



CMS USER MANUAL

CMS User Manual

Version 3.3.6

PSL TEAM

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1 Header Section

1.1 Header Features

1.1.1 CMS Header Contents

- a) Change Password: This link allows logged in user to change their password
- b) Welcome Text: Shows the welcome text for user with Username of the logged user And Role of logged in user
- c) Sign Out: Allows logged in user log out of the system
- d) Date :Current Calendar Date
- e) LST: Shows current Local sidereal Time
- f) UTC: Shows the UTC corresponding to current IST time
- g) IST: Shows current date in Indian Standard date
- h) Usage Mode (SINGLE/MULTIPLE): Indicates whether CMS is used in single user mode or multi user mode. This setting can be changed from “Settings->CMS Settings” link
- i) Project – Displays the project code for current active observation
- j) Set up : Displays either of following values along with corresponding band center frequency
 - a. Continuum
 - b. Pulsar
 - c. Spectral
 - d. Sun-moon
 - e. planetary
- k) CMS State: Current CMS state, this state is derived from state machine.
- l) ANT STATE: Display current servo subsystem status.
- m) Object ,RA,DEC :Current object tracked by telescope, and its corresponding RA,DEC
- n) DATA ACQ: Display current data acquisition status.
- o) ALARM: Recent Alarm generated by CMS by virtue of information received from wrapper or the alarm sent over directly by wrapper.
- p) Active Controller: Shows name of astronomer who is currently actively using the antenna.
Please refer to [Active Controller](#) section in miscellaneous section for further details.

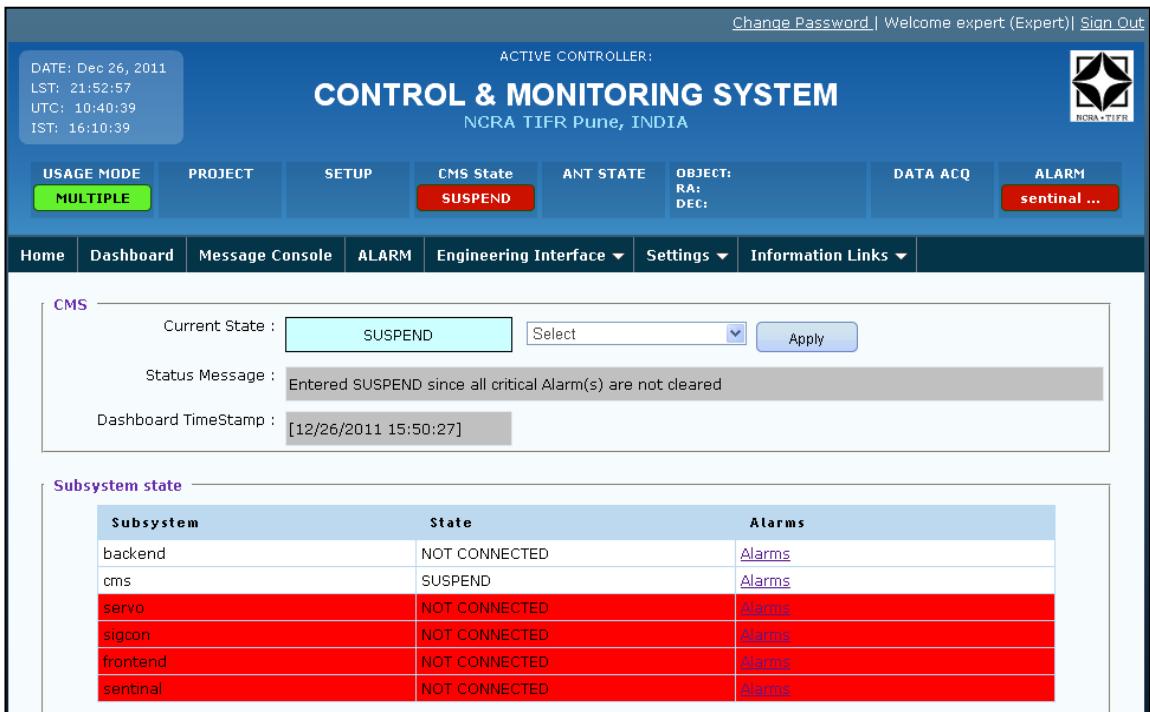
1.1.2 CMS Header Menus

1.1.2.1 Home

This menu link allows user to move to home page from any part of the application.

1.1.2.2 Dashboard

This menu link displays the CMS current state. It also allows user to change CMS from one state to another. It also displays current state of individual subsystem and alarms specific to particular subsystem.



The screenshot shows the CMS Dashboard interface. At the top, there is a header bar with the date (Dec 26, 2011), time (21:52:57), and location (NCRA TIFR Pune, INDIA). The header also includes links for 'Change Password', 'Welcome expert (Expert)', and 'Sign Out'. Below the header, the title 'CONTROL & MONITORING SYSTEM' is displayed, along with the NCRA TIFR logo.

The main navigation bar includes links for 'Home', 'Dashboard', 'Message Console', 'ALARM', 'Engineering Interface', 'Settings', and 'Information Links'.

The dashboard area contains several sections:

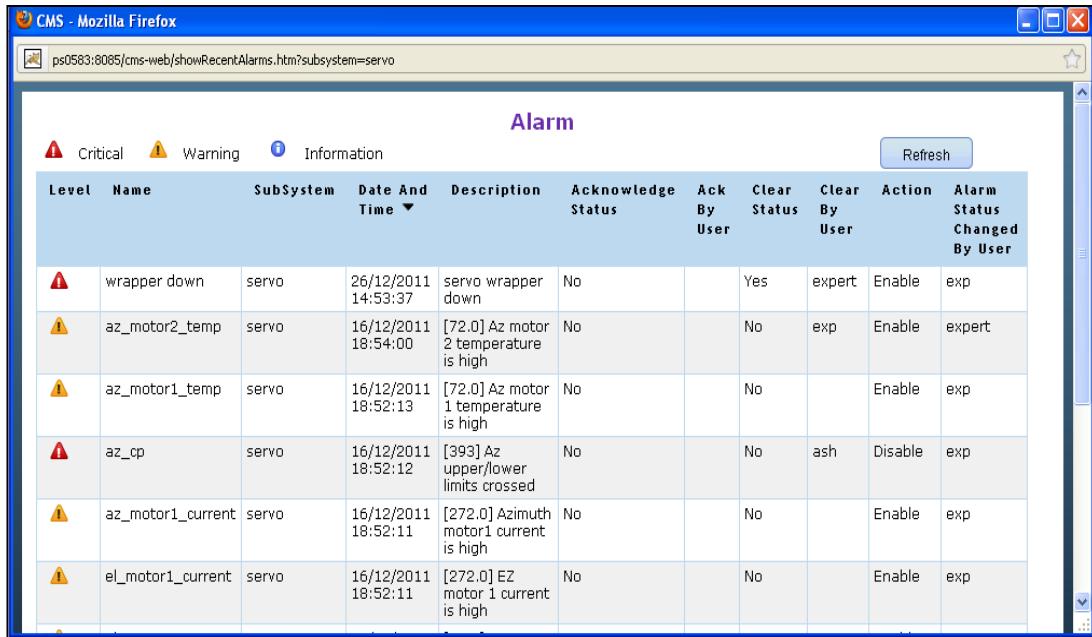
- CMS**: Shows the 'Current State' as 'SUSPEND' (highlighted in red) and a dropdown menu for 'Select' with an 'Apply' button.
- Status Message**: Displays the message: 'Entered SUSPEND since all critical Alarm(s) are not cleared'.
- Dashboard TimeStamp**: Shows the timestamp [12/26/2011 15:50:27].
- Subsystem state**: A table showing the status of various subsystems:

Subsystem	State	Alarms
backend	NOT CONNECTED	Alarms
cms	SUSPEND	Alarms
servo	NOT CONNECTED	Alarms
sigcon	NOT CONNECTED	Alarms
frontend	NOT CONNECTED	Alarms
sentinel	NOT CONNECTED	Alarms

User can view alarms of particular subsystem by clicking on the Alarm hyperlink.

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Alarm



The screenshot shows a Mozilla Firefox browser window displaying the CMS user manual. The main content is a table titled "Alarm" showing recent system events. The table has columns for Level, Name, SubSystem, Date And Time, Description, Acknowledge Status, Ack By User, Clear Status, Clear By User, Action, and Alarm Status Changed By User. The rows list various alarms, mostly of level "Warning", related to servo components like "wrapper down", "az_motor2_temp", and "az_motor1_current".

Level	Name	SubSystem	Date And Time	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
⚠	wrapper down	servo	26/12/2011 14:53:37	servo wrapper down	No		Yes	expert	Enable	exp
⚠	az_motor2_temp	servo	16/12/2011 18:54:00	[72.0] Az motor 2 temperature is high	No		No	exp	Enable	expert
⚠	az_motor1_temp	servo	16/12/2011 18:52:13	[72.0] Az motor 1 temperature is high	No		No		Enable	exp
⚠	az_cp	servo	16/12/2011 18:52:12	[393] Az upper/lower limits crossed	No		No	ash	Disable	exp
⚠	az_motor1_current	servo	16/12/2011 18:52:11	[272.0] Azimuth motor1 current is high	No		No		Enable	exp
⚠	el_motor1_current	servo	16/12/2011 18:52:11	[272.0] EZ motor 1 current is high	No		No		Enable	exp

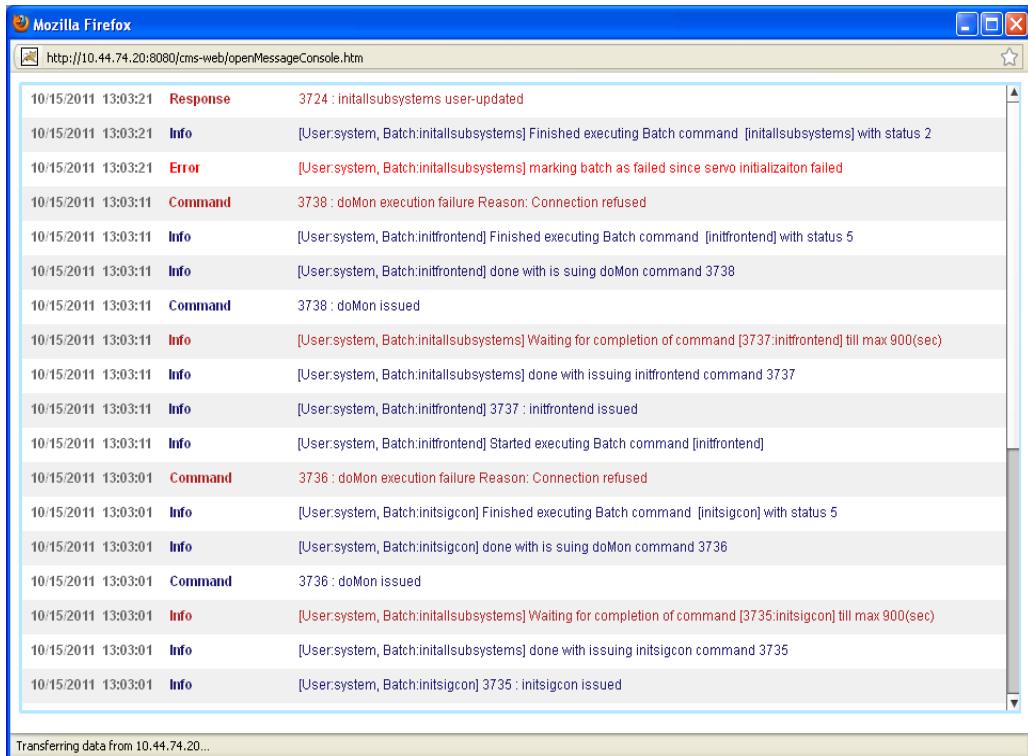
1.1.2.3 Message Console

Displays current command execution status .Latest command execution is displayed on top.

In case of motion commands, the percentage motion completed is also shown here. Wrapper needs to send a parameter named “steps” as part of intermediate response. This parameter should include the actual number of steps completed, so that CMS can calculate and display appropriate percentage motion completed.

All the entries in this console are also logged in separate log file messageconsole.log.

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The screenshot shows a Mozilla Firefox window displaying a log of system messages from a CMS application. The log entries are as follows:

Date	Time	Level	Message
10/15/2011	13:03:21	Response	3724 : initallsystems user-updated
10/15/2011	13:03:21	Info	[User:system, Batch:initallsystems] Finished executing Batch command [initallsystems] with status 2
10/15/2011	13:03:21	Error	[User:system, Batch:initallsystems] marking batch as failed since servo initialzaiton failed
10/15/2011	13:03:11	Command	3738 : doMon execution failure Reason: Connection refused
10/15/2011	13:03:11	Info	[User:system, Batch:initfrontend] Finished executing Batch command [initfrontend] with status 5
10/15/2011	13:03:11	Info	[User:system, Batch:initfrontend] done with issuing doMon command 3738
10/15/2011	13:03:11	Command	3738 : doMon issued
10/15/2011	13:03:11	Info	[User:system, Batch:initallsystems] Waiting for completion of command [3737:initfrontend] till max 900(sec)
10/15/2011	13:03:11	Info	[User:system, Batch:initallsystems] done with issuing initfrontend command 3737
10/15/2011	13:03:11	Info	[User:system, Batch:initfrontend] 3737 : initfrontend issued
10/15/2011	13:03:11	Info	[User:system, Batch:initfrontend] Started executing Batch command [initfrontend]
10/15/2011	13:03:01	Command	3736 : doMon execution failure Reason: Connection refused
10/15/2011	13:03:01	Info	[User:system, Batch:initsigcon] Finished executing Batch command [initsigcon] with status 5
10/15/2011	13:03:01	Info	[User:system, Batch:initsigcon] done with issuing doMon command 3736
10/15/2011	13:03:01	Command	3736 : doMon issued
10/15/2011	13:03:01	Info	[User:system, Batch:initallsystems] Waiting for completion of command [3735:initsigcon] till max 900(sec)
10/15/2011	13:03:01	Info	[User:system, Batch:initallsystems] done with issuing initsigcon command 3735
10/15/2011	13:03:01	Info	[User:system, Batch:initsigcon] 3735 : initsigcon issued

Transferring data from 10.44.74.20...

1.1.2.4 Alarm

Displays all generated alarm history. User can also sort the alarms based on various columns. User need to click on column header to sort that column. By default alarms are sorted by date and time.

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CMS - Mozilla Firefox

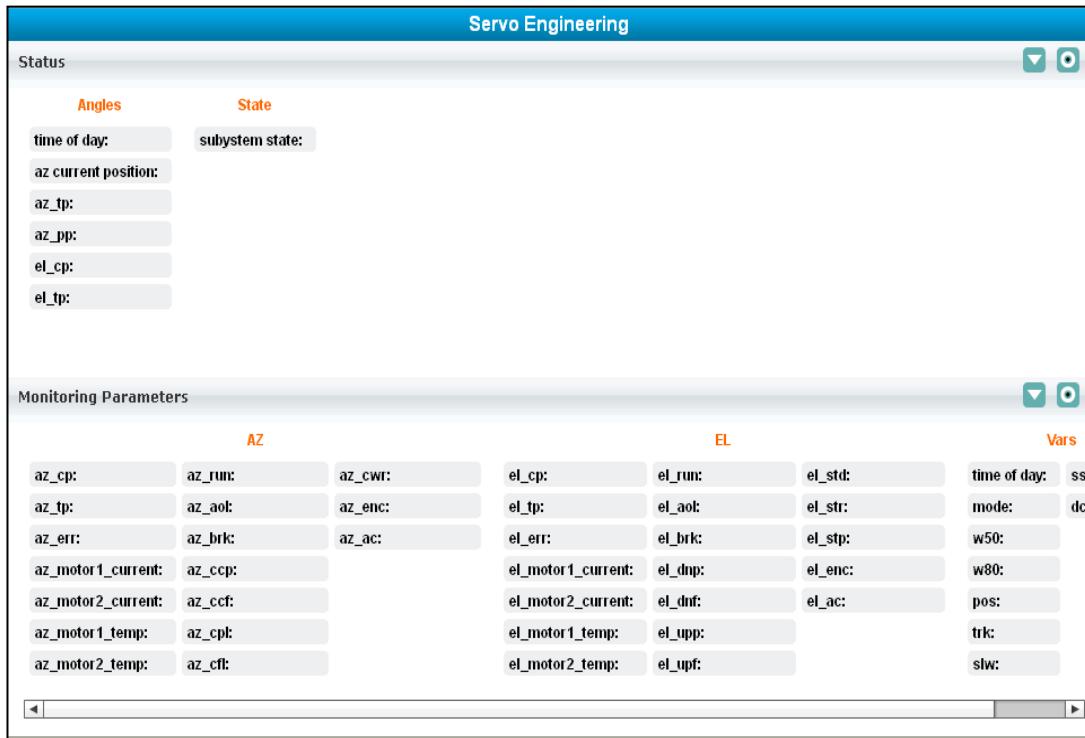
psu0583:8085/cms-web/showRecentAlarms.htm?subsystem=servo

Alarm

⚠ Critical	⚠ Warning	 ⓘ Information											Refresh
Level	Name	SubSystem	Date And Time ▾	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User			
⚠	wrapper down	servo	26/12/2011 14:53:37	servo wrapper down	No		Yes	expert	Enable	exp			
⚠	az_motor2_temp	servo	16/12/2011 18:54:00	[72.0] Az motor 2 temperature is high	No		No	exp	Enable	expert			
⚠	az_motor1_temp	servo	16/12/2011 18:52:13	[72.0] Az motor 1 temperature is high	No		No		Enable	exp			
⚠	az_cp	servo	16/12/2011 18:52:12	[393] Az upper/lower limits crossed	No		No	ash	Disable	exp			
⚠	az_motor1_current	servo	16/12/2011 18:52:11	[272.0] Azimuth motor1 current is high	No		No		Enable	exp			
⚠	el_motor1_current	servo	16/12/2011 18:52:11	[272.0] EZ motor 1 current is high	No		No		Enable	exp			

1.1.2.5 *Engineering Interface*

This menu provides link individual subsystem engineering interface where engineer can monitor system parameters and carry out engineering activities. Please refer to [engineering UI](#) section of document for further detail. The Engineering Interface contains pull-down menu for accessing individual subsystem Engineering UI.



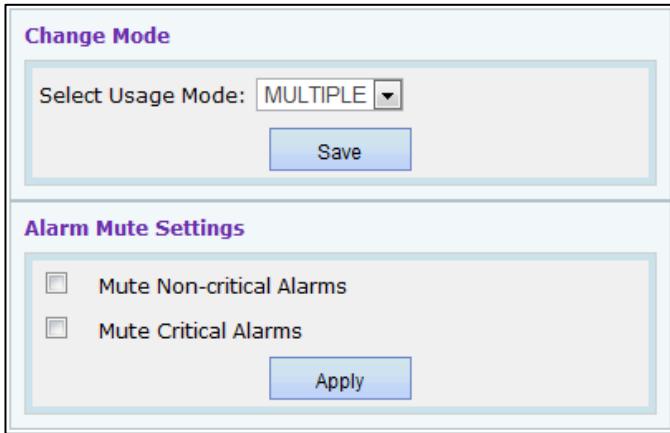
1.1.2.6 Settings → My Settings

Logged in User can update his contact details.

Name	:	natasha
Email Id	:	natasha@gmail.com
Contact Number	:	9970782976
Address	:	gjhgjhghj

1.1.2.7 Settings → CMS Settings

Logged in user can change the usage mode to multiple/single, and mute the critical/non-critical alarms.



The screenshot shows a window titled "Change Mode" with a dropdown menu set to "MULTIPLE". Below it is a "Save" button. Underneath is a section titled "Alarm Mute Settings" containing two checkboxes: "Mute Non-critical Alarms" and "Mute Critical Alarms". A blue "Apply" button is at the bottom.

Alarm Mute Settings

Alarm Mute Settings will display the current mute/un-mute settings for critical/non-critical alarms.

When user checks “Mute Critical alarms” and clicks on Apply all the critical alarms raised will go to mute state.



The screenshot shows the "Alarm Mute Settings" section with the "Mute Critical Alarms" checkbox checked. The "Apply" button is visible below the checkboxes.

When user checks “Mute Non-critical alarms” and clicks on Apply all the non-critical alarms raised will go to mute state.



The screenshot shows the "Alarm Mute Settings" section with the "Mute Non-critical Alarms" checkbox checked. The "Apply" button is visible below the checkboxes.

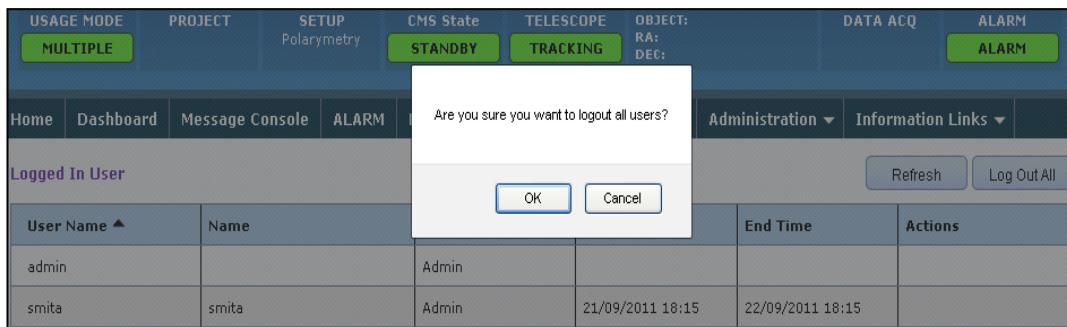
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Similarly user can uncheck to un-mute critical/non-critical alarms.

1.1.2.8 Settings → Force Logout

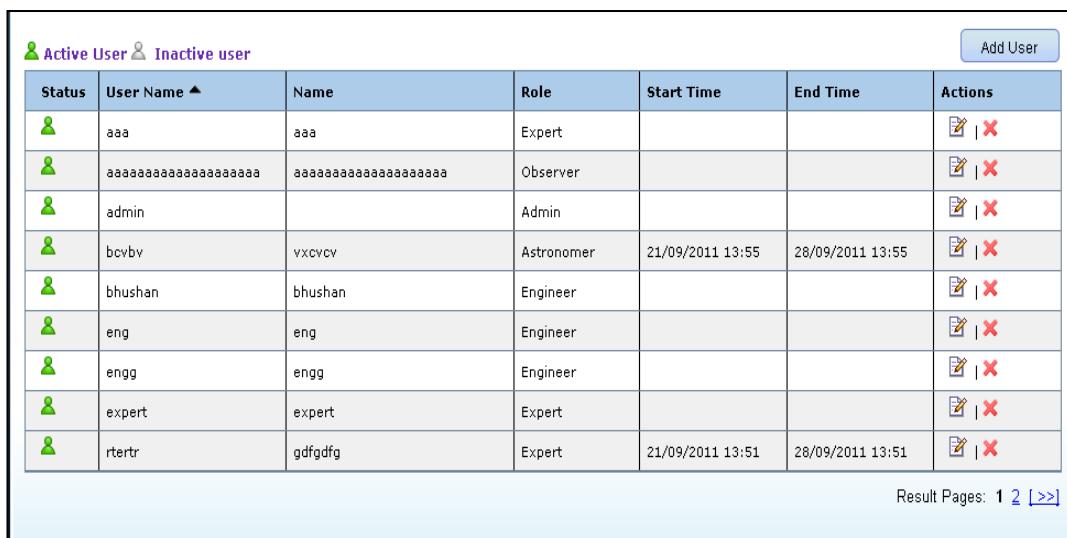
Force Logout option is visible to user only if “**FORCE LOGOUT**” permission is assigned to the logged in user’s role through Role Management. This allows user to forcefully log out other logged in users. Only non-expert, non-admin users can be logged out using this feature.

Log out All → Allows to log out all the logged in users except admin and expert users.
Refresh → Allows to refresh the logged in users list.



1.1.2.9 Administration → User Management

This menu link displays all users and their details available in the system. It also displays their Active/Inactive status.



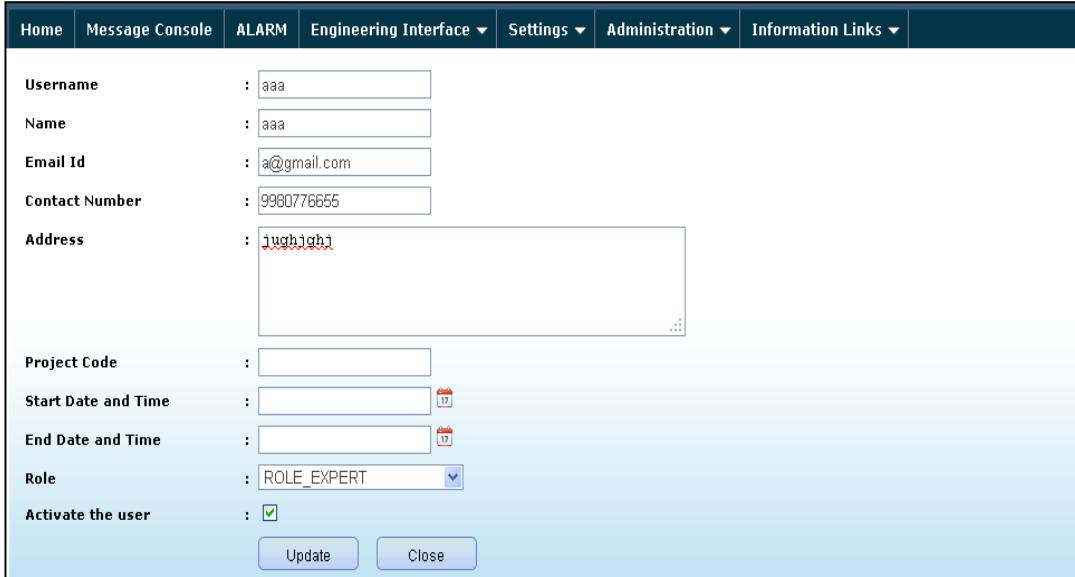
The screenshot shows the User Management page. At the top, there are filters for Active User and Inactive user, and an Add User button. Below is a table with columns: Status, User Name, Name, Role, Start Time, End Time, and Actions. The table lists several users with their details and status (Active or Inactive). At the bottom, there is a pagination message: "Result Pages: 1 2 [>>]".

Status	User Name ▲	Name	Role	Start Time	End Time	Actions
Active	aaa	aaa	Expert			
Active	aaaaaaaaaaaaaaaaaaaaaa	aaaaaaaaaaaaaaaaaaaaaa	Observer			
Active	admin		Admin			
Active	bcbvb	vxcvcv	Astronomer	21/09/2011 13:55	28/09/2011 13:55	
Active	bhushan	bhushan	Engineer			
Active	eng	eng	Engineer			
Active	engg	engg	Engineer			
Active	expert	expert	Expert			
Active	rtertr	gdfgdfg	Expert	21/09/2011 13:51	28/09/2011 13:51	

Result Pages: 1 2 [>>]

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User can update information of a user by clicking on Edit button in Actions Column on right side.



This screenshot shows the CMS User Management update form. It contains fields for Username, Name, Email Id, Contact Number, Address, Project Code, Start Date and Time, End Date and Time, Role (set to ROLE_EXPERT), and Activate the user (checkbox checked). At the bottom are Update and Close buttons.

Username	:	aaa
Name	:	aaa
Email Id	:	@gmail.com
Contact Number	:	9980776655
Address	:	jughbjgbj
Project Code	:	
Start Date and Time	:	
End Date and Time	:	
Role	:	ROLE_EXPERT
Activate the user	:	<input checked="" type="checkbox"/>
<input type="button" value="Update"/> <input type="button" value="Close"/>		

One can Deactivate user by clicking on the Deactivate button in Actions column.



This screenshot shows a confirmation dialog box asking "Are you sure you want to deactivate the user?". Below it, a message says "User natasha de-activated successfully." A table lists users with columns for Status, User Name, Name, Role, Start Time, End Time, and Actions. The Actions column contains edit and deactivate buttons. The deactivate button for the user "natasha" is circled in yellow.

Status	User Name	Name	Role	Start Time	End Time	Actions
Active	aaa	aaa	Expert			
Active	aaaaaaaaaaaaaaaaaaaaaa	aaaaaaaaaaaaaaaaaaaaaa	Observer			

1.1.2.10 Administration → User Management → Add User

This menu link allows user to add new users in the system. Fields marked in red are the compulsory fields. User can select the desired role to be given to the new user from Role dropdown.

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If a role selected for user is “**ROLE_ASTRONOMER**” or “**ROLE_CO-ASTRONOMER**” then it is mandatory to specify Project code, start and end date time.

Username *	:	<input type="text"/>
Name *	:	<input type="text"/>
Password *	:	<input type="password"/>
Confirm Password *	:	<input type="password"/>
Email Id *	:	<input type="text"/>
Contact Number *	:	<input type="text"/>
Address	:	<input type="text"/>
Project Code	:	<input type="text"/>
Start Date and Time	:	<input type="text"/> 
End Date and Time	:	<input type="text"/> 
Role *	:	<input type="button" value="▼"/>
<input type="button" value="Save"/> <input type="button" value="Close"/>		

1.1.2.11 Administration → Role Management

User can view all the available roles in the system. One can also edit or delete a particular role. In case of deletion if any other user is assigned that role, the role will not be deleted.

				Add Role
RoleId	Role Name ▲	Display Name	Actions	
12	role1	role1	 	
3	ROLE_ASTRONOMER	Astronomer	 	
4	ROLE_CO-ASTRONOMER	Co-Astronomer	 	
6	ROLE_ENGINEER	Engineer	 	
2	ROLE_EXPERT	Expert	 	
5	ROLE_OBSERVER	Observer	 	

1.1.2.11.1 Add Role

This button enables user to add new role in the system.

For Example: Consider addition of new role as “**sample_role**” in the system.

User needs to enter the role name and display name.

User needs to select **Permissions** to be given to the new role by selecting permissions from the dropdown.

Description of available permissions:

- a) **DEFAULT PERMISSIONS:** This is a minimum subset of generic set permissions .It contains permissions like allowing user to view and access home page, alarms, message console, Change password etc.

List of default permissions:

- BF_SHOW_HOME – Allow user to view home page of the CMS.
- BF_CONTROL_STATUS – Allow user to view header.
- BF_SHOW_ALARMS – Allow user to view the alarms.
- BF_ACK_ALARM – Allow user to acknowledge alarm.
- BF_GET_CMDLOG – Allow user to view command log.
- BF_CHANGE_PWD – Allow user to change password.
- BF_PLOT- Allow user to view 2D plot.
- BF_CATALOG – Allow user to view Catalog management.
- BF_SHOW_CMSINFO –Allow user to view the content of Help Menu
- BF_CREATE_EXCEL - Allow user to create excel sheet for command log.BF_OPEN_MSGCONSOLE – Allow user to view message console.
- BF_ABOUTUS – Allow user to view About Us page.
- BF_SHOW_TRACKINGSTATUS – Allow user to view Tracking status.BF_SHOW_RECEIVERSTATUS – Allow user to view Receiver status.
- BF_VIEW_DASHBOARD-Allow user to view Dashboard.

