Voltage ON  Last update: 2009.07.22 18:18

Module Status: ON Master Channel Status: ON

v1-v6	3601 V	3601 V	3601 V	3598 V	3601 V	3602 V
v7-v12	3600 V	3600 V	3600 V	3600 V	3600 V	3600 V
v13-v18	3601 V	3601 V	3600 V	3601 V	3601 V	3600 V
v19-v24	3600 V	3601 V	3600 V	3601 V	3599 V	3600 V
v25-v30	3601 V	3600 V	3599 V	3601 V	3599 V	3601 V

Disabled channels: none  
Module info: host=600; slot=7; addr=5; part=0 Master:ID=5, ch=5

Low Voltage ON  Last update: 2009.07.24 09:45

	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5
3.3 V	3.2V, 0.5A	3.2V, 0.5A	3.2V, 0.5A	3.2V, 0.5A	3.2V, 0.5A
5 V	4.9V, 0.9A	4.9V, 1.0A	4.9V, 0.9A	4.9V, 0.9A	4.9V, 0.9A
6 V	5.9V, 0.6A	5.9V, 0.5A	5.8V, 0.5A	5.9V, 0.5A	5.9V, 0.5A

	1.8 V	3.3 V	5.5 V	5.6 V
ALCT	1.8V, 0.7A	3.3V, 1.4A	5.6V, 1.2A	5.6V, 1.2A

Temperature ON  Last update: 2009.07.24 09:45

ALCT	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5	DMB
23 °C	24 °C	26 °C	25 °C	25 °C	26 °C	21 °C

Double click for control and more information

# Boring into CSC Status

- ❑ Double Click on CSC to get panel
- ❑ Double Click on 'Sub-System name tab to get >>> (see next slide)

The screenshot displays a control system interface. At the top, there are three circular diagrams labeled ME+1, ME, and ME+3, each with a grid of numbered segments. A red circle highlights a segment in the ME diagram, with an arrow pointing to a detailed panel for CSC\_ME\_P22\_C10. This panel shows the following data:

Object	State
ME_P22_C10	ON

Sub-System	State
ME_P22_C10_IV	ON
ME_P22_C10_TEMP	ON
ME_P22_C10_HV	ON

Below the table is a 'gBrowser' window with a 'BACK' button and a display showing 'MB+2/2/10'. To the right of the gBrowser are three buttons: 'HV\_1', 'IV\_1', and 'TEMP\_1'. The interface also includes a 'Messages' field at the bottom left and a 'Close' button at the bottom right.

# Boring into CSC Status 2

The screenshot displays the CERN control interface for the High Voltage (HV) system. The main window is titled 'HighVoltage/CSC\_ME\_P22\_C10\_HV: emufwUi\_v24r9'. The interface includes a circular diagram of the accelerator structure on the left, a central control panel for 'ME\_P22\_C10\_HV', and a 'gBrowser' table of channel parameters. The control panel shows the device state as 'ON' and includes a 'gBrowser' table with columns for channel number, voltage, current, and other parameters. An orange arrow points from the text box to the 'vset' field in the control panel.

ch#	vmon	imon	vset	vcur	rmpUp	rmpDn	vmax	imax	vTrip	iTrip(uA)	tripCn	tripDI	relay	fuse	state	status
1	3600	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
2	3601	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
3	3601	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
4	3598	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
5	3600	0	3598	3598	5	98	4000	1	0	0	0	500	0	0	ON	ON
6	3601	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
7	3600	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
8	3600	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
9	3600	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
10	3599	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
11	3599	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
12	3600	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
13	3601	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
14	3599	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
15	3601	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
16	3601	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
17	3601	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON
18	3600	0	3599	3599	5	99	4000	1	0	0	0	500	0	0	ON	ON

Object: ME\_P22\_C10 State: ON

Sub-System State

Sub-System	State
ME_P22_C10_LV	ON
ME_P22_C10_TEMP	ON
ME_P22_C10_HV	ON

gBrowser

ch# vset rampUp rampDn vmax imax state TripDI

3599 5 99 4000 1 ON 500  isEnabled

isDeviceEnabled TO SWITCH OFF refresh\_data Trend ME+2/2/10

MS\_STATUS ms\_tdiy ms\_id ms\_chan force on

host=600 slot=7 addr=5 part=0 ON 2000 5 5 09:47:16 MODULE Status ON

Messages

Close

- HV control and detail panel
- From this panel follow procedures to correct a UF HV trip

# Dubna HV

- Panel for control of HV
  - Use this panel when following procedures for Dubna HV
- Panel shows time history of voltage
  - Use this panel to watch ramp up of individual chamber HV

The screenshot displays the Dubna HV control interface. At the top, there are status bars for the date and time (Fri 24/07/2009 09:50:43) and the user (NO USER). The main interface is divided into several sections:

