



**Initial Mockup (Space Control Centres)**

**Issue 1.2.0**

**10-Jun-2011**

**Initial Mockup** (Space Control Centres)

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**Document Status**

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## Document Change Log

Each change or set of changes made to this document will result in an increment to the version number of the document.

This change log records the process and identifies for each version number of the document the modification (s) which caused the version number to be incremented.

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# 1 Introduction

## 1.1 Purpose of this Document

This is the Initial Mockup Document for Space Control Centres produced for the FP7 CUBIST project. It formalises part of the work done for Work Package 8 “Use Case: Semantic Business Intelligence for Space Control Centres” which is led by Space Applications Services.

This document is a public deliverable D8.1.2 Initial Mockup, formally due by M8 (= May-2011)

The context of this deliverable is as follows:

1. The 3 requirements Documents written for CUBIST were delivered at M6:

Del ID	Task ID	Due Date	Description
D7.1.1	T7.1	M6	Requirements Document (use case: Semantic business Intelligence for <b>Mouse Atlases</b> )
D8.1.1	T8.1		Requirements Document (use case: Semantic business Intelligence for <b>Space Control Centres</b> )
D9.1.1	T9.1		Requirements Document (use case: Semantic business Intelligence for <b>Recruitment</b> )

**Table 1 Deliverables for Requirements Engineering Task in CUBIST**

2. Its Chapter 9 is to be read with this Initial Mockup deliverable:

Del ID	Task ID	Due Date	Description
D8.1.2	T8.1	M6 + 2	Initial Mockup (use case: Semantic business Intelligence for <b>Space Control Centres</b> )

**Table 2 Deliverables for Task ID 8.1**

## 1.2 Scope of this Document

Task 8.1: Requirements Analysis (Lead SAP, M1-M8); Deliverable D8.1.2

Based on the guidelines and the requirements analysis provided by T1.1 and deliverable D1.1.1, the specific requirements for this use case were gathered and documented in the requirements Document.

This report contains a set of initial mockup screens for the expected user interfaces and a description of their functionalities. This report could be read as an annex of the previously issued User Requirements Document, more specifically Chapter 9. In the light of the current operations at the Belgian User Support and Operations Centre, it focuses on the expected interfaces to support the operations for the external payload SOLAR.




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**1.3 Document Overview**

Apart from the rest of this chapter where the conventions and reference documents are identified, this document consists of one additional chapter describing the graphical user interfaces and their functionalities. In the annex of the document all the screenshots are provided again.

**1.4 General Conventions**

**1.4.1 Graphical Conventions**

Icon	Description
	"Look at this" Points to a particularly important item, part of the executive summary.  <b>If you only have 1 hour to read this document, follow this pointer</b>
	"At work" Identifies a section still unstable or immature
	'Attention" Highlights a point worth reading, such as technical issue or a typical pitfall

**1.4.2 Acronyms and Abbreviations**

Concept	Description
SOLAR PP	SOLAR processed parameters, these are part of the SOLAR telemetry which are forwarded to the Columbus Control Centre (Col-CC) in Munich
SOLAR H&S	SOLAR Health and Status, Also part of the SOLAR telemetry received at B.USOC, This data is sent to B.USOC from Col-CC and mostly contains data generated by Columbus subsystems concerning SOLAR
SOLAR HK	SOLAR HouseKeeping, Part of the telemetry consisting of SOLAR data packets generated by the SOLAR payload. This data is routed directly to B.USOC
SOLAR CPD HK telemetry	SOLAR Coarse Pointing Device HouseKeeping, Part of the HouseKeeping data concerning the SOLAR Coarse Pointing devices
ISS ATL Timeline	International Space Station Attitude Timeline
AIB	Analogue Interface Board
USS	Unified Synoptic Software, software user for payload operations which displays real-time payload data

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**1.5 Reference and Applicable Documents**

**1.5.1 Applicable Documents**

Applicable documents (ADs) are the documents providing some “binding” information , to which a compliance is expected. ADs impose constraints that must be respected.

<b>CUBIST Deliverables</b>	
D1.1.1	F. Dau, Directives for the Requirements Analysis in the Use Cases (D1.1.1), v1.0, 22-Dec-2011
D8.1.1	A. Mikhailian et al,, Requirements Document, v. 2.9.1, 8-Apr-2011

**1.5.2 Reference Documents**

Reference Documents (RDs) contain additional information that is not binding

<b>Webpages</b>	
WB1	Belgian User Support and Operations Centre <a href="http://www.busoc.be">www.busoc.be</a>
WB2	Participatory Design Methodology <a href="http://www.larson-tech.com/567-Fall2004/pictive.htm#_Toc478476148">http://www.larson-tech.com/567-Fall2004/pictive.htm#_Toc478476148</a>



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## 2 SOLAR CUBIST interface

The main tool for the Payload operator on console, monitoring the SOLAR payload, is the USS Display displaying the SOLAR real-time SOLAR telemetry. The USS is a software tool used to display real-time telemetry on a computer screen. USS comes with a WYSIWYG display editing component, which allows creating complex and functional displays, such as those showing in Fig.1. This would be the entry point into CUBIST for SOLAR:

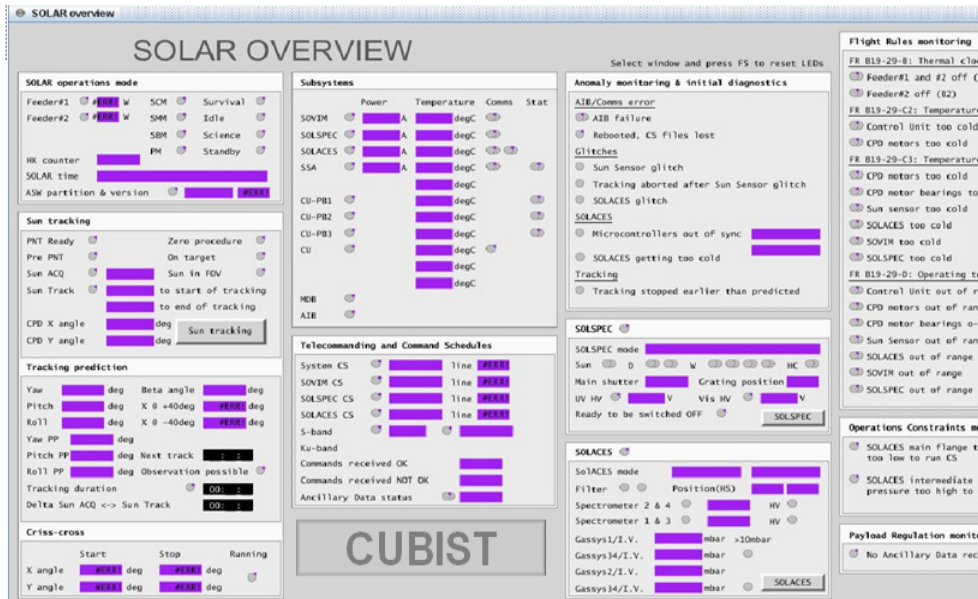


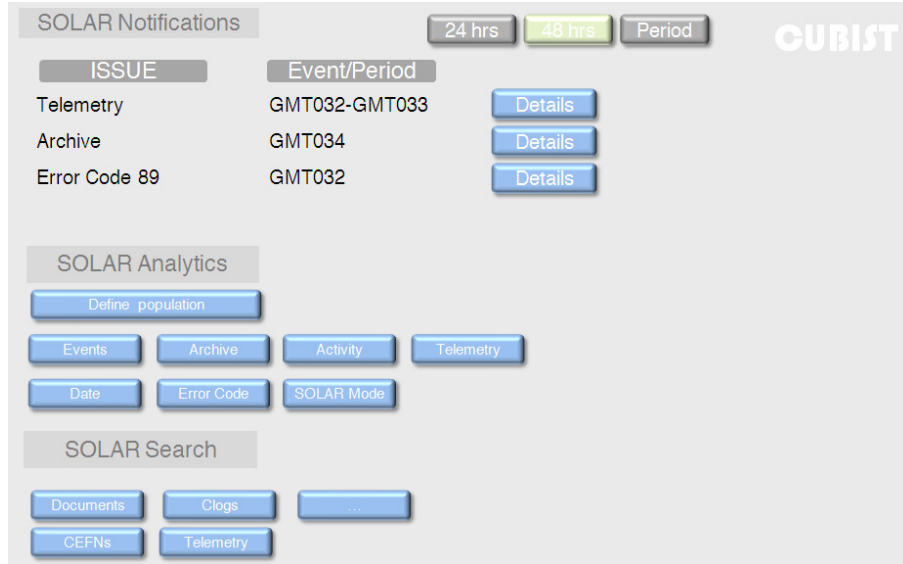
Figure 1: USS SOLAR Overview Display

The button for CUBIST should be highlighted (or some kind of indication shall be provided) whenever unexpected behaviour was detected, such as

- a telemetry parameter was out of its predefined soft values,
- an error code was issued by SOLAR
- a change has occurred impacting the SOLAR planning (? *Scope of the project TBC*) such as a change in the ISS ATL timeline

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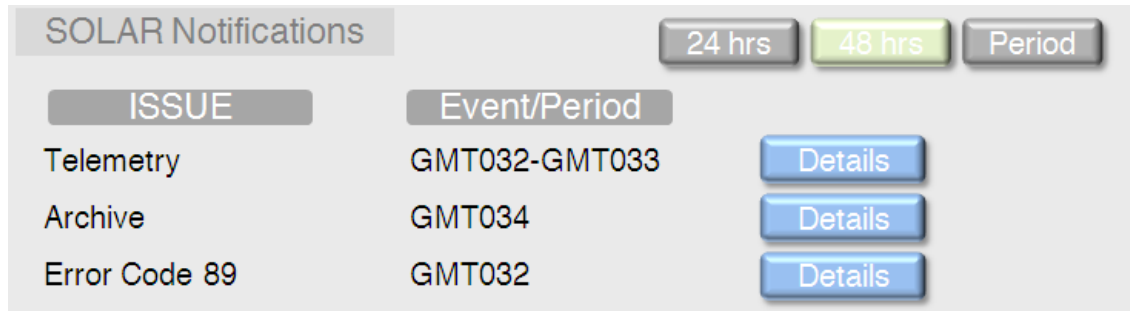
Clicking on the CUBIST button will bring the user to the CUBIST main page:



**Figure 2: CUBIST-SOLAR Main page**

Note that the last feature, the 'SOLAR Search' is currently not entirely in the scope of the project and shall thus not be elaborated in this document.

The first part of the main page consists of the so-called SOLAR notifications:



**Figure 3: CUBIST-SOLAR Main page: SOLAR Notifications**

This feature would allow the user to quickly be informed of any unexpected behaviour on the payload or more generally in the payload operations. By defining a period (24hrs, 48hrs, special period), it displays a list, indicating the component that deviates and the date in the Day Of Year GMT time format.

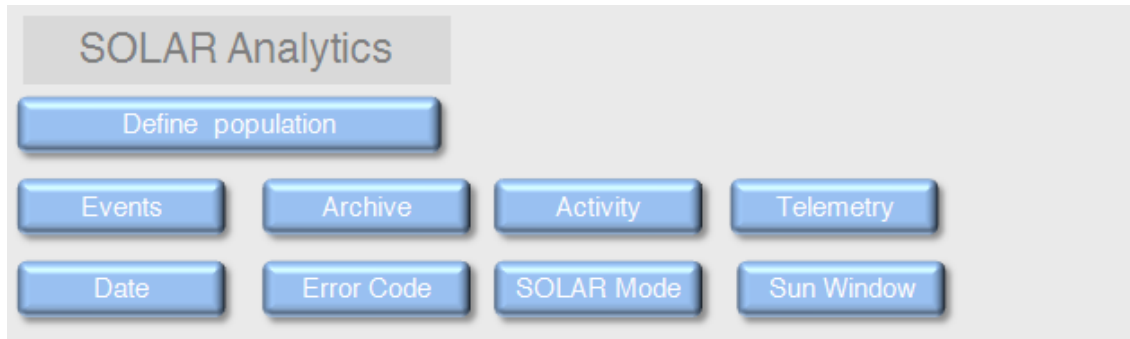
These notifications are based on predefined conditional requirements with respect to the SOLAR parameters. Only objects showing unexpected parameters within a specified context will be added to the list.

The user can further analyse the issue by clicking on the Details button which would open the SOLAR Analytics pages.

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**2.1 SOLAR Analytics pages**

From the main CUBIST interface the user can also access the SOLAR Analytics:



**Figure 4: CUBIST-SOLAR main page: SOLAR Analytics**

Here the user can choose between defining a population from the SOLAR archive (Define population button) or using a predefined context (the remaining buttons). Following sections will first describe the SOLAR Analytics where the user would start defining the required population to analyse. Section 2.4 will provide a detailed description of the predefined populations.