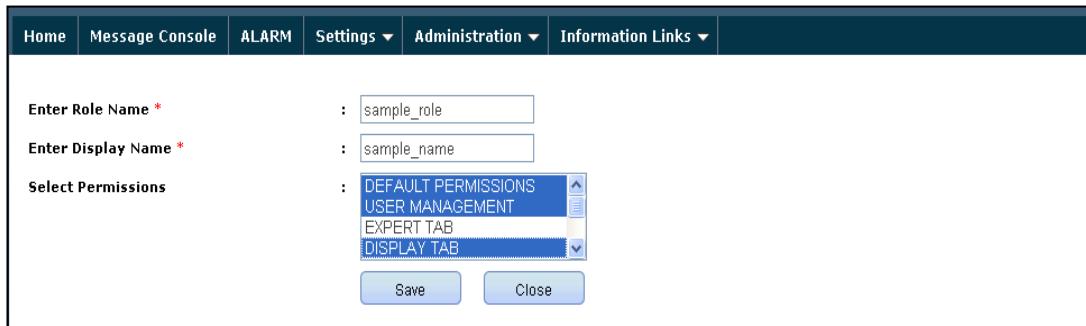
- b) **USER MANAGEMENT:** User management is visible and accessible to user, only if this permission is given.
- c) **EXPERT TAB:** Expert tab is visible and accessible to user, only if this permission is given.
- d) **TUNE RECEIVER:** Tune receiver tab is visible and accessible to user, only if this permission is given.
- e) **DISPLAY TAB:** Display tab is visible and accessible to user, only if this permission is given.
- f) **MANUAL MODE:** Manual mode tab is visible and accessible to user, only if this permission is given.
- g) **FORCE LOGOUT:** Force logout feature is visible and accessible to user, only if this permission is given. It allows user to forcefully logout other logged in users.
- h) **BATCH MODE:** Batch mode tab is visible and accessible to user, only if this permission is given.
- i) **COMMAND LOG:** Command log is visible and accessible to user, only if this permission is given.

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- j) **META DATA:** Meta Data is visible and accessible to user, only if this permission is given, by default admin and expert users can see the Meta Data tab.
- k) **ROLE MANAGEMENT:** Role management feature is visible and accessible to user, only if this permission is given.
- l) **DISPLAY_TAB_SAVESYSTEM_CATALOG:** Enables user to save catalog as system catalog.
- m) **SERVO_ENGINEERING:** Servo engineering interface is visible and accessible to user only if this permission is given.
- n) **CMS DASHBOARD:** CMS dashboard is visible and accessible to user, only if this permission is given.
- o) **ENABLE DISABLE ALARM:** User can enable/disable alarm, only if this permission is given.
- p) **CLEAR ALARM:** User can clear alarm, only if this permission is given.
- q) **MAINTENANCE STATE:** If CMS is in maintenance state, user can log in to CMS only if this permission is given.
- r) **CHANGE CMS STATE:** User can change CMS state from one to another, only if this permission is given.

Consider that user does not want “sample_role” to view the EXPERT TAB then keep “**EXPERT TAB**” option unselected. This will never allow users with “sample_role” role to view expert tab unless that permission is reassigned to that role.

Permissions assigned to user with “**Admin**” role cannot be changed.



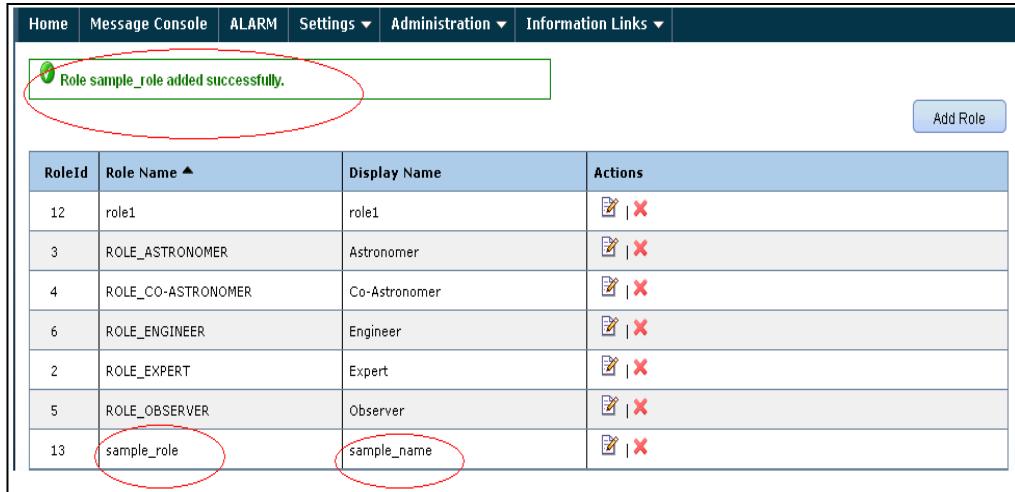
The screenshot shows a web-based CMS interface for managing roles. At the top, there is a navigation bar with links: Home, Message Console, ALARM, Settings ▾, Administration ▾, and Information Links ▾. Below the navigation bar, there is a form for adding a new role. The form fields are as follows:

- Enter Role Name ***: A text input field containing "sample_role".
- Enter Display Name ***: A text input field containing "sample_name".
- Select Permissions**: A dropdown menu listing several permissions:
 - DEFAULT PERMISSIONS
 - USER MANAGEMENT
 - EXPERT TAB
 - DISPLAY TAB
 The "DISPLAY TAB" option is highlighted with a blue selection bar.

At the bottom of the form are two buttons: "Save" and "Close".

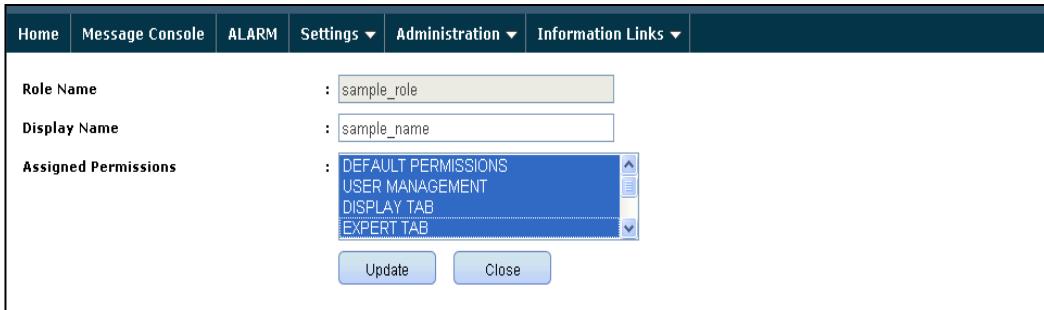
Role “sample_role” added successfully.

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RoleId	Role Name ▲	Display Name	Actions
12	role1	role1	
3	ROLE_ASTRONOMER	Astronomer	
4	ROLE_CO-ASTRONOMER	Co-Astronomer	
6	ROLE_ENGINEER	Engineer	
2	ROLE_EXPERT	Expert	
5	ROLE_OBSERVER	Observer	
13	sample_role	sample_name	

Consider now, we want users with “**sample_role**” to view Expert tab. In that case user needs to click on Edit button in Actions Column (See top right) against “sample_role”. Select “EXPERT TAB” from Permissions list and Click Update. “**sample_role**” can now view Expert tab.



Role Name : sample_role

Display Name : sample_name

Assigned Permissions :

- DEFAULT PERMISSIONS
- USER MANAGEMENT
- DISPLAY TAB
- EXPERT TAB**

Update **Close**

1.1.2.12 Information Links → Help Menu

Provides important help links. The link path can be changed by modifying the path in cmsinfo.properties file.



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1.1.2.13 Information Links → Batch Templates

This link opens a page which displays the information related to the Batch Templates available. To download the batch template the user will have to click on the batch file name. The Batch templates can be configured in BatchMenu.properties.

Batch Templates	
Batch File Name	Information
batchTemplate1.txt	Sample Template1
batchTemplate2.txt	Sample Template2

1.1.2.14 Information Links → Catalog Templates

This link opens a page which displays the information related to the Catalog Templates available. To download the Catalog template the user will have to click on the Catalog file name. The Catalog Templates can be configured CatalogMenu.properties.

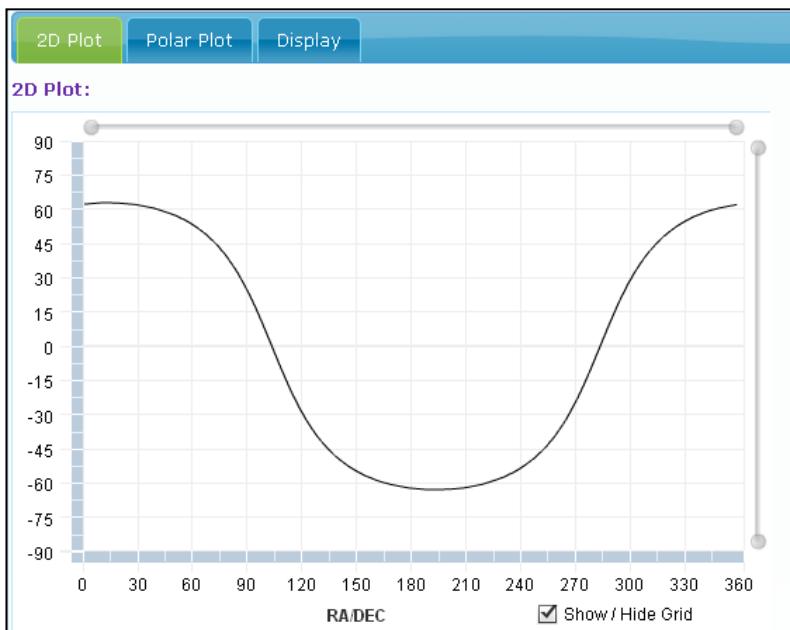
Catalog Templates	
Catalog File Name	Information
ncra15m.catalog	Sample Catalog

2 Catalog & 2D Plot

This section allows the user to upload the catalogs into the system, edit or delete them. It facilitates addition of various sources from catalog into the 2D plot.

2.1 2D Plot Features

The 2D plot displays the selected catalog source objects plot as per their Dec value for the current RA value. 2D plot also displays the Galactic curve for reference as displayed below:



2.1.1 System checkbox

It is visible to user who has corresponding permission (UPLOAD_SYSTEM_CATALOG), through this; user can upload the catalog which can be used across the system by all users.

2.1.2 Upload

After selecting file in correct format user can upload the catalog into the system. Refer to system check box documentation (section 2.2.1 System check box) for understanding how to upload system wide catalogs.

2.1.3 Catalog

CMS USER MANUAL

This button allows user to view Catalog.

Go to “Catalog and Settings” tab in section 2 of Home page. Select the catalog database (either user or system) using the radio button. Click on “View Catalog” button to view the catalog.

Section No.2

2D Plot Polar Plot Catalog and Settings

Catalog and Settings:

Load Catalog File:

System :

No file chosen

Select Catalog Type:

User System

Scale:

2.1.4 Catalog Type

- User - Catalog specific to the logged in user are displayed.
- System- all System catalogs is displayed.

SOURCE CATALOG

Select	Source Name	Right Ascension ▲	Declination	Epoch	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
<input type="checkbox"/>	3C48	01:38:21.06	33:13:10.4	2000	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
<input type="checkbox"/>	CRAB	05:31:30.00	+21:58:00.0	1950	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
<input type="checkbox"/>	CYGA	19:57:45.00	+40:36:00.0	1950	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
<input type="checkbox"/>	CASA	23:21:11.00	+58:33:00.0	1950	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>

2.1.5 Scale

If selected as Ra/Dec, the 2D plot is plotted with scale Ra vs. Dec.
User has also got an option to select Az/Alt for 2D plot display.

2.1.6 Apply

After changing the scale (RA/DEC or ALT/AZ) user needs to click on ‘Apply’ button to apply the changes in 2D plot.

2.1.7 Catalog Details

User comes to this page after clicking on ‘Catalog’ button in Display tab in Section 2.

SOURCE CATALOG					
Select	Source Name	Right Ascension ▲	Declination	Epoch	
<input type="checkbox"/>	3C48	01:38:21.06	33:13:10.4	2000	
<input type="checkbox"/>	CRAB	05:31:30.00	+21:58:00.0	1950	
<input type="checkbox"/>	CYGA	19:57:45.00	+40:36:00.0	1950	
<input type="checkbox"/>	CASA	23:21:11.00	+58:33:00.0	1950	

[Add](#) [Delete](#) [Cancel](#)

2.1.8 Add

On clicking the catalog button the source list on the catalog details page will be displayed to user as shown below. User can select the source to be added to 2D plot from the list by selecting the checkbox of that source. Click on Add button to add the selected source to 2D plot.

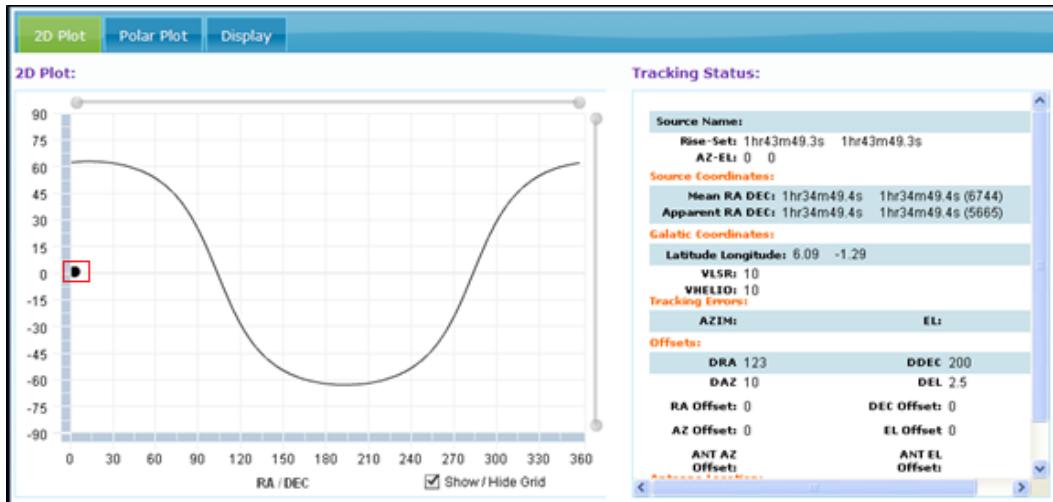
The selection of already plotted object is disabled.

SOURCE CATALOG					
Select	Source Name	Right Ascension ▲	Declination	Epoch	
<input type="checkbox"/>	3C48	01:38:21.06	33:13:10.4	2000	
<input type="checkbox"/>	CRAB	05:31:30.00	+21:58:00.0	1950	
<input checked="" type="checkbox"/>	CYGA	19:57:45.00	+40:36:00.0	1950	
<input type="checkbox"/>	CASA	23:21:11.00	+58:33:00.0	1950	

[Add](#) [Delete](#) [Cancel](#)

On clicking on Add the user will be asked to confirm the addition of object. If ok is selected the user will be taken to the 2D plot UI where the newly added object will be visible as displayed below:

CMS USER MANUAL



2.1.8.1 Delete

On Clicking Delete button the user will be asked to confirm the deletion of object. If ok is selected, the selected catalog will be deleted from the database.

2.1.8.2 Edit

User can also update the catalog details by clicking on the edit button as shown below.

SOURCE CATALOG					
Select	Source Name	Right Ascension	Declination	Epoch	
<input type="checkbox"/>	3C48	01:38:21.06	33:13:10.4	2000	<input checked="" type="button"/> <input type="button"/>
<input checked="" type="checkbox"/>	CRAB	05:31:30.00	+21:58:00.0	1950	<input checked="" type="button"/> <input type="button"/>
<input checked="" type="checkbox"/>	CYGA	19:57:45.00	+40:36:00.0	1950	<input checked="" type="button"/> <input type="button"/>
<input type="checkbox"/>	CASA	23:21:11.00	+58:33:00.0	1950	<input checked="" type="button"/> <input type="button"/>

Add Delete Cancel

Edit button will open Edit Catalog page which will allow user to edit the selected catalog.

Catalog

Source *	CRAB
Alias	-
RA *	05:31:30.00
DEC *	+21:58:00.0
Epoch *	1950
Morph Code	SNR
Band GHz	-
SI_ESI	--
Flux Density	---
Source Velocity	-
Source Vel ref Frame	-
Source Vel. Type	-
Comment	GMRT

2.1.8.3 Remove from Plot

When user clicks on the delete button provided in extreme right against each catalog, the selected source object is deleted from the 2D plot.

SOURCE CATALOG

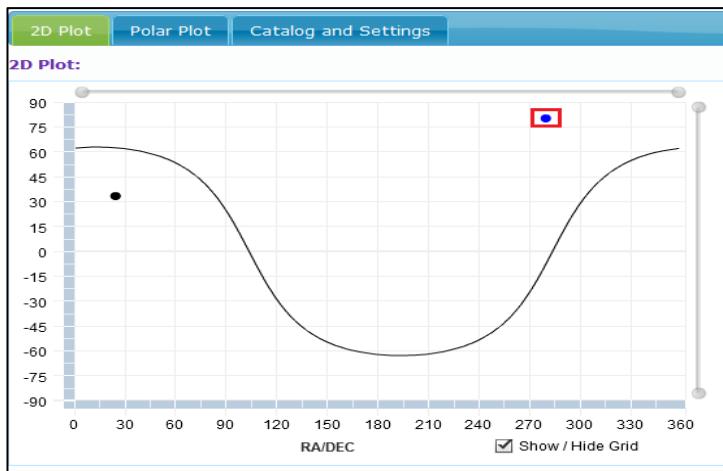
Select	Source Name	Right Ascension ▲	Declination	Epoch	
<input type="checkbox"/>	<u>3C48</u>	01:38:21.06	33:13:10.4	2000	
<input type="checkbox"/>	<u>CRAB</u>	05:31:30.00	+21:58:00.0	1950	
<input checked="" type="checkbox"/>	<u>CYGA</u>	19:57:45.00	+40:36:00.0	1950	
<input checked="" type="checkbox"/>	<u>CASA</u>	23:21:11.00	+58:33:00.0	1950	

Note: Source Name containing value “ERROR” or “error” should be not used since it is being used as a keyword in CMS for communicating errors.

2.1.9 Tracking Object & Antenna Position Display

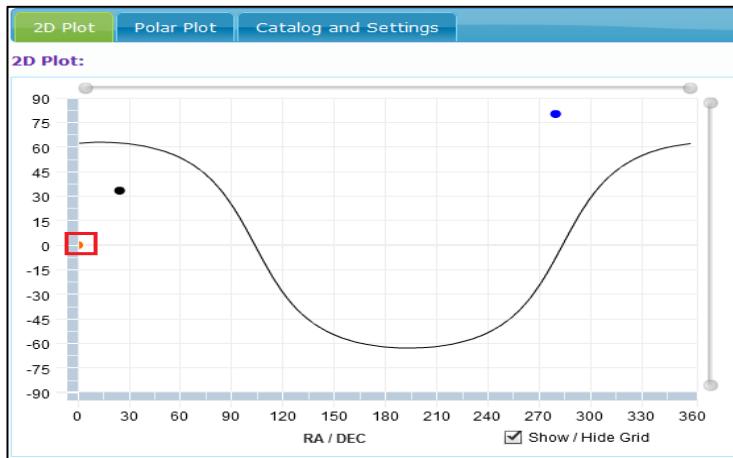
2.1.9.1 *Tracking Object Display:*

Current object being tracked gets added in 2d plot when user executes the trackobject command from the expert tab, or issues track command from manual mode. After execution of the trackobject command, the target source can be seen in blue color.



2.1.9.2 *Antenna Position Display:*

The antenna position in 2d plot can be viewed when, CMS receives the "ant_ra" and "ant_dec" monitoring parameters values from wrapper, and here antenna position can be seen in orange color.



3 Polar Plot

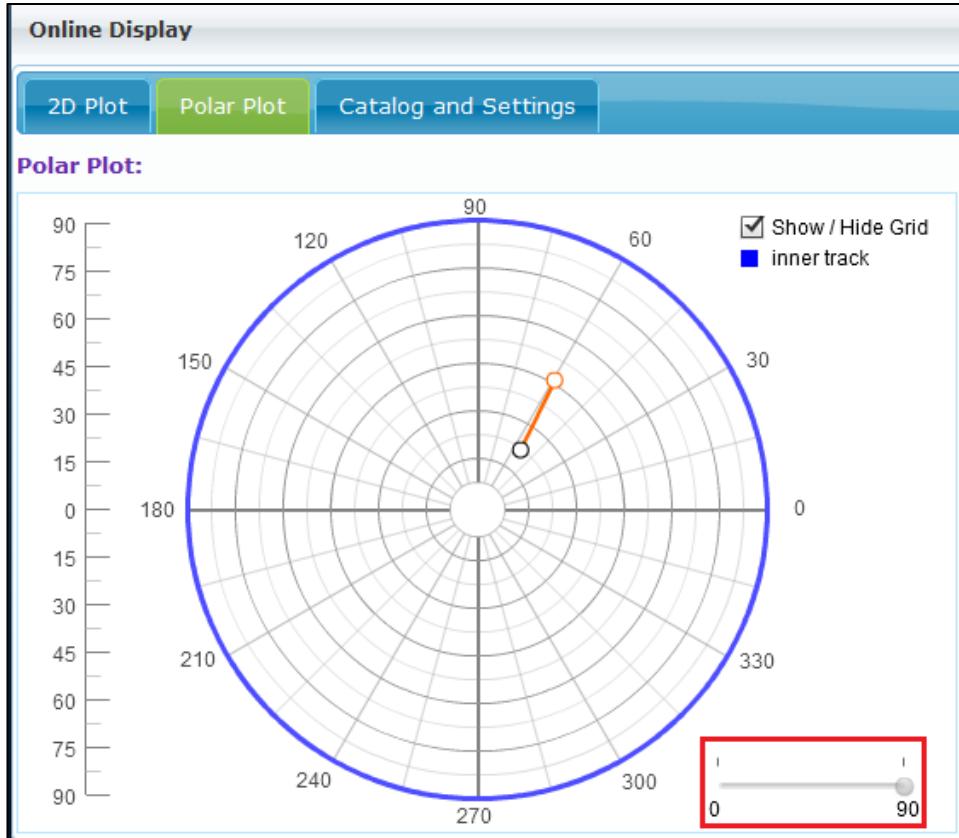
Polar plot displays the tracking of actual position of Telescope and the position of the source being tracked (target position).

3.1 Features

1. Zoom-in and zoom out
2. Configurable telescope position points
3. Configurable refresh interval for updating polar plot

3.2 Viewing Polar Plot

To view polar plot go to **Section 2 → Polar Plot tab**



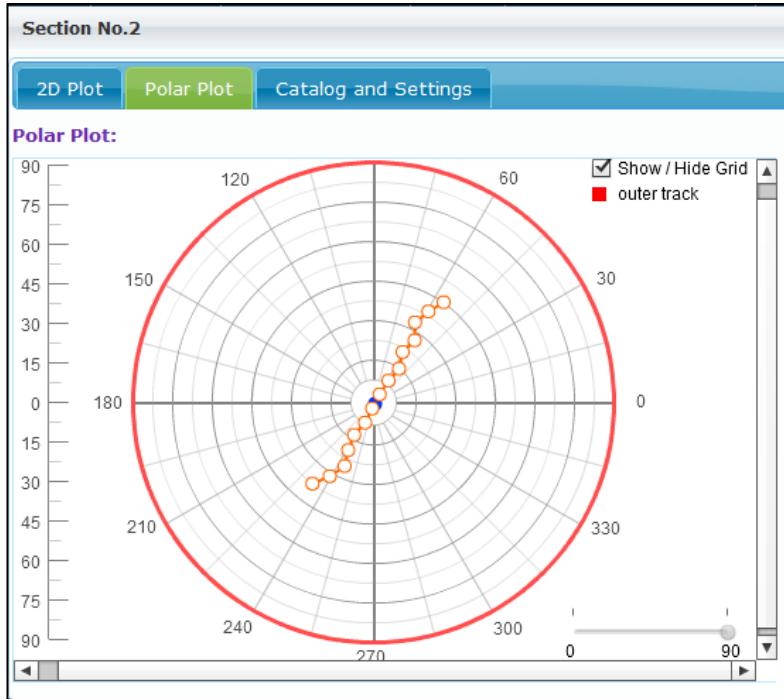
Here orange color showing az, el tracking points, Red marker indicates zoom- in zoom-out functionality, blue track color indicated the inner track, black color showing the starting point of az, el tracking points.

Tracking Object Display:

The tracking object in polar plot gets added when user executes the trackobject command from the expert tab. After execution of the trackobject command the target source can be seen in blue color, here in above figure it is in center.

Inner/Outer Track Display:

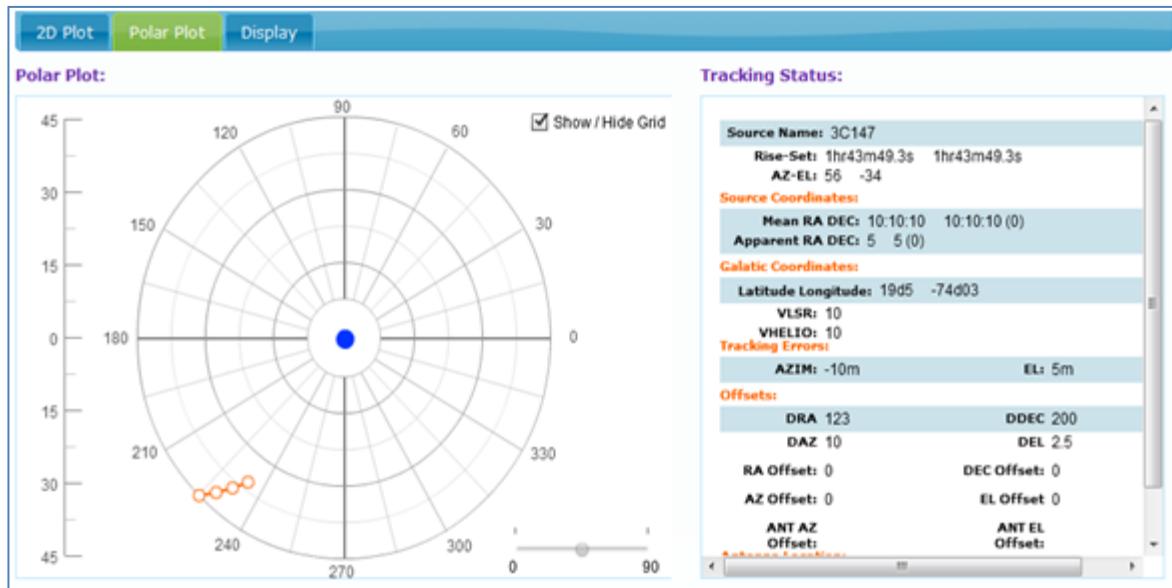
The Inner track is displayed if the srvcrd global property value is 0. This is the default track. For outer track the srvcrd value can be changed to 1. This value can be changed by executing the command “load property, srvcrd, 1” from the expert tab (under cms subsystem). The outer track is displayed in the figure below.



Target source is in blue color.

3.2.1 Zoom-in and zoom out feature

Polar plot has capability to zooms in and zooms out elevation, from scale 0-90, default it is in 90, e.g. here we can zoom in to 45 as show in below figure.



4 Tracking Status

Tracking status section shows the status of Antenna Tracking parameters.

1. .

4.1 Tracking UI



The screenshot displays the 'Tracking Status' interface with the following data:

- Source Name:** 3C147
- Rise-Set:** 23h13m18.328s 9h14m46.553s
- Ant AZ-EL:** 0 0
- Source Coordinates:**
 - Target AZ-EL:** -179.9973 81.0787
 - Mean RA DEC:** 10:10:10 10:10:10 (2000.0)
 - Apparent RA DEC:** 10:10:43 00:40:41 (2011.9911)
- Tracking Errors:**

AZIM:	EL:
DRA: 123	DDEC: 200
DAZ: 10	DEL: 2.5
RA Offset: 0	DEC Offset: 0
AZ Offset: 0	EL Offset: 0
ANT AZ 0	ANT EL 0
Offset:	Offset:
- Antenna Location:**
 - LAT:** 19d5
 - Long:** -74d03
 - Height:** 543m
 - TimeZone:** IST[GMT+5.30]

It shows the information about the source which is being tracked actively. As shown in the figure, the information about the source 'CYGA' is getting displayed. It shows the Mean RA, Mean DEC, Epoch, Apparent RA, Apparent DEC and Epoch, Azimuth Elevation etc. related Information about the source. The Source Name, Rise-Set and other source related parameters get updated when servo trackobject command is executed. The Az-El gets updated when az_cp and el_cp servo monitoring parameters are received by CMS.

The Tracking status gets updated in the following scenarios:

1. TrackObject or rawtrack command is executed from Expert tab.
2. Track is executed from manual mode
3. loadProperty command is executed from Expert tab for any of the Tracking Status parameters.
4. Ldantoff command from servo updates the ANT Az Offset and ANT El Offset from tracking status.



CMS USER MANUAL

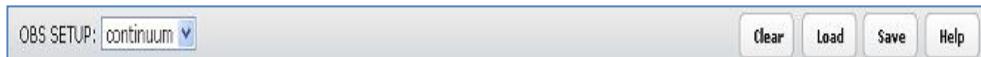
5. The ANT az – el gets updated when az_cp and el_cp servo monitoring parameters are received by CMS.
6. Tune Receiver Digital backend settings when applied will update the Tracking Status as per settings selected by user.

5 Tune Receiver

This section is used to tune settings of various subsystems (sigcon, frontend, digital backend) before observation starts.

5.1 Tune Receiver UI

5.1.1 Tools Menu



5.1.1.1 OBS SETUP

This is used to choose one of the following 5 standard receiver setups.

Each of these setups have a receiver setup file associated with it, same is mentioned in braces below

- Continuum (continuum.xml)
- Pulsar(pulsar.xml)
- Spectral(spectral-line.xml)
- Planetary(planetary.xml)
- Sun-moon(sun-moon.xml)

When user selects one of the setup Tune receiver UI is loaded with settings for corresponding observational setup.

User may also customize the values as per the observational needs.

5.1.1.2 Clear

Used to reset/reload various defaults settings associated with standard receiver setups.

5.1.1.3 Load

This is used to import the tune receiver settings from custom/standard receiver setup files. Tune receiver settings can be customized at 2 levels

- Customizing the values for parameters - This involves modifying the values for standard configuration parameters and then exporting them to xml file using Save functionality described in section 5.2.1.4
- Customizing the Parameters – This involves adding or removing the configuration parameters for some of the subsystem. Please refer to Tune Receiver section in “Dynamic UI Generation.docx” for further details.

The custom files are used to tune the subsystems if observational needs fall outside the standard range of observation parameters.

5.1.1.4 *Save*

It exports the contents of Tune Receiver settings to create custom receiver settings for use at later point of time using Load functionality mentioned in section 5.2.1.3

5.1.2 *Settings and Command Execution*

This section allows user to first customize the settings for a given setup and then send configuration commands to wrapper. User can also save these settings using Save functionality mentioned in section 5.2.1.4



5.1.2.1 *Default*

Used to reset/reload various defaults settings associated with selected receiver setup. All the controls for configuration parameters are disabled when user selects this option forcing user to send standard configuration parameters to wrapper.

5.1.2.2 *Custom*

In case user needs to modify the default configuration settings, this option should be selected. It enables the controls so that user can modify the parameters send customized values to wrapper.

5.1.2.3 *Set*

This control allows user to select a specific subsystem for which command configuration is to be done. It also allows to do command configuration for all subsystems at once if user selects

“all” option. In order to send configuration information to wrapper user should click on “Apply” button.