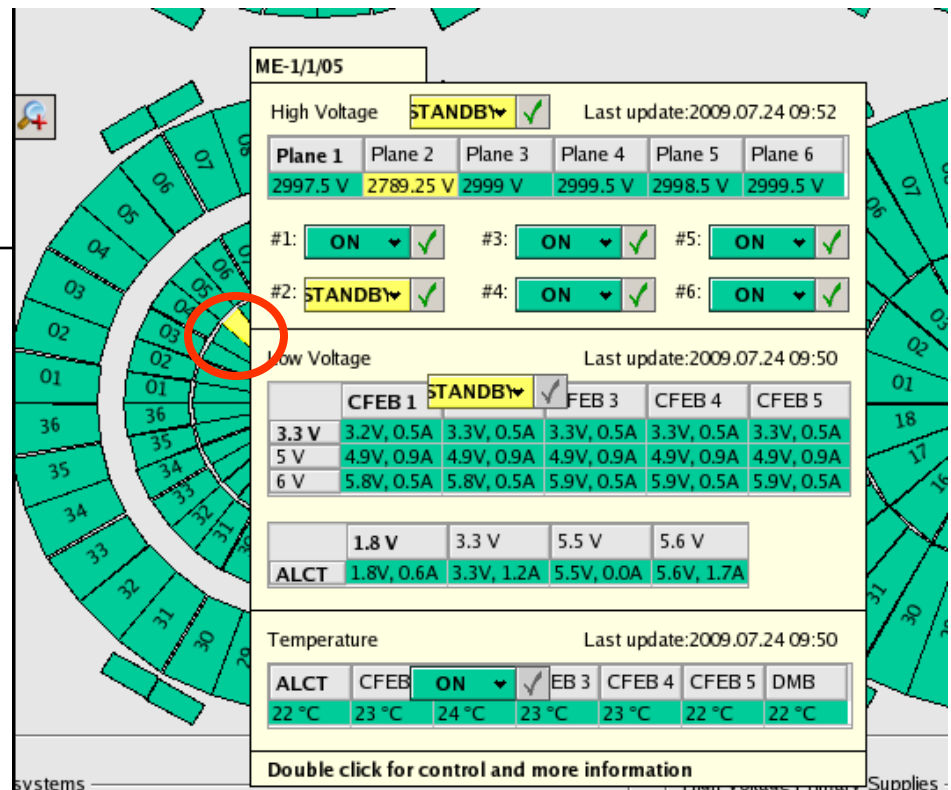
- Control Panel:** Located at the top right, it shows the state of the HV system. The "Object" is "CSC\_ME\_N11\_C05\_HV" and its "State" is "OFF".
- Sub-System Table:** A table listing the status of individual HV sub-systems. The table has two columns: "Sub-System" and "State".
- Time History Graph:** A graph showing the voltage history over time. The y-axis represents voltage (0.0 to 5.0) and the x-axis represents time (09:40:00 AM to 10:50:00 AM). A blue vertical bar indicates a voltage ramp up.
- Chamber Status Diagram:** A circular diagram showing the status of 36 chambers, numbered 01 to 36. Chamber 05 is highlighted in grey.
- Messages:** A section at the bottom left for displaying messages.

Two red arrows point from the text in the yellow box to the control panel and the time history graph.

Sub-System	State
CSC_ME_N11_C05_HV/P1	ON
CSC_ME_N11_C05_HV/P2	OFF
CSC_ME_N11_C05_HV/P3	ON
CSC_ME_N11_C05_HV/P4	ON
CSC_ME_N11_C05_HV/P5	ON
CSC_ME_N11_C05_HV/P6	ON