**2.2 Dataset definition**

When defining a population, the user has access to the complete SOLAR Telemetry archive (or at least the parameters) and can select the data he/she wants to work with (similar to the example provided at the CUBIST design workshop)

SOLAR Analytics Population CUBIST

	SOLARCPD HK	SOLARH&S	SoIACES HK	SOLSPEC HK	SOLAR Ancillary Stat	SOLAR Events/Warning	PP			
Time	SOLAR_P B3_Outlet 1_Trip_Stat	SOLAR_P B3_Outlet 2_Trip_Stat	SOLAR_P B3_Outlet 3_Trip_Stat	SOLAR_P B3_Outlet 4_Trip_Stat	SOLAR_Ancillary Stat	SOLAR_P B1_Stat	SOLAR_P B1_Temp	SOLAR_P B2_Temp	SOLAR_C U_Therm 1_Temp	SOLAR_C U_Therm 3_Temp
GMT32/00:00:01	OK	OK	OK	OK	OK	OK	12.3	13.7	24.3	25.1
GMT32/00:00:02	OK	OK	OK	OK	OK	OK	12.3	13.6	24.3	25.1
GMT32/00:00:03	OK	OK	OK	OK	OK	OK	12.4	13.6	24.2	25.0
GMT32/00:00:04	OK	OK	OK	OK	OK	OK	12.6	13.5	24.2	25.0
GMT32/00:00:05	OK	OK	OK	OK	OK	OK	12.8	13.6	24.2	25.0
GMT32/00:00:06	OK	OK	OK	OK	OK	OK	12.9	13.6	24.2	25.0
GMT32/00:00:07	OK	OK	OK	OK	OK	OK	12.7	13.6	24.1	25.1

Buttons: Create formal Context, Main Page

**Figure 5: SOLAR Analytics Population**

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Note that, taking into account the amount of data available in the SOLAR archive, it might be useful to only load the parameter set and provide the user the possibility to load a specific period in order to limit the loading time.

The already existing distinction of the SOLAR telemetry shall be visualised by tabs to provide a user friendly interface. Following categories of data can be made:

- SOLAR CPD House Keeping (HK) telemetry
- SOLAR Health and Status
- SOLAR SoIACES HK
- SOLAR SOLPSEC HK
- SOLAR Event/Warning/Reports
- Processed Parameters

Each of the tabs will list the parameters under that category. Note that, these subdivisions are based on the origin of the telemetry not on nature. The parameters of the telemetry of one subdivision can be float, Boolean, integer or string.

From the overview, the user can select data from different categories; moreover the user should have the possibility to load columns to the analysis by selecting them. Especially taking into account the wide range of parameters, it is advised that the user selects the parameters rather than removing them. Nevertheless one should have the possibility to select them all (per tab), an example would be to select all SOLAR PPs with one simple click.

A semi-automatic generation of FCA scales should be feasible in order to limit the number of objects. Therefore the operator shall be able to define periods of time (e.g. 5s, 10s, ) in which they should be grouped and be able to set a timeframe (e.g. 1 month). Furthermore he/she should have the possibility to group the parameters chosen as attributes, through defined intervals and to restrict the dataset by selecting a specific range or value of an attribute. Thus the user shall have the ability to restrict the dataset on different levels, tailored to the required analysis. For some parameters, the grouping is already defined following the payload requirements (soft limits, hard limits). These are fixed and cannot be changed by the user.

For each of the floating point parameters the user can easily view the maximum and minimum value as the distribution over a period of 3 months (or even a configurable time interval) by going to the header of the column.

By clicking on the 'Create Formal Context' the user will have the formal context showing the different attributes and objects:

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SOLAR Analytics CUBIST

Time	<input checked="" type="checkbox"/> SOLAR_P B3_Outlet 1_Trip_Stat_OK	<input checked="" type="checkbox"/> SOLAR_P B3_Outlet 1_Trip_Stat_OK	<input checked="" type="checkbox"/> SOLAR_P B3_Outlet 3_Trip_Stat_OK	<input checked="" type="checkbox"/> SOLAR_P B3_Outlet 4_Trip_Stat_OK	<input checked="" type="checkbox"/> SOLAR_A ncillary_Stat_OK	<input checked="" type="checkbox"/> SOLAR_P B1_Stat_OK	<input checked="" type="checkbox"/> SOLAR_P B1_Temp_nominal	<input checked="" type="checkbox"/> SOLAR_P B1_Temp_offnominal	<input checked="" type="checkbox"/> SOLAR_C U_Therm1_Temp_nominal	<input checked="" type="checkbox"/> SOLAR_C U_Therm1_Temp_nominal
GMT32/00:00:01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:40	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:50	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GMT32/00:01:10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:30	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:40	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GMT32/00:01:50	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:02:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:02:10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

View Lattice Save Context Main Page Back to Population

**Figure 6: SOLAR Analytics: Formal Context**

The formal context overview allows the operator to further manage it by removing attributes which does not seem relevant for the analysis. The user shall also be able to restrict the selection for objects having specific attributes.

In case the user has defined the population, the CUBIST system will allow saving this selection as a predefined selection and adding it to the main page. This predefined set will not include the restrictions set initially, but it will remember the grouping and selected parameters and will be included in the list on the CUBIST Main page, if requested by the user.

**2.3 FCA Visualisation Pages**

By generating the Lattice from the formal context overview, the CUBIST system will display the lattice visualisation based on the formal context defined by the user. By default the visualisation displays the full Hasse diagram.

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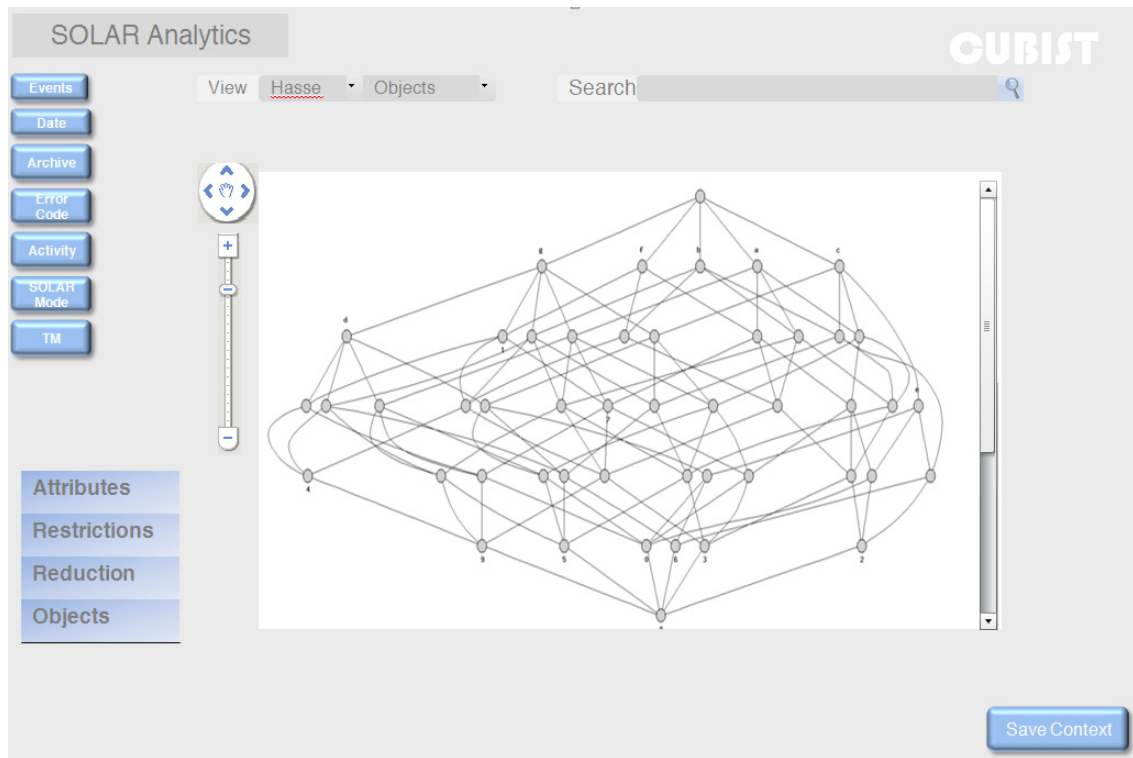


Figure 7: SOLAR Analytics Main

Again, at every step in the process, the user has the possibility to save the context as a predefined context/dataset combination.