5.1.3 Configuration Parameters

This section shows various configuration parameters for all three subsystems. For digital back end sub system these parameters are also stored at global level in CMS so that other subsequent digital backend commands can use these configuration settings.
User can add or remove parameters in any of section as described in “Dynamic UI Generation.doc” document.

5.1.3.1 Configuration parameters for Frontend

RF											
RF SWAP:	<input type="radio"/> SWAP <input checked="" type="radio"/> UNSWAP										
FRONTEND UNIT:	<input checked="" type="checkbox"/>										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #ADD8E6;"> <th style="padding: 2px;">POL1</th> <th style="padding: 2px;">POL2</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">BAND CENTRE: <input type="text" value="300"/> MHz</td> <td style="padding: 2px;">350 MHz</td> </tr> <tr> <td style="padding: 2px;">RF ATTENUATION: <input type="text" value="0"/> dB</td> <td style="padding: 2px;">0 dB</td> </tr> <tr> <td style="padding: 2px;">RF TERMINATE: <input checked="" type="checkbox"/></td> <td style="padding: 2px;"><input type="checkbox"/></td> </tr> <tr> <td style="padding: 2px;">RF FILTER: <input type="text" value="100"/></td> <td style="padding: 2px;"><input type="text" value="150"/></td> </tr> </tbody> </table>		POL1	POL2	BAND CENTRE: <input type="text" value="300"/> MHz	350 MHz	RF ATTENUATION: <input type="text" value="0"/> dB	0 dB	RF TERMINATE: <input checked="" type="checkbox"/>	<input type="checkbox"/>	RF FILTER: <input type="text" value="100"/>	<input type="text" value="150"/>
POL1	POL2										
BAND CENTRE: <input type="text" value="300"/> MHz	350 MHz										
RF ATTENUATION: <input type="text" value="0"/> dB	0 dB										
RF TERMINATE: <input checked="" type="checkbox"/>	<input type="checkbox"/>										
RF FILTER: <input type="text" value="100"/>	<input type="text" value="150"/>										

5.1.3.2 Configuration parameters for Sigcon

SIGCON		POL1	POL2	
IF PRE-ATTN:	<input type="text" value="10"/>	dB	<input type="text" value="5"/>	dB
LOCAL OSC:	<input type="text" value="300"/>	MHz	<input type="text" value="400"/>	MHz
SIGCON FILTER:	<input type="text" value="100"/>	MHz	<input type="text" value="100"/>	MHz
IF POST-ATTN:	<input type="text" value="10"/>	dB	<input type="text" value="14"/>	dB
AGC:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	

5.1.3.3 Configuration parameters for Digital Backend

DIGITAL BACKEND			
ADC CLOCK	<input type="text" value="200"/>	FFT LENGTH	<input type="text" value="10"/>
ACQ INTEG	<input type="text" value="0.92"/>	Sec FFT SHIFT	<input type="text" value="10"/>
LTA INTEG:	<input type="text" value="0.92"/>	Sec SCALING FACTOR:	<input type="text" value="11"/>
CHANNELS:			
START:	<input type="text" value="10"/>	STOP:	<input type="text" value="15"/>
INCR:	<input type="text" value="1"/>		
SAMPLING GAIN CONTROL:			
ON:	<input checked="" type="radio"/>	OFF:	<input type="radio"/>
CHAN AVG:	<input type="text" value="100"/>		

Note – Only few parameters for digital backend are shown here because of space constraints.

5.2 Receiver Status

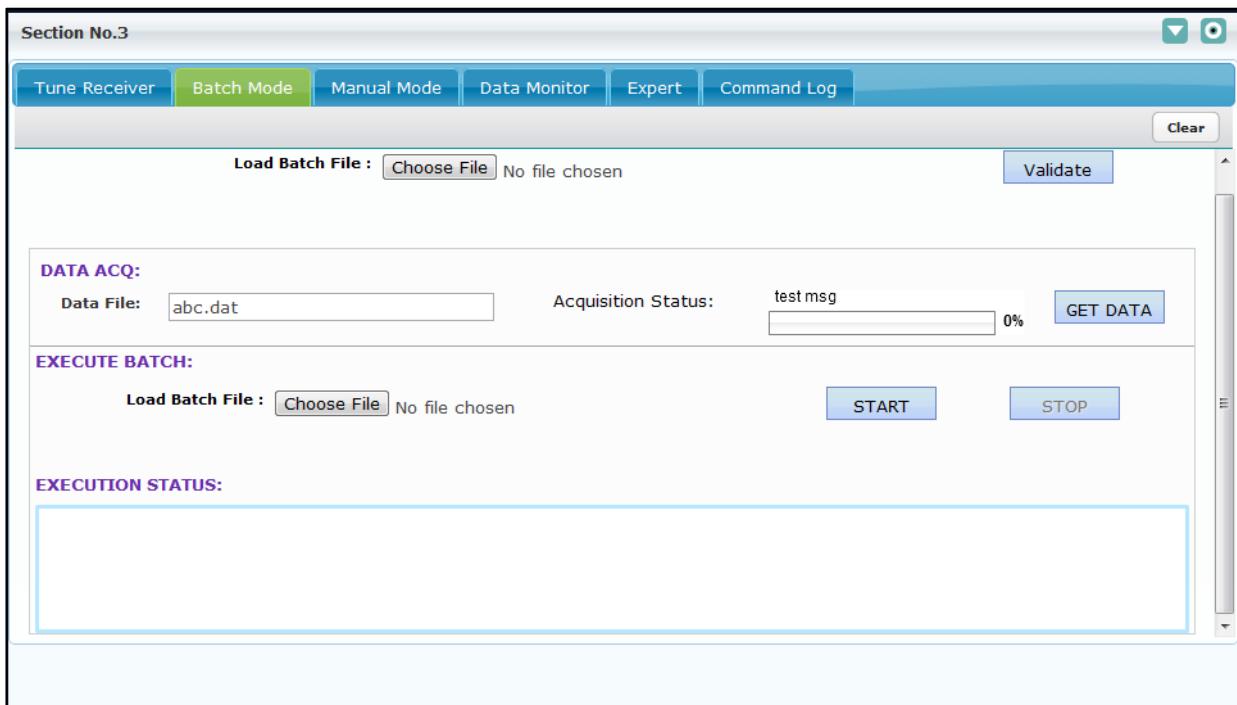
This section shows the real time status of various receiver configurations parameters as sent over by wrapper via monitoring information for corresponding subsystems.

Receiver Status:	
RF LNA Bias Voltages Channel 1	1 V
RF LNA Bias Voltages Channel 2	1 V
Common Box Power Supply Status	ON
Common box Pre Amplifier Bias Voltage Channel 1	3 V
Common box Pre Amplifier Bias Voltage Channel 2	3 V
Common Box Post Amplifier Bias Voltage Channel 1	3 V
Common Box Post Amplifier Bias Voltage Channel 2	3 V
RF Detector Voltage Channel 1	4 V
RF Detector Voltage Channel 2	4 V
Common Box Temperature Channel 1	5 Deg

6 Batch Mode

6.1 Features

Batch Mode tab is used to execute the batch script containing the set of commands and shows its execution status simultaneously.

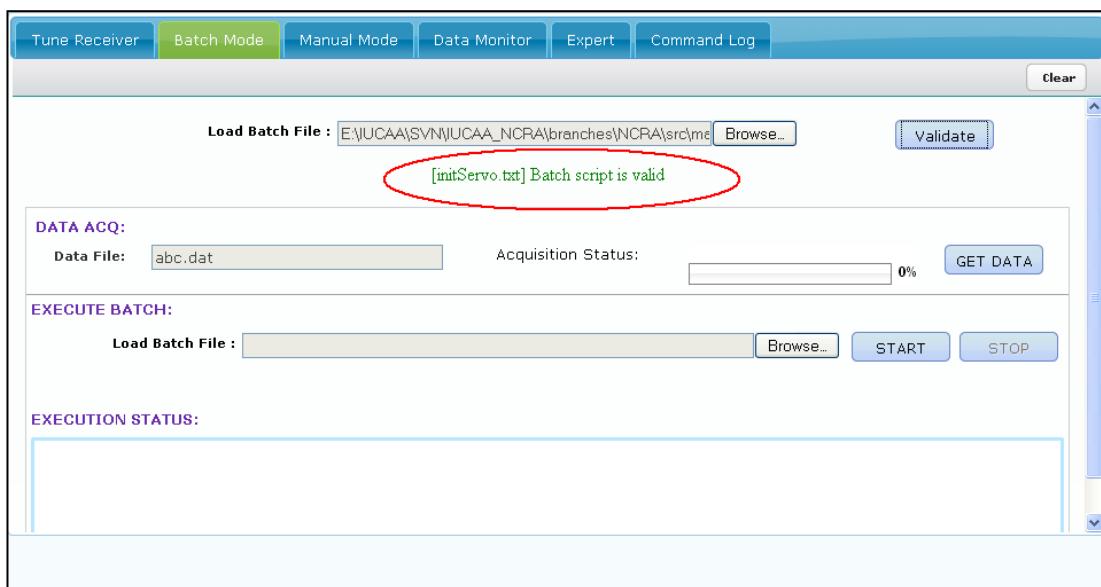


In Batch Mode user can browse the batch file by clicking on the Browse button. The Load Batch File textbox will contain the path of the selected batch file.

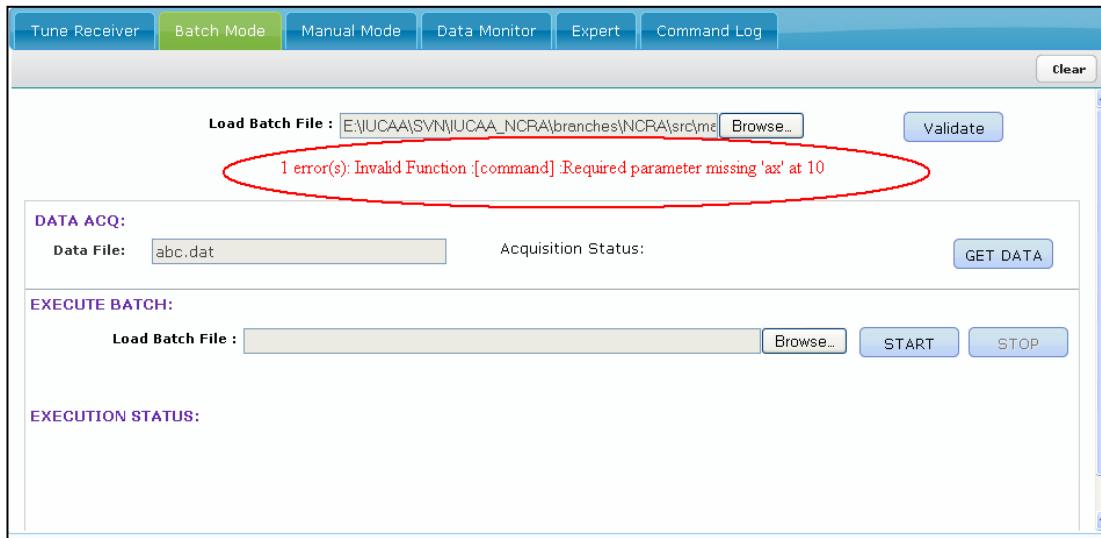
6.1.1.1 Validate Button

Validate button is used to validate the selected batch script. If the Batch Script is valid, user will get the success message and if the batch script is invalid user will get the failure message.

6.1.1.2 Success Message



6.1.1.3 Failure message



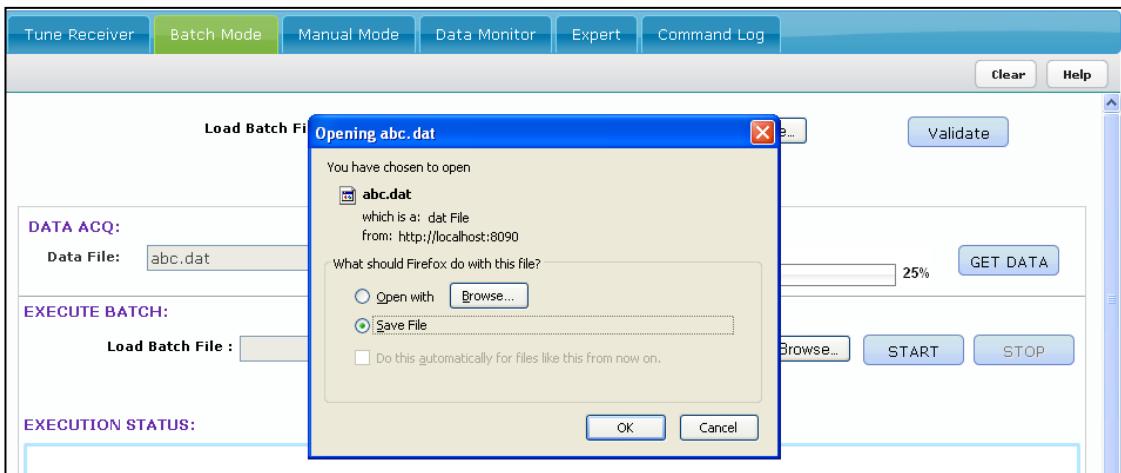
6.1.1.4 DATA ACQ

The DATA ACQ section displays the data file name and the acquisition status in percentage. The acquisition status is received in backend monitoring parameter **acq-percentage**. Also a message can be sent in monitoring parameter **acq-message** which will get displayed above the progress bar.

DATA ACQ:	Data File: abc.dat	Acquisition Status:	<div style="width: 100px; height: 10px; background-color: red; margin-bottom: 5px;"></div> 4%	GET DATA
------------------	---------------------------	----------------------------	---	-----------------

6.1.1.5 GET DATA

The GET DATA features allows user to download the Astronomical data on to user's machine. On clicking GET DATA the Astronomical data file is pushed to user's machine. The browser may or may not prompt the user on saving data based on the browser settings.



6.1.1.6 Execute Batch Section

EXECUTE BATCH:
Load Batch File : <input type="text" value="E:\batch4.txt"/> <input type="button" value="Browse..."/> <input type="button" value="START"/> <input type="button" value="STOP"/>
[batch4.txt] Batch script started successfully

Under this section user selects the batch file by clicking on the browse button. Initially the Start button is enabled and Stop button is disabled. When User selects the batch script and clicks on the Start button, the Batch execution is started. Once the batch script starts executing, Start button will get disabled and 'Stop' button will get enabled. During the execution of the batch script user can anytime click on the Stop button to stop the execution. If user skips validation section and directly starts execution, the batch will be first validated and if valid the execution will start.

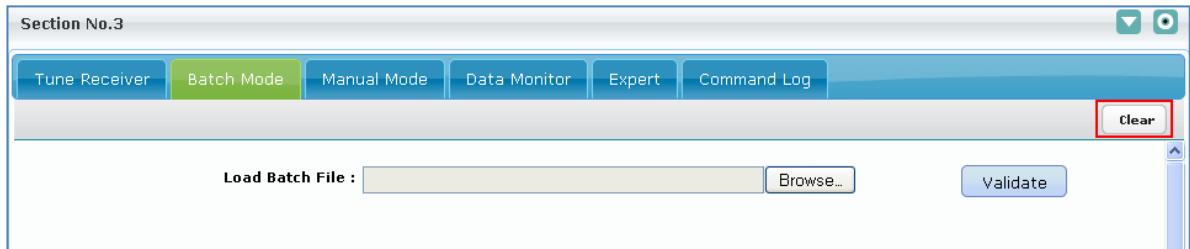
6.1.1.7 Execution Status

EXECUTION STATUS:		
10/15/2011 15:38:10	Info	issuing trackObject command
10/15/2011 15:38:10	Info	done with issuing trackObject command 3786
10/15/2011 15:38:10	Command	3786 : init issued

This section shows the status of the batch script which is currently executing. It shows all the info messages, the command execution success/failure messages etc. The messages are displayed in the top-down order i.e. the latest message will appear on the top.

6.1.1.8 Clear Button

On click of Clear button, the contents present in the ‘Load Batch File’ text box and ‘Execution Status’ section will get cleared.



7 Manual Mode

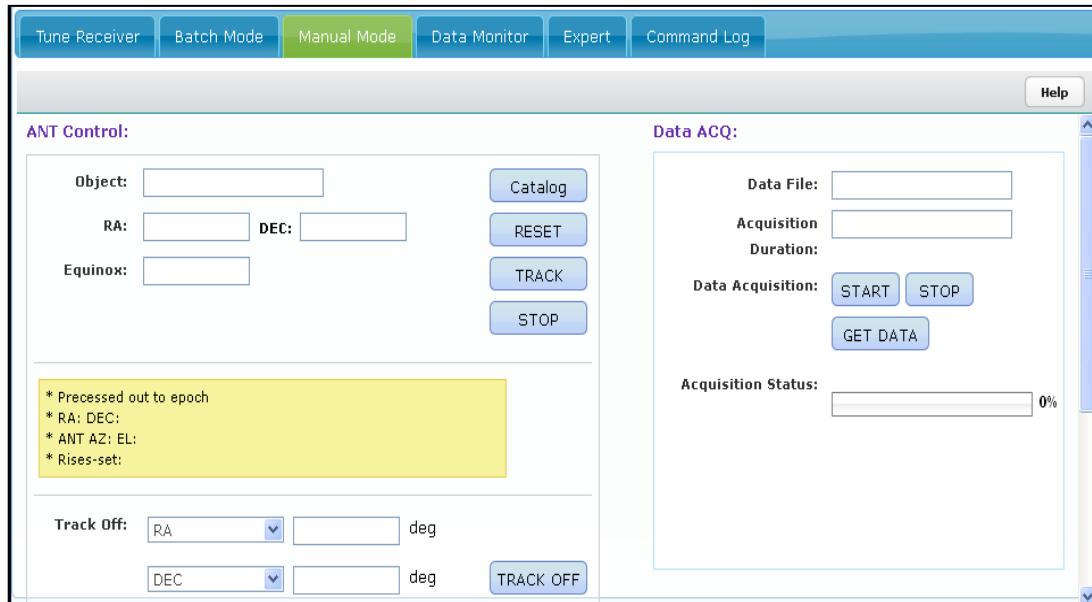
This section is used to execute most frequently used commands for servo and backend subsystem to track and manage various telescope operations.

7.1 Manual Mode Command Details

7.1.1.1 *TRACK*

Moves the telescope to a new source and track it. Internally “trackObject” command is used to track the source.

User can also populate the details of a particular object by entering the object name and pressing enter key, which will enable user to get details of entered source, if present, from the Catalog database maintained in CMS.



7.1.1.2 *RESET*

Resets all controls in manual mode tab to default values.

7.1.1.3 STOP

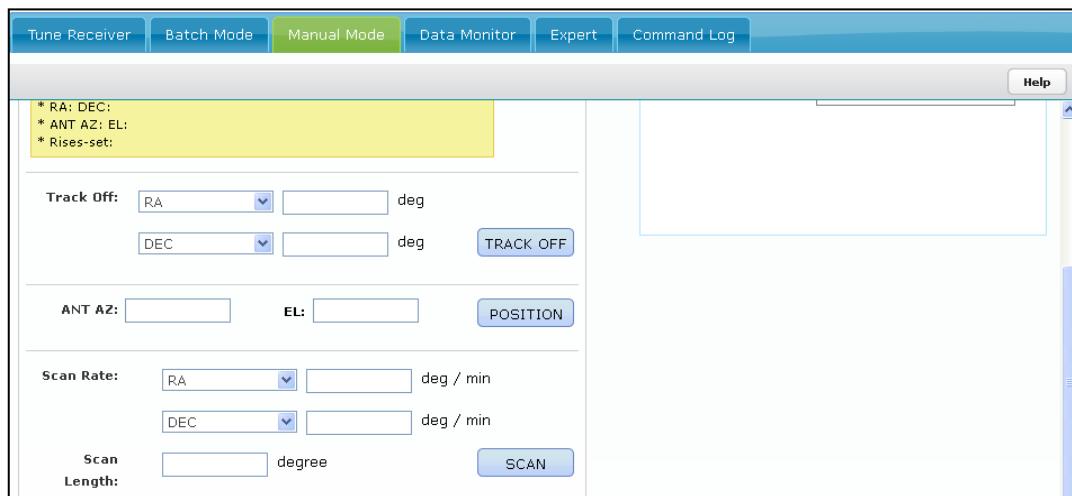
Stops the antenna tracking,positioning or scanning activity.

7.1.1.4 TRACK OFF

This control allows user to track the antenna on the source with customized offsets either in “RA/AZIMUTH” and “DEC/ELEVATION” using two menu driven buttons.

7.1.1.5 POSITION

Position command allows the user to position the antenna at desired azimuth and elevation by giving the antenna co-ordinates for both axes.



7.1.1.6 SCAN

Take a scan across the given source in “RA”, “DEC”, “AZIMUTH” or “ELEVATION” with specified rate in degree/min and total length of scan in degrees.

7.1.1.7 CATALOG

Click on this button allows user to view catalogs available in database specific to current user and SYSTEM. User can view all the details of the catalog by clicking on the hyperlink provided at source name. User can also sort the catalog based on Source Name, Right Ascension and Declination.

CMS USER MANUAL

Catalog

SOURCE CATALOG: STRONG CALIBRATORS

Source Name	Right Ascension ▲	Declination	Epoch
0000-177	00:00:48.60	-17:43:57.0	1950
0000-177	00:00:48.60	-17:43:57.0	1950
0106+130	01:06:13.80	+13:03:44.0	1950
0106+130	01:06:13.80	+13:03:44.0	1950
3C48	01:38:21.06	33:13:10.4	1950
3C48	01:38:21.06	33:13:10.4	1950
B0518+165	05:18:16.10	+16:35:27.5	1950
B0518+165	05:18:16.10	+16:35:27.5	1950
3C298	14:19:08.18	+06:28:34.8	2000
3C298	14:19:08.18	+06:28:34.8	2000

UTILITY TOOLS

RISE AND SET
TIME CONVERSION
LOAD
HELP

PRECESS TO
DOPSET
CANCEL

Catalog page provides following functionality:

7.1.1.8 RISE AND SET

Click on this button allows User to calculate IST and LST for Rise, Set and Transit time of the selected source. The selected source is displayed in blue color.

Catalog

SOURCE CATALOG: STRONG CALIBRATORS

Source Name	Right Ascension ▲	Declination	Epoch
0000-177	00:00:48.60	-17:43:57.0	1950
0000-177	00:00:48.60	-17:43:57.0	1950
0106+130	01:06:13.80	+13:03:44.0	1950
3C48	01:38:21.06	33:13:10.4	1950
3C48	01:38:21.06	33:13:10.4	1950
B0518+165	05:18:16.10	+16:35:27.5	1950
B0518+165	05:18:16.10	+16:35:27.5	1950
3C298	14:19:08.18	+06:28:34.8	2000
3C298	14:19:08.18	+06:28:34.8	2000

RiseSet ×

SOURCE: 0000-177 RA: 00:00:48.60 DEC: -17:43:57.0 1950

TIME	RISE	TRANSIT	SET
IST	18h57m00.472s (4.9611)	4.3946	14h37m20.701s (3.8281)
LST	21h45m46.724s(5.6975)	3.46	4h40m10.376s(1.2225)

UPTIME: -4h19m39.771s (-1.133)

UTILITY TOOLS

RISE AND SET
TIME CONVERSION

7.1.1.9 TIME CONVERSION

One can convert the given IST into GMT, Julian day and LST. GMT and Julian Day conversions are also available.

CMS USER MANUAL

Catalog

SOURCE CATALOG: STRONG CALIBRATORS

Source Name	Right Ascension ▲	Declination	Epoch
0000-177	00:00:48.60	-17:43:57.0	1950
0000-177	00:00:48.60	-17:43:57.0	1950

01
01 Time Converter x

From: IST Date and Local Time: 12/10/2011 14:43:06 APPLY

Time: 12 Oct 2011 at 14:43:06
 UT: 12 Oct 2011 at 09:13:06
 The Julian Day is : 55846.3841
 The Local Sidereal Time is : 15h29m28.883s (4.0556)

7.1.1.10 PRECESS TO

Precess To allows user to precess the selected source to the given epoch.

Catalog

SOURCE CATALOG: STRONG CALIBRATORS

Source Name	Right Ascension ▲	Declination	Epoch
0000-177	00:00:48.60	-17:43:57.0	1950
0000-177	00:00:48.60	-17:43:57.0	1950
0106+130	01:06:13.80	+13:03:44.0	1950

0106+
3C48
3C48
B0518
B0518
3C298
3C298
UTILIT
Precess To x

SOURCE: 0000-177 RA: 00:00:48.60 DEC: -17:43:57.0 (1950) Help

Enter Epoch Date to Precess: 12/10/2011 14:49:23 SUBMIT

SOURCE: 0000-177 RA: 0.0172 DEC: -0.3036 (2011.0)

7.1.1.11 DOPSET

Spectral Line observation requires some care for setting the observing frequency since due to Doppler tracking effect actual spectral-line frequency shifts to other value. Hence observing (sky) frequency of the telescope needs to be set to the changed value. Dopset button allows user to calculate and display this value.



CMS USER MANUAL

7.1.1.12 CANCEL

Click on this allows user to return to homepage.

7.1.1.13 LOAD

User can select a particular source and click on Load button. The selected source is loaded in ANT Control section of manual mode .Corresponding precessed RA , precessed DEC, precessed Epoch, Azimuth, Elevation, Rise, Set values are calculated and displayed in yellow box as shown below.

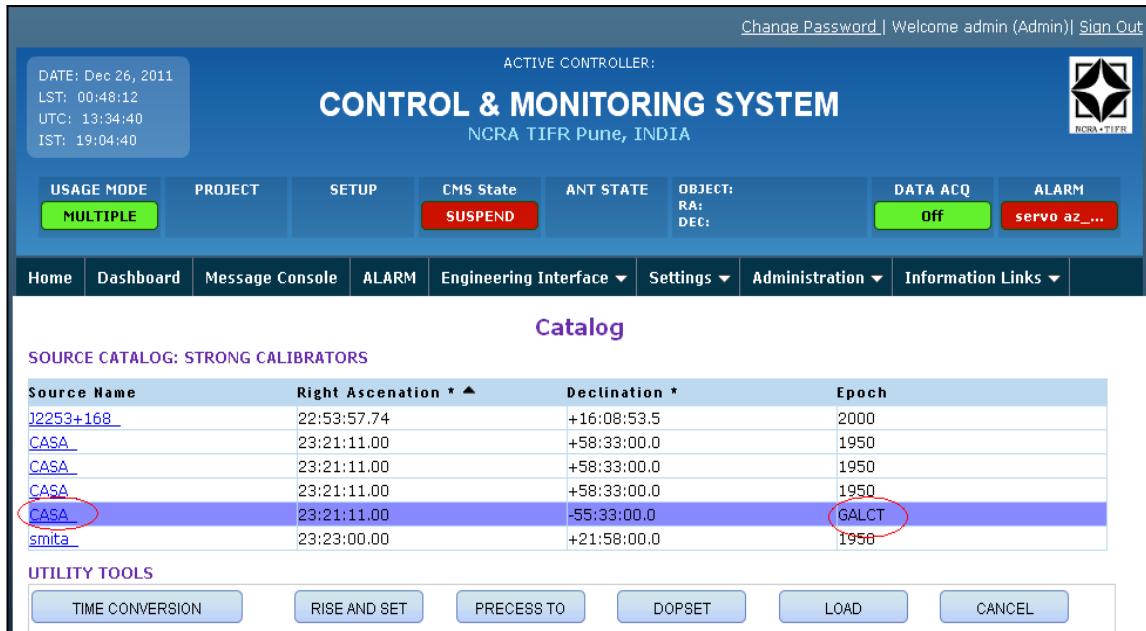
Tune Receiver	Batch Mode	Manual Mode	Data Monitor	Expert	Command Log	Help
ANT Control:						Data ACQ:
Object:	0106+130		Catalog			
RA:	01:06:13.80	DEC:	+13:03:44.0	RESET		
Equinox:	1950		TRACK			
			STOP			
<ul style="list-style-type: none"> * Precessed out to epoch 2011.0 * RA: 0.303 DEC: 0.2336 * ANT AZ: 1.2442 EL: -0.216 * Rises-set: 19h14m01.009s 14h54m57.701s 						0%
						Acquisition Status:
						Data File: <input type="text"/>
						Acquisition: <input type="text"/>
						Duration: <input type="text"/>
						Data Acquisition: <input type="button" value="START"/> <input type="button" value="STOP"/>
						<input type="button" value="GET DATA"/>

CMS USER MANUAL

7.1.1.14 Loading an object having epoch value as “GALCT”

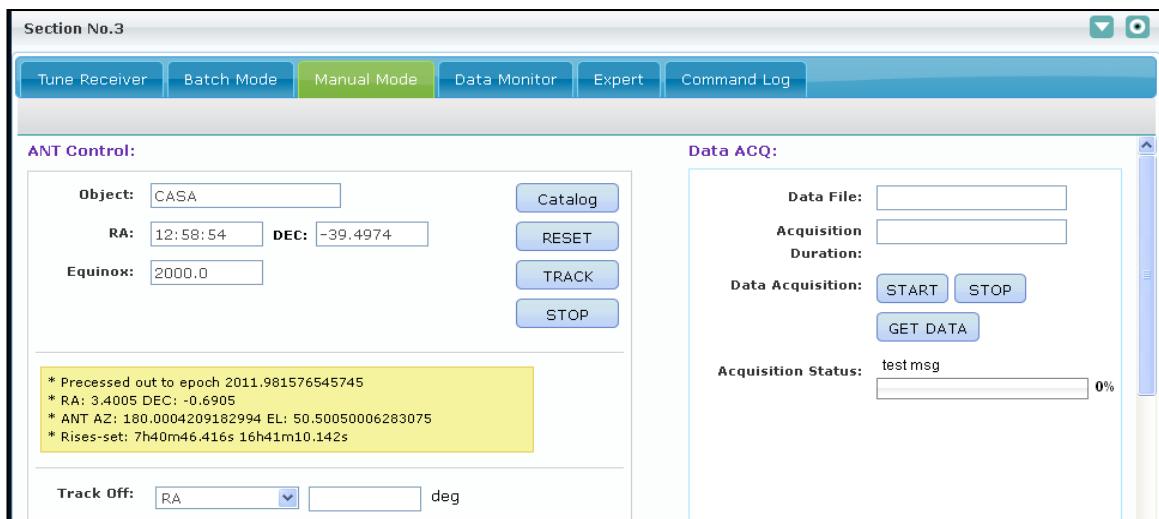
Whenever user tries to load an object having epoch value as “GALCT” the corresponding ra, dec contains Galactic latitude and longitude. Then from the given Galactic latitude, Galactic Longitude and epoch value ra, dec are calculated and loaded.

For Example: User tries to load an object named “CASA” having epoch value as “GALCT”.



The screenshot shows the CMS Control & Monitoring System interface. At the top, there is a header with the date (Dec 26, 2011), time (LST: 00:48:12), and other coordinates (UTC: 13:34:40, IST: 19:04:40). Below the header, the title "CONTROL & MONITORING SYSTEM" and subtitle "NCRA TIFR Pune, INDIA" are displayed. The main menu includes tabs for Home, Dashboard, Message Console, ALARM, Engineering Interface, Settings, Administration, and Information Links. The "Catalog" tab is selected, displaying a table titled "SOURCE CATALOG: STRONG CALIBRATORS". The table has columns for Source Name, Right Ascension, Declination, and Epoch. One row for "CASA" is highlighted with a red oval around its epoch value "GALCT". Other rows include "J2253+168", "CASA", "CASA", "CASA", and "smita". Below the catalog table, there is a section titled "UTILITY TOOLS" with buttons for TIME CONVERSION, RISE AND SET, PRECESS TO, DOPSET, LOAD, and CANCEL.

