

DQM Online/Offline Shift Tutorial



20th August 2009

Before coming to P5

➤ Safety requirements before coming to P5:

- Online CMS **level 4C safety class** has to be passed.
- Each shifter should have **appropriate P5 access rights** (request access to “CMS CR” through EDH).

➤ Read the DQM online/offline **shift instructions**:

<https://twiki.cern.ch/twiki/bin/view/CMS/DQMShiftInstructions>

- Attend the **shift tutorial** given by your shift supervisor.
- If needed, sign up for the **shuttle service** for transportation to P5:

<https://twiki.cern.ch/twiki/bin/view/CMS/P5Shuttle>

DQM Shifts Overview

➤ Online Shifts at P5 (3/day for 24 hours coverage)

0:00-7:00 | 7:00-15:30 | 15:30-0:00

- On the **first day** of global running, shifts start at **9:00h**.

➤ Offline Shifts (CRAFT09: 2/day)

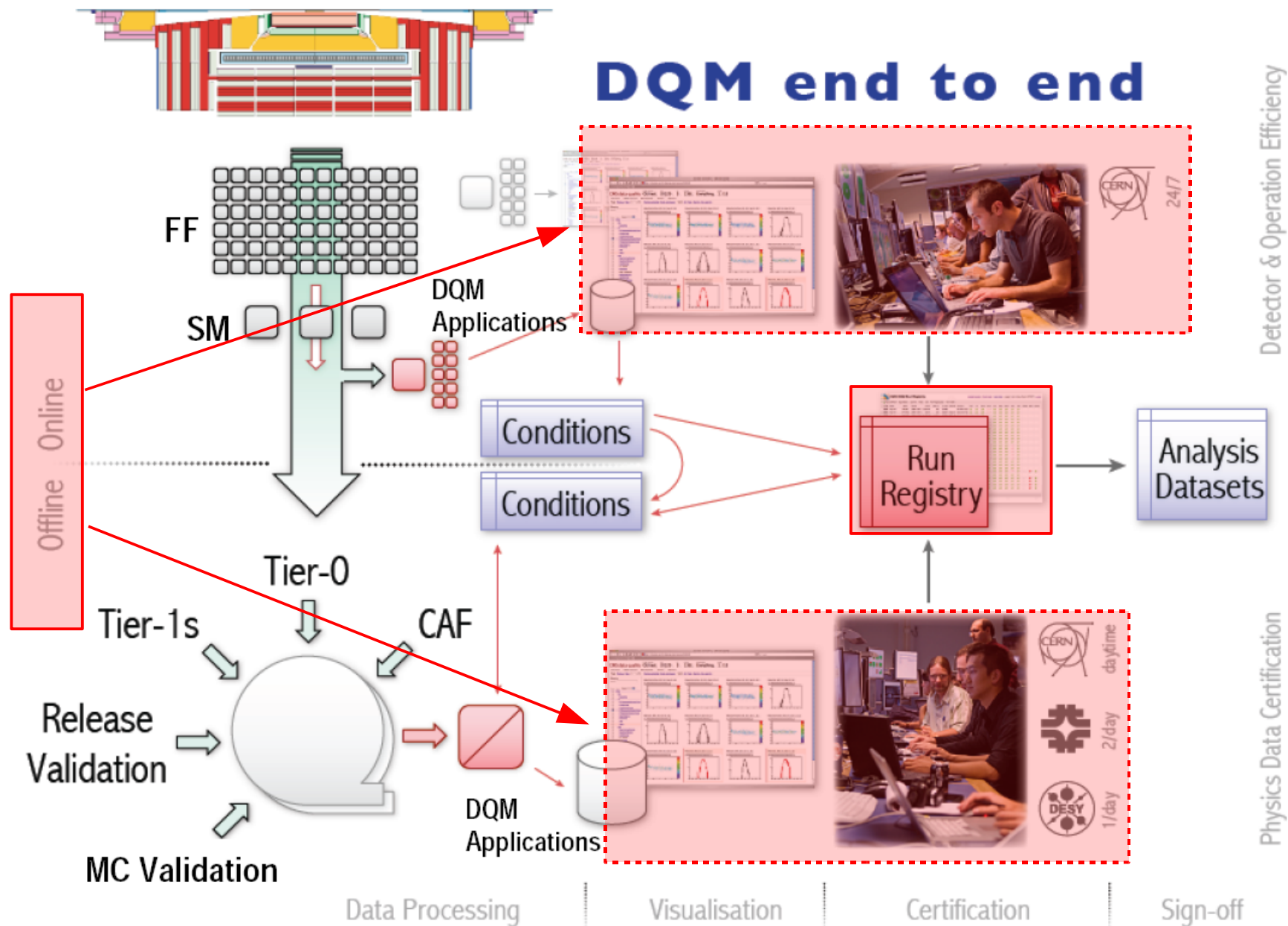
9:30-17:30 | 13:30-21:30

- Run at Meyrin CC with a delay of ~24 hours.

➤ Remote Shifts (3/day for 24 hours coverage)

- Run at FNAL and DESY ROC's in parallel with P5 shifts.

The DQM workflow



Summary of DQM Shift Persons Tasks

- DQM shift persons will be responsible for:
 - (1) Histogram inspection (**DQM GUI**):
 - Assess the run status and provide feedback to the shift leader and the detector experts.
 - (2) Run-by-run bookkeeping using the **Run Registry**.
 - (3) Submit one summary at the end of your shift to the ELOG (**CMS Online page**).

Task 0: Make sure applications are running

(1) Make sure **Online DQM and GUI** are running during data taking:

- In case they are not running, ask first the:

DQM expert on call:
165579

- Stay in close contact to the shift leader.

(2) Log-in to the **Run Registry**.

(3) Make sure the **event display** is running:

- It is expected to **run automatically**, but make sure, that it is functioning.
- DQM shift instruction page has simple instructions of how to manually start it in case it is not running.

Task 1: Monitoring of the shift histograms

This is your main task!

➤ Follow the online/offline shift instructions.

➤ Run-by-run procedure:

(1) Inspection of the **shift histograms**:

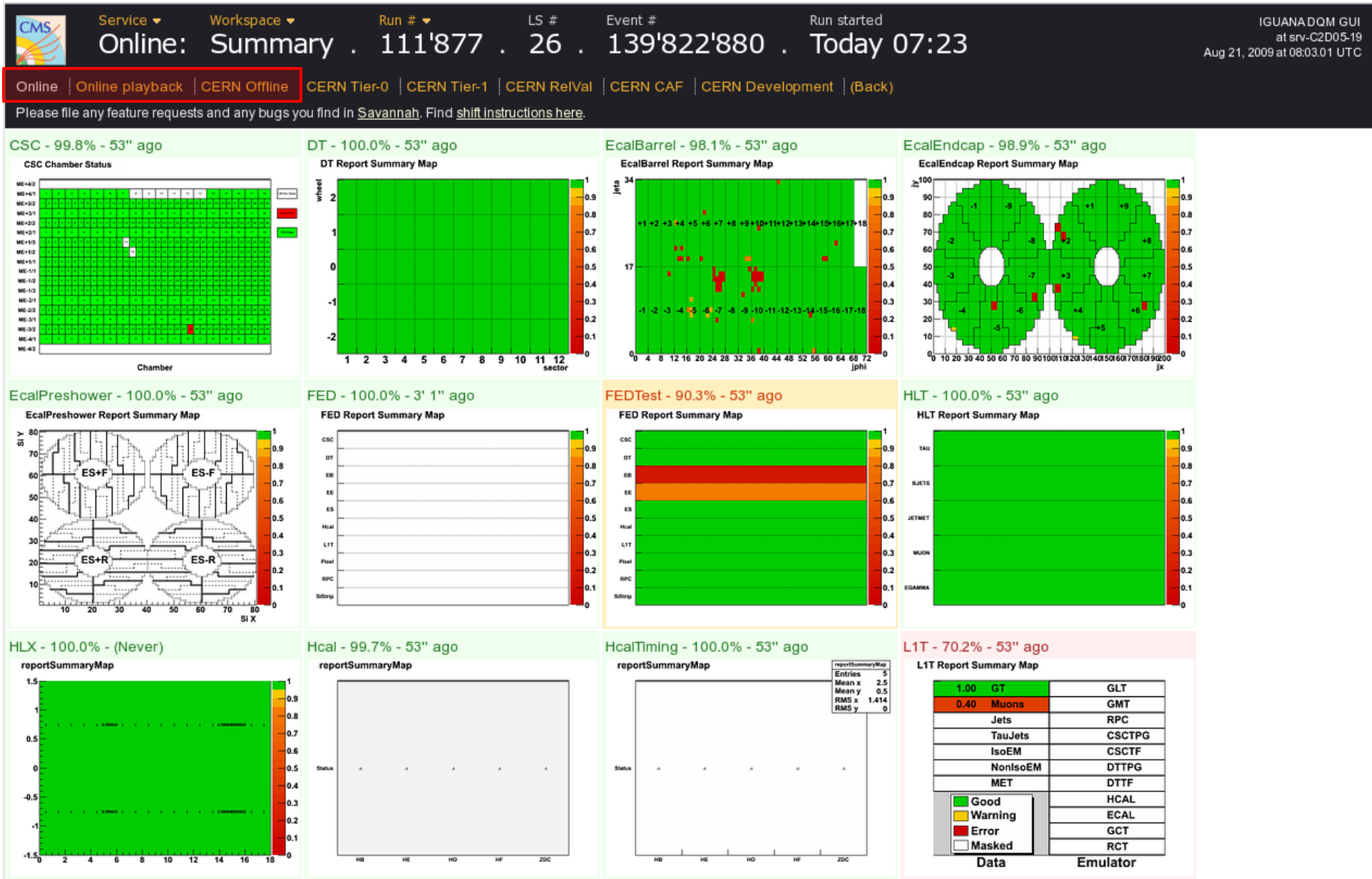
- Look at the Summary page, the Report page and the 00 Shift Layouts.
- Make an effort to look at all the plots one by one.
- If you spot a problem or have a question regarding a specific plot, please contact the sub-system expert that is present in the control room.

(2) Edit significant runs in the Run Registry.

(3) Stay in close contact to the **shift leader**!

GUI - Summary page

DQM GUI for online shifters: <https://cmsweb.cern.ch/dqm/online>



GUI - Reports page


 Service ▾ Online: **Reports** Workspace ▾ Run # ▾ 111'877 . LS # 27 . Event # 145'212'832 . Run started Today 07:23