### 2.3.1 Visualisation and browsing options

The user can manipulate the visual representation by choosing another visualisation under View. *(different ways of visualisation to be defined later)* Moreover under View, the user can select to see all objects or the percentages with respect to the total amount of objects.

Under the 'Search' feature the user can search in the visualisation for certain attributes or objects. An autocomplete feature of the search box will suggest possible values to the user. The user can provide one or more attributes/objects. Clicking on the search button will highlight the corresponding concepts in the diagram:

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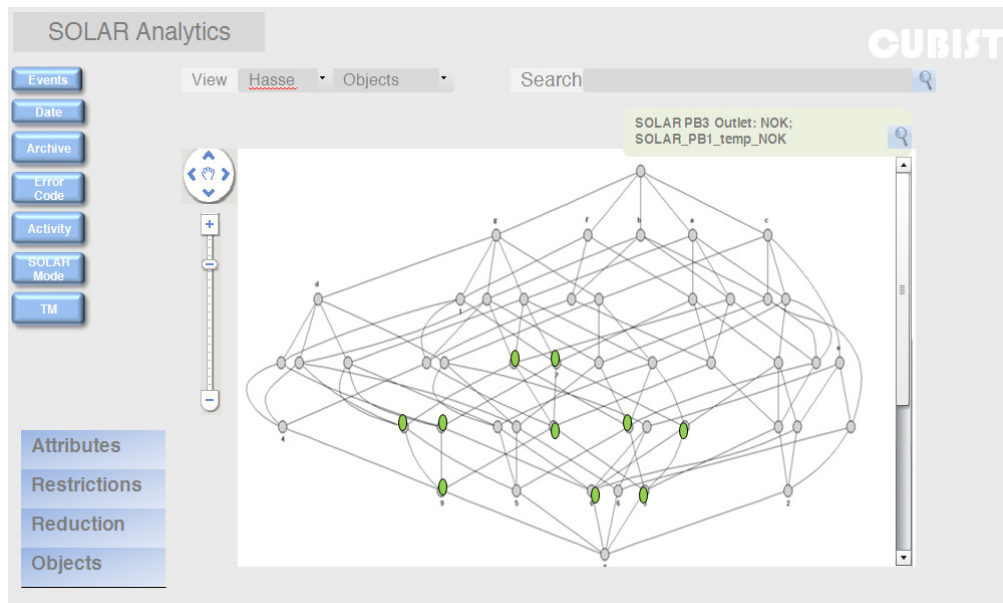


Figure 8: SOLAR Analytics search feature

Note that the system also allows searches from the visualisation part, meaning that the user can double click on a node, which will be the same as searching for the corresponding attribute(s).

From this page with the highlighted search, the user can then narrow the visualisation by clicking again on the search/view next to the attributes under the search selection. Here CUBIST will only show those concepts that have both attributes as a starting point. Under 'Attributes' on the left, it will show which other attributes from the original context created by the user are still included in the analysis. Also, the grouping and restrictions that were defined with the creation of the formal context are still respected.

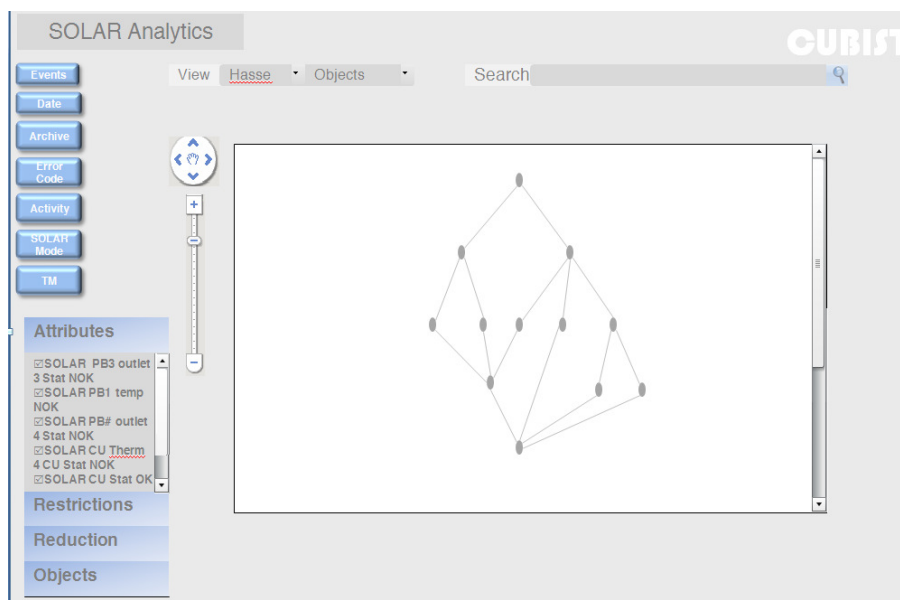
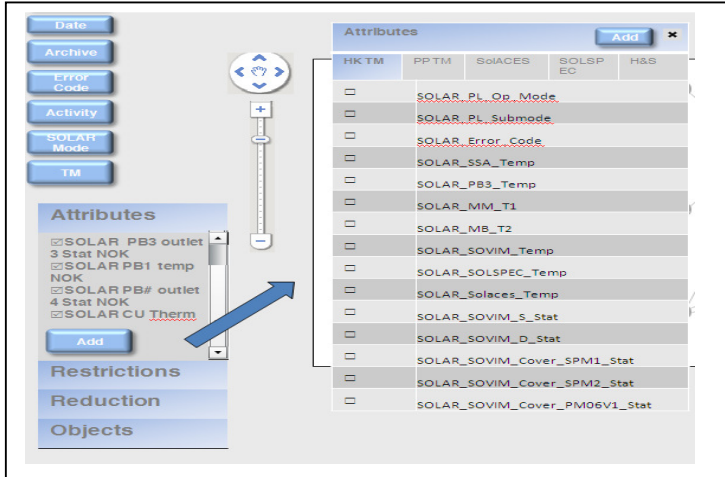


Figure 9: SOLAR Analytics Selection feature

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Generally for the SOLAR Analytics page the user can manipulate the dataset. At each stage of the analysis the user is able to add or remove attributes, including derived attributes from parameters originally not included in the formal context. The similar possibility should be available for the objects.



**Figure 10: SOLAR Analytics Attributes**

Moreover the user should have the ability to renew the restrictions and to define new groups.

The user can also manipulate the presentation through the Reduction options. These include Support, stability and other typical features for FCA analysis. This feature does not change the actual formal context used.