Here Right Ascension and Declination contains Galactic latitude and longitude, corresponding ra, dec will be calculated and loaded as shown below.



The screenshot shows the CMS Section No.3 interface. At the top, there is a navigation bar with tabs for Tune Receiver, Batch Mode, Manual Mode (which is selected), Data Monitor, Expert, and Command Log. Below the navigation bar, there are two main sections: "ANT Control" and "Data ACQ". The "ANT Control" section includes fields for Object (CASA), RA (12:58:54), DEC (-39.4974), Equinox (2000.0), and buttons for Catalog, RESET, TRACK, and STOP. A yellow box at the bottom of this section displays precessed epoch information: "Precessed out to epoch 2011.981576545745", "RA: 3.4005 DEC: -0.6905", "ANT AZ: 180.0004209182994 EL: 50.50050006283075", and "Rises-set: 7h40m46.416s 16h41m10.142s". The "Data ACQ" section includes fields for Data File, Acquisition Duration, and a button for GET DATA. It also displays the "Acquisition Status" as "test msg" with a progress bar at 0%.

Similarly rise, set, precess ra, precess dec, dopset calculation will also be affected whenever user selects an object having epoch as “GALCT”.

7.2 Data Acquisition Command Details

The Data ACQ section provides interface to execute commands which starts and stops data Acquisition. It also allows downloading the captured Astronomical data on user’s machine.



Data ACQ:

Data File: abc.dat

Acquisition: 10:0:0

Duration:

Data Acquisition: START STOP

GET DATA

Acquisition Status: 25%

7.2.1.1 START

Start button sends the command to wrapper which starts the actual data acquisition for given duration. User needs to specify the name of the data acquisition file where astronomical data will be captured on data server.

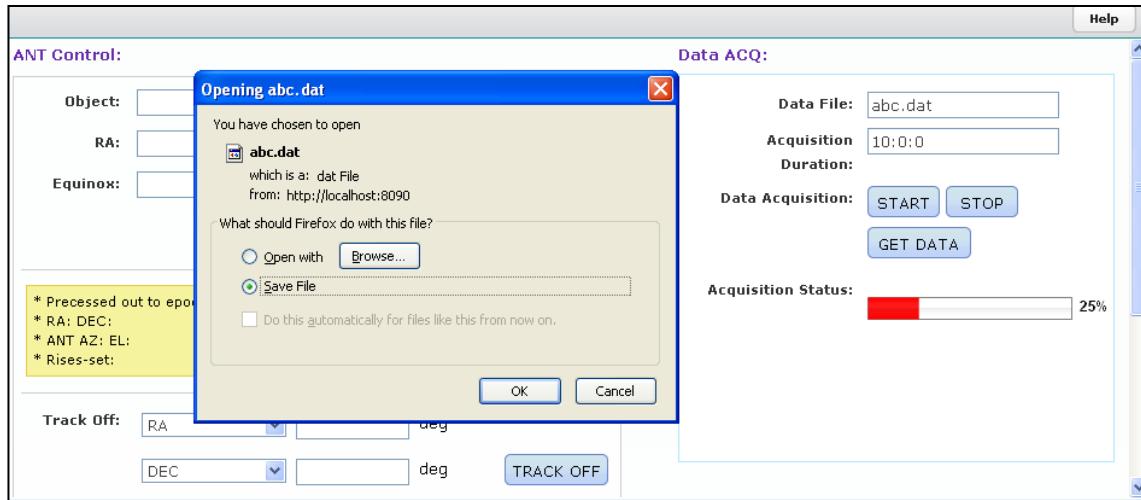
7.2.1.2 STOP

User can instruct the backend subsystem wrapper to stop the data acquisition using STOP button.

7.2.1.3 GET DATA

The GET DATA features allows user to download the Astronomical data on to user’s machine. On the click of GET DATA button the Astronomical data file is pushed to user’s machine. The browser may or may not prompt the user on saving data based on the browser settings.

CMS USER MANUAL

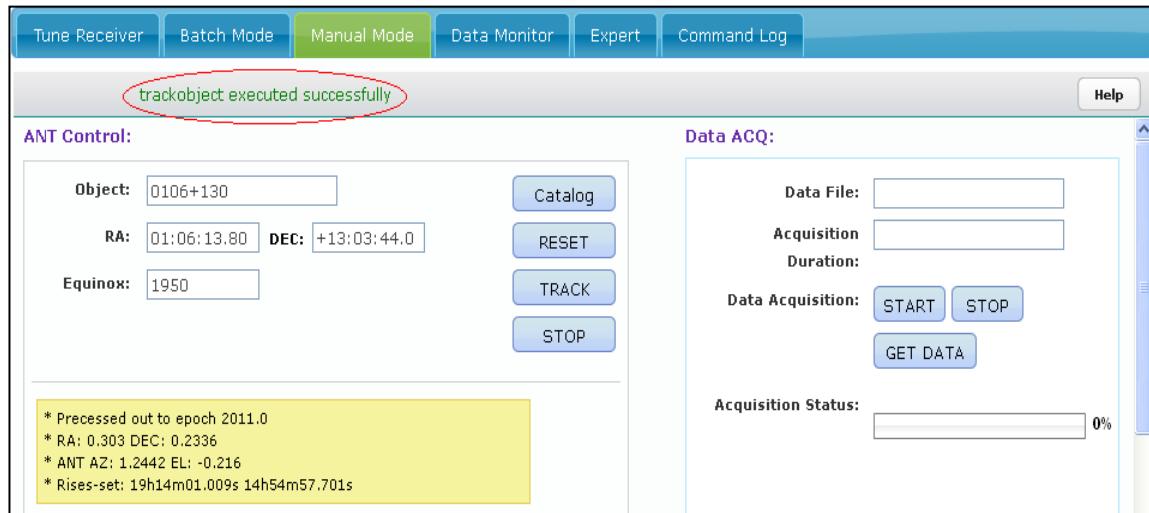


7.2.1.4 DATA ACQUISITION STATUS

This progress bar reflects the status of data acquisition as sent over by wrapper.

7.3 Command Execution Status

Once user executes any command in Manual mode, command execution status is displayed in status bar provided in manual mode. Command execution status is also displayed in message console.



8 Data Monitor Tab

This section is used to display chart recorder, spectral and pulsar line plots.

8.1 Data Monitor Tab Sections

This tab contains chart recorder plot, pulsar plot, and spectral plot data. Plot drop down option provides the user to select the plot.

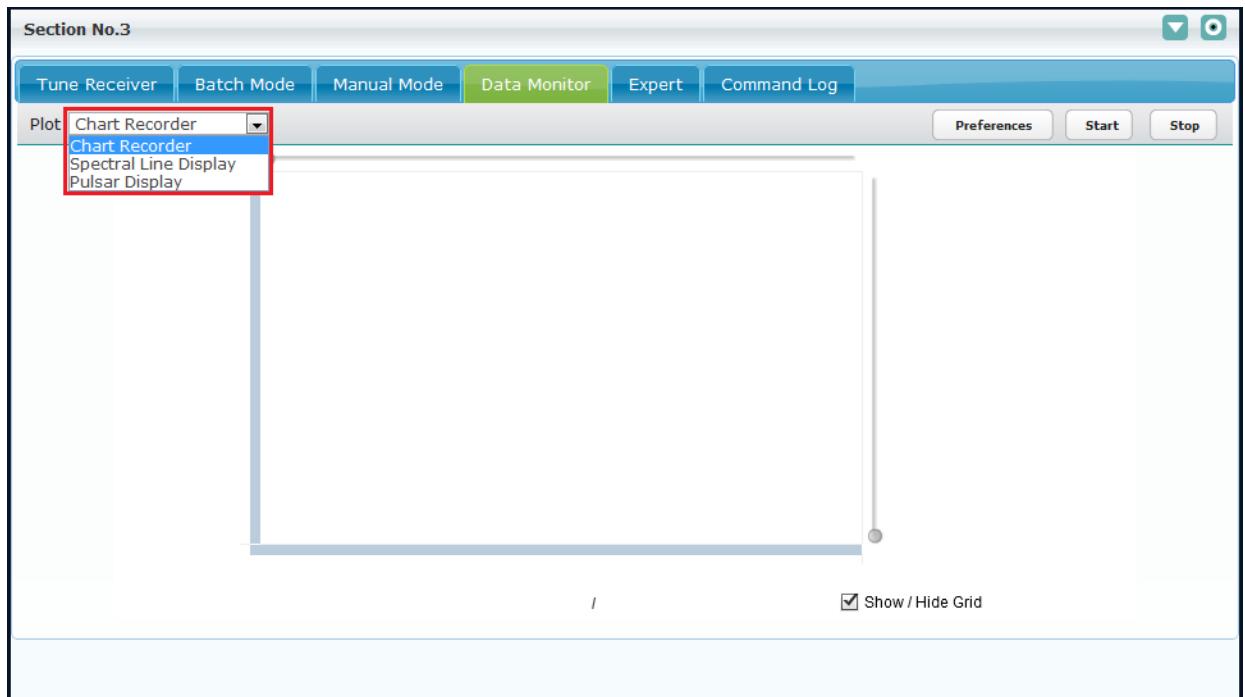
Preference – Preference button provides the preference page for the selected plot

Start – Starts plotting the data/rendering the image as per option selected in plot drop down control

Stop – Stops plotting the data/rendering the image as per option selected in plot drop down control

8.1.1 Chart Recorder

Chart recorder plots the monitoring parameters values, at any point of time maximum of 3 monitoring parameters can be plotted.



8.1.1.1 Chart Recorder Preference

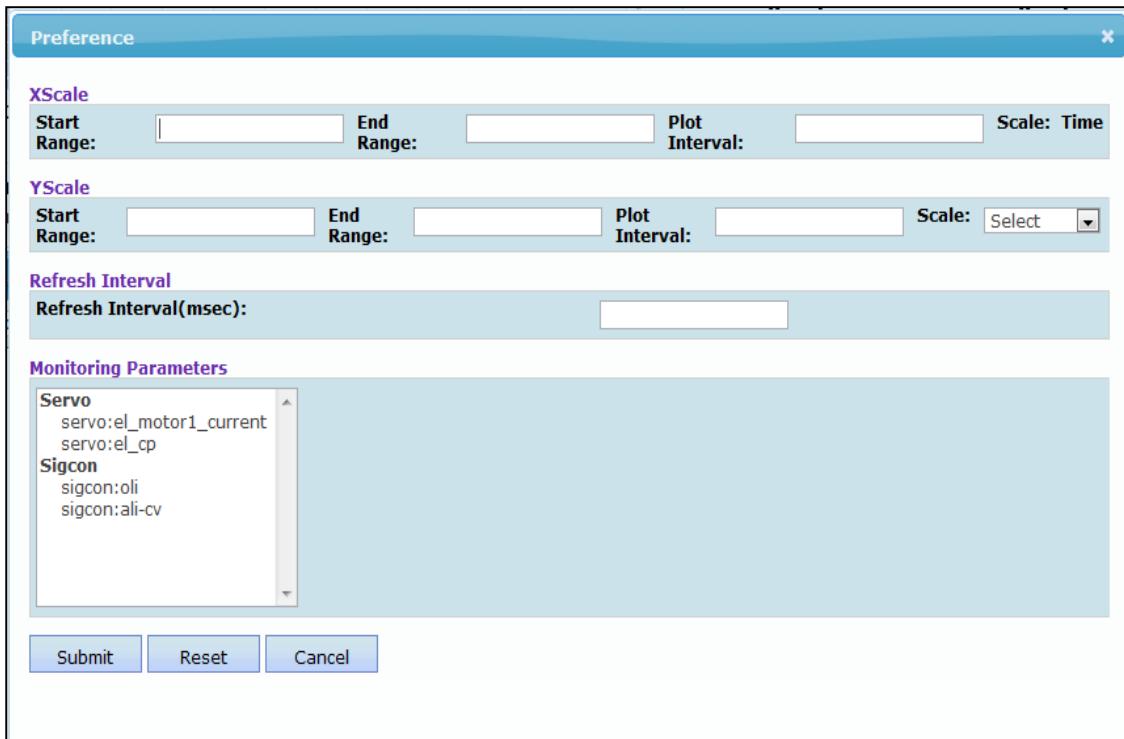
Chart recorder preferences UI is a dynamically generated UI, using ChartRecorder.xml and ChartRecorder.xsl.

User can dynamically add or delete parameters on UI by modifying ChartRecorder.xml

CMS USER MANUAL

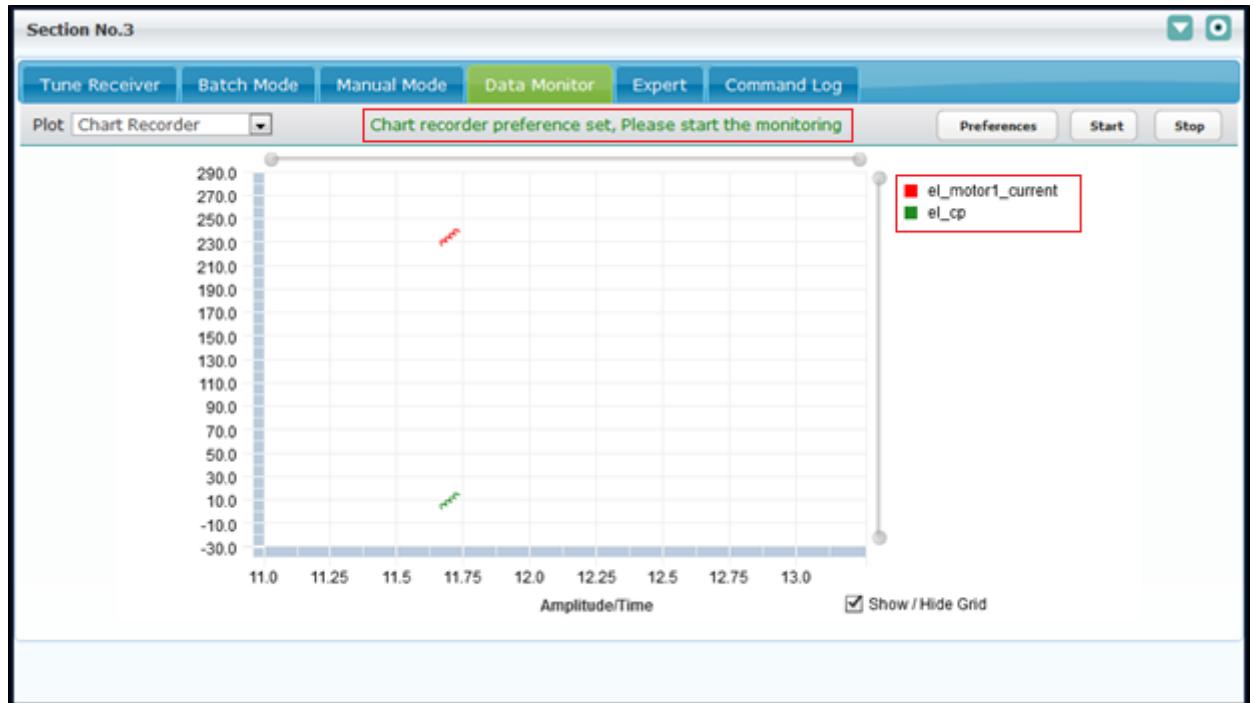
It allows user to set the chart recorder's x scale and y scale values.

- X scale is always time and it's start and end range value varies in between 0 to 24, and interval value divides the start and end range into intermediate parts
- Y scale may vary between Amplitude or Power; user can add more options for it, for example Voltage, Time etc.
- Refresh interval indicates after how many milliseconds the plot should get updated with latest data from wrapper via monitoring information
- Monitoring Parameters section allow user to select the monitoring parameters to plot, user can select maximum 3 parameters.
- Submit – Submitting the user preference values.
- Reset – Reset the user preference all values
- Cancel – Close the user preference.



After submitting the Preference, user can see status message "Chart recorder preference set, Please start the monitoring". And the user can view the selected monitoring parameter plotted (with current available value, however they are not updated until you click on start button). Also the legends are provided as below.

CMS USER MANUAL

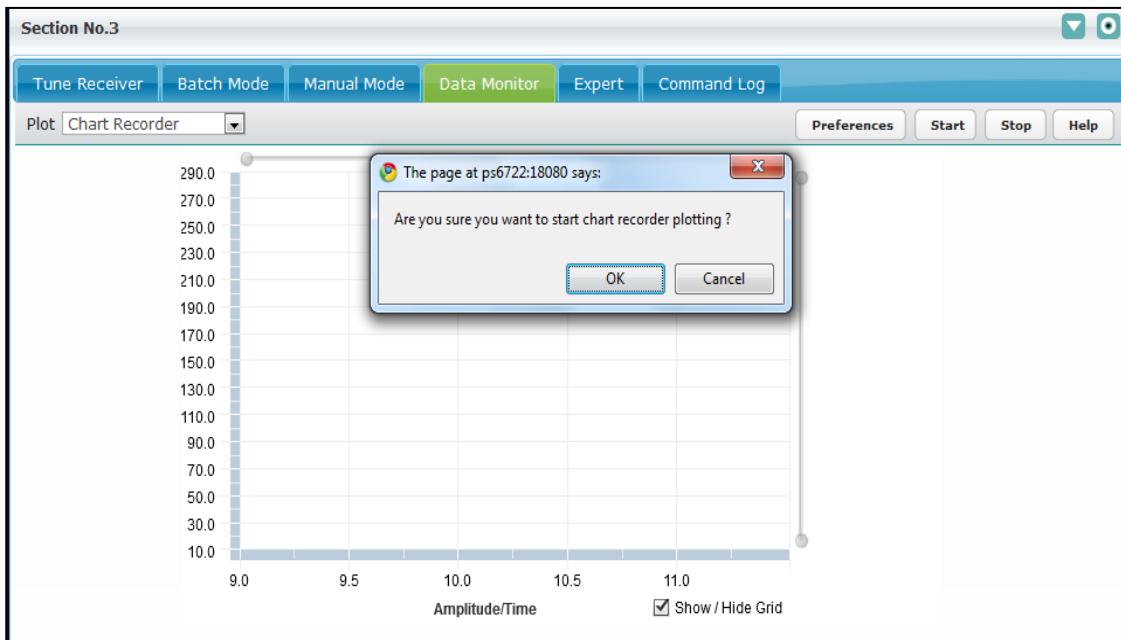


If monitoring is already started and user submits new preference then user will get below informative message and use does not require restarting the monitoring again.



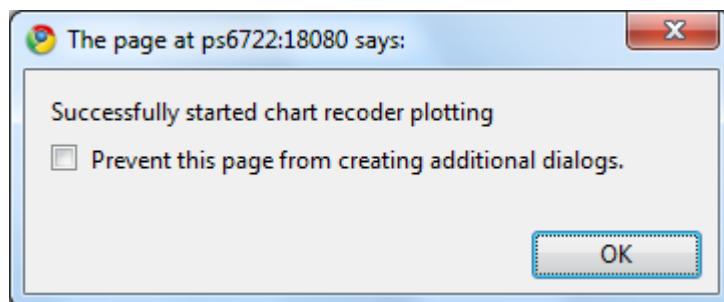
8.1.1.2 Chart Recorder Start

Start – Actually starts plotting monitoring parameters, a confirmation message is displayed before plotting parameters.



Click on “OK” user will get the below message depend on the selected x-scale “end range” of preference.

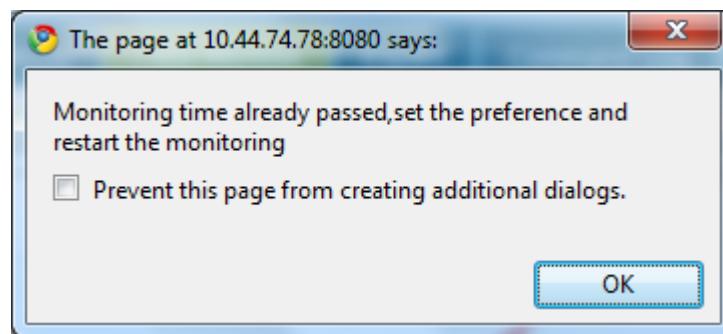
1. If x scale end range (is end time) do not pass away than user will get below success message.



User can see the monitoring plot as shown; here selected 2 monitoring parameter, if user selects the 3 parameters on preference then user can see 3 plots here.



2. If x scale end range (is end time) passed than user will get below informative message.



Press "OK" and user see the same informative message on chart recorder as below,

CMS USER MANUAL

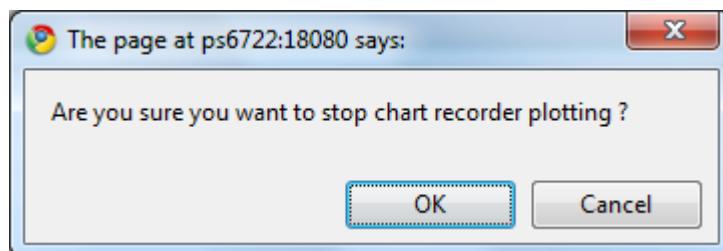


8.1.1.3 Chart Recorder Stop

8.1.1.3.1 Manual Stop

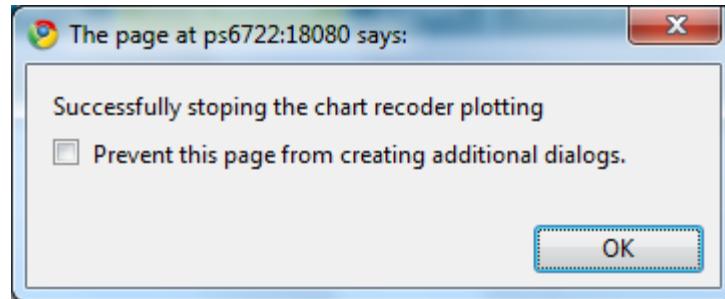
User manually stops the chart recorder plotting as below

Stop – Click on stop button will stop the plotting of the monitoring parameter.
Click on stop button, shows the confirmation message as shown below.



Click on “OK” will stop the plotting of monitoring parameters and user will get success as shown below.

CMS USER MANUAL



Press "OK" and user see the same informative message on chart recorder as below,



8.1.1.3.2 Auto Stop

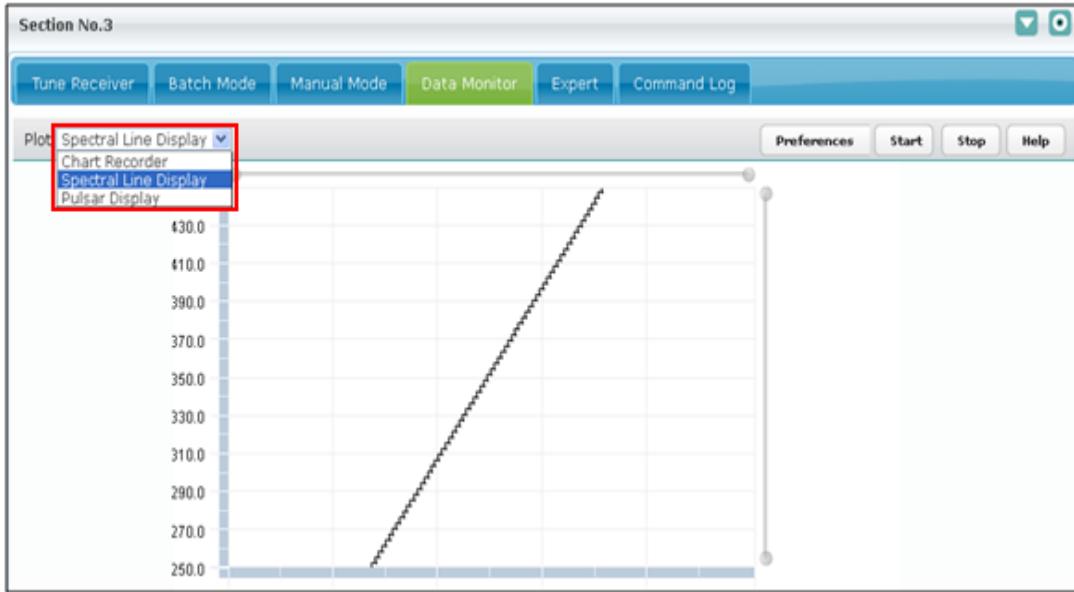
When the time specified in x-scale end time is crossed, CMS automatically stop the chart recorder plotting and user will get below status message.

CMS USER MANUAL



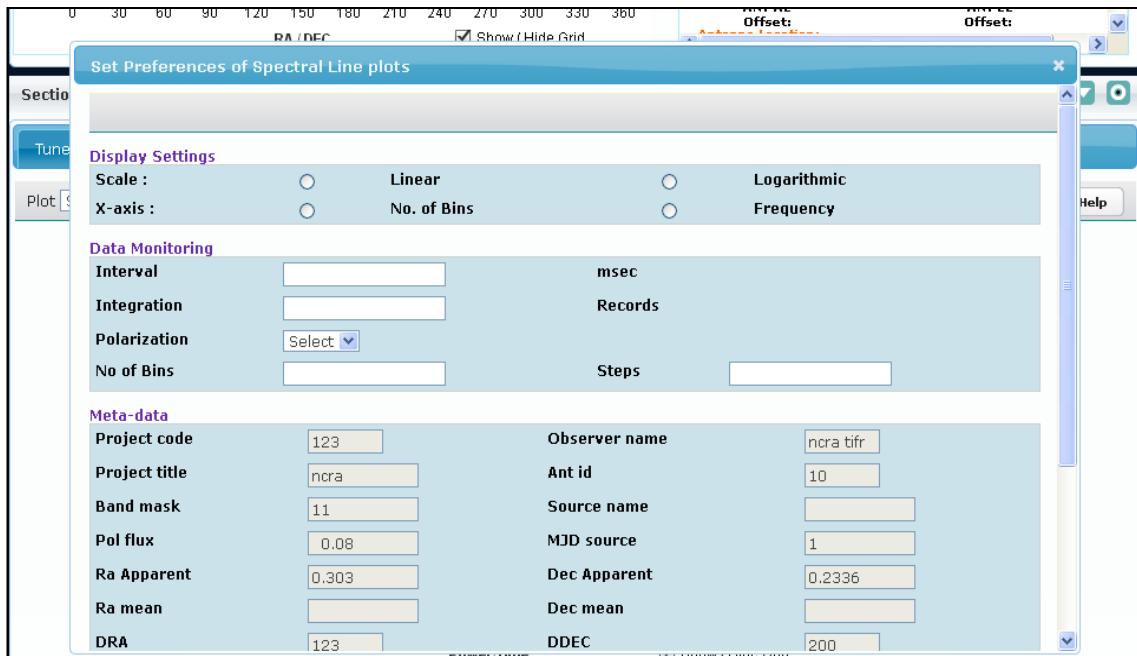
8.1.2 Spectral Line Display

Spectral Line display plot can be plotted by selecting the “Spectral Line Display” from the plot dropdown. It displays the discrete and accumulated spectrum.



8.1.2.1 Spectral Line Preference

Spectral Line display preferences UI is a dynamically generated UI, using SpectralLineDisplay.xml and SpectralLineDisplay.xsl. User can dynamically add or delete parameters on UI by modifying SpectralLineDisplay.xml. It allows user to set preferences of Spectral line dialog panel, where user can customize spectral line display along with Data monitoring parameters like update interval, integration, polarization and scale of X-axis. User cannot modify the meta-data section parameters. Meta data can be modified through tune-receiver (Digital back-end section) or expert tab (trackobject command). Manual mode tab also provides option to update the Meta data parameters such as data file, acq-duration etc.



8.1.2.1.1 Spectral Preferences submit

After providing the Display Settings and Data Monitoring Settings user can click on the ok button in order to submit the preferences. Internally “**sendspectralplottingdata**” command of backend subsystem is executed. Spectral line display plot is then rendered on screen from backend monitoring information.

CMS USER MANUAL

Set Preferences of Spectral Line plots

Polarization	Select <input type="button" value="▼"/>	Steps	<input type="button" value="▲"/>
No of Bins	<input type="text"/>		<input type="button" value="▲"/>
Meta-data			
Project code	<input type="text"/> 123	Observer name	<input type="text"/> nra
Project title	<input type="text"/> nra	Ant id	<input type="text"/> 10
Band mask	<input type="text"/> 11	Source name	<input type="text"/> CYGA
Pol flux	<input type="text"/> -	MJD source	<input type="text"/> 1
Ra Apparent	<input type="text"/> 0.0	Dec Apparent	<input type="text"/> 0.0
Ra mean	<input type="text"/> 19:57:45.00	Dec mean	<input type="text"/> +40:36:00.0
DRA	<input type="text"/> 123	DDEC	<input type="text"/> 200
Frequency	<input type="text"/> 0	First lo	<input type="text"/> 0
bb lo	<input type="text"/> 0	Rest freq	<input type="text"/> 0
LSR velocity	<input type="text"/> 0	Source id	<input type="text"/> 0
antenna_id	<input type="text"/> 10	calcode	<input type="text"/> G
Net sign	<input type="text"/> 0		

Command execution status is displayed to user in status window.

Set Preferences of Spectral Line plots

sendspectralplottingdata wrapper acknowledged

Display Settings	<input checked="" type="radio"/> Linear	<input type="radio"/> Logarithmic
X-axis :	<input checked="" type="radio"/> No. of Bins	<input type="radio"/> Frequency
Data Monitoring		
Interval	<input type="text"/> 100	msec
Integration	<input type="text"/> 100	Records
Polarization	<input type="button" value="both ▼"/>	
No of Bins	<input type="text"/> 20	Steps <input type="text"/> 10
Meta-data		
Project code	<input type="text"/> 123	Observer name <input type="text"/> nra.tifr
Project title	<input type="text"/> nra	Ant id <input type="text"/> 10
Band mask	<input type="text"/> 11	Source name <input type="text"/> B0518+165
Pol flux	<input type="text"/> 1.4	MJD source <input type="text"/> 1
Ra Apparent	<input type="text"/> 1.4041	Dec Apparent <input type="text"/> 0.2906
Ra mean	<input type="text"/> 05:18:16.10	Dec mean <input type="text"/> +16:35:27.5
DRA	<input type="text"/> 123	DDEC <input type="text"/> 200

8.1.2.1.2 Spectral Preferences reset

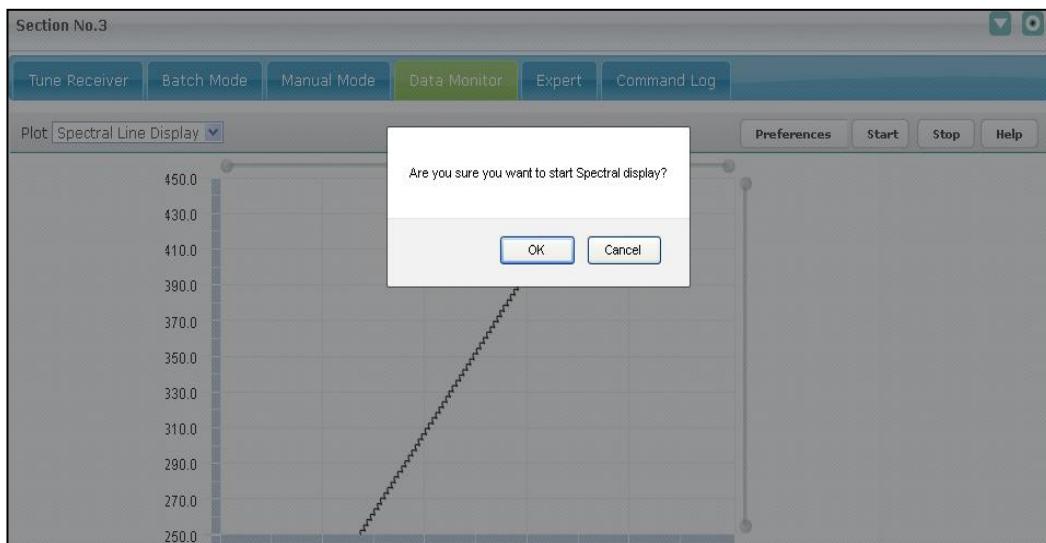
On clicking Reset button all the Spectral Line display preferences dialog are reset to default values.