Summaries
 Summary
 Reports
 Shift
 Everything

Tracker/Muons
 CSC
 DT
 Pixel
 RPC
 SiStrip

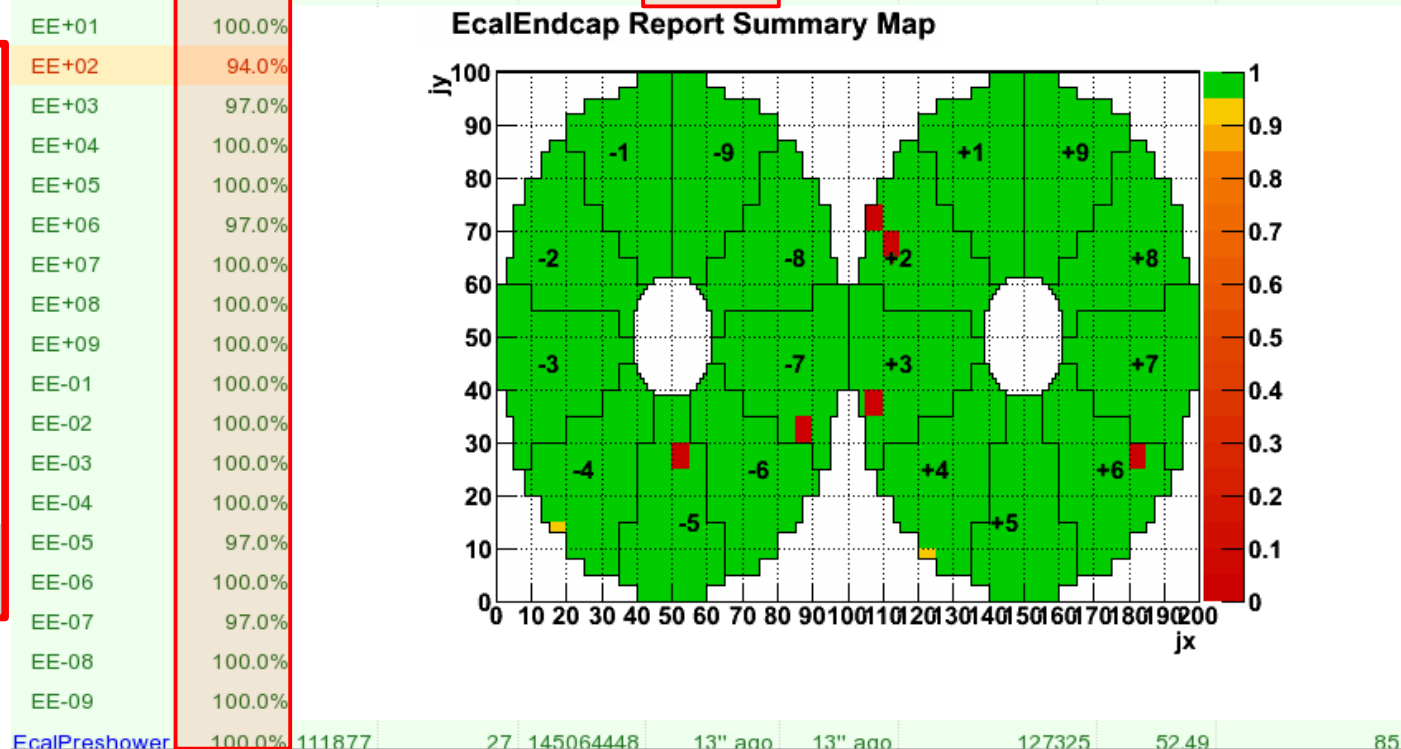
Calorimeter
 EcalBarrel
 EcalEndcap
 EcalPreshower
 HCAL

Trigger/Lumi
 HLT
 HLX
 L1T
 L1TEMU

(Back)

Please file any feature requests and any bugs you find in [Savannah](#). Find [shift instructions](#) here.

Subsystem	Summary	Run	Lumi section	Event	Last update	Last event	Processed events	Event rate	Monitor elements
CSC	99.8%	111877	27	144648944	13" ago	13" ago	224131	90.69	427
DT	100.0%	111877	27	145212832	13" ago	13" ago	134843	56.12	5976
EcalBarrel	98.1%	111877	27	144603104	13" ago	13" ago	47552	27.42	17206
EcalEndcap	98.9%	111877	27	144437808	13" ago	13" ago	50998	23.93	10476



Global summary values
by subsystems:

Good: $\geq 95\%$

Warning: $< 95\%$

ERROR: $< 85\%$

No DAQ: not in readout

GUI – 00 Shift Layouts

- Histograms you are requested to monitor are the ones under “00 Shift”.

- Under “00 Shift” there are ~10 histograms/panels per subsystem.

- A link is provided to the **histogram description** on the Twiki page.



Description of DQM shift histograms

- The description of the shift histograms can be found here:

<https://twiki.cern.ch/twiki/bin/view/CMS/DQMShiftHistograms>

- Reference histograms given per subsystem for **Online and Offline DQM**.