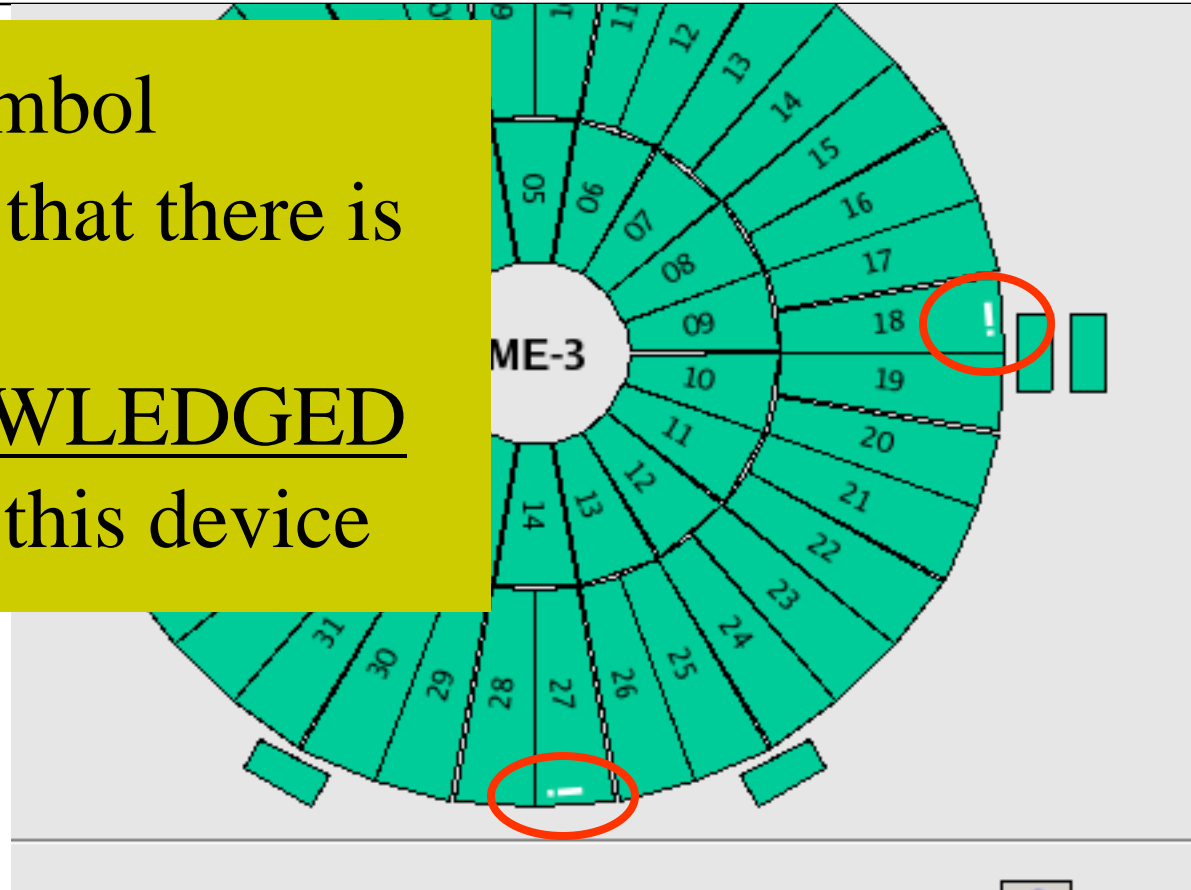
# Single Chamber HV Ramp

- In this example CSC ME-1/1/05 (Dubna) is ramping after a trip
- The upper level status will remain ON
- The Majority Logic bar will show 1 device in Ramp



# Acknowledged Alarms

- The ! Symbol indicates that there is an ACKNOWLEDGED alarm on this device



# Viewing PCrate LV Values

## □ PCrate LV Status

- Move cursor over pCrate
- Shows the LV at CRB
- LV delivered to different boards in pCrate

Peripheral Crate VME+2/2 (top),id14 ON ✓

CRB voltages Last update:2009.07.24 09:47

Board	3.3V line 1	3.3V line 2	5V line
TMB/DMB 1	3.34 V	3.32 V	5.12 V
TMB/DMB 2	3.35 V	3.34 V	5.08 V
TMB/DMB 3	3.34 V	3.36 V	5.04 V
TMB/DMB 4	3.33 V	3.34 V	5.07 V
TMB/DMB 5	3.35 V	3.34 V	5.07 V
TMB/DMB 6	3.36 V	3.35 V	5.08 V
TMB/DMB 7	3.36 V	3.35 V	5.07 V
TMB/DMB 8	3.35 V	3.35 V	5.07 V
TMB/DMB 9	3.31 V	3.33 V	5.04 V
CCB/MPC	3.35 V		5.07 V
VCC	3.34 V		5.04 V

1.5V line 1	1.5V line 2
1.55 V	1.55 V

5V Standby 1	5V Standby 2	10V Standby 3
4.84 V	5.06 V	10.08 V

Monitoring Board (ELMB) Status: OPERATIONAL

Supplying MARATON (ID=11): ON ✓

Maraton Info: crate no. 4 on YE+2

Double click for control and more information

# Controlling PCrate LV

- Double click to get >>> PCB LV detail and control panel
- Individual OFF|ON control each group or board or voltage
  - VCC – Crate Controller Shown
- Button in RED switches OFF/ON entire crate

Numberless mode: General state Change Mode UI Version 1.0.14 (2009/07/23)

Number View:

Peripheral Crate VME-32 (top) Jd14 ON

CRB Voltages Last update: 2009.07.21 09:48

Board	3.3V line 1	3.3V line 2	5V line
ME/DVB 1	3.34 V	3.32 V	5.12 V
ME/DVB 2	3.35 V	3.34 V	5.08 V
ME/DVB 3	3.34 V	3.36 V	5.04 V
ME/DVB 4	3.33 V	3.34 V	5.07 V
ME/DVB 5	3.35 V	3.34 V	5.07 V
ME/DVB 6	3.36 V	3.35 V	5.08 V
ME/DVB 7	3.36 V	3.35 V	5.07 V
ME/DVB 8	3.35 V	3.35 V	5.07 V
ME/DVB 9	3.31 V	3.33 V	5.04 V
CRB/WPE	3.35 V		5.07 V
VCC	3.34 V		5.04 V

1.5V line 1 1.5V line 2  
1.55 V 1.55 V

Device State  
ME\_P2\_PC2\_CRB/M1d 14 ON

Bus #1 (count from 0) position: XSR41/top;2: ELMB\_0e(hex)  
ME\_P2\_PC2\_CRB/M1d 14

ch01	3.34	3.32	5.12	OFF	ON	is Enabled
ch02	3.35	3.34	5.08	OFF	ON	is Enabled
ch03	3.34	3.36	5.04	OFF	ON	is Enabled
ch04	3.33	3.34	5.07	OFF	ON	is Enabled
ch05	3.35	3.34	5.07	OFF	ON	is Enabled
ch06	3.36	3.35	5.08	OFF	ON	is Enabled
ch07	3.36	3.35	5.07	OFF	ON	is Enabled
ch08	3.35	3.35	5.07	OFF	ON	is Enabled
ch09	3.31	3.33	5.04	OFF	ON	is Enabled

isCrbEnabled

ccb	3.35	5.07	OFF	ON	is Enabled
vcc	3.34	5.04	OFF	ON	is Enabled
1.5	1.55	1.55	OFF	ON	is Enabled

switch with no delay  
**TO SWITCH OFF**

Messages

Close

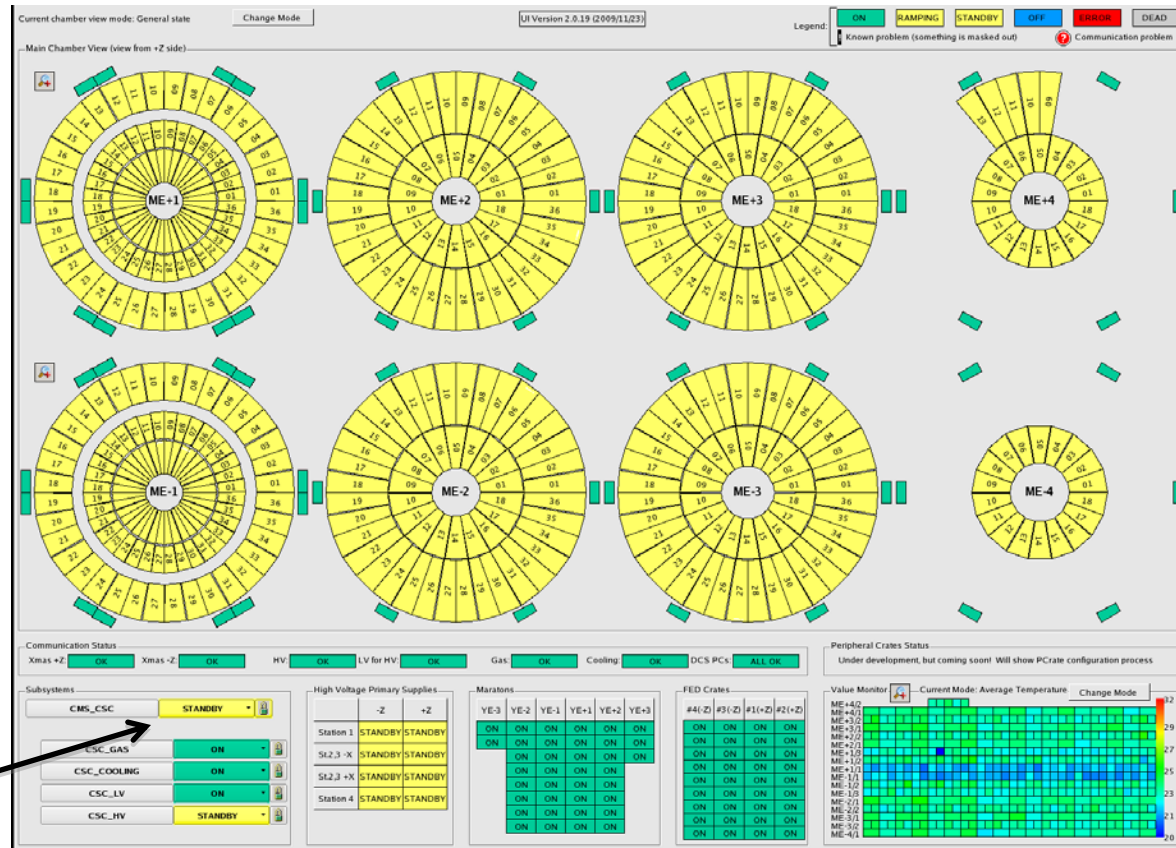
# Change Mode

- Change Mode
  - Sets mode for Stations view
  
- General State
  - Shows all values
- High Voltage – only
- Low Voltage – only
- Temperature – only