8.1.2.1.3 Spectral Preferences cancel

The cancel button provides the user the option to cancel the preferences and return back.

8.1.2.2 *Spectral Line Start*

Actually starts plotting spectral line plot, a confirmation message is displayed before plotting parameters.



Click on “OK” invoke the “startspectralplottingdata” command, which actually sent to digital backed. Digital backend on receiving this command will send the image data in below format periodically and that image will be populated here.

Image data response format:

```
<responses><response><seq>1</seq><id>41</id><name>doMon</name><systemid>backend
</systemid><version>1.0</version><timestamp></timestamp><code>10</code><event>15</e
vent><message>wrapper ack</message><data><param><name>spectral</name><value>real
image data in base 64 encoded format </value></param></data></response></responses>
```

CMS USER MANUAL

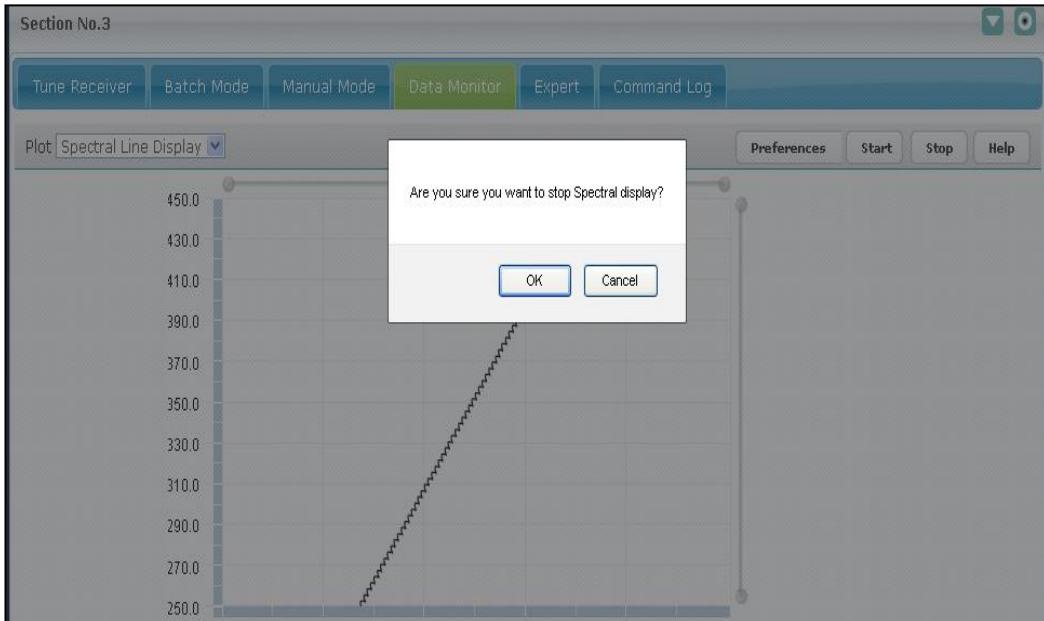
Currently .jpg and .png image are supported

Here, <name> contain value should be “spectral” and <value> contain base 64 encoded image data.

This response should be sent on event port which is mention in cms.properties

8.1.2.3 Spectral Line Stop

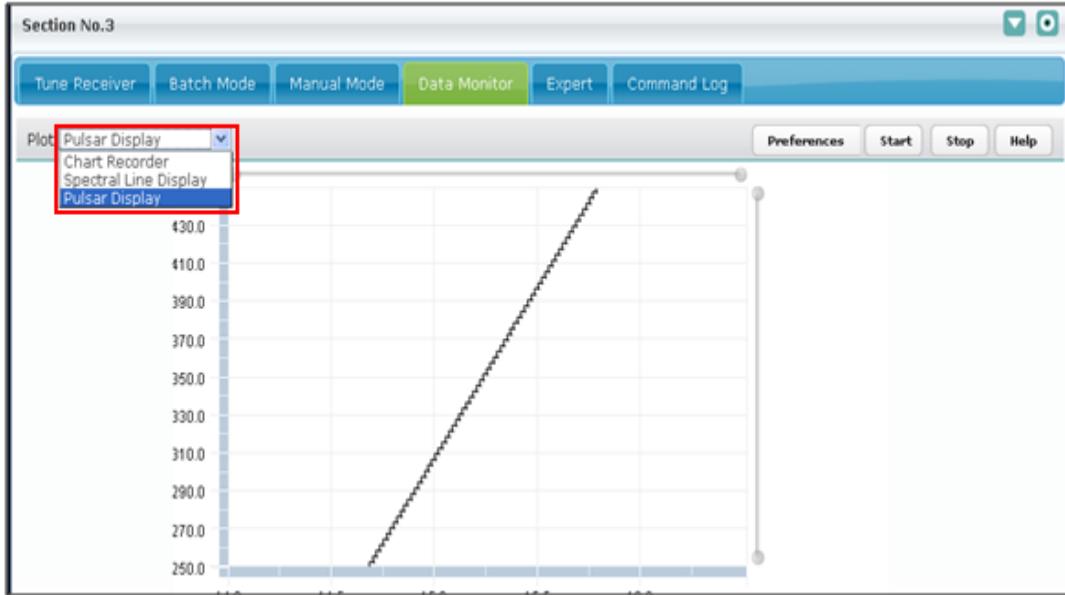
To stop plotting the spectral plot user can click on stop button.



Click on “OK” invoke the “stopspectralplottingdata” command, which actually sent to digital backed. Digital backend on receiving this command will not send any image data.

8.1.3 Pulsar Line Display

Pulsar Line display can be plotted by selecting the “Pulsar Line Display” from the plot dropdown. It displays the current profile of pulsar, folded/accumulated profile of pulsar and band shape spectrum in the form of image as sent over from wrapper. However this functionality would be implemented in upcoming releases.



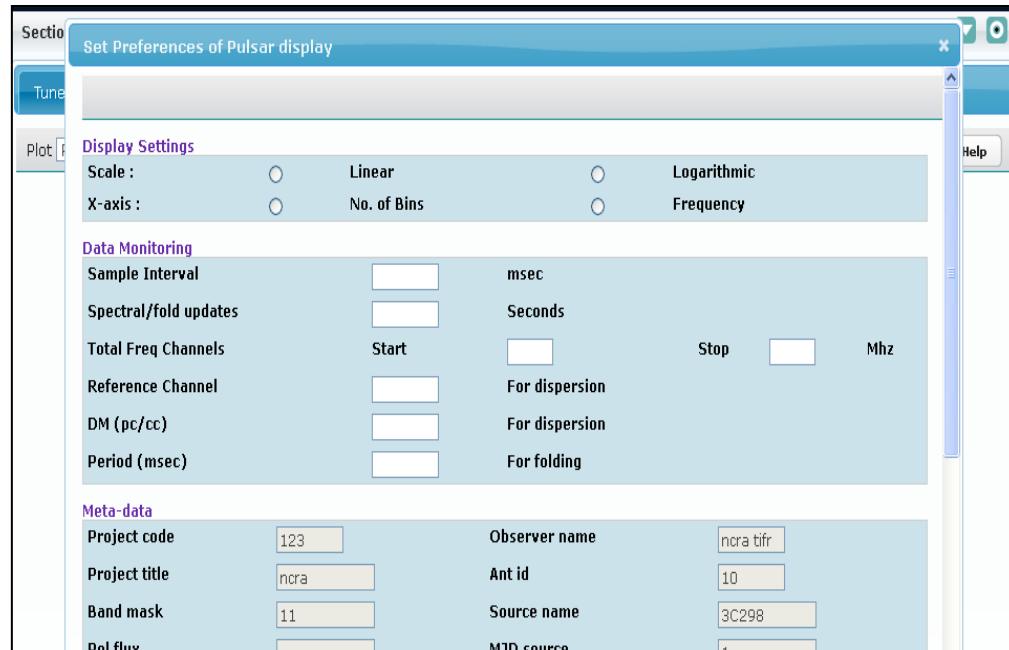
8.1.3.1 Pulsar Line Preferences

Pulsar display preferences UI is a dynamically generated, using PulsarDisplay.xml and PulsarDisplay.xsl. User can dynamically add or delete parameters on UI by modifying PulsarDisplay.xml.

It displays the current profile of pulsar, folded/accumulated profile of pulsar and band shape spectrum in the form of image as sent over from wrapper. However this functionality would be implemented in upcoming releases.

The pulsar visualization/monitoring specifically depend upon sampling interval, dispersion measure and period of pulsar at given frequency. These variables along with display settings can be done using the set preferences of pulsar display. User however cannot modify the meta-data section data .Meta data can be modified through tune-receiver, expert tab or manual mode tab.

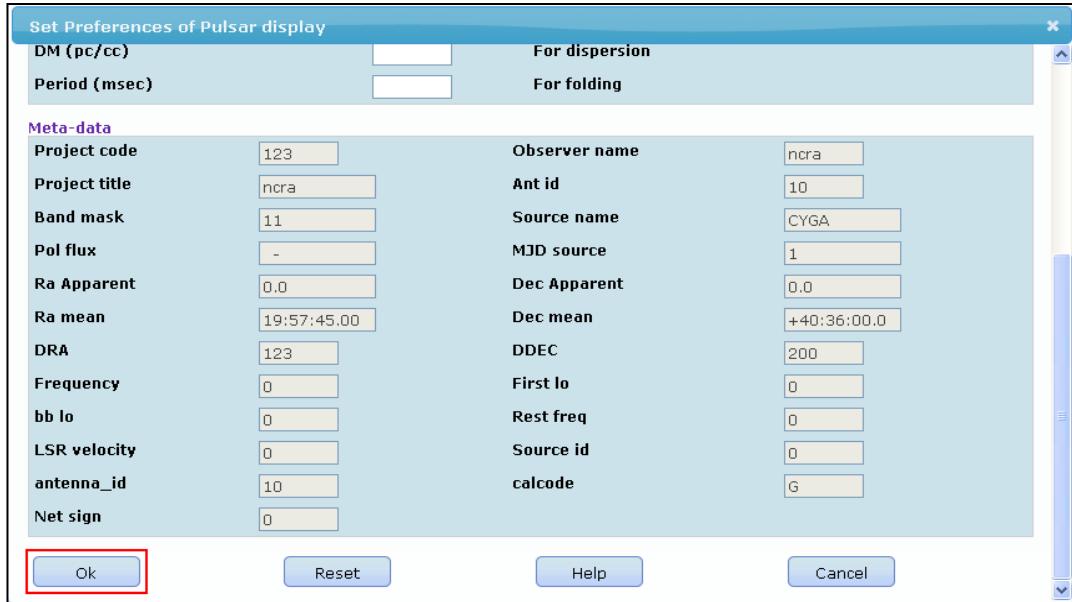
CMS USER MANUAL



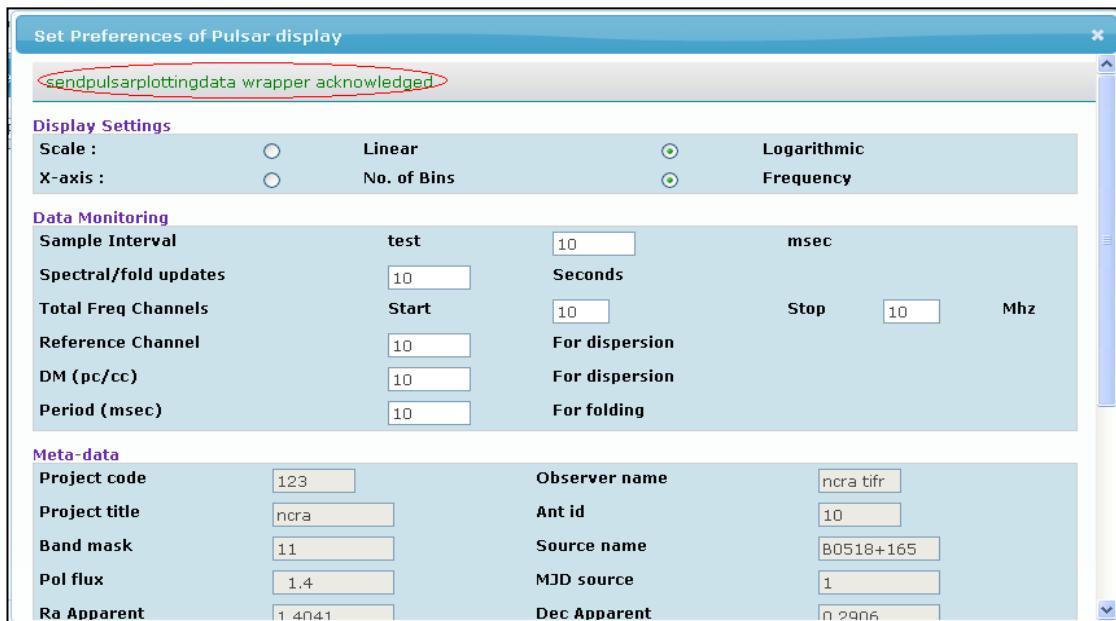
8.1.3.1.1 Pulsar Preferences submit

After providing the Display Settings and Data Monitoring Settings, user can click on the ok button in order to submit the preferences. Internally “**sendpulsarplottingdata**” command of backend subsystem is executed. Spectral line display plot is then rendered on UI in form of image as sent over by backend subsystem via wrapper.

CMS USER MANUAL



Command execution status is displayed to user in status window.



8.1.3.1.1 Pulsar Preferences reset

On clicking Reset button all the Pulsar Line display preferences dialog are reset to default values.

8.1.3.1.2 Pulsar Preferences cancel

The cancel button provides the user the option to cancel the preferences and return back.

8.1.3.2 *Pulsar Line Start*

Actually starts plotting Pulsar line plot, a confirmation message is displayed before plotting parameters.



Click on “OK” invoke the “startpulsarplottingdata” command, which actually sent to digital backed. Digital backend on receiving this command will send the image data in below format periodically and that image will be populated here.

Image data response format:

```
<responses><response><seq>1</seq><id>41</id><name>doMon</name><systemid>backend</systemid><version>1.0</version><timestamp></timestamp><code>10</code><event>15</event><message>wrapper ack</message><data><param><name>pulsar</name><value>real image data in base 64 encoded format </value></param></data></response></responses>
```

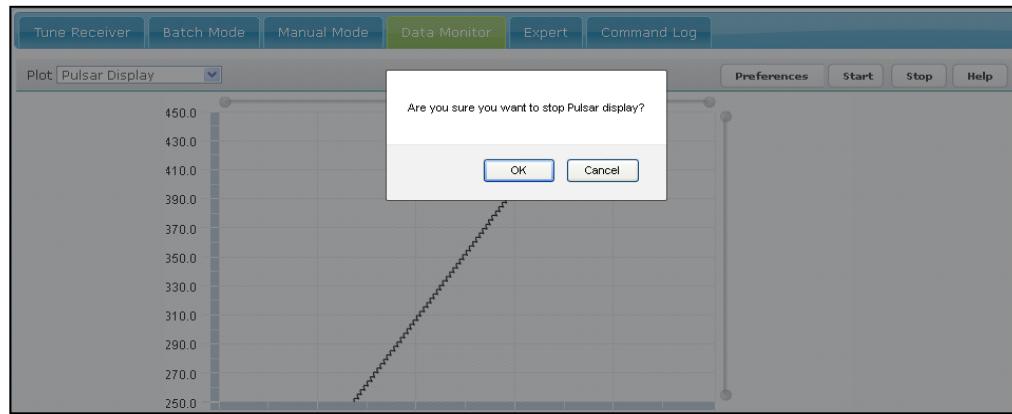
Currently .jpg and .png image are supported

Here, <name> contain value should be “pulsar” and <value> contain base 64 encoded image data.

This response should be sent on event port which is mention in cms.properties

8.1.3.3 Pulsar Line Stop

To stop receiving the pulsar plot user can click on the stop button.



Click on “OK” invoke the “stoppulsarplottingdata” command, which actually sent to digital backend. Digital backend on receiving this command will not send any image data

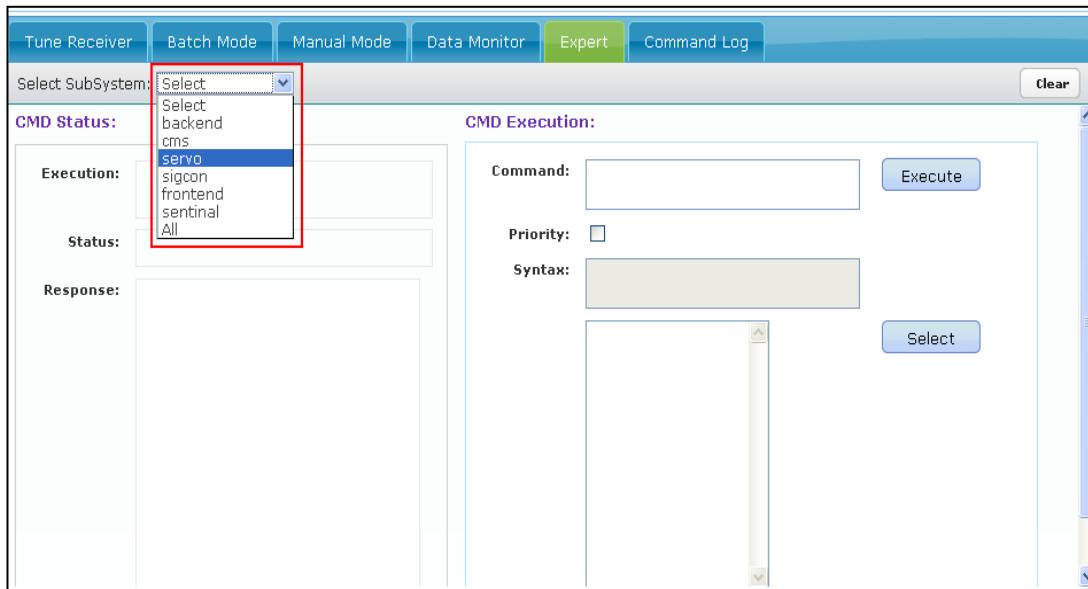
9 Expert Tab

This section is used to execute all the possible commands configured for a given subsystem. This is an expert level feature and permission for this should be chosen carefully.

9.1 Expert Tab Features

9.1.1 Select Subsystem Dropdown

This Dropdown will contain the list of all the subsystems whose entries are configured in ‘ncra-subsystemconfig.xml’ file. User can select a subsystem from the dropdown. The All option displays the commands of all configured subsystems in the commands list.



9.1.2 CMD Execution Section

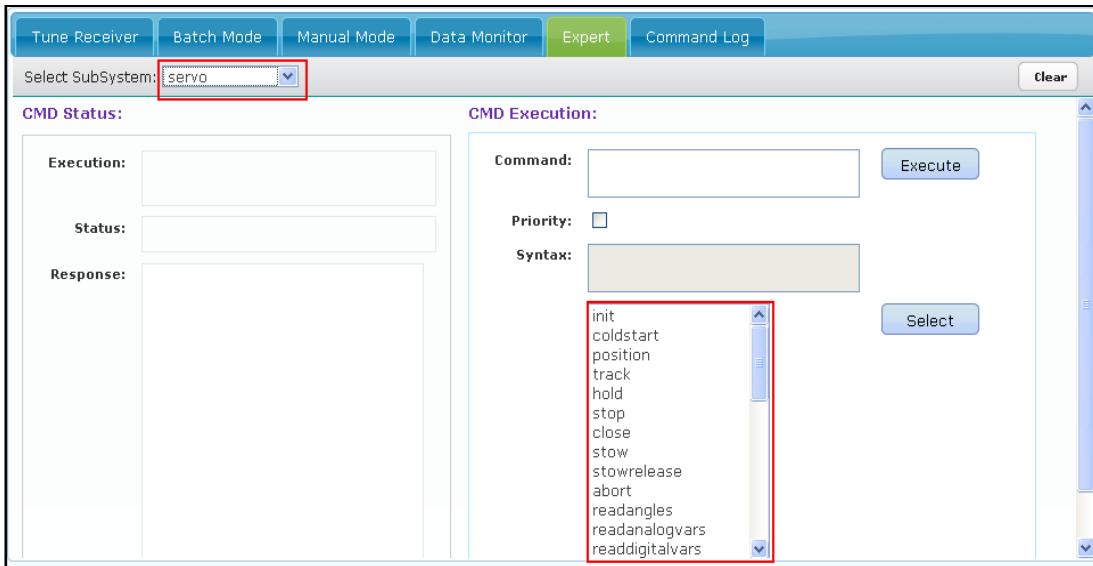
When user selects a subsystem from the ‘Select Subsystem Dropdown’, all the commands present in commands configuration file of that subsystem will appear in the last box of “CMD

Execution” section as shown in figure below. Here user has selected ‘servo’ subsystem in ‘Select Subsystem’ dropdown and all the commands of that subsystem will appear.



PERSISTENT

CMS USER MANUAL

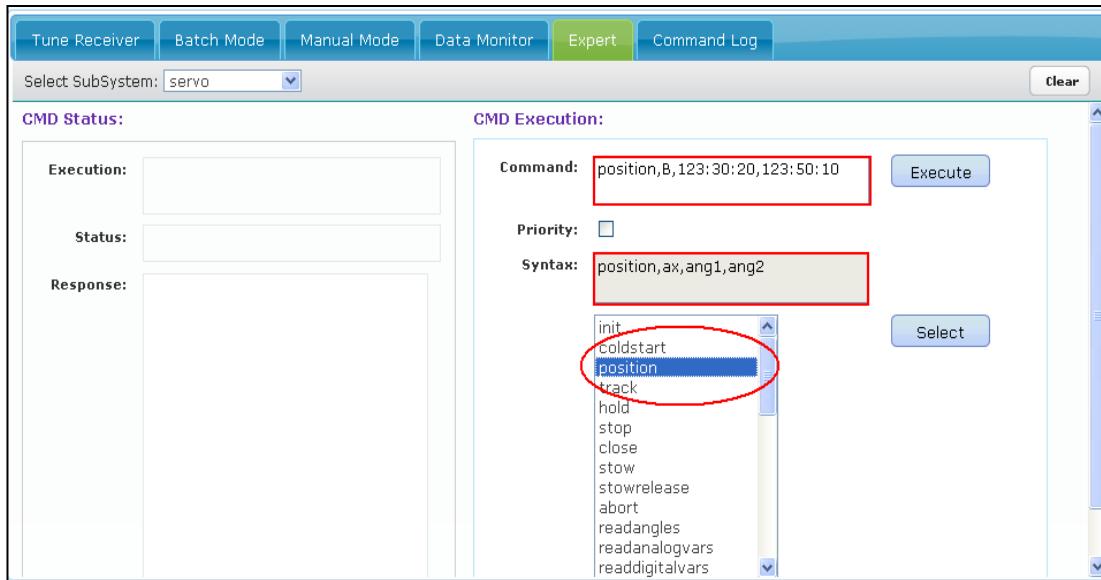


User can select the command to be executed in 3 ways.

1. Click on the command name and press 'Select' button.
2. By double click on the command name.
3. By selecting or typing the command and pressing enter key.

After selecting the command in first two ways, the command name with parameter names will appear in 'Syntax' box and command name with sample parameters will appear in 'Command' box as shown in the figure below. For the third option user needs to be aware of the command syntax before executing the command.

CMS USER MANUAL

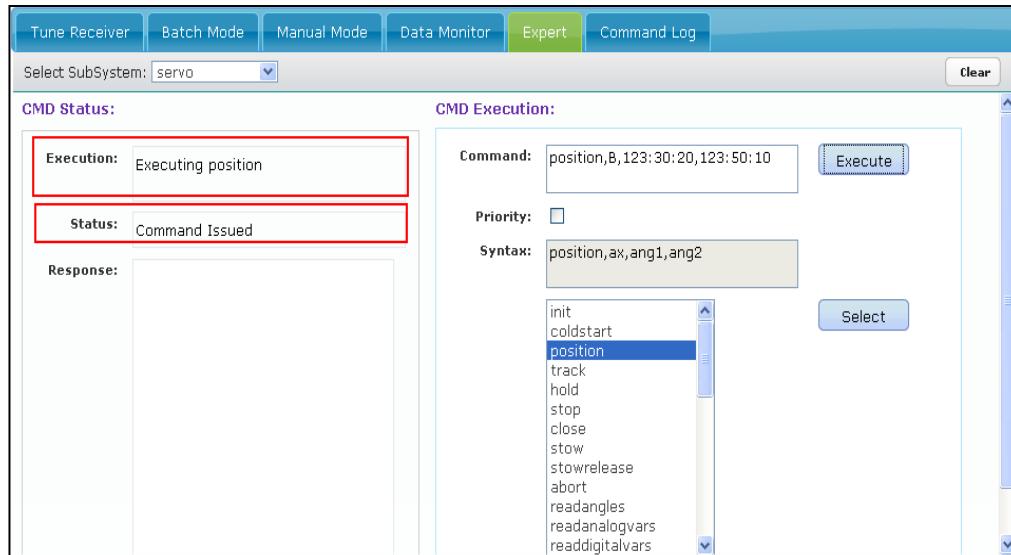


Priority checkbox is used to set the priority of the command. If it is checked the command will be sent with priority as 1 (i.e. High Priority) otherwise it will be sent with the priority as 0. When user clicks on ‘Execute’ button command execution will start.

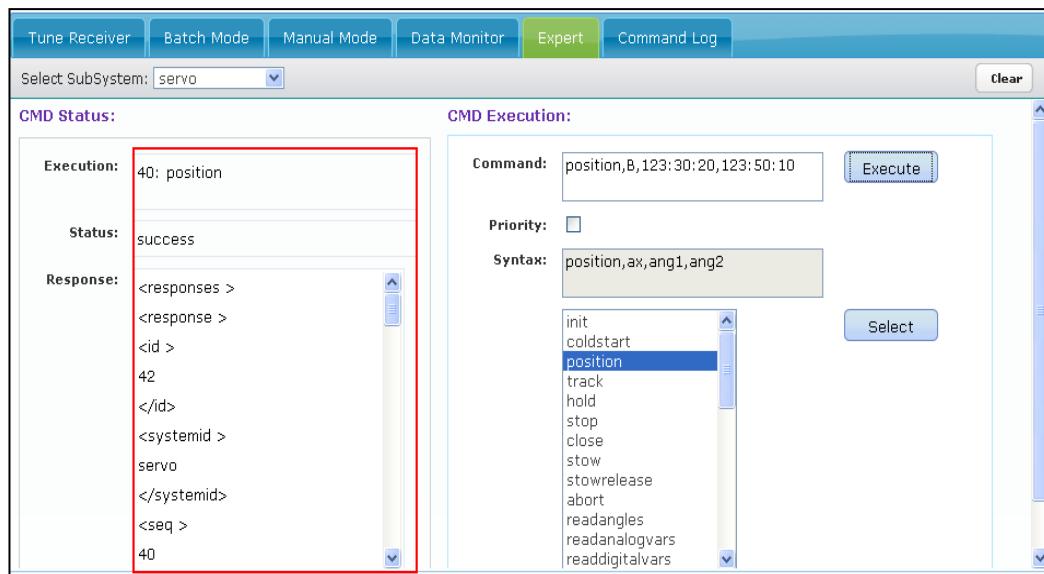
9.1.3 CMD Status Section

Once the command execution starts the ‘Execution’ box shows ‘Executing command name’. For example if position command is getting executed ‘Execution’ box will show ‘Executing position. Status box will show the status of the command. For example when the command is issued, the Status box will show ‘Command Issued’.

CMS USER MANUAL



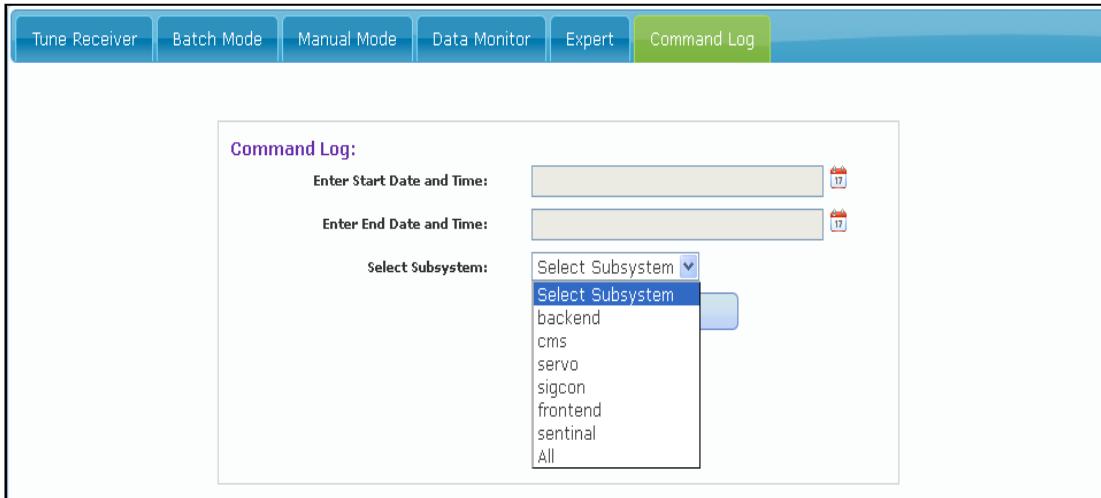
When the command executed successfully ‘Execution’ box will show the sequence number of the command and the command name. Status box will show ‘success’. The ‘Response’ box shows the response received from the Wrapper as shown in the figure.



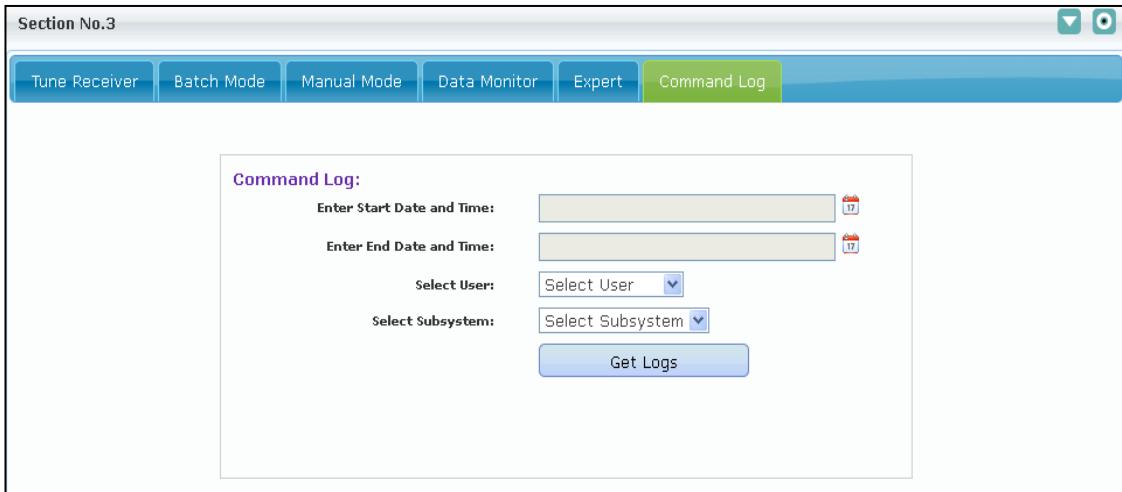
10 Command Log

10.1 Command Log Details

Commands executed by user are logged in database. For each Command, request sent and all responses received from wrapper are saved in database. User can specify start and end date time and can view logs of commands executed in that period of time. A logged in user, whose role is other than expert can view logs of only self-executed commands. User can view logs of particular subsystem or all subsystems, by selecting it from “Select Subsystem” dropdown.