Description of DQM Shift histograms

Contents:

- Description of DQM Shift histograms
- Online
- Offline DQM

Useful Links

Online

- Data format integrity checks
- (DPG)
 - CSC
 - DT
 - Ecal (calorimeter)
 - Hcal
 - Pixel
 - RPC
 - SiStrip
 - Trigger
 - Trigger Emulator
 - Trigger HLT

Offline DQM

- (DPG)
 - CSC Offline DQM
 - DT Offline DQM
 - Ecal (calorimeter) Offline DQM
 - HLT Offline DQM
 - Hcal Offline DQM
 - Trigger Offline DQM
 - Trigger Emulator Offline DQM
 - Pixel Offline DQM
 - SiStrip Offline DQM
 - RPC Offline DQM
 - more systems to come here (please stick to [page style and naming convention as given here](#))
- (POG)
 - Muon Offline DQM
 - JetMET Offline DQM
 - Egamma Offline DQM
 - more systems to come here (please stick to [page style and naming convention as given here](#))

List of Shift Histograms

ECAL DQM report summary

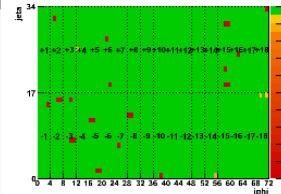
Description: the histogram shows, for each 5x5 crystals matrix, the fraction of good channels / 25. The goodness of the crystal is decided based on the results of many analysis on it. The grid with numbers delimit different readout units (supermodules in barrel, sectors in endcap). They are known as FEDs

Legend:
green : status = [95-100]%
yellow : status = [85-95]%
red : status = [0-85]%
white : not being readout (not in DAQ)

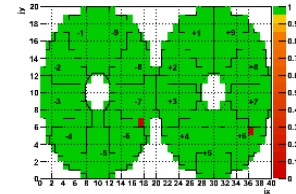
Evaluation criteria: The overall % of the subsystem should be more than 98% and different regions in the 2D plot should be Green. Red or Yellow regions in the histogram would represent problems

Subsystem Evaluation and Action: If one FED has a % less than 95%, the reason has to be identified in the plots below and a commented. If it is lower than 85%, the ECAL shifter should be contacted. The same if the overall status of the subsystem is lower than 85%.

EcalBarrel Report Summary Map



EcalEndcap Report Summary Map

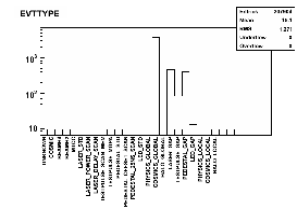
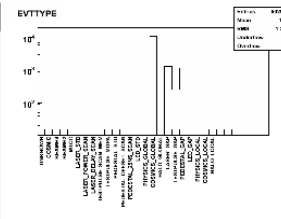


00 Event Type

Description: Frequency of the event types found in the DQM event-stream. **Evaluation criteria:** If the calibration sequence is ON, histograms should show entries in "COSMICS_GLOBAL", "LASER_GAP", "PEDESTAL_GAP" ("LED_GAP" also in the case of Endcap).

Subsystem Evaluation: If only cosmics is filled, or proportions different from reference, data are still good.

Action items: If the calibration sequence is ON, but only "COSMICS_GLOBAL" is filled, contact the central trigger shifter and check the calibration rate (normally 100 Hz).



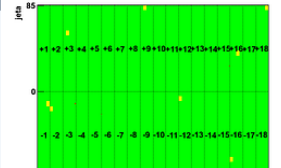
01 Integrity Summary

Description: quality summary checking that data for each crystal follows all the formatting rules and all the constraints which are dictated by the design of the electronics.

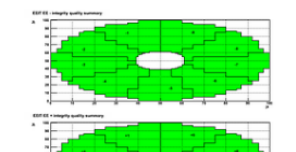
Evaluation criteria: It should be all green.
green : good; **red** : bad; **yellow** : no entries.