The screenshot displays a control interface with several circular station views. A red circle highlights a 'Change Mode' button at the top. A red arrow points from this button to a 'Mode changer' dialog box. The dialog box has a title bar 'Mode changer' and a 'Value Monitor Mode' section with four radio button options: 'General state' (selected), 'High Voltage', 'Low Voltage', and 'Temperature'. Below the options is a 'NOTE' box containing the text: 'It's not recommended to keep other than "general" mode for a long time. Therefore after 5 minutes mode will automatically switch back to "General state" mode'. The background shows station views with labels like 'ME+2' and 'ME-2'.

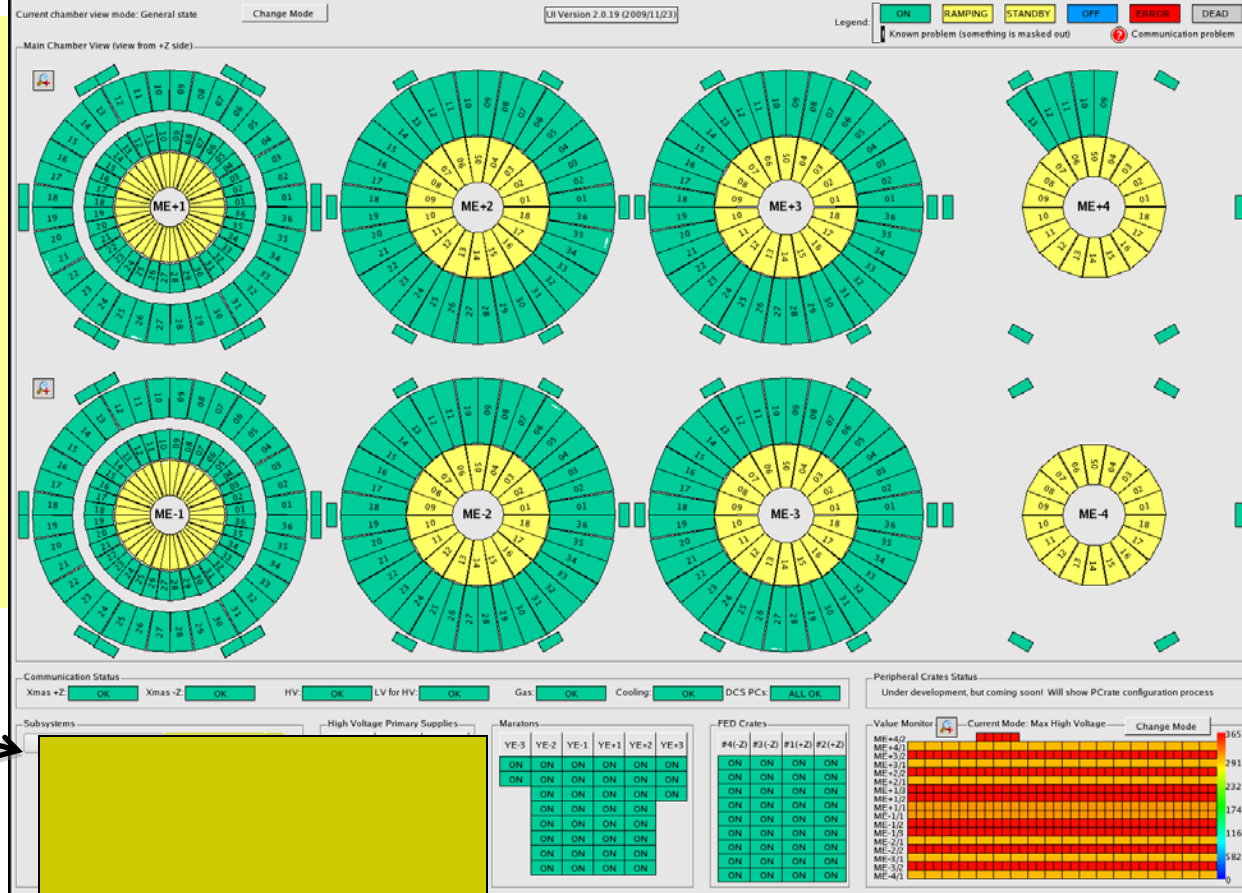
# Standby State

- Standby indicates that the high voltage has been lowered below data taking levels
- This is currently also our Safe state
- This state is for unknown or dangerous beam conditions
- To reach this state from any state, select **STANDBY** from **CMS\_CSC**