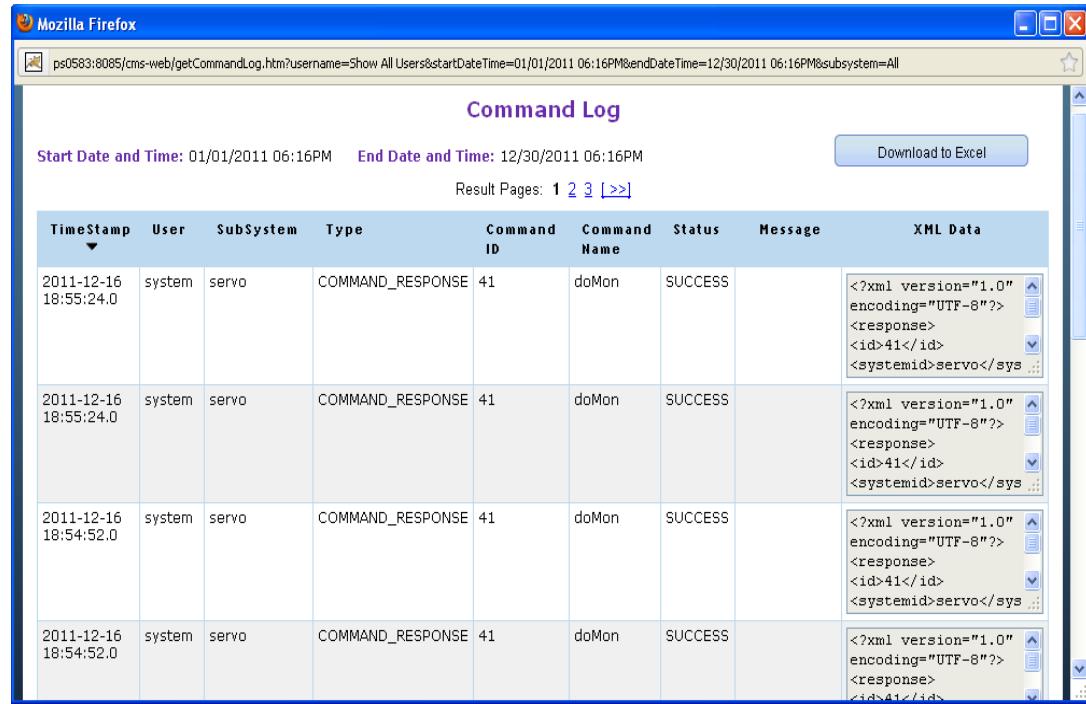


However an Expert has an option to select a particular user or all users along with subsystem to view logs.



CMS USER MANUAL

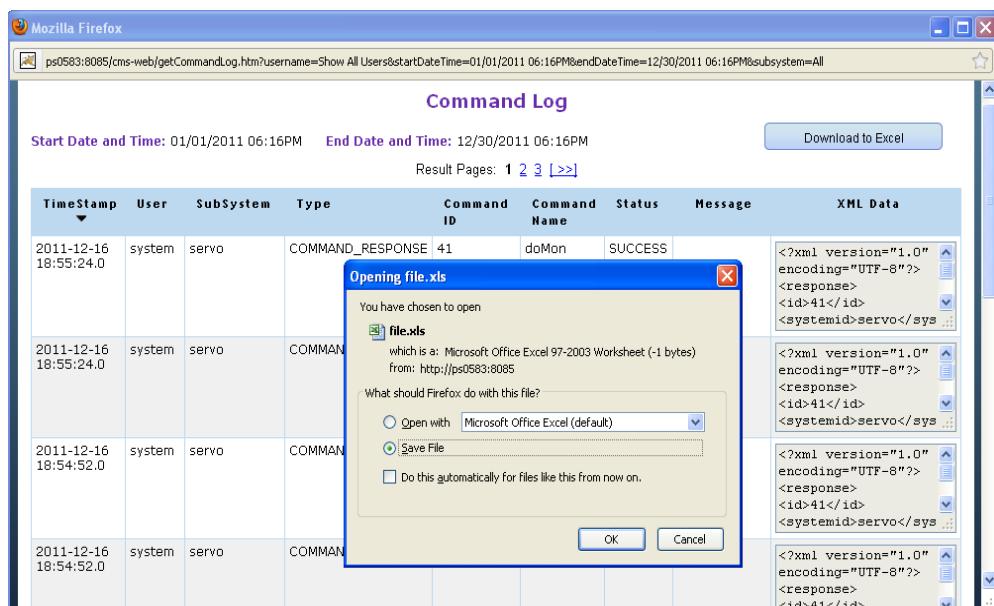
Once user specifies start and end date time, he can view logs present in database.



TimeStamp	User	SubSystem	Type	Command ID	Command Name	Status	Message	XML Data
2011-12-16 18:55:24.0	system	servo	COMMAND_RESPONSE	41	doMon	SUCCESS		<?xml version="1.0" encoding="UTF-8"?><response><id>41</id><systemid>servo</sys...
2011-12-16 18:55:24.0	system	servo	COMMAND_RESPONSE	41	doMon	SUCCESS		<?xml version="1.0" encoding="UTF-8"?><response><id>41</id><systemid>servo</sys...
2011-12-16 18:54:52.0	system	servo	COMMAND_RESPONSE	41	doMon	SUCCESS		<?xml version="1.0" encoding="UTF-8"?><response><id>41</id><systemid>servo</sys...
2011-12-16 18:54:52.0	system	servo	COMMAND_RESPONSE	41	doMon	SUCCESS		<?xml version="1.0" encoding="UTF-8"?><response><id>41</id>

10.1.1.1 Download to Excel

Enables user to download the logs to an excel sheet and save them.



The dialog box content:

You have chosen to open file.xls which is a: Microsoft Office Excel 97-2003 Worksheet (-1 bytes) from: http://ps0583:8085

What should Firefox do with this file?

Open with Microsoft Office Excel (default)

Save File

Do this automatically for files like this from now on.

11 Meta Data

This section displays the Meta data values

11.1 Meta Data Details

Meta Data tab displays the Meta data information configured in MetaData.xml
 Meta Data tab is by default visible to only “admin” and “expert” users.

CMS Controls

Tune Receiver	Batch Mode	Manual Mode	Data Monitor	Expert	Command Log	Meta Data
---------------	------------	-------------	--------------	--------	-------------	-----------

Meta Data:

Project code	123	Observer name	ncra
Project title	ncra	Ant id	10
Band mask	11	Source name	
Pol flux	I	MJD source	1
Ra Apparent		Dec Apparent	
Ra mean		Dec mean	
DRA	123	DDEC	200
Frequency	0	First lo	0
bb lo	0	Rest freq	0
LSR velocity	0	Source id	0
antenna_id	10	calcode	0
Net sign	0		

12 Engineering UI

This section allows an engineer to configure various engineering parameters related to the individual subsystems.

12.1 Engineering UI Sections

The Engineering UI is divided into 5 sections as specified below. For details of configuring these sections refer to **Engineering UI Configuration NCRA** document. The structure of the UI will vary as per the XML configuration.

12.1.1 Status Parameters:

The status parameter contains the parameters that indicate the status of the subsystem. The status parameters section and parameters will be visible in UI as displayed below:

Status	Angles	State
time of day: 14:30:30		subsystem state: Track
az current position:	11:10:20	
az_tp:	50:10:10	
az_pp:	1	
el_cp:	11:10:20	
el_tp:	-20:10:10	

12.1.2 Raw Parameters

The raw parameters section displays the raw data sent by a subsystem. This data is sent through monitoring parameter with name **rawstream**.

12.1.3 Monitoring Parameters:

The monitoring parameters section displays the values of the subsystem Monitoring parameters. The Monitoring parameters section will be visible in UI as displayed below:

CMS USER MANUAL

Monitoring Parameters

ABC	Analog vars	Angles	AZ Digital vars	EL Digital vars	
timeofday: 10:12:20	timeofday: 12:50:10 az_motor1_current: 35.12 az_motor2_current: 34.56 az_tacho1: 434 az_tacho2: 23 el_motor1_current: 34 el_motor2_current: 12.50	el_tacho1: 978 wind_volt1: 64 wind_volt2: 64	timeofday: 10:12:20 az_cp: 123:50:10 az_tp: 10:50:10 az_pp: 13:50:10 el_cp: 123:50:10 el_tp: 123:50:10 el_pp: 123:50:10	AMPOL: 0 ENCKOK: 0 STPOS: 0 STWD: 0 STRLSD: 0 BRK1: 0 BRK2: 0	ENCKO: 0 RUN: 0 CCPL: 0 CCFL: 0 CWPL: 0 CWFL: 0 BRK1: 0 BRK2: 0

All status and monitoring parameter values are updated when CMS receives monitoring parameters response from wrapper.

12.1.4 Basic Commands:

The basic commands sections displays the buttons for executing basic commands
The basic commands section will be visible in UI as displayed below:

Basic Commands

init	coldstart	position	track	trackObject	hold	stop
close	set_time_of_day	setstowangles				

If any command is not configured in subsystemname_commands.xml and if it is executed from this section; the user will get an error message “command not found”.

Basic Commands

System shutdown	init	coldstart	position	track	trackObject	hold
stop	close					

Command Execution

Error occurred in Execute Command. Reason :System shutdown : servo [System shutdown] command notfound

OK

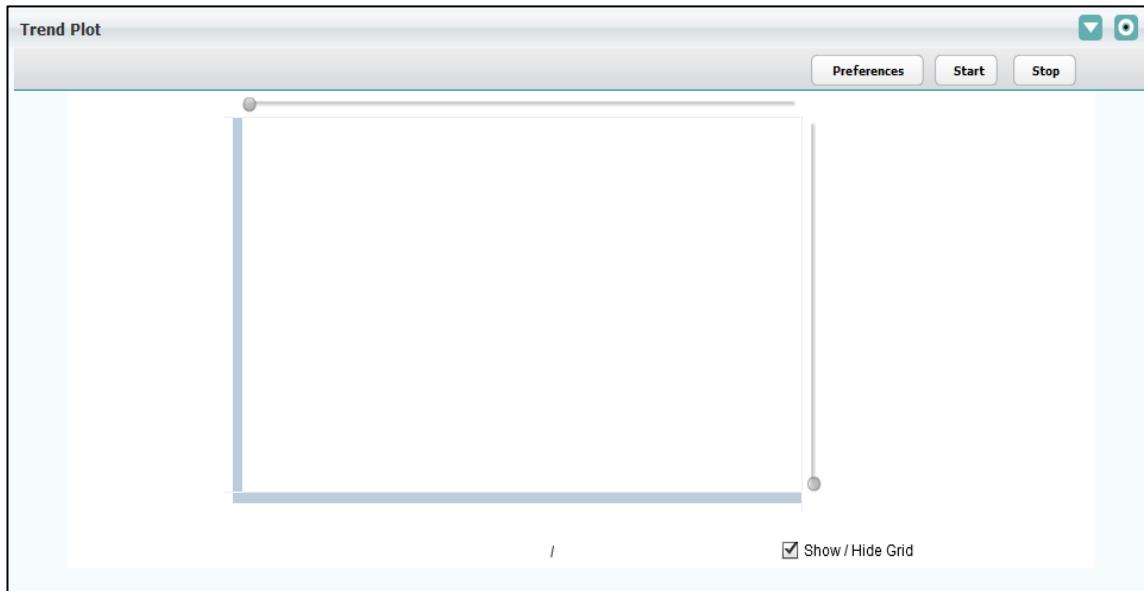
12.1.5 Detailed Commands:

The detailed commands section includes the commands which are sparingly used. The look and feel of the added command will be similar to the basic command.



12.1.6 Trend Plot:

Trend plot plots the one monitoring parameter vs. another monitoring parameter and it is sub system based, means each sub system has its own trend plot to plot monitoring parameters, and their respective configuration files name as <subSystemName>TrendPlot.xml
For example: servo sub system configuration file name as servoTrendPlot.xml



12.1.6.1 Trend Plot Preference

Trend plot preferences UI is a dynamically generated UI, using servoTrendPlot.xml and ChartRecorder.xsl

User can dynamically add or delete parameters on UI by modifying servoTrendPlot.xml

It allows user to set the chart recorder's x scale and y scale values.

CMS USER MANUAL

Preference

XScale

XScale: **Plot Interval:**

YScale

YScale: **Plot Interval:**

Time Range

Time From: **Time To:**

Refresh Interval

Refresh Interval(msec):

Submit **Reset** **Cancel**

- X scale is a monitoring parameter, when user selects any monitoring parameter, its min and max value automatically populated, if it is configured in configuration file (Please refer to Developer Guide for configuration details).
 - If any of the parameter min and max value not configured in configuration file then user needs to manually enter these values and will get below informative message on preference page.

Preference

No min and max value configured for Y Scale parameter 'az_motor1_temp' in servo_engineering.xml

XScale

XScale: **Plot Interval:**

YScale

YScale: **Plot Interval:**

Time Range

Time From: **Time To:**

Refresh Interval

Refresh Interval(msec):

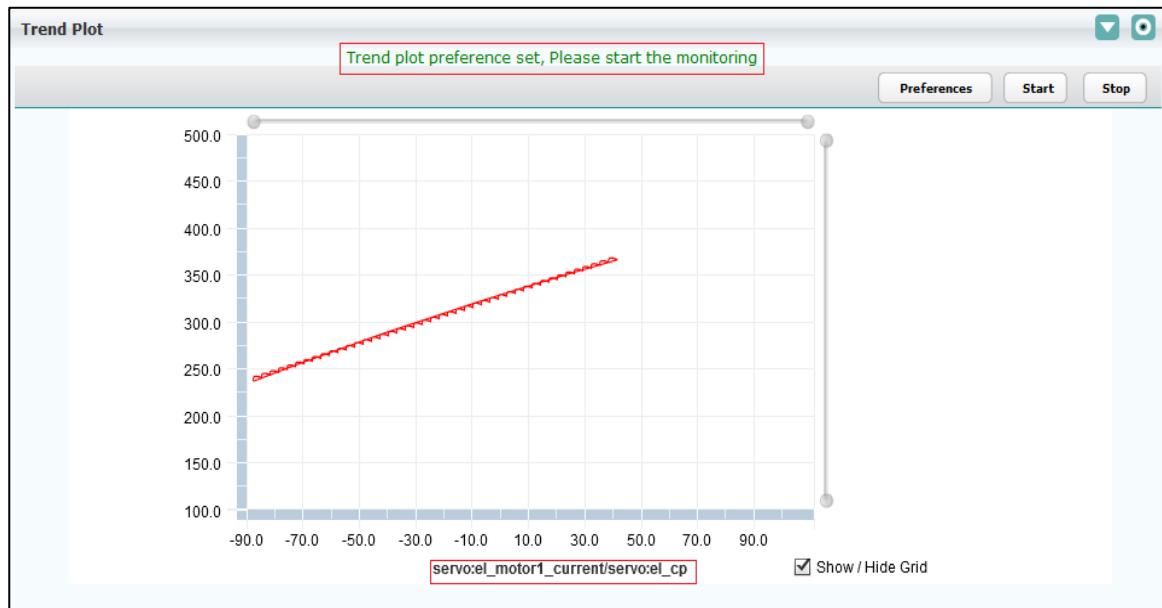
Submit **Reset** **Cancel**

- Interval value divides the min and max into intermediate parts.
- Y scale is same as X scale.
- Time Range is used to see the plot for time period.
- Refresh interval indicates after how many milliseconds the plot should get updated with latest data from wrapper via monitoring information

CMS USER MANUAL

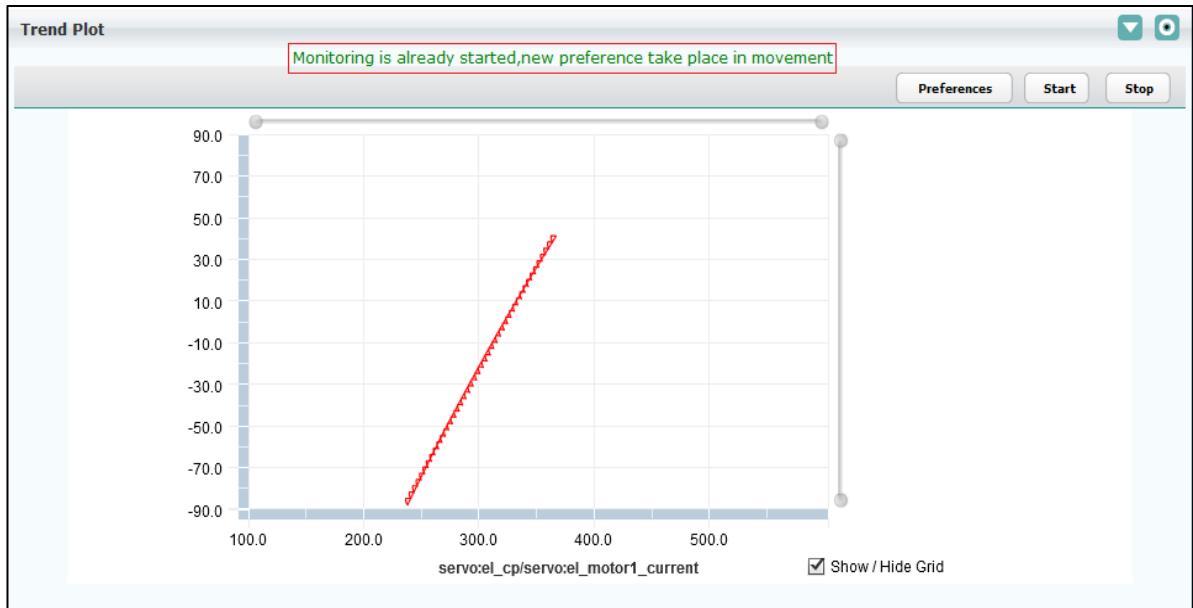
- Submit – Submitting the user preference values.
- Reset – Reset the user preference all values
- Cancel – Close the user preference.

After submitting the Preference, user can see status message “Trend plot preference set, please start the monitoring” and selected monitoring parameter plotted (with current available value, however they are not updated until you click on start button) as below.



If monitoring is already started and user submits new preference then user will get below informative message and user need not start the monitoring again.

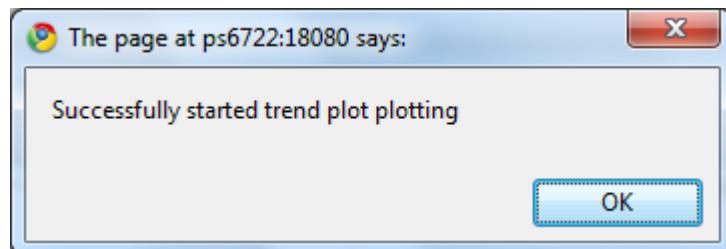
CMS USER MANUAL

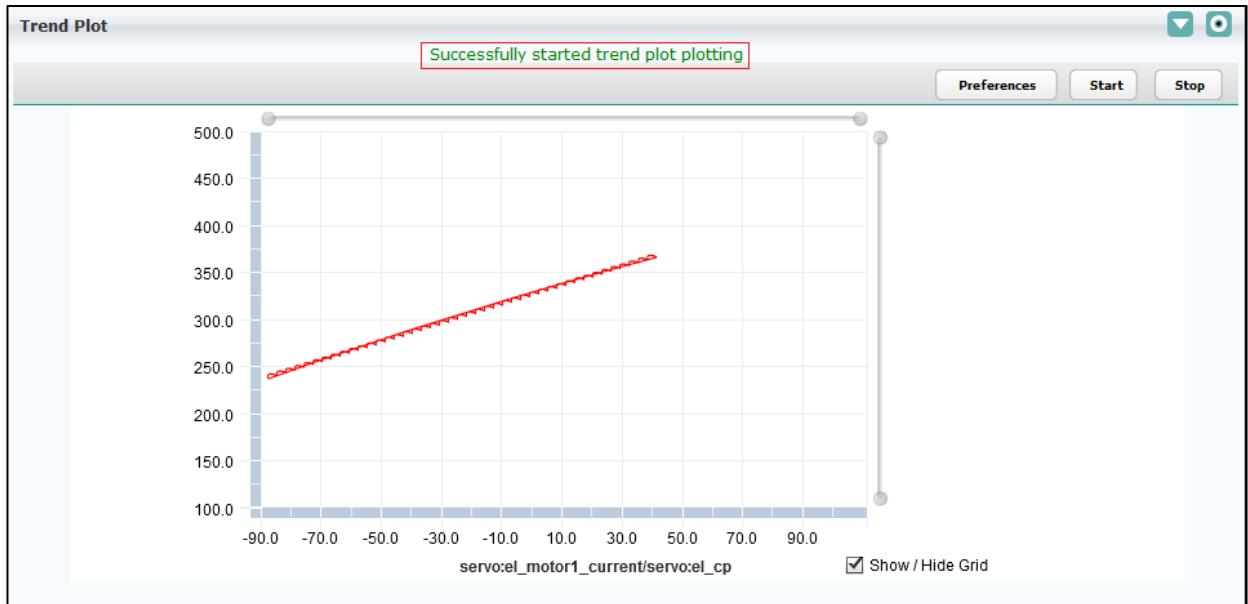


12.1.6.2 Trend Plot Start

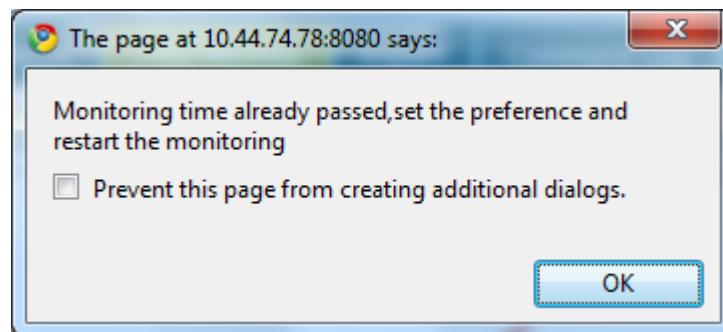
Start – Actually starts plotting monitoring parameters, Click on Start button and user will get the message depend on selected value of “Time To” in preference page.

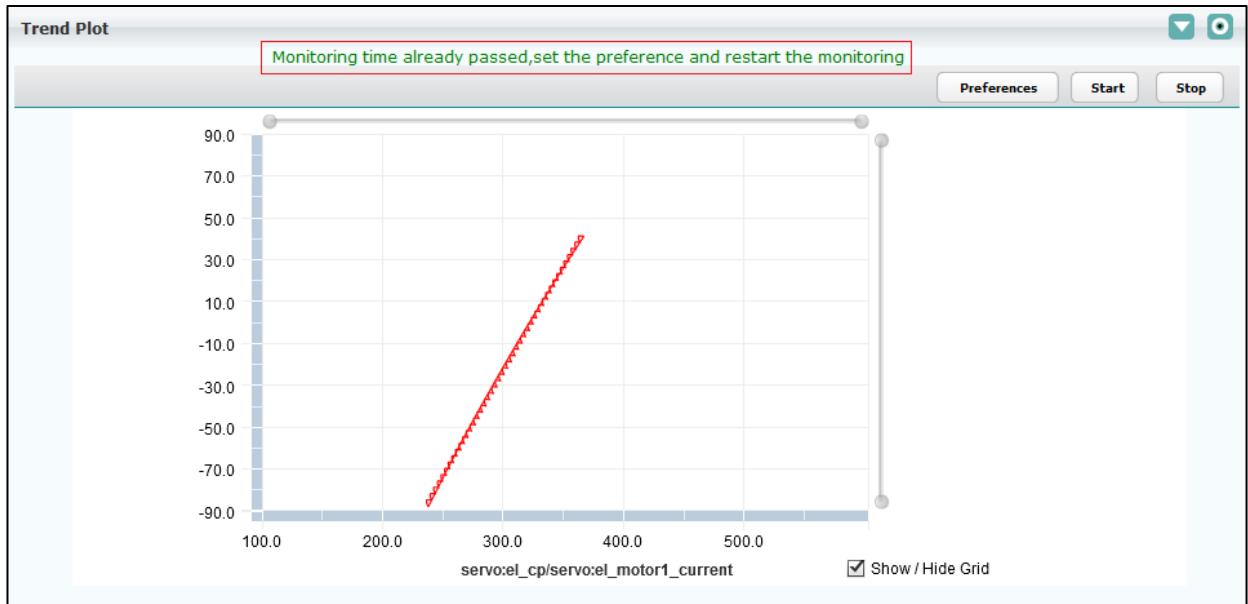
1. If “Time To” is not elapsed already then user will get below success message.



CMS USER MANUAL

2. If "Time To" is already elapsed then user will get below informative message.



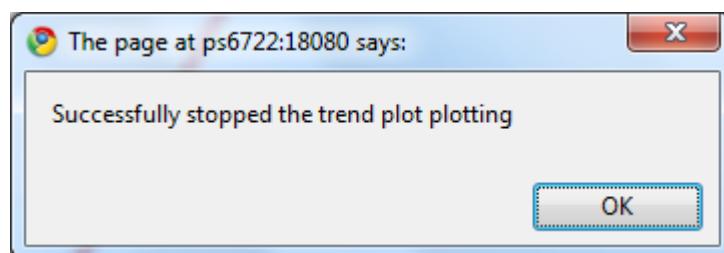


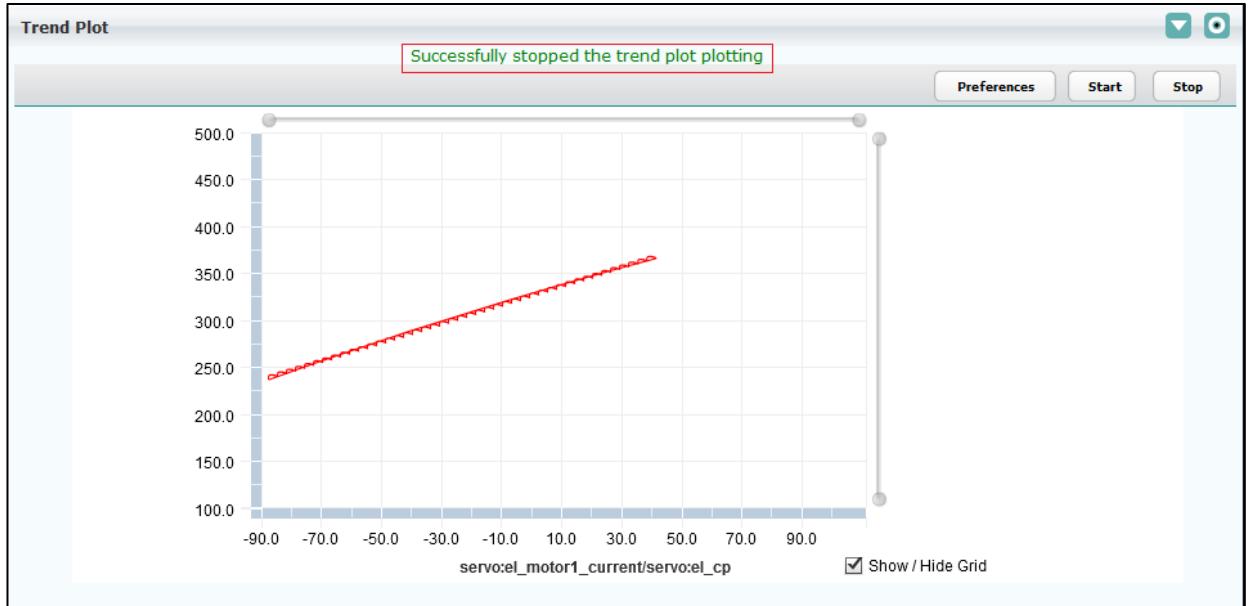
12.1.6.3 Trend Plot Stop

12.1.6.3.1 Manual Stop

User manually stops the trend plot plotting as below

Stop – Click on stop button will stop the plotting of the monitoring parameter.
 Click on stop button, will stop the plotting of monitoring parameters and user will get success as shown below.





12.1.6.3.2 Auto Stop

When time mentioned in “Time To” control is elapsed, CMS automatically stops the trend plot plotting.

13 State Machine

This is the most important component of CMS; it tracks state of individual sub systems as well state of CMS as a whole system.

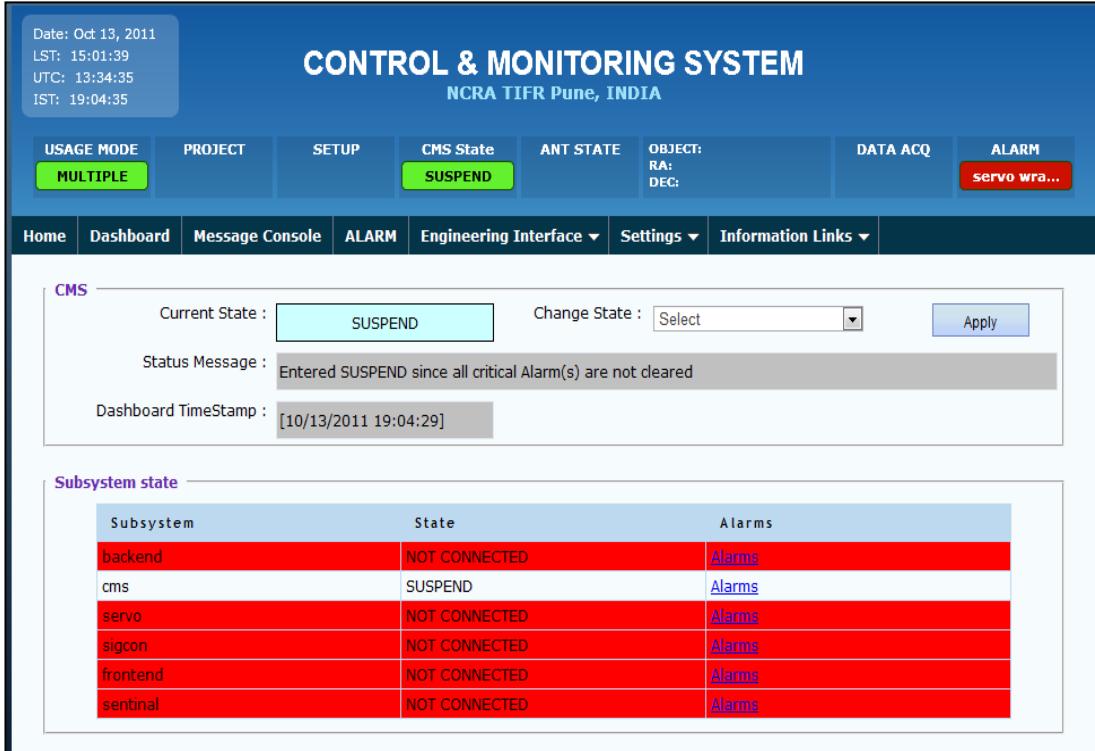
It allows taking automated corrective actions in cases of critical alarms and also responds and takes corrective action on CMS side in case of malfunction, asynchronous events received from sub systems through wrapper.