**2.3.2 Visualisation window**

The Hasse diagram showed for the SOLAR analytics, will, when first generated, provide the complete overview and details to the extent that these can be read. By zooming in, more information becomes visible where each concept is then made visible by tagging the node with the corresponding attributes and/or objects.

The user can browse through the diagram by using the grab function, moving the entire content of the diagram.

When going over the nodes with the mouse the CUBIST system will generate a pop up window showing the information of that node, also specifying the 'main' attribute of that specific node as illustrated in Fig.11:



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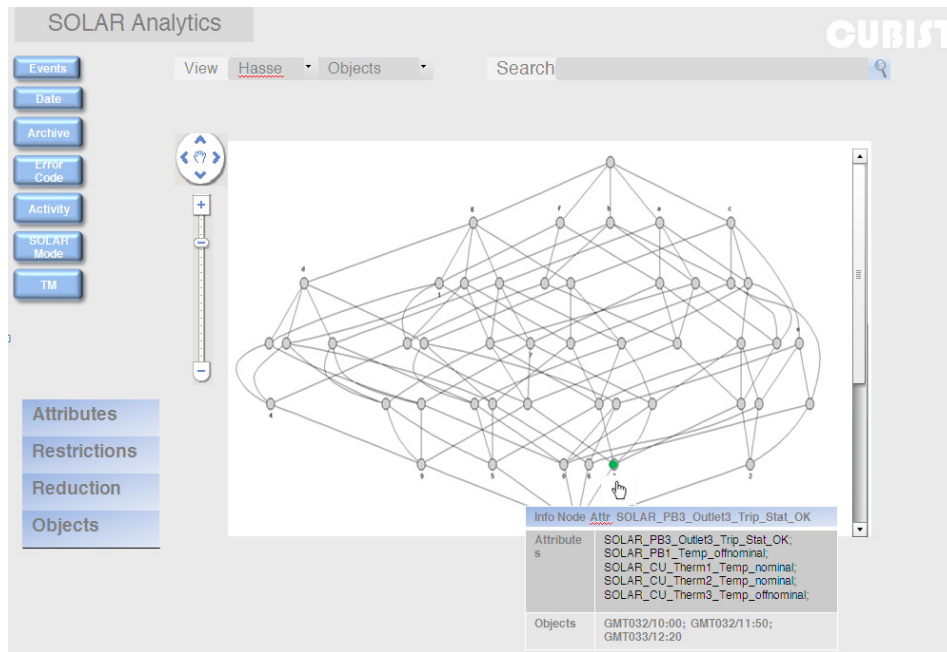


Figure 11: SOLAR Analytics Visualisation

In case the operator would like to analyse a dataset with a high number of attributes a different visualisation through scaling might be useful.

2.4 Predefined datasets

For SOLAR operations, it would be useful to already have some predefined data sets available, so that the operator can always use these as a starting point and then further tailor it following his needs. These will then be immediately accessible from the main page:

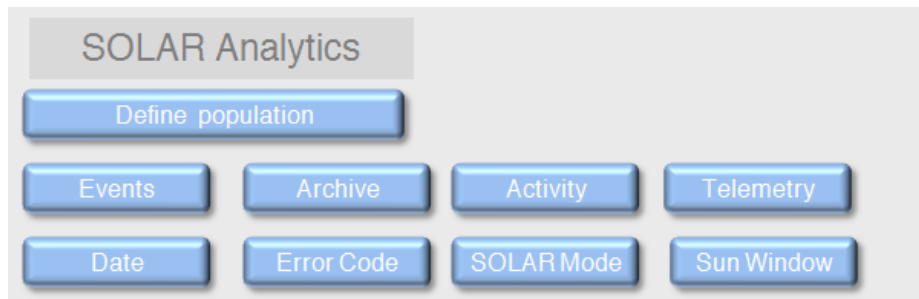


Figure 12: SOLAR Analytics predefined subsets

The user can then select one of the predefined contexts under the already provided structure

At this stage we already have some typical examples:

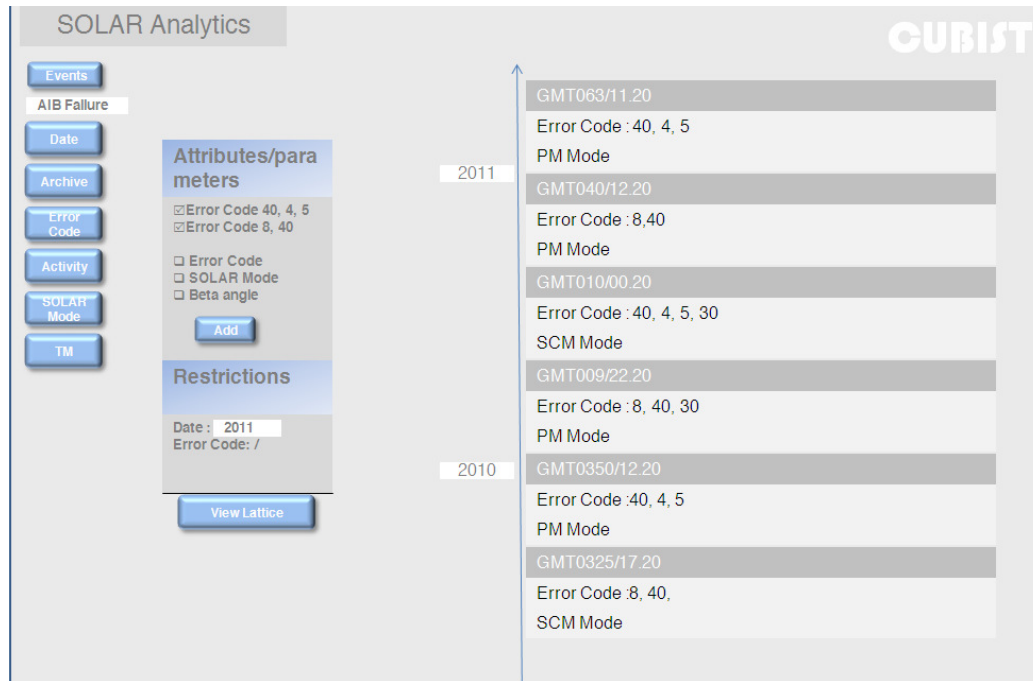
- Events: Typically a combination of errors. For example the AIB failure, having errors 40, 4, 5 or 8, 40 subsequently. Only the set of objects with those attributes shall be considered.
- Archive (TBC): using the archive as a dataset itself

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- **Activity:** The user can provide a typical activity which will then withhold all objects when that activity was running
- **Telemetry:** only takes into account the SOLAR telemetry and not the other datasets
- **Date:** These refer to special GMT dates where a special event or failure was experienced
- **Error Code:** User can take into account objects (or object within a predefined interval of time) with a specific Error Code was issued.
- **SOLAR Mode:** User can choose to look for objects restricted to those in a specific SOLAR modes (Set Up and Configuration mode, Pointing Mode, Stand-by Mode)
- **Sun Window:** This refers to a specific periods in time of the SOLAR operations. The so-called Sun Visibility Windows are the period where Sun observation is possible.