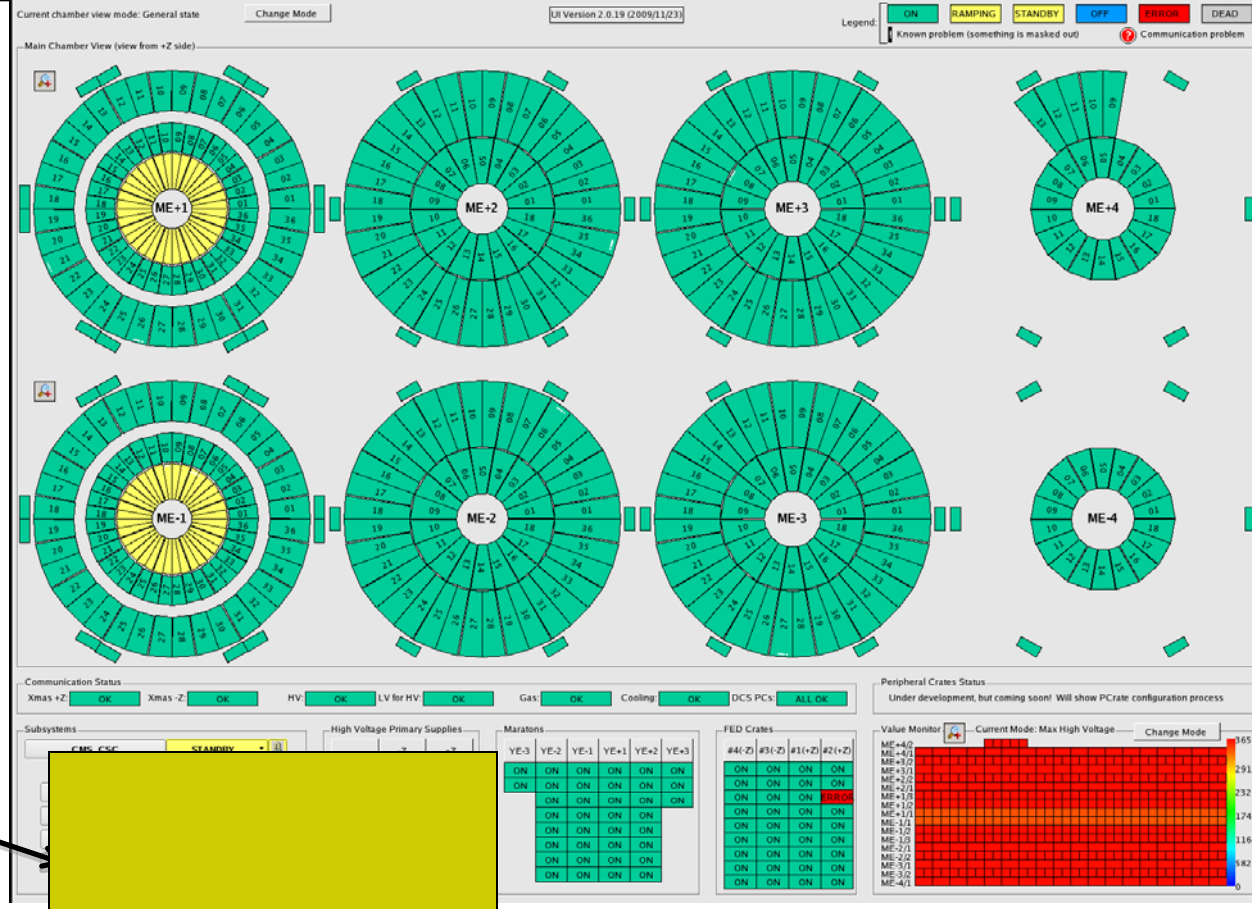
# Outer ON State

- In this state the
- HV for outer rings is ON
- HV for inner rings is at STAND BY