13.1 Start up and Initialization in State Machine

13.1.1 State Machine start-up

When CMS is started, state-machine always enters the START state and the steps mentioned below are performed:

1. State Machine checks the wrapper connectivity for configurable amount of time if wrapper is not connected then State Machine raises the wrapper down alarms, and moves into SUSPEND state – refer below figure.



The screenshot shows the CMS interface with the following details:

- Header:** Date: Oct 13, 2011, LST: 15:01:39, UTC: 13:34:35, IST: 19:04:35. Title: CONTROL & MONITORING SYSTEM, NCRA TIFR Pune, INDIA.
- Top Navigation Bar:** USAGE MODE (MULTIPLE), PROJECT, SETUP, CMS State (SUSPEND), ANT STATE, OBJECT: RA: DEC:, DATA ACQ, ALARM (servo wra...).
- Bottom Navigation Bar:** Home, Dashboard, Message Console, ALARM, Engineering Interface ▾, Settings ▾, Information Links ▾.
- CMS Section:**
 - Current State: SUSPEND
 - Change State: Select, Apply
 - Status Message: Entered SUSPEND since all critical Alarm(s) are not cleared
 - Dashboard TimeStamp: [10/13/2011 19:04:29]
- Subsystem State Table:**

Subsystem	State	Alarms
backend	NOT CONNECTED	Alarms
cms	SUSPEND	Alarms
servo	NOT CONNECTED	Alarms
sigcon	NOT CONNECTED	Alarms
frontend	NOT CONNECTED	Alarms
sentinal	NOT CONNECTED	Alarms

2. To view the alarm for the particular subsystem click on the alarm link. Refer figure below, the alarm raised for servo sub system wrapper down

CMS USER MANUAL

Alarm

⚠ Critical ⚠ Warning ⓘ Information

Refresh

Clear Alarms Acknowledge alarms

Result Pages: 1 2 3 [>>]

Select	Level	Name	Sub System	Date And Time ▾	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
<input type="checkbox"/>	⚠	restoreservo	servo	04/12/2012 17:16:10	dummy alarm raised by sys...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	el_motor2_temp	servo	04/12/2012 11:28:14	[61] EL motor 2 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	az_motor2_temp	servo	04/12/2012 11:28:04	[61] Az motor 2 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	el_motor1_temp	servo	04/12/2012 11:28:04	[61] EL motor 1 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	az_motor1_temp	servo	04/12/2012 11:27:14	[61] Az motor 1 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	az_ac	servo	04/12/2012 11:25:14	[62] AZ ac final-limit re...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	el_ac	servo	04/12/2012 11:25:14	[62] EL ac final-limit re...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	az_aol	servo	04/12/2012 11:25:14	[62] dummy alarm raised b...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	⚠	az_ccf	servo	04/12/2012 11:25:14	[62] AZ counter clockwise	No Acknowledge		No Clear		Disable	

13.1.2 State Machine initialization

1. If previously state-machine was moved to SHUTDOWN state and when CMS is restarted and all the wrappers get connected then state-machine moves to INIT state and executes initialization script “initAllSubsystems.txt”.
2. After successfully completion of the INIT state state-machine moves into NORMAL state and as displayed below:

CMS USER MANUAL

Date: Oct 13, 2011
 LST: 15:15:45
 UTC: 13:47:37
 IST: 19:17:37

CONTROL & MONITORING SYSTEM
 NCRA TIFR Pune, INDIA

USAGE MODE: MULTIPLE PROJECT SETUP CMS State: NORMAL ANT STATE: OBJECT: RA: DEC: DATA ACQ ALARM backend d...

Home Dashboard Message Console ALARM Engineering Interface ▾ Settings ▾ Administration ▾ Information Links ▾

CMS

Current State : **NORMAL** Change State : **Select** **Apply**

Status Message : system-automated

Dashboard TimeStamp : [10/13/2011 19:17:23]

Subsystem state

Subsystem	State	Alarms
backend	CONNECTED	Alarms
cms	NORMAL	Alarms
servo	CONNECTED	Alarms
sigcon	CONNECTED	Alarms
frontend	CONNECTED	Alarms
sentinal	CONNECTED	Alarms

3. If initialization is not successful then CMS raises the initialization failure alarm as shown below and moves to SUSPEND state.

Date: Sept 21, 2011
 LST: 09:59:33
 UTC: 09:59:48
 IST: 15:29:48

CONTROL & MONITORING SYSTEM
 IUCAA

CMS Link **UP**

USAGE MODE: MULTIPLE PROJECT SETUP Spectroscopy CMS State: **SUSPEND** TELESCOPE OBJECT: RA: DEC: DATA ACQ ALARM **ccu wrapp...**

Home Dashboard Message Console ALARM Engineering Interface ▾ Settings ▾ Administration ▾ Information Links ▾

CMS

Current State : **SUSPEND** Change State : **Select** **Apply**

Status Message : Entered State - SUSPEND

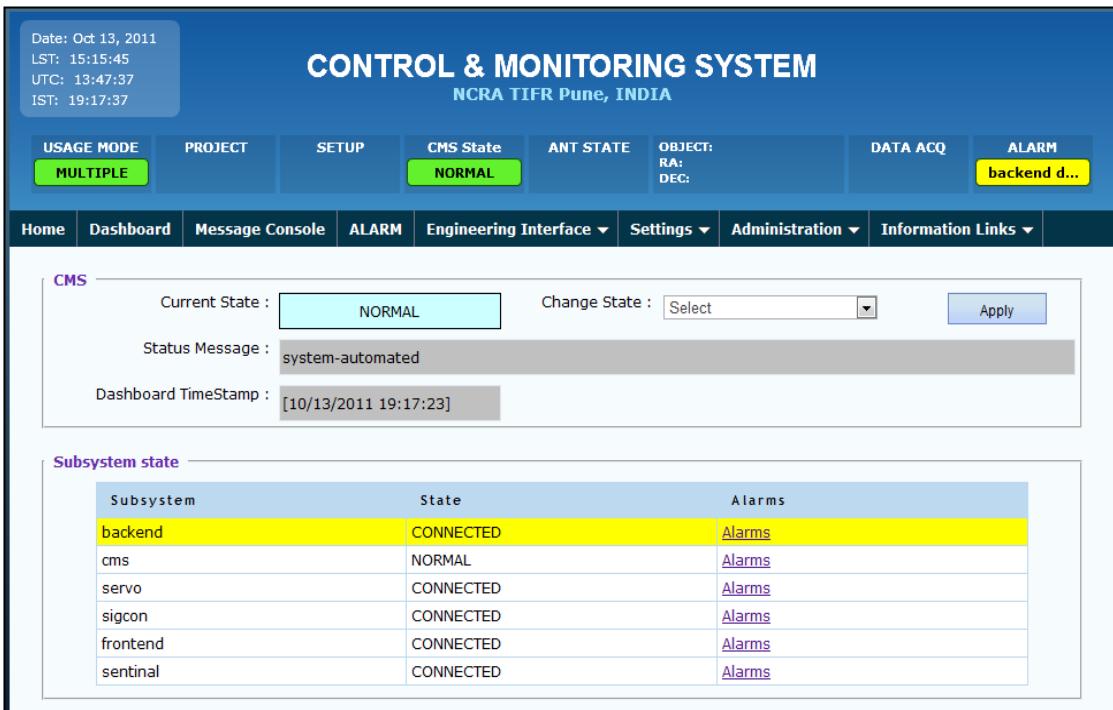
Subsystem state

Subsystem	State	Alarms
cms	SUSPEND	Alarms
ecs	NOT CONNECTED	Alarms
ccu	NOT CONNECTED	Alarms
tcs	NOT CONNECTED	Alarms

4. Click on the alarms link to view the alarm raised for the particular subsystem.

13.1.3 State Machine initialization on power failure

1. If state-machine was not moved to SHUTDOWN state in case of abrupt power failure and wrappers get connected after CMS start-up then state-machine moves to INIT_ON_POWERFAILURE state as shown in below screenshot. In this state state-machine executes all the sub system restore scripts as specified in “init_on_powerfailure.txt” batch script.



The screenshot shows the CMS interface with the following details:

- Header:** Date: Oct 13, 2011, LST: 15:15:45, UTC: 13:47:37, IST: 19:17:37.
- Title:** CONTROL & MONITORING SYSTEM, NCRA TIFR Pune, INDIA.
- Top Navigation:** USAGE MODE (MULTIPLE), PROJECT, SETUP, CMS State (NORMAL), ANT STATE, OBJECT: RA: DEC:, DATA ACQ, ALARM (backend d...).
- Sub-navigation:** Home, Dashboard, Message Console, ALARM, Engineering Interface ▾, Settings ▾, Administration ▾, Information Links ▾.
- CMS Section:**
 - Current State: NORMAL
 - Change State: Select, Apply
 - Status Message: system-automated
 - Dashboard TimeStamp: [10/13/2011 19:17:23]
- Subsystem State Table:**

Subsystem	State	Alarms
backend	CONNECTED	Alarms
cms	NORMAL	Alarms
servo	CONNECTED	Alarms
sigcon	CONNECTED	Alarms
frontend	CONNECTED	Alarms
sentinel	CONNECTED	Alarms

2. If CMS couldn't restore the sub system then state-machine raises the alarm for initialization failure and then moves into SUSPEND state

CMS USER MANUAL

Date: Oct 13, 2011
LST: 15:01:39
UTC: 13:34:35
IST: 19:04:35

CONTROL & MONITORING SYSTEM

NCRA TIFR Pune, INDIA

USAGE MODE	PROJECT	SETUP	CMS State	ANT STATE	OBJECT: RA: DEC:	DATA ACQ	ALARM
MULTIPLE			SUSPEND				servo wra...

Home | Dashboard | Message Console | ALARM | Engineering Interface | Settings | Information Links

CMS

Current State : **SUSPEND** Change State :

Status Message : Entered SUSPEND since all critical Alarm(s) are not cleared

DashboardTimeStamp : [10/13/2011 19:04:29]

Subsystem state

Subsystem	State	Alarms
backend	NOT CONNECTED	Alarms
cms	SUSPEND	Alarms
servo	NOT CONNECTED	Alarms
sigcon	NOT CONNECTED	Alarms
frontend	NOT CONNECTED	Alarms
sentinal	NOT CONNECTED	Alarms

3. If state-machine either successfully completed INIT or INIT_ON_POWERFAILURE than state-machine moves into NORMAL state and no alarms are shown below

Date: Oct 13, 2011
LST: 15:15:45
UTC: 13:47:37
IST: 19:17:37

CONTROL & MONITORING SYSTEM

NCRA TIFR Pune, INDIA

USAGE MODE	PROJECT	SETUP	CMS State	ANT STATE	OBJECT: RA: DEC:	DATA ACQ	ALARM
MULTIPLE			NORMAL				backend d...

Home | Dashboard | Message Console | ALARM | Engineering Interface | Settings | Administration | Information Links

CMS

Current State : **NORMAL** Change State :

Status Message : system-automated

DashboardTimeStamp : [10/13/2011 19:17:23]

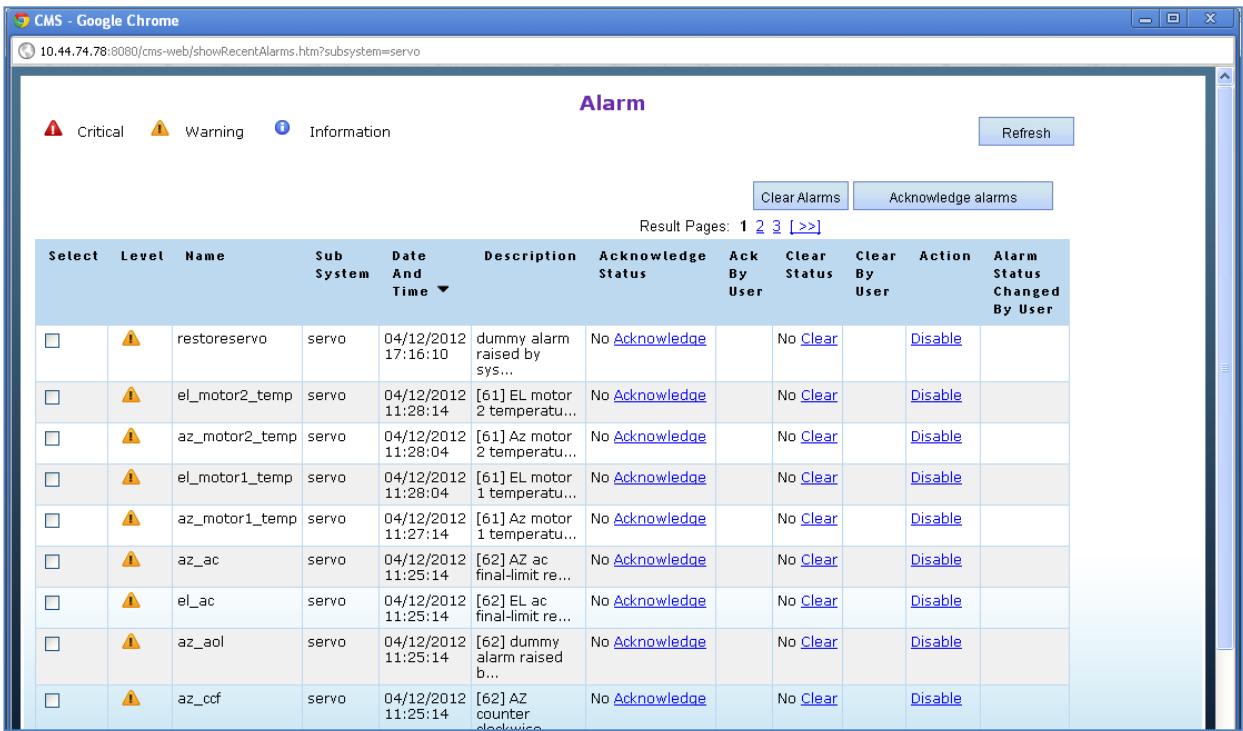
Subsystem state

Subsystem	State	Alarms
backend	CONNECTED	Alarms
cms	NORMAL	Alarms
servo	CONNECTED	Alarms
sigcon	CONNECTED	Alarms
frontend	CONNECTED	Alarms
sentinal	CONNECTED	Alarms

13.2 Viewing the alarms

To view the recently raised alarms go to Dashboard Tab

1. Dashboard shows the current state of the CMS, and other sub system states, along with alarms link, depending on the alarm severity and level the background color of subsystem is changed.
2. Click on alarm links show sub system specific alarms details and their severity level along with color.



Alarm

Result Pages: 1 2 3 [>>]

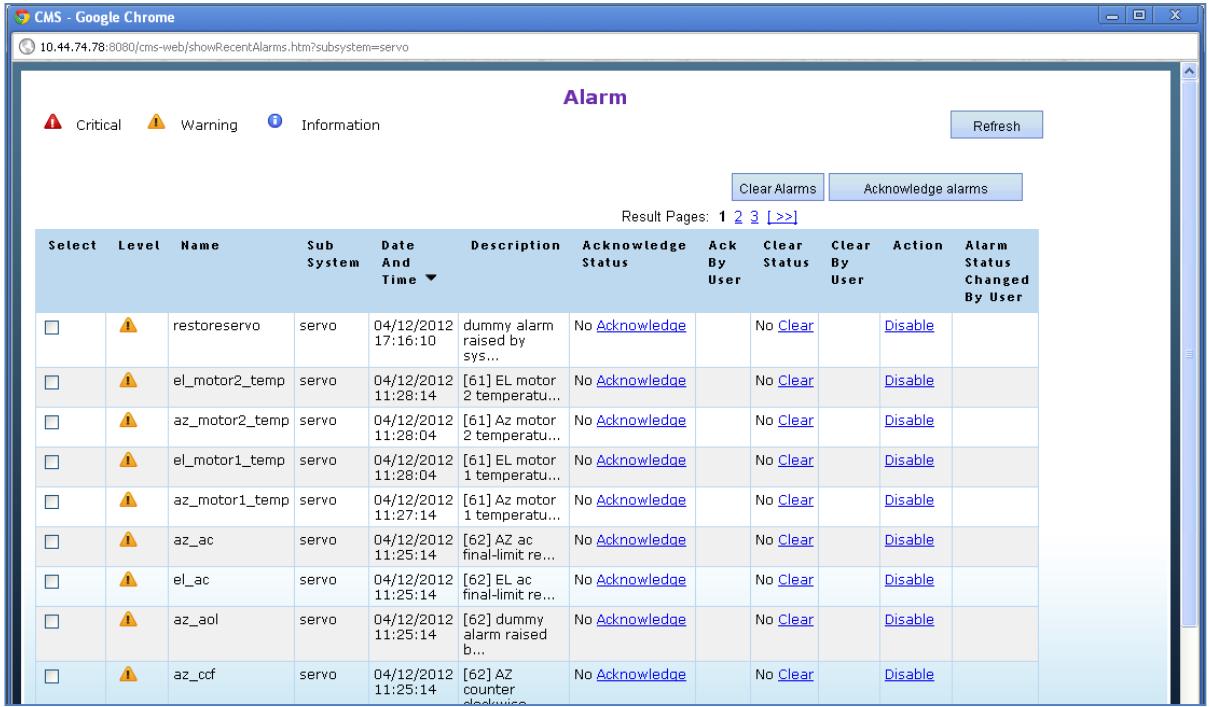
Select	Level	Name	Sub System	Date And Time	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
<input type="checkbox"/>	!	restoreservo	servo	04/12/2012 17:16:10	dummy alarm raised by sys...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	el_motor2_temp	servo	04/12/2012 11:28:14	[61] EL motor 2 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_motor2_temp	servo	04/12/2012 11:28:04	[61] Az motor 2 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	el_motor1_temp	servo	04/12/2012 11:28:04	[61] EL motor 1 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_motor1_temp	servo	04/12/2012 11:27:14	[61] Az motor 1 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_ac	servo	04/12/2012 11:25:14	[62] AZ ac final-limit re...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	el_ac	servo	04/12/2012 11:25:14	[62] EL ac final-limit re...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_aol	servo	04/12/2012 11:25:14	[62] dummy alarm raised b...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_ccf	servo	04/12/2012 11:25:14	[62] AZ counter checkwise	No Acknowledge		No Clear		Disable	

3. Alarms levels as below

- 3.1. If alarm level 5 then background is shown in red color
- 3.2. If alarm level equals 3 or 4 then background shown in orange color
- 3.3. If alarm level equals 1 or 2 then background shown in yellow color

Alarm level below 1 is treated as info level only.

CMS USER MANUAL



The screenshot shows a web-based CMS interface titled "Alarm". The page header includes navigation links for "Critical", "Warning", and "Information" levels, along with a "Refresh" button. Below the header is a table with columns for Select, Level, Name, Sub System, Date And Time, Description, Acknowledge Status, Ack By User, Clear Status, Clear By User, Action, and Alarm Status Changed By User. The table lists nine alarms, all of which are currently acknowledged (Status: No Acknowledge) and have their clear status set to "No Clear". The alarms are categorized by level: Critical (restoreservo, el_motor2_temp, az_motor2_temp, el_motor1_temp, az_motor1_temp, az_ac, el_ac), Warning (az_aol, az_ccf), and Information (None). The "Date And Time" column shows the alarm was raised between April 12, 2012, at 11:25:14 and 17:16:10.

Select	Level	Name	Sub System	Date And Time	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
<input type="checkbox"/>	!	restoreservo	servo	04/12/2012 17:16:10	dummy alarm raised by sys...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	el_motor2_temp	servo	04/12/2012 11:28:14	[61] EL motor 2 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_motor2_temp	servo	04/12/2012 11:28:04	[61] Az motor 2 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	el_motor1_temp	servo	04/12/2012 11:28:04	[61] EL motor 1 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_motor1_temp	servo	04/12/2012 11:27:14	[61] Az motor 1 temperatu...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_ac	servo	04/12/2012 11:25:14	[62] AZ ac final-limit re...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	el_ac	servo	04/12/2012 11:25:14	[62] EL ac final-limit re...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_aol	servo	04/12/2012 11:25:14	[62] dummy alarm raised b...	No Acknowledge		No Clear		Disable	
<input type="checkbox"/>	!	az_ccf	servo	04/12/2012 11:25:14	[62] AZ counter de...	No Acknowledge		No Clear		Disable	

13.3 Clearing and acknowledging the alarms

13.3.1 Alarm clearing

1. User who has been granted the permission to clear the alarm can only view the Clear Status link or clear Alarm button. Other users can only view the current clear status of alarm. To grant user permission to clear the alarm refer section 1.2.2.11.1 Add Role.
2. Assuming user has been granted clear alarm permission ,when user clears the alarm it will ask for the confirmation to clear the alarm, if user selects ok, the alarm gets cleared and the background color changes for the particular subsystem, and user name is updated in clear by user column.

For e.g. in below figure the critical level alarm wrapper down for servo subsystem is being cleared.

CMS USER MANUAL

Alarm

Level	Name	SubSystem	Date And Time	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
⚠ Critical	wrapper down	servo	2011-12-16 14:53:37	The page at ps0583:8085 says:	No Acknowledge	No Clear			Enable	exp
⚠ Warning	az_motor2_temp	servo	2011-12-16 18:52:11	Are you sure you want to clear alarm?	No Acknowledge	No Clear	exp	Disable	exp	
⚠ Warning	az_motor1_temp	servo	2011-12-16 18:52:13	1 temperature is high	Acknowledge	No Clear		Enable	exp	
⚠ Critical	az_cp	servo	2011-12-16 18:52:12	[393] Az upper/lower limits crossed	No Acknowledge	No Clear	ash	Disable	exp	
⚠ Warning	az_motor1_current	servo	2011-12-16 18:52:11	[272.0] Azimuth motor1 current is high	No Acknowledge	No Clear		Enable	exp	
⚠ Warning	el_motor1_current	servo	2011-12-16 18:52:11	[272.0] EZ motor 1 current is high	No Acknowledge	No Clear		Enable	exp	

ps0583:8085/cms-web/showRecentAlarms.htm?subsystem=servo#

SUSPEND Alarms

cms	SUSPEND	Alarms
servo	NOT CONNECTED	alarms
sigcon	NOT CONNECTED	alarms
frontend	NOT CONNECTED	alarms
serialna	NOT CONNECTED	alarms

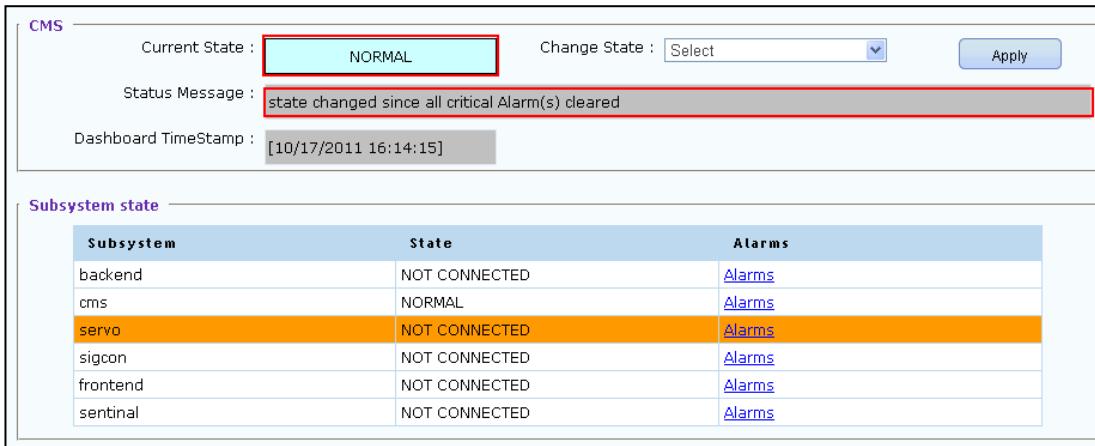
3. After clearing the alarm, the backend alarm page and dashboard will look like as below,

Alarm

Level	Name	SubSystem	Date And Time	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
⚠ Critical	wrapper down	servo	2011-12-16 14:53:37	servo wrapper down	No Acknowledge		Yes	expert	Enable	exp
⚠ Warning	az_motor2_temp	servo	2011-12-16 18:54:00	[72.0] Az motor 2 temperature is high	No Acknowledge		No Clear	exp	Enable	expert
⚠ Warning	az_motor1_temp	servo	2011-12-16 18:52:13	[72.0] Az motor 1 temperature is high	No Acknowledge		No Clear		Enable	exp
⚠ Critical	az_cp	servo	2011-12-16 18:52:12	[393] Az upper/lower limits crossed	No Acknowledge		No Clear	ash	Disable	exp
⚠ Warning	az_motor1_current	servo	2011-12-16 18:52:11	[272.0] Azimuth motor1 current is high	No Acknowledge		No Clear		Enable	exp
⚠ Warning	el_motor1_current	servo	2011-12-16 18:52:11	[272.0] EZ motor 1 current is high	No Acknowledge		No Clear		Enable	exp
⚠ Warning	el_motor1_temp	servo	2011-12-16 18:52:09	[72.0] EL motor 1 temperature is high	No Acknowledge		No Clear		Enable	exp

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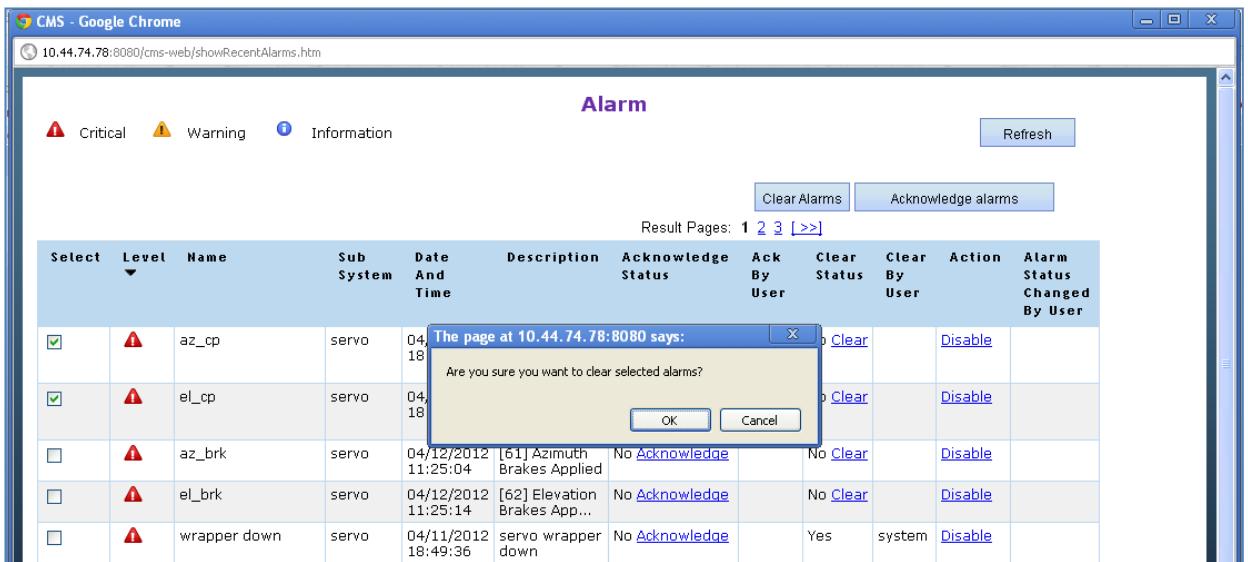
4. If all critical alarms are cleared CMS will enter the state prior to entering SUSPEND state and Status message will display as below:



The screenshot shows the CMS dashboard. At the top, it displays "Current State : NORMAL" and "Change State : Select". Below this, a status message box contains the text "state changed since all critical Alarm(s) cleared". A red border highlights this message box. Underneath, a "Dashboard TimeStamp" shows [10/17/2011 16:14:15]. The main area is titled "Subsystem state" and contains a table with columns "Subsystem", "State", and "Alarms". The subsystems listed are backend, cms, servo, sigcon, frontend, and sentinel. The cms and frontend rows are highlighted in orange, indicating they are NOT CONNECTED.

Subsystem	State	Alarms
backend	NOT CONNECTED	Alarms
cms	NORMAL	Alarms
servo	NOT CONNECTED	Alarms
sigcon	NOT CONNECTED	Alarms
frontend	NOT CONNECTED	Alarms
sentinal	NOT CONNECTED	Alarms

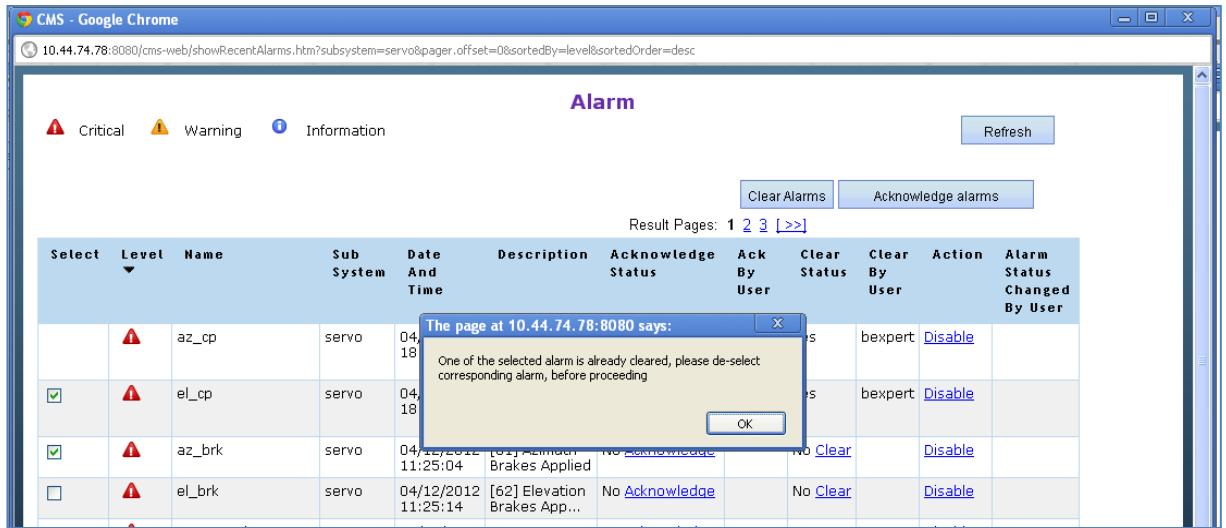
5. User can also clear multiple alarms at a time by selecting the checkboxes against corresponding alarms. Please see the image below for same –



The screenshot shows the CMS web interface under the "Alarm" section. It lists several alarms with columns for Select, Level, Name, Sub System, Date And Time, Description, Acknowledge Status, Ack By User, Clear Status, Clear By User, Action, and Alarm Status Changed By User. Two alarms are selected: "az_cp" and "el_cp", both marked as Critical (red exclamation). A modal dialog box is overlaid on the page, containing the text "The page at 10.44.74.78:8080 says:" followed by "Are you sure you want to clear selected alarms?". It has "OK" and "Cancel" buttons. Above the table, there are filters for Critical, Warning, and Information levels, and buttons for "Clear Alarms" and "Acknowledge alarms". Page navigation buttons show "Result Pages: 1 2 3 [>]".

Note that if one of the selected alarms is already in cleared state then, system will show appropriate error message and would not clear any of alarm.