For SOLAR operations it might even be that each operator within the SOLAR Ops team will generate and save his/her personal context.

Clicking on one of the buttons will generate the list of already saved contexts where the user can select one to generate the overview with all the objects compliant to these attributes:



**Figure 13 SOLAR Analytics Predefined Subsets preview**

Note that for a great amount of objects and attributes, the overview can be shown in a different format, such as a matrix ( Fig. 6)

A box requesting for additional attributes (possibly with suggestions based on previous analysis) and the restrictions, will allow the user to further tailor the required context and generate the lattice diagram.

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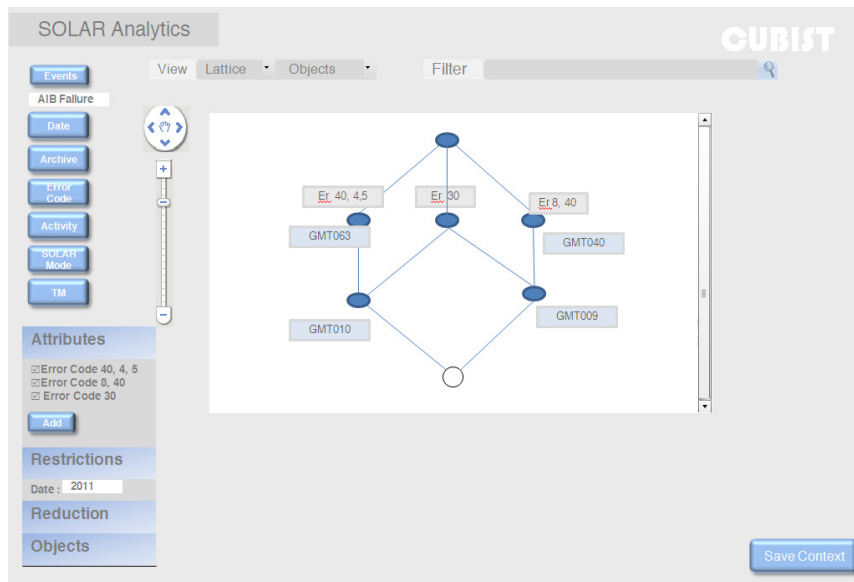


Figure 14 SOLAR Analytics Main Page



Reference : CUBIST-SA-D812  
Version : Issue 1.2.0  
Date : 10-Jun-2011  
Page : 1

**Initial Mockup** (Space Control Centres)

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## **Appendix A Screenshots Initial Mockup Space Control Centres**

This appendix provides the PowerPoint presentation created in order to draft the initial mockup

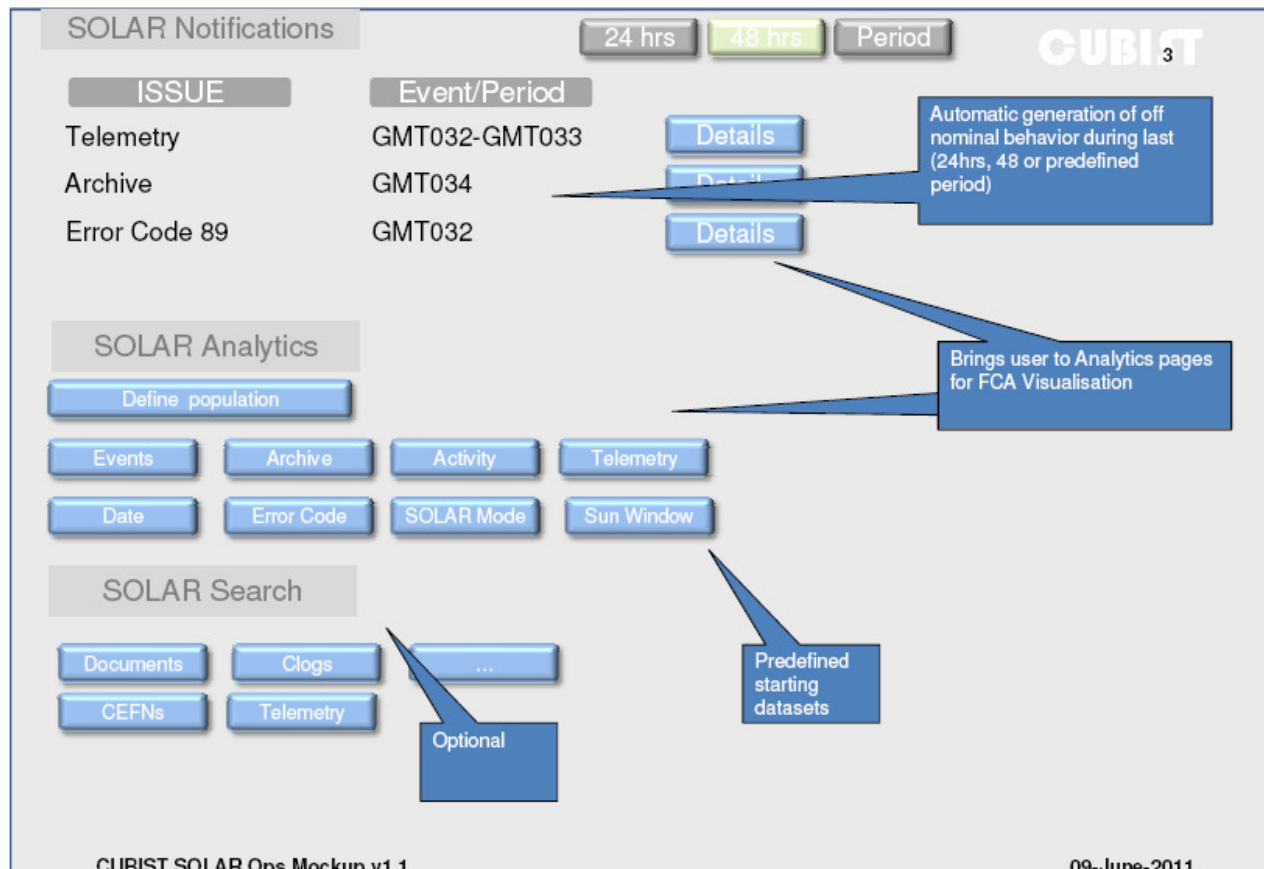
## Space Applications Services CUBIST SOLAR Ops Mockup

09-June-2011  
Issue 1.1.0

Initial Mockup (Space Control Centres)

Different color coding in case of notifications

Initial Mockup (Space Control Centres)



The screenshot displays the CUBIST 3 interface with the following sections and callouts:

- SOLAR Notifications:**
  - Buttons: 24 hrs, 48 hrs, Period
  - ISSUE: Telemetry, Archive, Error Code 89
  - Event/Period: GMT032-GMT033, GMT034, GMT032
  - Buttons: Details (for each event)
  - Callout: "Automatic generation of off nominal behavior during last (24hrs, 48 or predefined period)" points to the Details buttons.
- SOLAR Analytics:**
  - Buttons: Define population, Events, Archive, Activity, Telemetry, Date, Error Code, SOLAR Mode, Sun Window
  - Callout: "Brings user to Analytics pages for FCA Visualisation" points to the Sun Window button.
- SOLAR Search:**
  - Buttons: Documents, Clogs, ... (Optional), CEFNs, Telemetry
  - Callout: "Optional" points to the ... button.
  - Callout: "Predefined starting datasets" points to the Sun Window button.

