



Test Viewer SGSE Specification

Ref: ROC-TST-GSE-SPC-00012-LES
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SOLAR ORBITER



RPW Operation Centre

Test Viewer SGSE Specification

ROC-TST-GSE-SPC-00012-LES
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CLASSIFICATION

PUBLIC



RESTRICTED



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Change Record

Issue	Rev.	Date	Authors	Modifications
01	00	06/04/2016	X.Bonnin	First release

Acronym List

Acronym	Definition	Acronym	Definition
ROC	RPW Operation Centre	TBD	To Be Determined
SGSE	Software Ground Segment Equipment	TBC	To Be Confirmed
EGSE	Electric Ground Segment Equipment	TBW	To Be Written
TM	Telemetry	IDB	Instrument DataBase
TC	Tele Command	DPU	Digital Processing Unit
HK	House Keeping	S/W	Software
CDF	Common Data Format	CSV	Comma Separated Values
ISTP	International Solar Terrestrial Physics	GUI	Graphical User Interface
XML	EXtensible Markup Language	WS	Web Services
MEB	Main Electronic Box	TAP	Table Access Protocol
I/F	Interface		



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1 GENERAL

1.1 Scope of the Document

This document describes the specifications of the Test Viewer SGSE (TV-SGSE), a software (S/W) application dedicated to the visualization of the RPW data produced during on-ground calibration tests at system level.

The Test Viewer is one the main component of the ROC SGSE [RD4], to be developed, delivered and maintained by the RPW Operation Centre [RD1].

The TV-SGSE specifications are based on the requirements listed in [AD1] and [AD2]. A detailed description of the ROC-SGSE architecture can be found in [RD4].

1.2 Applicable Documents

This document responds to the requirements of the documents listed in the following table:

Mark	Reference/Iss/Rev	Title of the document	Author s	Date
AD1	ROC-TST-GSE-SWU-00003-LES/1/1	RPW Calibration Data Visualization User Requirements	Xavier Bonnin	10/02/2015
AD2	SOLO-RPWSY-PT-1235-CNES/01/00	RPW Instrument Calibration Plan	Milan Maksimovic	11/12/2014
AD3				
AD4				

1.3 Reference Documents

This document is based on the documents listed in the following table:

Mark	Reference/Iss/Rev	Title of the document	Author s	Date
RD1	ROC-GEN-SYS-PLN-00002-LES/01/01	RPW Operation Centre Concept and Implementation Requirements Document (CIRD)	Yvonne de Conchy	26/10/2015
RD2	ROC-GEN-SYS-PLN-00015-LES/00/00	ROC Software Development Plan	Xavier Bonnin	23/12/2014
RD3	ROC-OPS-PIP-NTT-00008-LES/01/00	RPW Engineering Guidelines	Xavier Bonnin	01/10/2014
RD4	ROC-TST-GSE-SPC-00004-LES/0/2	ROC SGSE Description	Xavier Bonnin	01/10/2014
RD5	RPW-SYS-MEB-GSE-SPC-00125-LES/01/01	MEB GSE Description	L. Gueguen	26/11/2012
RD6	cdf35ifd.pdf	CDF Internal Format Description	NASA/	25/09/2012



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			GSFC	
RD7	ROC-TST-GSE-SUM-00035-LES/0/0	Plugin Oriented Pipeline framework for Python (POPPy) framework	M.Duarte	24/11/2015



3 SOFTWARE ENVIRONMENT

3.1 Hardware requirements

TV-SGSE requires at least the following configuration to run correctly:

- CPU clock rate of TBD GHz
- TBD Mbytes of RAM
- TBD Mbytes of free space on the disk.

3.2 Software requirements

TV-SGSE is developed in Python X.Y using the following modules:

- PyQt Version X.Y
- SQLAlchemy Version X.Y

It has been tested on TBD operating system.

4 SOFTWARE ARCHITECTURE

The TV-SGSE will be designed using the Model-View-Controller (MVC) pattern. The architecture is based on the POPPy framework [RF7].