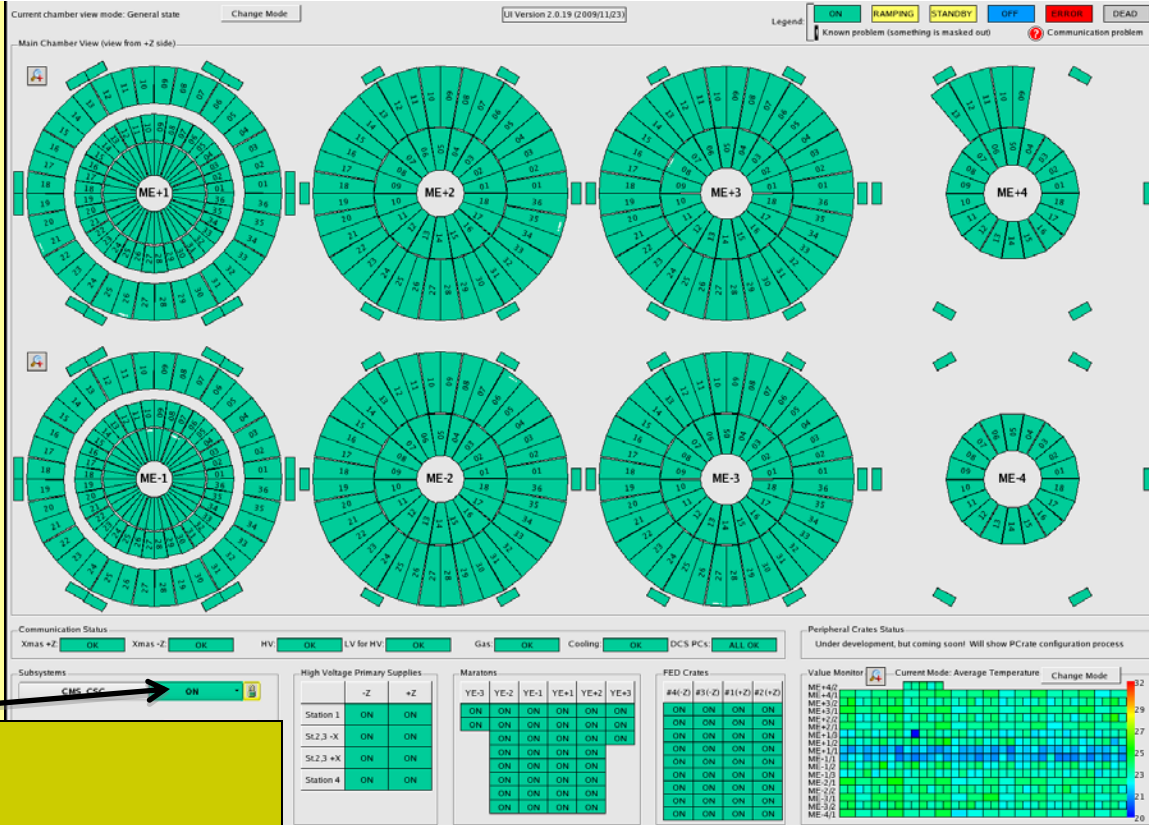
# Inner ON State

- In this state the
- HV for outer rings is ON
- HV for inner rings is also ON
- HV for ME1/1 is at **STANDBY**