CUBIST 3 logo is visible in the top right corner of the interface.

Initial Mockup (Space Control Centres)

SOLAR Analytics Population
CUBIST

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Time	SOLAR_P B3_Outlet 1_Trip_Stat	SOLAR_P B3_Outlet 2_Trip_Stat	SOLAR_P B3_Outlet 3_Trip_Stat	SOLAR_P B3_Outlet 4_Trip_Stat	SOLAR_A nciillary_Stat	SOLAR_P B1_Stat	SOLAR_P B1_Temp	SOLAR_P B2_Temp	SOLAR_C U_Therm 1_Temp	SOLAR_C U_Therm 3_Temp
GMT32/00:00:01	OK	OK	OK	OK	OK	OK	12.3	13.7	24.3	25.1
GMT32/00:00:02	OK	OK	OK	OK	OK	OK	12.3	13.6	24.3	25.1
GMT32/00:00:03	OK	OK	OK	OK	OK	OK	12.4	13.6	24.2	25.0
GMT32/00:00:04	OK	OK	OK	OK	OK	OK	12.6	13.5	24.2	25.0
GMT32/00:00:05	OK	OK	OK	OK	OK	OK	12.8	13.6	24.2	25.0
GMT32/00:00:06	OK	OK	OK	OK	OK	OK	12.9	13.6	24.2	25.0
GMT32/00:00:07	OK	OK	OK	OK	OK	OK	12.7	13.6	24.1	25.1

Create formal Context
Main Page

CUBIST SOLAR Ops Mockup v1.1
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Initial Mockup (Space Control Centres)

SOLAR Analytics
CUBIST

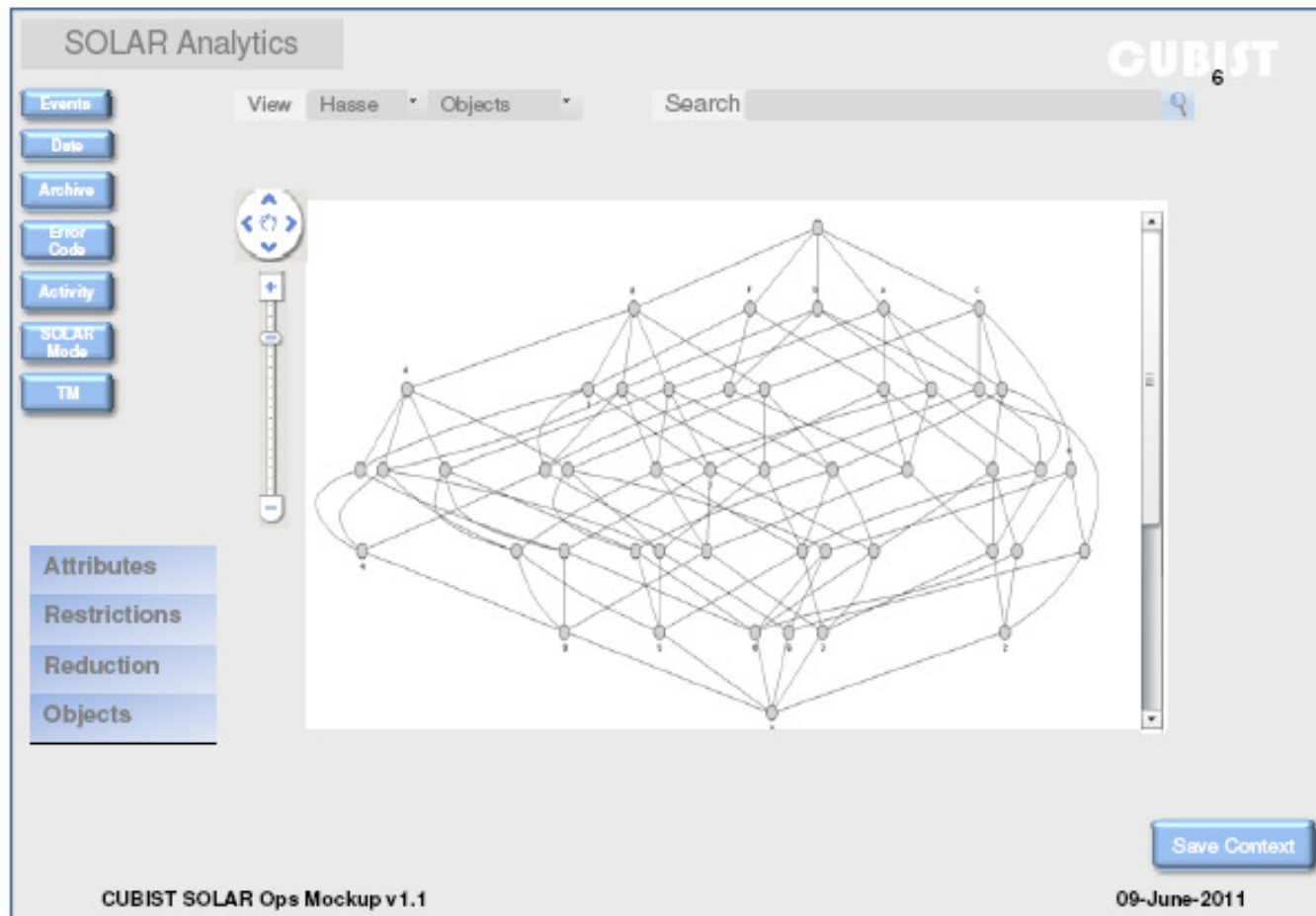
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Time	SOLAR_P B3_Outlet 1_Trip_St at_OK	SOLAR_P B3_Outlet 1_Trip_St at_OK	SOLAR_P B3_Outlet 3_Trip_St at_OK	SOLAR_P B3_Outlet 4_Trip_St at_OK	SOLAR_A ncillary_St at_OK	SOLAR_P B1_Stat_ OK	SOLAR_P B1_Temp_ _nominal	SOLAR_P B1_Temp_ _offnomin al	SOLAR_C U_Therm1 _Temp_no minal	SOLAR_C U_Therm _Temp
GMT32/00:00:01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:40	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:00:50	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:00	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GMT32/00:01:10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:20	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:30	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:01:40	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
GMT32/00:01:50	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:02:00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
GMT32/00:02:10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

View Lattice
Save Context
Main Page
Back to Population

CUBIST SOLAR Ops Mockup v1.1

09-June-2011

Initial Mockup (Space Control Centres)