5 GRAPHICAL USER INTERFACE DESIGN

This section describes the main components of the graphical user interface (GUI) of the TV-SGSE. It corresponds to the view part of the

5.1 Main window

Figure TBD shows the organisation of the GUI main window. This latter is divided into five frames:

- The data visualization frame
- The test selection frame
- The data inspector frame
- The options frame
- The data selection frame

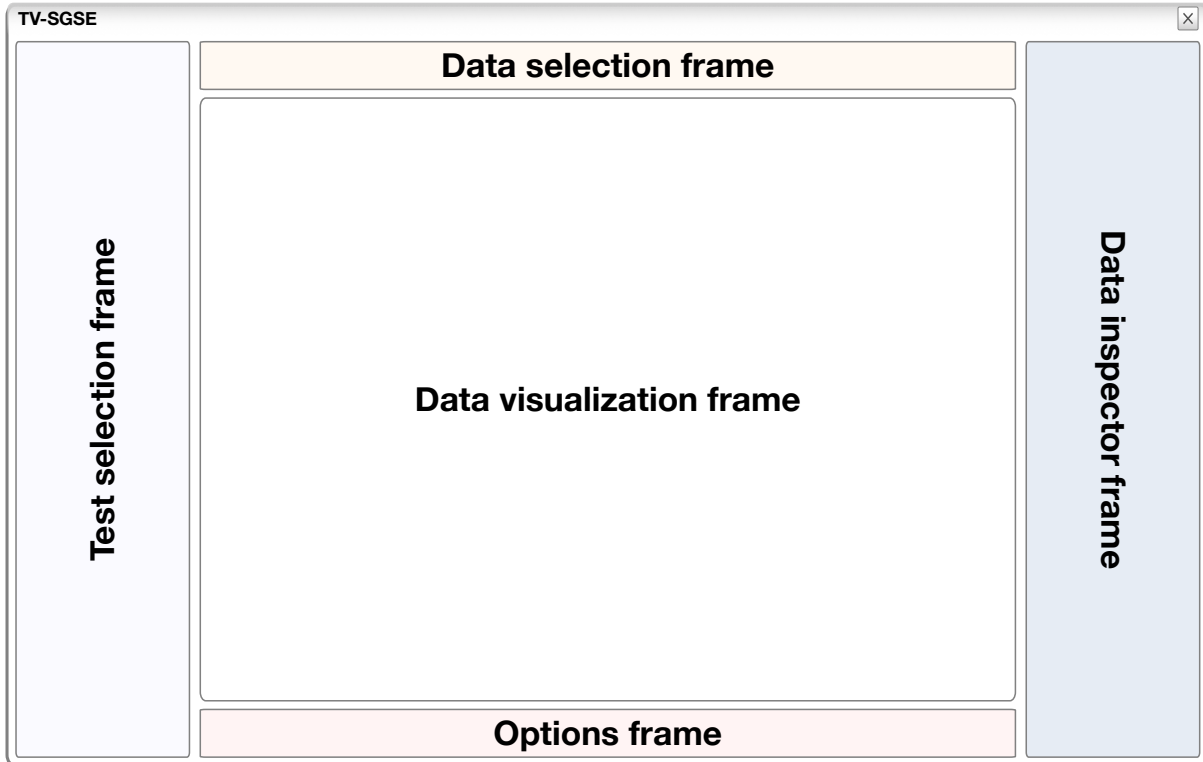


Figure 1. TV-SGSE main window organization.

These five frames are described in more details in the next sections.

5.1 Test selection frame

This frame is used to select the input tests to be loaded by the S/W. It is composed of the “Test selection” panel displayed on the figure 2.



Test selection

Selection criteria

Test name:

Starttime: Endtime:

TNR HFR TDS LFR BIA SCM PA

Config: Temp: Run:

Available tests

PRC-000734-001-02_Normal_Param5_TNR_Config_LogTHR_2

PRC-000735-001-02_Normal_Param5_TDS_Config_LogTDS_3

PRC-000134-001-02_Normal_Param6_TDS_Config_LogTDS_2

PRC-000234-001-02_Normal_Param6_TNR_Config_LogTHR_4

Information about the test

Figure 2. Test management frame.

The frame allows users to select a given test by giving the name of the test, or by defining a time range with “Starttime” and “Endtime” fields, and/or filtering using criteria (e.g., TNR, HFR, Configuration, Temperature, Run). The “Get selection” and the “Reset” buttons permits respectively to display the list of available tests and to reset the selected criteria. If no criterion is selected, pressing the “Get selection” will return the complete list of tests available in the GT-SGSE database.