Subsystem Evaluation: a single crystal (a pixel in this scale) with integrity errors is not a problem. This will be skipped in reconstruction. Regions with concentrated red spots are problems because entire trigger towers are

EBIT Integrity quality summary



01-Integrity



Task 2: Run Registry Maintenance

- The Run Registry can be found here:

<http://pccmsdqm04.cern.ch/runregistry/>

- You need your **NICE password** to log in!



CMS DQM Run Registry

[Message Board](#) | [Plot Chart](#) | [Advanced search](#) | [Dump Data](#) | [Request Access](#) | [Options](#) | [Help](#) | Logged in as **Markus Marienfeld** Logout

Manual Refresh	Single Select	Columns	Reset	Summary values	Edit	Run Registry Data	View in DBS										
Tags	Run#	Global Name	Online Shifter	Status	Started	Events	Rate, Hz	Stop Reason	Online Comment	CSC	DT	ECAL	HCAL	PIX	RPC	SCAL	STRIP
	101828	CRUZET_II	Darren Michael Pui	OFFLINE	2009.07.01 12:51:27	28,951	32	Completed first test of CSC.		GOOD	EXCL	EXCL	GOOD	GOOD	EXCL	GOOD	EXC
	101819	CRUZET_II	Darren Michael Pui	OFFLINE	2009.07.01 12:19:04	24,414,475	33,157	Stop to begin CSC radiation		GOOD	EXCL	EXCL	GOOD	GOOD	EXCL	GOOD	EXC
	101818	CRUZET_II	Darren Michael Pui	OFFLINE	2009.07.01 12:08:12	4,456,691	13,693	Stop to implement correct Tri		GOOD	EXCL	EXCL	GOOD	GOOD	EXCL	GOOD	EXC
	101767	CRUZET_II	Darren Michael Pui	SIGNOFF	2009.07.01 09:35:02	20,635	104	ECAL went into error.		GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101753	CRUZET_II	Darren Michael Pui	OFFLINE	2009.07.01 08:44:40	78,963,570	44,210	Changing configuration of EC		GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101728	CRUZET_II	Darren Michael Pui	OFFLINE	2009.07.01 07:38:00	21,115,078	19,211	EB went into error when atte		GOOD	BAD!	GOOD!	GOOD	GOOD	EXCL	GOOD	EXC
	101725	CRUZET_II	Dmytro Kovalskyi	OFFLINE	2009.07.01 01:20:10	695,056,821	37,536	CSCTF went out of sync and		GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101724	CRUZET_II	Dmytro Kovalskyi	SIGNOFF	2009.07.01 00:56:20	113,984	420	ECAL readout issues		GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101722	CRUZET_II	Dmytro Kovalskyi	SIGNOFF	2009.07.01 00:35:10	150,490	626	ECAL data format errors	plots are not available, so no DQM	GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101720	CRUZET_II	Dmytro Kovalskyi	SIGNOFF	2009.06.30 22:59:01	163,119,771	34,640			GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101705	CRUZET_II	Sharon Hagopian	SIGNOFF	2009.06.30 20:22:27	56,070,587	23,451	add RPC	More noise than usual in ECAL. D	GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101700	CRUZET_II	Sharon Hagopian	SIGNOFF	2009.06.30 19:54:01	563,724	625	DAQ errors	Some ECAL FED problems.	GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101695	CRUZET_II	Sharon Hagopian	SIGNOFF	2009.06.30 18:04:32	60,365,368	14,603	Problem with DT FEDs	DT wheel 1 sectors 1-6 masked, D	GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101689	CRUZET_II	Sharon Hagopian	SIGNOFF	2009.06.30 17:17:52	46,642,810	19,720	Problem with PIXEL FED	1/4 of EB being read out but not i	GOOD	GOOD	GOOD	GOOD	GOOD	EXCL	GOOD	EXC
	101649	CRUZET_II	Sharon Hagopian	OFFLINE	2009.06.30 14:47:05	152,087,401	30,001	DAQ error	HCAL HB/HE noise trigger, rand	EXCL	EXCL	EXCL	GOOD	EXCL	EXCL	GOOD	EXC
	101644	CRUZET_II	Sharon Hagopian	OFFLINE	2009.06.30 14:27:03	9,219,488	11,690	reconfiguring trigger RCT	HCAL/RCT trigger problem	EXCL	EXCL	EXCL	BAD!	EXCL	EXCL	GOOD	EXC
	101598	CRUZET_II	Grzegorz Brona	OFFLINE	2009.06.30 12:34:29	20,243,157	17,780	one card of DTTF put FED 76	DT will be removed starting from	GOOD	BAD!	EXCL	GOOD	EXCL	EXCL	GOOD	EXC
	101594	CRUZET_II	Grzegorz Brona	OFFLINE	2009.06.30 11:53:36	44,213,748	26,355	14h12 : DTTF FED 780 is per	3 first minutes without random tri	GOOD	GOOD	EXCL	GOOD	EXCL	EXCL	EXCL	EXC
	101590	CRUZET_II	Grzegorz Brona	OFFLINE	2009.06.30 11:31:56	130,407	112	FED 770 : it will be masked o	run started finally : FED 773 was	GOOD	GOOD	EXCL	EXCL	EXCL	EXCL	EXCL	EXC
	101565	CRUZET_II	Grzegorz Brona	SIGNOFF	2009.06.30 09:38:23	190,660	288	Stoped to include HCAL		GOOD	GOOD	EXCL	EXCL	EXCL	EXCL	EXCL	EXC
	101045	MWGR26	Emanuele Di Marco	SIGNOFF	2009.06.23 21:43:08	1,340,568	4	test the CSCTF with a new co	the run has been too short to acc	GOOD	GOOD	GOOD	GOOD	EXCL	EXCL	GOOD	GOOD
	101032	MWGR26	Emanuele Di Marco	SIGNOFF	2009.06.23 19:32:00	15,268,270	3,756	test CSCTF in another config		BAD!	GOOD!	GOOD!	GOOD!	EXCL	EXCL	GOOD	GOOD
	101018	MWGR26	Emanuele Di Marco	SIGNOFF	2009.06.23 16:55:12	107,390,971	13,573	to put back in CSC		EXCL	GOOD!	GOOD!	GOOD!	EXCL	EXCL	GOOD	GOOD
	101012	MWGR26	Emanuele Di Marco	SIGNOFF	2009.06.23 16:37:33	18,415,852	32,453	to take out CSCTF in the trig		EXCL	GOOD!	GOOD!	GOOD!	EXCL	EXCL	GOOD	GOOD
	101004	MWGR26	Emanuele Di Marco	SIGNOFF	2009.06.23 16:12:05	38,387	404	Before DTTF, then TEC, went	very short run. Many histograms :	GOOD	GOOD	GOOD	GOOD	EXCL	EXCL	GOOD	GOOD