Initial Mockup (Space Control Centres)

SOLAR Analytics
CUBIST 7

Events
Date
Archive
Error Code
Activity
SOLAR Mode
TM

View
Hasse
Objects

Search

Attributes
Restrictions
Reduction
Objects

Info Node Attr SOLAR_PB3_Outlet3_Trip_Stat_OK	
Attribute s	SOLAR_PB3_Outlet3_Trip_Stat_OK; SOLAR_PB1_Temp_offnominal; SOLAR_CU_Therm1_Temp_nominal; SOLAR_CU_Therm2_Temp_nominal; SOLAR_CU_Therm3_Temp_offnominal;
Objects	GMT032/10:00; GMT032/11:50; GMT033/12:20

Save Context

CUBIST SOLAR Ops Mockup v1.1
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Initial Mockup (Space Control Centres)

The screenshot displays the 'SOLAR Analytics' interface. At the top left, the 'spaceapplications SERVICES' logo is visible. The main header area includes the 'CUBIST' logo with a small '8' below it, and a search bar containing the text 'SOLAR PB3 Outlet: NOK; SOLAR\_PB1\_temp\_NOK'. Below the search bar, there are dropdown menus for 'View' (set to 'Hasse') and 'Objects'. On the left side, a vertical toolbar contains buttons for 'Events', 'Date', 'Archive', 'Error Code', 'Activity', 'SOLAR Mode', and 'TM'. Below these buttons is a section with 'Attributes', 'Restrictions', 'Reduction', and 'Objects' tabs. The central area features a complex network graph with numerous nodes and connecting lines. A blue callout box with a pointer highlights a node in the graph, containing the text: 'User can 'highlight' attributes by filtering or by clicking on the node. Plus the possibility to further search on that those re-initiating the process'. At the bottom right, there is a 'Save Context' button and the date '09-June-2011'. The bottom left corner of the interface shows the text 'CUBIST SOLAR Ops Mockup v1.1'.

Initial Mockup (Space Control Centres)

SOLAR Analytics CUBIST 9

Events View Hasse Objects Search

Date  
Archive  
Error Code  
Activity  
SOLAR Mode  
TM

SOLAR PB3 Outlet: NOK;  
SOLAR\_PB1\_temp\_NOK

Attributes  
Restrictions  
Reduction  
Objects

CUBIST SOLAR Ops Mockup v1.1 Save Context  
09-June-2011

**Initial Mockup (Space Control Centres)**

SOLAR Analytics CUBIST 10

View Hasse Objects Search

Events  
Date  
Archive  
Error Code  
Activity  
SOLAR Mode  
TM

Attributes

- SOLAR PB3 outlet 3 Stat NOK
- SOLAR PB1 temp NOK
- SOLAR PB# outlet 4 Stat NOK
- SOLAR CU Therm 4 CU Stat NOK
- SOLAR CU Stat OK

Restrictions  
Reduction  
Objects

CUBIST SOLAR Ops Mockup v1.1 Save Context 09-June-2011

Initial Mockup (Space Control Centres)

SOLAR Analytics
CUBIST 11

Events
Date
Archive
Error Code
Activity
SOLAR Mode
TM

View
Hasse
Objects

Search

**Attributes**

- SOLAR\_PB3 outlet
- 3 Stat NOK
- SOLAR\_PB1 temp NOK
- SOLAR\_PB# outlet
- 4 Stat NOK
- SOLAR\_CU Therm

Add

HK TM	PP TM	SoIAC ES	SOL SPE C	H&S
<input type="checkbox"/>		SOLAR_PL_Op_Mode		
<input type="checkbox"/>		SOLAR_PL_Submode		
<input type="checkbox"/>		SOLAR_Error_Code		
<input type="checkbox"/>		SOLAR_SSA_Temp		
<input type="checkbox"/>		SOLAR_PB3_Temp		
<input type="checkbox"/>		SOLAR_MM_T1		
<input type="checkbox"/>		SOLAR_MB_T2		
<input type="checkbox"/>		SOLAR_SOVIM_Temp		
<input type="checkbox"/>		SOLAR_SOLSPEC_Temp		
<input type="checkbox"/>		SOLAR_Solaces_Temp		
<input type="checkbox"/>		SOLAR_SOVIM_S_Stat		
<input type="checkbox"/>		SOLAR_SOVIM_D_Stat		
<input type="checkbox"/>		SOLAR_SOVIM_Cover_SPM1_Stat		
<input type="checkbox"/>		SOLAR_SOVIM_Cover_SPM2_Stat		
<input type="checkbox"/>		SOLAR_SOVIM_Cover_PM06V1_Stat		

**Restrictions**

**Reduction**

**Objects**

Save Context

CUBIST SOLAR Ops Mockup v1.1
09-June-2011

Initial Mockup (Space Control Centres)

SOLAR Notifications

24 hrs

48 hrs

Period

CUBIST

ISSUE	Event/Period	
Telemetry	GMT032-GMT033	<a href="#">Details</a>
Archive	GMT034	<a href="#">Details</a>
Error Code 89	GMT032	<a href="#">Details</a>

SOLAR Analytics

Events \*

Define population

Events

Archive

Activity

Telemetry

Date

Error Code

SOLAR Mode

Sun Window

Documents
Clogs
...

CEFNs

Telemetry

CUBIST SOLAR Ops Mockup v1.1

09-June-2011



Initial Mockup (Space Control Centres)

SOLAR Analytics
CUBIST 13

**Events**

AIB Failure

Date

Archive

Error Code

Activity

SOLAR Mode

TM

**Attributes/parameters**

Error Code 40, 4, 5  
 Error Code 8, 40

Error Code  
 SOLAR Mode  
 Beta angle

Add

2011

GMT063/11.20  
 Error Code : 40, 4, 5  
 PM Mode

GMT040/12.20  
 Error Code : 8,40  
 PM Mode

GMT010/00.20  
 Error Code : 40, 4, 5, 30  
 SCM Mode

GMT009/22.20  
 Error Code : 8, 40, 30  
 PM Mode

2010

GMT0350/12.20  
 Error Code :40, 4, 5  
 PM Mode

GMT0325/17.20  
 Error Code :8, 40,  
 SCM Mode

**Restrictions**

Date : 2011  
 Error Code: /

View Lattice

Initial Mockup (Space Control Centres)

SOLAR Analytics
CUBIST 14

View Lattice ▾ Objects ▾
Filter

**Events**

AIB Failure

Date

Archive

Error Code

Activity

SOLAR Mode

TM

---

**Attributes**

Error Code 40, 4, 5

Error Code 8, 40

Error Code 30

Add

---

**Restrictions**

Date : 2011

---

**Reduction**

---

**Objects**

+

-

Save Context

CUBIST SOLAR Ops Mockup v1.1

09-June-2011



Reference : CUBIST-SA-D812  
Version : Issue 1.2.0  
Date : 10-Jun-2011  
Page : 16

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**Initial Mockup** (Space Control Centres)

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