The “Available tests” board will display the list of tests that matches the selection criteria. Users can then select one test in the list and load it by clicking on “Load test” button.

When the “Load test” button is pressed, the S/W will load metadata about the selected test and open a new empty tab in the data visualization frame.



The “Update database” button permits to update the database content, by checking if new tests that match the criteria are available in the MEB GSE database. If new tests are found, a pop-up window shall be created providing information about new tests (e.g., number, size, etc.) and allowing users to confirm the database update or not. The date and time of the last database update shall be indicated TBD.

5.2 Data selection frame

This frame will allow users to select between the different categories of RPW sub-systems and type of data available in the loaded test.

It will compose of two levels of tabs:

- A tab for selecting the categories of data to view (e.g., data, status, statistics, etc.)
- A tab for selecting the sub-items relative to the data categories (e.g., RPW sub-systems)

5.2.1 DATA tab

The “DATA” allows users to select and view the data produced during the test, namely: RPW TM/TC packet data, including science data in raw and engineering units, stimuli data. In complement with the Data inspector, users can handle and plot selected data.

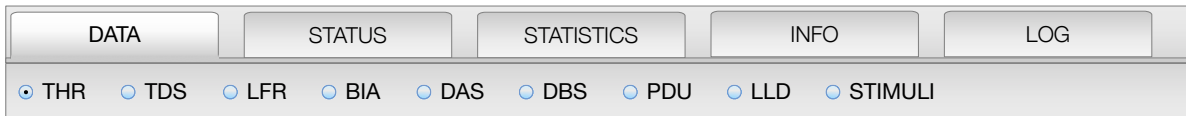


Figure 3. DATA tab.

5.2.2 STATUS tab

The “STATUS” tab permits to check the system status (e.g., ON/OFF, warning, etc.)

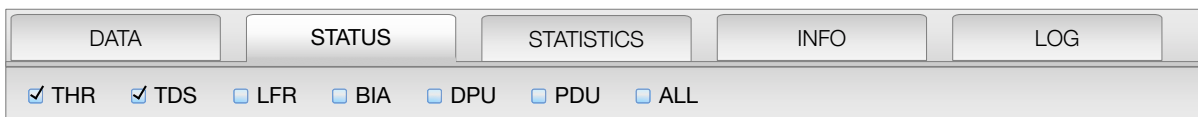


Figure 4. STATUS tab.

5.2.3 STATISTICS tab

The “STATISTICS” tab provides statistics about the test data. Especially, it allows users to view the list of events produced during a test.

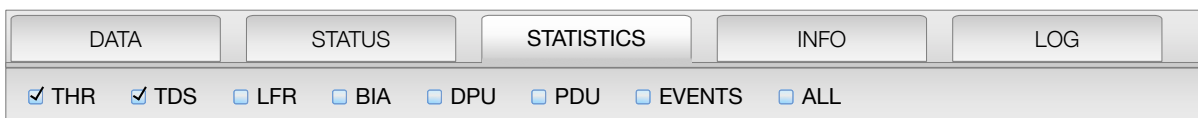


Figure 5. STATISTICS tab.

5.2.4 INFO tab

The “INFO” tab provides general information about the test, but also about the IDB and the GT-SGSE.



Figure 6. INFO tab.

5.2.5 LOG tab

The “LOG” tab contains a console printing a history of the GT-SGSE and TV-SGSE activities.

5.3 Data inspector frame

The data inspector shall allow users to refine the data selection to be viewed for a given test. Its content shall depend on the tab selections made by users in the Data selection frame.

5.3.1 Coupled with the “DATA” tab

If one of the “DATA” tab items in the Data selection frame is selected, the data inspector shall switch on the following tabs:

- A “Packet browser” tab to filter the packet data “manually” from several criteria (e.g., type of packet: TM or TC, category of packet: HK, Science, Calibration, process and error event reports, TC verif., memory management, tests, etc.) as illustrated on the figure 7.
- A “ForeignGSE tool” tab that offers the same main functionalities in terms of data handling than the corresponding foreign GSE.
- A “Scenario loader” tab that permits to load pre-defined data selection and plotting scenarios saved in specific format files. This tab is showed on the Figure 8.