Run Registry bookkeeping

- Runs are automatically entered in the 'All Run Info Data'.
- **Bookkeeping** should be done for **significant runs**:
 - (1) Register only runs with **number of events more than 10'000** or which is **running for more than 10 minutes** (if you are in doubt, ask the **shift leader**).
 - (2) Follow the **run-by-run workflow** inspecting the shift histograms.
 - (3) **Ask the shift leader for confirmation** before a run is moved to “OFFLINE”.
- For **Online DQM**: Always work on the **ongoing or latest run**.

Register runs to the Run Registry

- Find a **significant run** in 'All Run Info Data' mode.
- Select the run number under consideration and click “Edit”:
 - Provide the “**Global name**” (i.e. CRUZET, CRAFT)
 - Select the active “**L1 sources**” (ask trigger shift person).
 - Click “**Save**”.
- During the run:
 - Based on the shift histogram instructions, set the **online subsystem flags** (**GOOD/BAD**) and **enter comments**.
 - If you **find a subsystem as BAD**, inform the **shift leader and the subsystem expert** and **give a short description** in the comments field.
- After the run:
 - Enter a “**stop reason**”.
 - The certification results **must be confirmed by the shift leader**, before the **status** of a given run is **moved to “OFFLINE”**.

Run Registry Message Board

- Communication between shift persons and DQM operators:
 - You should be always in contact with the other (**remote** / offline) shift persons using the **run registry message board** at the bottom of that page.
 - The main purpose of this is to inform them in real time about the run status.
 - After the previous shift person has logged out, you have to log in again and reopen the message board.

100893	MWGB26	Dmytro Kovalskiy	SIGNOFF	2009.06.23 03:27:20	275,086,76	44,355	0.01882	end of run, low L1 rate	Random		GOOD	GOOD	EXCL	OK
100891	MWGB26	Dmytro Kovalskiy	SIGNOFF	2009.06.23 01:25:07	338,315.86	68.903	0.01882	Long run with decreasing L1	Random		GOOD	GOOD	EXCL	OK

Run #100923 (SIGNOFF) has been updated (status SIGNOFF)

[10:06:13] Valdas Rapsevicius (EXPERT)@PC

Run #100923 (SIGNOFF) has been updated (status SIGNOFF)

[10:07:41] Valdas Rapsevicius (EXPERT)@PC

Run #100923 (SIGNOFF) has been updated (status SIGNOFF)

[10:09:45] Valdas Rapsevicius (EXPERT)@PC

Run #100923 (SIGNOFF) has been updated (status SIGNOFF)

[10:10:12] Valdas Rapsevicius (EXPERT)@PC

Run #100923 (SIGNOFF) has been updated (status SIGNOFF)

[10:12:52] Valdas Rapsevicius (EXPERT)@PC

Run #101012 (SIGNOFF) has been updated (status SIGNOFF)

[17:15:04] Run# 101209 start attempt without subsystems and no events so far.

[17:21:04] Run# 101210 start attempt without subsystems and no events so far.

[17:47:04] Run# 101212 start attempt without subsystems and no events so far.

Priority

Done Message Board pccmsdqm04.cern.ch

Task 3: Shift summary

- You need to log in with your AFS account to the **CMS Online page**:

<http://cmsonline.cern.ch/portal/page/portal/CMS%20online%20system>

- Click on Elog (left panel) and choose **Subsystems → Event display and DQM**.
- At the end of your shift **submit one shift summary** to the Elog, reporting **your comments and a short summary** of the runs taken:
 - The recorded and assessed run range.
 - General comments, remarks, reports.
- All **run information** is stored in the **Run Registry** and **should not be duplicated** here!
- Use this Elog also to report **comments on the histograms and documentation**, for instance for suggesting improvements.
- **Type** should be **“shift summary”** and **subject**: “Online at P5”, “Offline” or “Online Remote”

Final comments / shift turnover

- Upon your arrival in the control room the previous shifter will be there:
 - Get from him/her **information about the current status** of the data taking and what happened during the previous shift.
 - The shift person will show you where the tools are running, which you will be using (DQM GUI, CMS Online page, Run Registry).
 - **If anything with your tasks is not clear, ask at that moment!**
 - At the end of your shift wait for the next shift person to arrive and provide the same support.
- Offline shifts at Meyrin CC:
 - Run during daytime asynchronously with a delay of ~24 hours.
 - Also evaluate **reconstructed objects** (i.e. muons, jets, EGamma).

Useful links & phone numbers

➤ Online shift instructions:

- All instructions/information given in this tutorial and more are available at:

<https://twiki.cern.ch/twiki/bin/view/CMS/DQMShiftInstructions>

➤ Useful phone numbers:

- On call DQM shift expert: 165579
- Shift supervisor: given at your shift tutorial.

➤ Web Pages you will be using:

- **DQM Online GUI:** <http://cmsweb.cern.ch/dqm/online/>
- **Run Registry page:** <http://pccmsdqm04.cern.ch/runregistry/>
- **ELOG:** <http://cmsonline.cern.ch/portal/page/portal/CMS%20online%20system>