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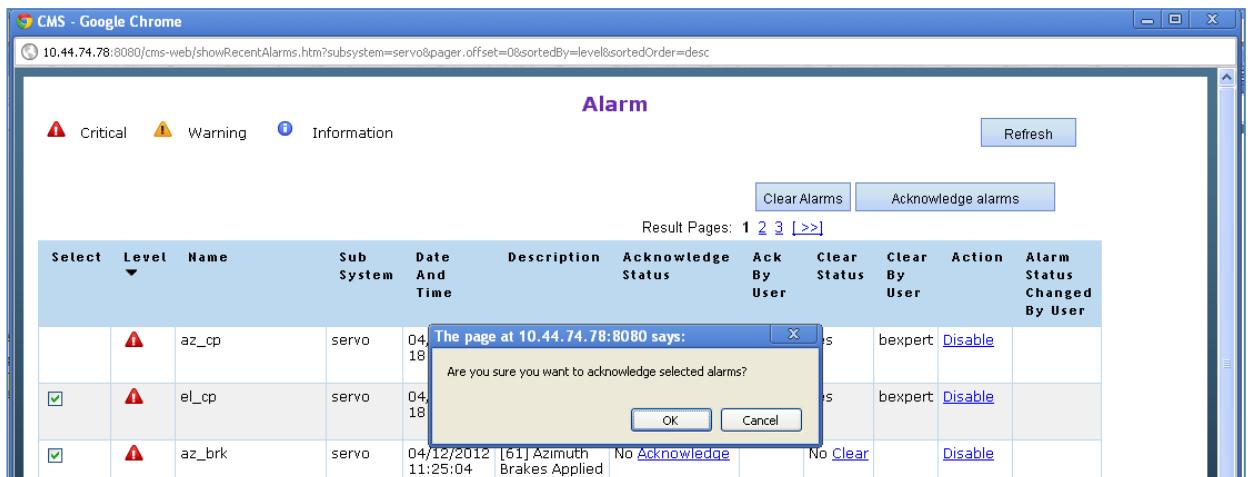


The screenshot shows the CMS Alarm page with a modal dialog box overlaid. The dialog box contains the message: "The page at 10.44.74.78:8080 says: One of the selected alarm is already cleared, please de-select corresponding alarm, before proceeding". There are two checkboxes in the table row for "el_cp" and "az_brk" which are checked. The "el_cp" row has an "Acknowledge" status of "No Acknowledged". The "az_brk" row has an "Acknowledge" status of "No Acknowledged". The "OK" button is visible in the dialog box.

Select	Level	Name	Sub System	Date And Time	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
	!	az_cp	servo	04/18	[61] Azimuth Brakes Applied	No Acknowledged	bexpert	Disable			
<input checked="" type="checkbox"/>	!	el_cp	servo	04/18	[62] Elevation Brakes App...	No Acknowledged	bexpert	Disable			
<input checked="" type="checkbox"/>	!	az_brk	servo	04/12/2012 11:25:04	[61] Azimuth Brakes Applied	No Acknowledged	No Clear		Disable		
<input type="checkbox"/>	!	el_brk	servo	04/12/2012 11:25:14	[62] Elevation Brakes App...	No Acknowledged	No Clear		Disable		

13.3.2 Alarm Acknowledging

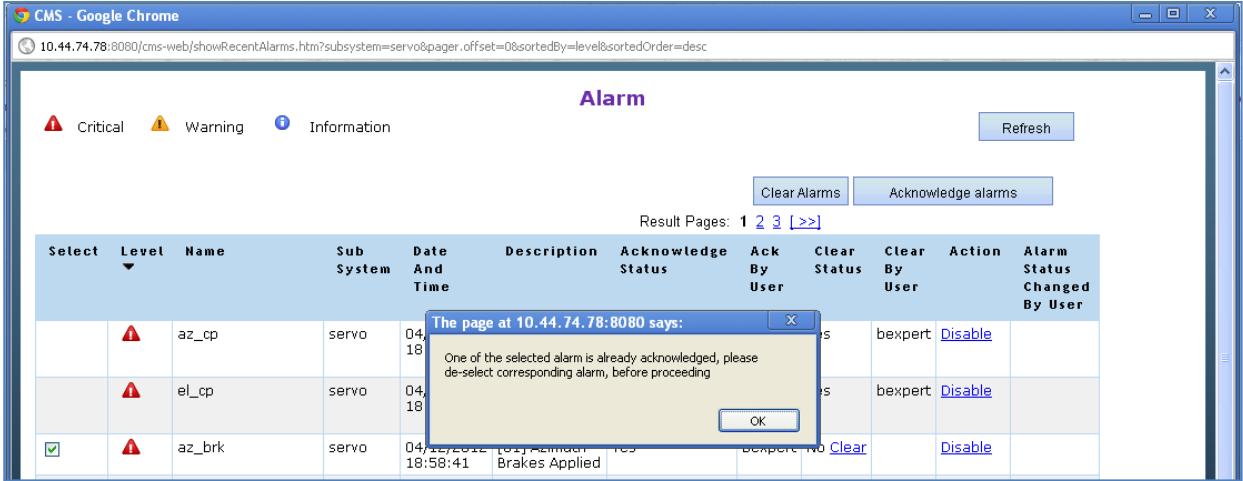
1. If user has appropriate permission to acknowledge the alarm then “Acknowledge Alarm” link or “Acknowledge Alarms” button will be visible to user.
2. When user clicks on Acknowledge link on the recent alarm page the alarm gets acknowledged and the user name of the user who acknowledged the alarm appears on the page.
3. Alternatively user can also acknowledge multiple alarms by selecting checkboxes against corresponding rows. Please see the image below for same –



The screenshot shows the CMS Alarm page with a modal dialog box overlaid. The dialog box contains the message: "Are you sure you want to acknowledge selected alarms?". There are two checkboxes in the table row for "el_cp" and "az_brk" which are checked. The "OK" and "Cancel" buttons are visible in the dialog box.

Select	Level	Name	Sub System	Date And Time	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
	!	az_cp	servo	04/18	[61] Azimuth Brakes Applied	No Acknowledged	bexpert	Disable			
<input checked="" type="checkbox"/>	!	el_cp	servo	04/18	[62] Elevation Brakes App...	No Acknowledged	bexpert	Disable			
<input checked="" type="checkbox"/>	!	az_brk	servo	04/12/2012 11:25:04	[61] Azimuth Brakes Applied	No Acknowledged	No Clear		Disable		

Note that if one of the selected alarms is already acknowledged then, system will show appropriate error message and would not acknowledge any of alarm.



The screenshot shows a browser window titled "CMS - Google Chrome" displaying the "Alarm" page at the URL 10.44.74.78:8080/cms-web/showRecentAlarms.htm?subsystem=servo&pageOffset=0&sortedBy=level&sortedOrder=desc. The interface includes a legend for Critical (red), Warning (yellow), and Information (blue) levels. A "Refresh" button is in the top right. Below it are buttons for "Clear Alarms" and "Acknowledge alarms". A "Result Pages" navigation bar shows pages 1, 2, 3, and a "More" link. The main table has columns: Select, Level, Name, Sub System, Date And Time, Description, Acknowledge Status, Ack By User, Clear Status, Clear By User, Action, and Alarm Status Changed By User. Three rows of data are visible: az_cp (warning), el_cp (warning), and az_brk (warning). A modal dialog box is centered over the table, containing the text: "The page at 10.44.74.78:8080 says: One of the selected alarm is already acknowledged, please de-select corresponding alarm, before proceeding". It has an "OK" button.

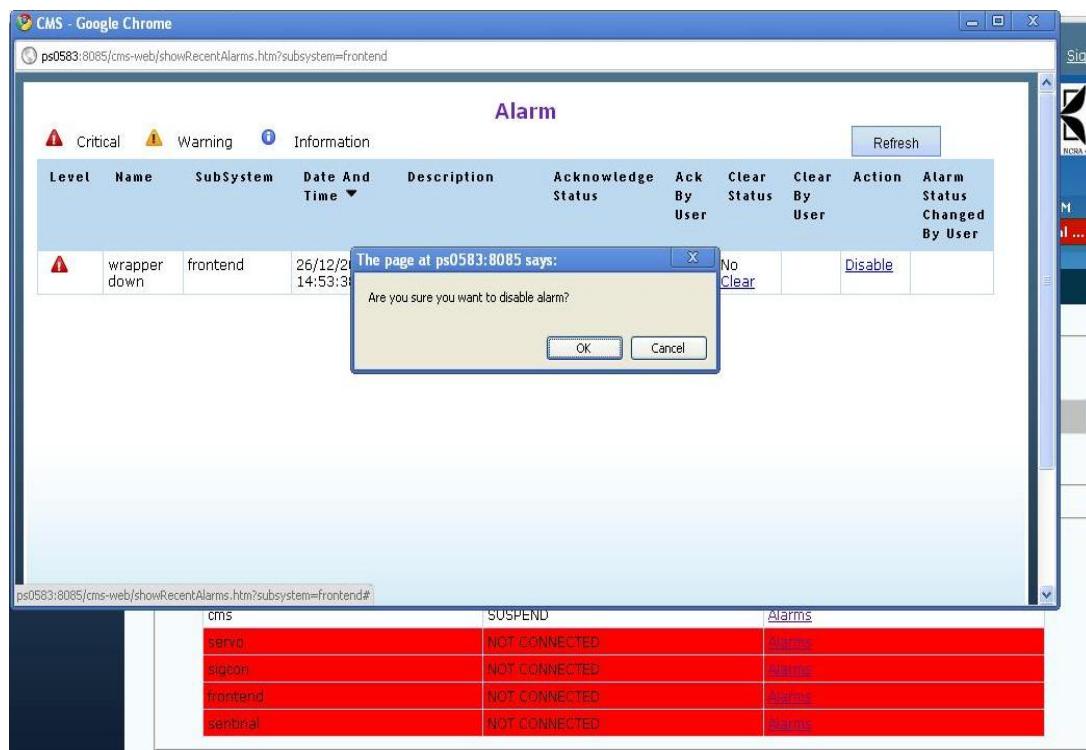
13.4 Enabling-Disabling of Alarms

13.4.1 Disabling of Alarm

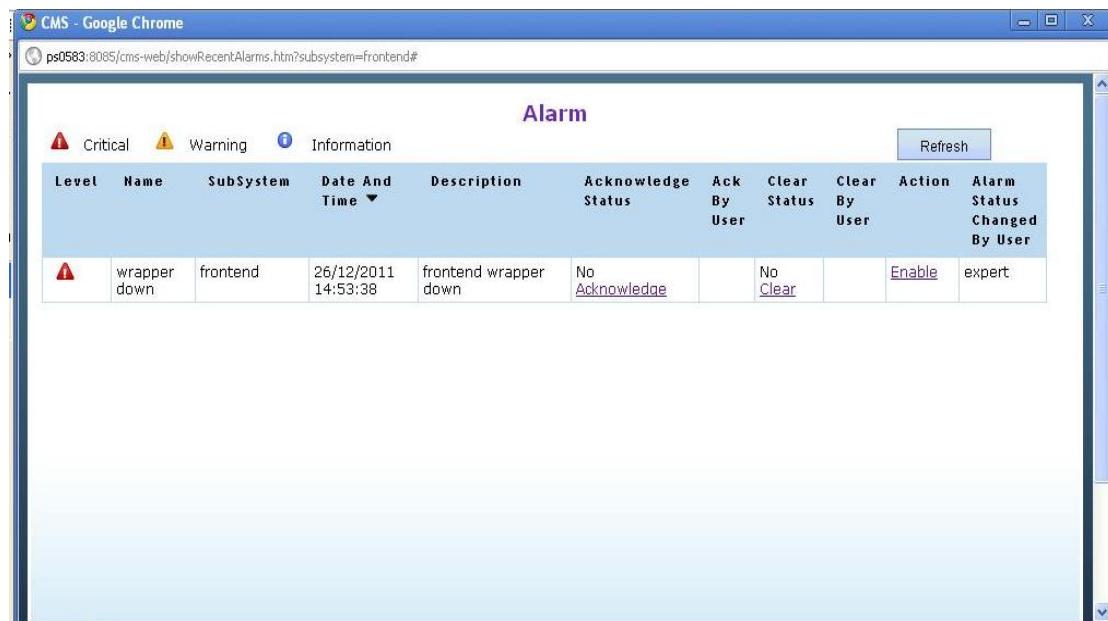
1. User who has been granted the permission to enable-disable the alarm can only view the Action link. Other users can only view the current enable-disable status of alarm. To grant user the permission to enable-disable the alarm refer section 1.2.2.11.1 Add Role.
2. By default all alarms are enabled. If user wants an alarm can be disabled. Once a particular alarm has been disabled next time if the same alarm arrives, then it won't be raised till it is enabled again.
3. Assuming user has been granted alarm enable-disable permission, when user disables an alarm it will ask for the confirmation, if user selects ok, the alarm gets disabled and the background color changes for the particular subsystem, and user name is updated in alarm status changed by user column.

For e.g. in below figure the critical level alarm wrapper down for frontend subsystem is being disabled.

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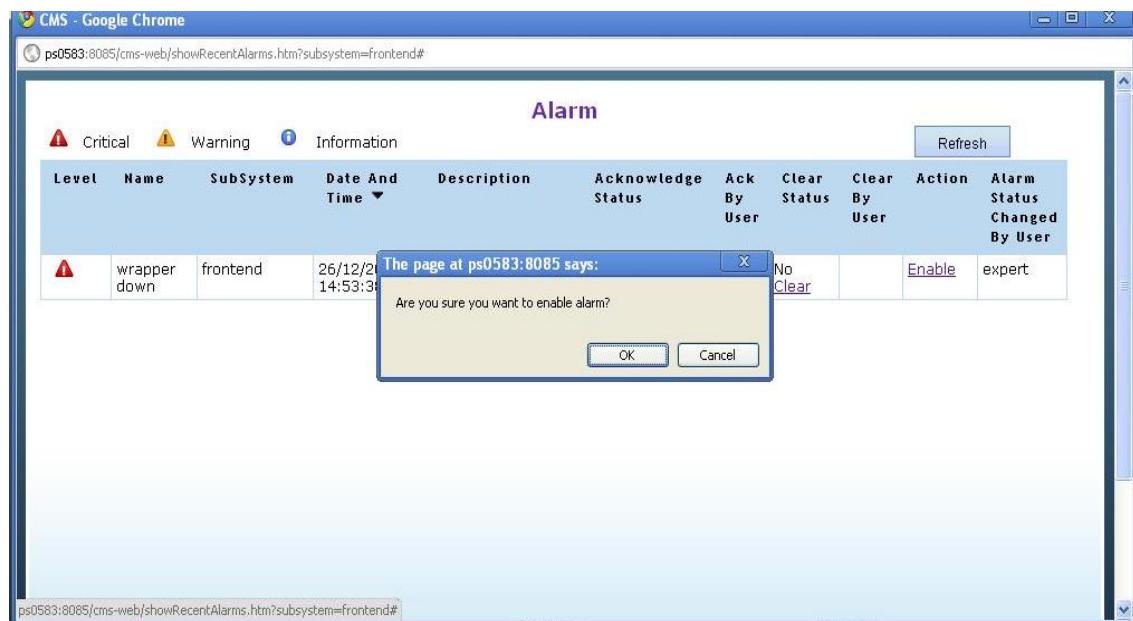
- After disabling the alarm, the frontend alarm page and dashboard will look like as below. User can now enable the same alarm.



CMS USER MANUAL

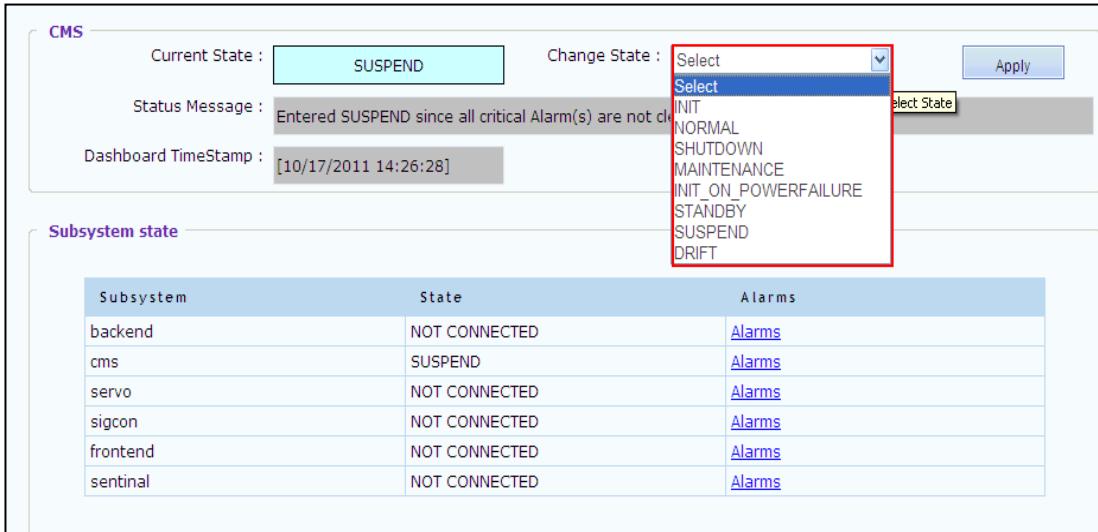
5. User can enable the alarm, by clicking on the Enable link. When user enables an alarm it will ask for the confirmation , if user selects ok, the alarm gets enabled and the background color changes for the particular subsystem, and user name is updated in alarm status changed by user column.

For e.g. in below figure the critical level alarm wrapper down for frontend subsystem is being enabled.



13.5 Changing state in CMS

- List of the CMS states are as displayed below:



The screenshot shows the CMS User Manual interface. At the top, there are fields for 'Current State' (SUSPEND), 'Status Message' (Entered SUSPEND since all critical Alarm(s) are not cleared), and 'DashboardTimeStamp' (10/17/2011 14:26:28). Below these, a 'Subsystem state' table lists various subsystems and their current states. To the right of the table is a dropdown menu titled 'Change State' with a list of states: Select, INIT, NORMAL, SHUTDOWN, MAINTENANCE, INIT_ON_POWERFAILURE, STANDBY, SUSPEND, and DRIFT. The 'Select' option is currently selected. An 'Apply' button is located to the right of the dropdown.

Subsystem	State	Alarms
backend	NOT CONNECTED	Alarms
cms	SUSPEND	Alarms
servo	NOT CONNECTED	Alarms
sigcon	NOT CONNECTED	Alarms
frontend	NOT CONNECTED	Alarms
sentinal	NOT CONNECTED	Alarms

- To change the state select the State and click on apply button. Then CMS will try to transition to the selected state, the following transitions are supported.

Transition_INIT_TO_NORMAL
 Transition_INIT_TO_MAINTENANCE
 Transition_INIT_TO_SHUTDOWN
 Transition_INIT_TO_EXCEPTION
 Transition_INIT_TO_SUSPEND
 Transition_INIT_TO_STANDBY

 Transition_INIT_ON_POWERFAILURE_TO_MAINTENANCE
 Transition_INIT_ON_POWERFAILURE_TO_SHUTDOWN
 Transition_INIT_ON_POWERFAILURE_TO_EXCEPTION
 Transition_INIT_ON_POWERFAILURE_TO_NORMAL
 Transition_INIT_ON_POWERFAILURE_TO_SUSPEND
 Transition_INIT_ON_POWERFAILURE_TO_STANDBY

 Transition_NORMAL_TO_SHUTDOWN
 Transition_NORMAL_TO_MAINTENANCE
 Transition_NORMAL_TO_EXCEPTION
 Transition_NORMAL_TO_STANDBY
 Transition_NORMAL_TO_SUSPEND
 Transition_NORMAL_TO_DRIFT
 Transition_NORMAL_TO_INIT

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```

Transition_NORMAL_TO_INIT_ON_POWERFAILURE
Transition_MAINTENANCE_TO_SHUTDOWN
Transition_MAINTENANCE_TO_NORMAL
Transition_MAINTENANCE_TO_STANDBY
Transition_MAINTENANCE_TO_SUSPEND
Transition_MAINTENANCE_TO_EXCEPTION
Transition_MAINTENANCE_TO_DRIFT
Transition_MAINTENANCE_TO_INIT
Transition_MAINTENANCE_TO_INIT_ON_POWERFAILURE

Transition_EXCEPTION_TO_NORMAL
Transition_EXCEPTION_TO_SHUTDOWN
Transition_EXCEPTION_TO_SUSPEND
Transition_EXCEPTION_TO_STANDBY
Transition_EXCEPTION_TO_INIT
Transition_EXCEPTION_TO_INIT_ON_POWERFAILURE
Transition_EXCEPTION_TO_MAINTENANCE
Transition_EXCEPTION_TO_DRIFT

Transition_STANDBY_TO_NORMAL
Transition_STANDBY_TO_SHUTDOWN
Transition_STANDBY_TO_EXCEPTION
Transition_STANDBY_TO_SUSPEND
Transition_STANDBY_TO_INIT
Transition_STANDBY_TO_INIT_ON_POWERFAILURE
Transition_STANDBY_TO_MAINTENANCE
Transition_STANDBY_TO_DRIFT

Transition_SUSPEND_TO_NORMAL
Transition_SUSPEND_TO_SHUTDOWN
Transition_SUSPEND_TO_MAINTENANCE
Transition_SUSPEND_TO_EXCEPTION
Transition_SUSPEND_TO_INIT
Transition_SUSPEND_TO_INIT_ON_POWERFAILURE
Transition_SUSPEND_TO_DRIFT
Transition_SUSPEND_TO_STANDBY

Transition_DRIFT_TO_NORMAL
Transition_DRIFT_TO_SUSPEND
Transition_DRIFT_TO_EXCEPTION
Transition_DRIFT_TO_SHUTDOWN
Transition_DRIFT_TO_INIT
Transition_DRIFT_TO_INIT_ON_POWERFAILURE
Transition_DRIFT_TO_STANDBY
Transition_DRIFT_TO_MAINTENANCE

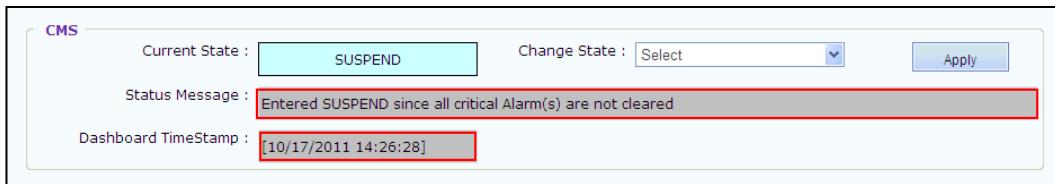
```

3. If CMS is moved to INIT or INIT_ON_POWERFAILURE state then CMS again executes the initialization script or restore script and raises the alarm as mention in State Machine Initialization section in case of initialization failure.
4. If CMS is moved to SHUTDOWN state the state-machine thread end and no other state-change happens. The tomcat server and active-mq server will also be shutdown. And for CMS and state-machine to be up an active-mq restart and tomcat restart will be required.

13.6 Dashboard Status Message and Timestamp

The dashboard status message displays the reason for state-change.

The time stamp indicates the time at which cms changed its state from one to another.



The screenshot shows a CMS interface with the following fields:

- Current State :** SUSPEND (highlighted in light blue)
- Change State :** Select (dropdown menu)
- Status Message :** Entered SUSPEND since all critical Alarm(s) are not cleared (highlighted with a red border)
- Dashboard TimeStamp :** [10/17/2011 14:26:28] (highlighted with a red border)
- Apply** button (blue)

13.7 Monitoring Parameter out of range Alarms

Monitoring Parameter out of range alarm would be raised whenever a monitoring parameter sent by wrapper goes out of range.

Alarms for various subsystems would be displayed in various colors depending upon the level of alarms raised for that particular subsystem.

Alarms that are configured for Monitoring Parameter out of range will only be raised. The alarm configuration is mentioned in the CMS Configuration and Deployment [NCRA] document. The alarm name and the monitoring parameter name should be same for the alarm to be raised.

For example: “el_motor2_temp” alarm would be raised whenever parameter reaches out of limit as shown below.

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Alarm

⚠ Critical ⚠ Warning ⓘ Information

[Refresh](#)

Level	Name	SubSystem	Date And Time ▾	Description	Acknowledge Status	Ack By User	Clear Status	Clear By User	Action	Alarm Status Changed By User
⚠	el_motor2_temp	servo	26/12/2011 18:37:52	[74.0] EL motor 2 temperature is high	No Acknowledge		No Clear		Disable	
⚠	wrapper down	servo	26/12/2011 14:53:37	servo wrapper down	No Acknowledge		Yes	expert	Enable	exp
⚠	az_motor2_temp	servo	16/12/2011 18:54:00	[72.0] Az motor 2 temperature is high	No Acknowledge		No Clear	exp	Enable	expert
⚠	az_motor1_temp	servo	16/12/2011 18:52:13	[72.0] Az motor 1 temperature is high	No Acknowledge		No Clear		Enable	exp
⚠	az_cp	servo	16/12/2011 18:52:12	[393] Az upper/lower limits crossed	No Acknowledge		No Clear	ash	Disable	exp
⚠	az_motor1_current	servo	16/12/2011 18:52:11	[272.0] Azimuth motor1 current is high	No Acknowledge		No Clear		Enable	exp
⚠	el_motor1_current	servo	16/12/2011 18:52:11	[272.0] EZ motor 1 current is high	No Acknowledge		No Clear		Enable	exp

14 Miscellaneous

14.1 Pre-Observer Role

```
#####
# Pre-Observation settings for Astronomer #####
#####
# Period in milli seconds #####
#15 Minutes by default, infinite if -1
preObservationTime=900000
```

An astronomer/co-astronomer logs in to CMS in preObservation time as pre-observer.

preObservationTime before observation start time, allows astronomer to upload catalogs and validate his batch file in CMS. If “-1” then astronomer can login at any time to perform observation activities.

14.2 Active Controller

The Astronomer/Co-astronomers users in CMS have some specific schedule of observation. These users are considered active during their particular schedule. CMS has a scheduler which runs after specific time interval. This Scheduler keeps track of schedules and when a schedule is active it displays the name of the Astronomer in Active Controller and the corresponding project code in Header.

The time interval after which scheduler will be invoked is configurable. It is specified in “observation_schedular_frequency” property in cms.properties. By default minimum time interval is 15 minutes. Any value specified below 15 minutes will be ignored by CMS and 15 min will be considered as scheduler frequency.

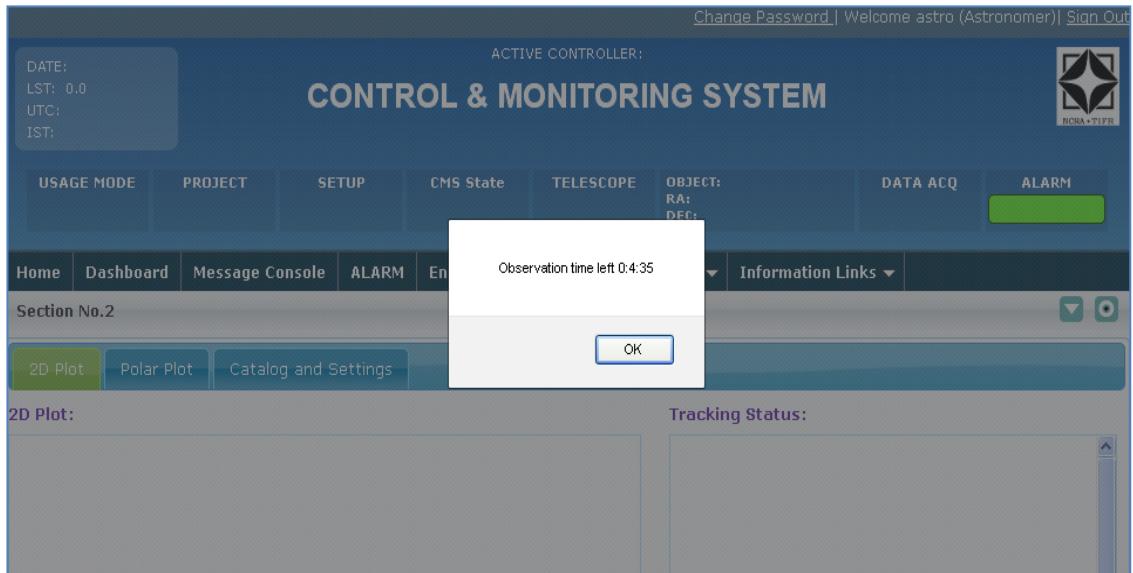
E.g.: The below figure displays the Active controller as “astro” since the current schedule belong to Astronomer whose username is “astro”.



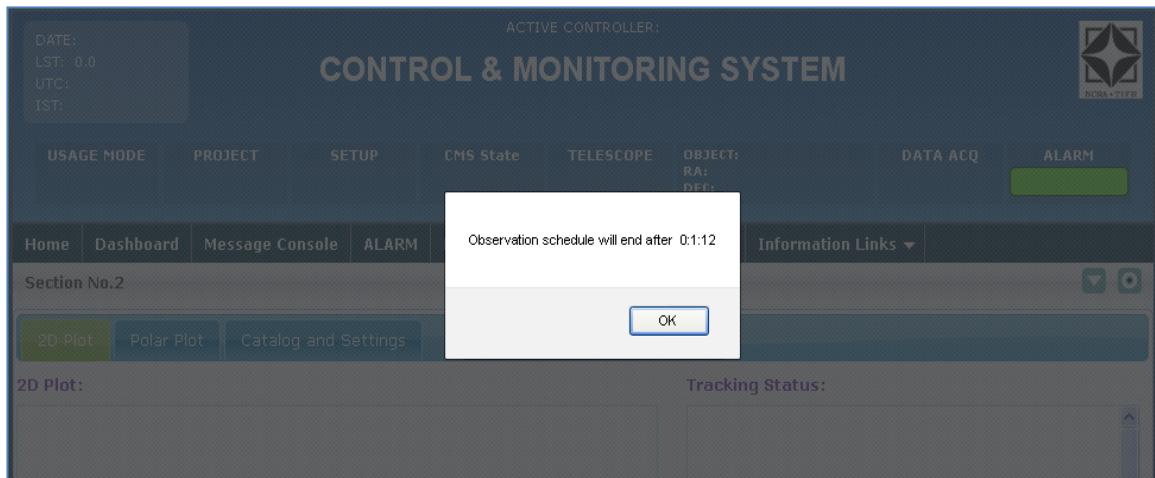
Whenever an active Astronomer/Co-astronomer logs in during their particular schedule, an alert message is displayed to that Astronomer/Co-astronomer showing the remaining observation time.

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For E.g.: Below figure displays the time for which astronomers schedule will last, in this case it is 4 min 35 seconds.



Astronomer/Co-astronomer will also be given a warning message showing the time left after which their observation will get over.



Once a particular schedule is over Active controller will display the name of next active astronomer/co-astronomer or will remain blank. Corresponding astronomer/Co-astronomer will also be logged out automatically once their schedule is over.



14.3 Message Console Logs

All the data appearing on Message console is logged in **messageconsole.log** file. This file is generated in Tomcat log directory.

14.4 Dashboard logs

The CMS state changed history is logged in **dashboardhistory.log** file. This file is generated in Tomcat log directory.

14.5 Email Alerts

CMS supports following emails alerts

14.5.1 User Registration

If a valid email address is supplied in while creating a user in CMS, then CMS sends registration email to corresponding user with preliminary login information.

14.5.2 Critical Alarm Alert

When CMS receives a critical alarm from wrapper or CMS generates critical alarm due to system variables going critically out of range an email is sent out to an email alias configured in cms.properties (criticalalarmemailalias property) about critical alarm situation, so that corresponding users can trigger corrective action.