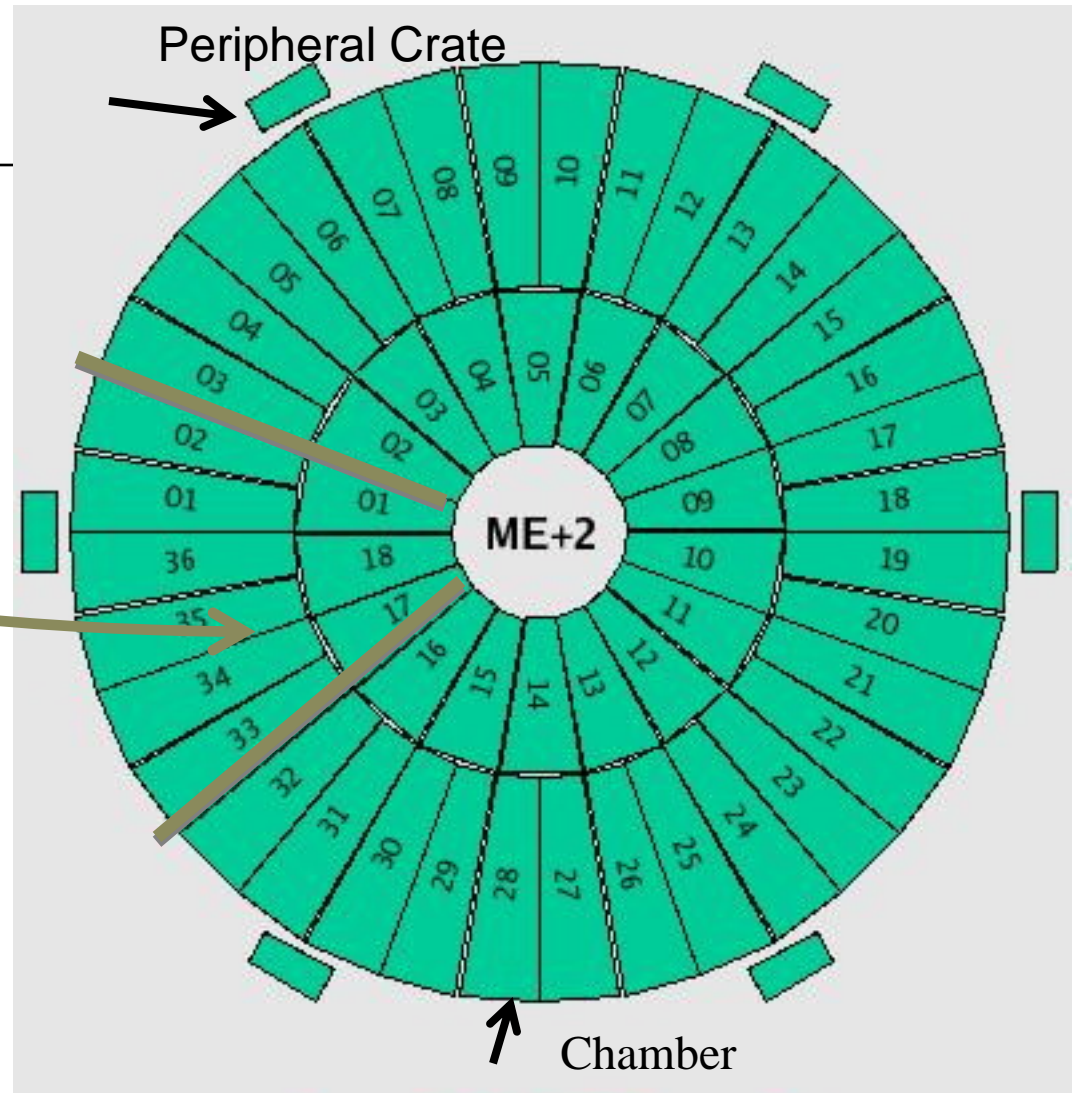
# All On State

- This is our data taking state
- This state is not safe for unknown or dangerous beam conditions
- To reach this state from any state, select **ON** from **CMS\_CSC**









# Terminology

- Each disc is called a **Station**
- Trapezoids represent **Chambers** – the number is its ID number
- Squares outside wheel represent **Peripheral Crates**
- Each Peripheral Crate controls 9 chambers and is 1 Trigger Sector TS
- Each radial ring of chambers is called a **Ring**



# Legend

Legend:  ON  RAMPING  STANDBY  NOT-READ  OFF  ERROR  DEAD  Known problem  Communication problem

- States of CSC
  - ON – on and ready for operation
  - RAMPING – HV – moving from STANDBY to ON
  - STANDBY – HV – at a safe voltage value for ALL beam operations
  - NOT-READY – not ready for operation
  - OFF- off, no HV or LV
  - ERROR – this value is outside the allowed operation window
  - DEAD – this value is disabled
- Known problem
  - The ‘!’ signifies that one of the values for this group of values has been acknowledged
- Communication problem
  - The ‘?’ signifies that the read back of this group of values is not current

# CSC Status

- ❑ Move cursor over Chamber to read LV, HV, and Temperature
- ❑ You must double click the chamber to perform control actions upon it

Vision\_1: CMS Endcap Muon System DCS  
UI Version 1.0.14 (2009/07/23)

**ME+2/2/10** ON

High Voltage ON  Last update: 2009.07.22 18:18

Module Status: ON Master Channel Status: ON

v1-v6	3601 V	3601 V	3601 V	3598 V	3601 V	3602 V
v7-v12	3600 V	3600 V	3600 V	3600 V	3600 V	3600 V
v13-v18	3601 V	3601 V	3600 V	3601 V	3601 V	3600 V
v19-v24	3600 V	3601 V	3600 V	3601 V	3599 V	3600 V
v25-v30	3601 V	3600 V	3599 V	3601 V	3599 V	3601 V

Disabled channels: none  
Module info: host=600; slot=7; addr=5; part=0 Master:ID=5, ch.=5

Low Voltage ON  Last update: 2009.07.24 09:45

	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5
3.3 V	3.2V, 0.5A	3.2V, 0.5A	3.2V, 0.5A	3.2V, 0.5A	3.2V, 0.5A
5 V	4.9V, 0.9A	4.9V, 1.0A	4.9V, 0.9A	4.9V, 0.9A	4.9V, 0.9A
6 V	5.9V, 0.6A	5.9V, 0.5A	5.8V, 0.5A	5.9V, 0.5A	5.9V, 0.5A

	1.8 V	3.3 V	5.5 V	5.6 V
ALCT	1.8V, 0.7A	3.3V, 1.4A	5.6V, 1.2A	5.6V, 1.2A

Temperature ON  Last update: 2009.07.24 09:45

ALCT	CFEB 1	CFEB 2	CFEB 3	CFEB 4	CFEB 5	DMB
23 °C	24 °C	26 °C	25 °C	25 °C	26 °C	21 °C

Double click for control and more information



# Extra Slides

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