Packet Browser ForeignGSE tool Scenario loader

Packet Browser

Selection criteria

Packet name:

TM TC HK Science Event reporting Configuration

TC verification Memory Management Time Management Test

Available packets & parameters

▶ TC_THR_ENABLE_SCIENCE	↑	HK_THR_CPU_LOAD
◀ TM_THR_HK	→	HK_THR_CPU_LOAD_MAX
HK_THR_CPU_LOAD	→	HK_THR_CPU_LOAD_AVE
HK_THR_CPU_LOAD_MAX	←	
HK_THR_CPU_LOAD_AVE	←	
HK_THR_SEQ_POS	↓	

Short description of the packet or parameter

Figure 7. Packet browser tab.



Packet browser ForeignGSE tool Scenario loader

Scenario loader

Selection criteria

Name:

Author:

Creation date:

Tags: TDS
 LFR
 Science
 RSWF

Available scenarios

- TV-SGSE_S00001_PRC-000735_Config2_V1.json
- TV-SGSE_S00002_PRC-000737_Config2_V1.json**
- TV-SGSE_S00010_PRC-000001_Config4_V5.json
- TV-SGSE_S00101_PRC-000740_Config2_V1.json

Short description of the scenario

Figure 8. Scenario loader tab.



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Packet Browser ForeignGSE tool Scenario loader

ForeignGSE tool

LFR

Waveforms normal burst sbm1 sbm2

Snapshot Continuous

F0 F1 F2

V E1 E2 B1 B2 B3

Spectral matrices normal burst sbm1 sbm2

F0 F1 F2 Element: E1E1
 E2E2
 B1B1

Spectrum: Single Dyn.

Basic parameters normal burst sbm1 sbm2

F0 F1 F2 BP1: PE
 PB
 ELLIP

BP2: CROS_I
 CROS_
 AUTO_

PDU

DPU

BIA

THR

TDS

Reset Select all Plot data



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- Packet Browser
- ForeignGSE tool
- Scenario loader

ForeignGSE tool

TDS [-]

HF snapshots

normal burst sbm1 sbm2

Band: A B C D Channel: 1 2

AGC Auto Cross Phase Power

Histograms

Low rate information

LFR redundant mode

PDU [+]

DPU [+]

BIA [+]

LFR [+]

THR [+]

Reset Select all Plot data



Packet Browser ForeignGSE tool Scenario loader

ForeignGSE tool

THR

TNR

normal burst sbm1 sbm2

Band: A B C D Channel: 1 2

AGC Auto Cross Phase Power

HFR

normal burst sbm1 sbm2

HF1 HF2 Channel: 1 2

PDU

DPU

BIA

LFR

TDS

Reset Select all Plot data

5.3.1 Coupled with the “STATISTICS” tab

If one of the “STATISTICS” tab items in the Data selection frame is selected, the data inspector shall switch on the following tabs:

- A “Packet browser” tab to filter the packet data “manually” from several criteria (e.g., type of packet: TM or TC, category of packet: HK, Science, Calibration, process and error event reports, TC verif., memory management, tests, etc.)



5.4 Data visualization frame

This frame is dedicated to visualize data and information using graphics or tables (hereafter called plots for more convenience).

5.4.1 Test tabs

When a test is loaded using the test selection panel, it creates a new tab in the data visualization frame. This tab area will contain the windows to view test data. A tab can be closed using the dedicated button as shown in the figure 9.

5.4.2 Plot window

Each time users create a new plot, a new window containing this plot is open inside the current tab.





Figure 9. Example of a graphics window inside the data visualization frame.

More than one window can be open. In this case the GUI will automatically organize the tab in such a way all of the generated windows fit the available area, as illustrated on the figure10. The window index starting at 1 is incremented each time a new window is open (this is true regardless of which tab users are in). The contour of the active window shall be highlighted to be distinguishable from the others. To make a window active, users just have to click on it with the mouse left button.

3 types of action can be done on an open window:

- It can be closed using the button on the upper right.



- It can be reduced using the button  on the upper right. In this case, the window appears as a simple bar at the bottom of the frame and can be expanded using the  button.
- It can be extracted from the frame. In this case, the resulting pop-up window can be freely and independently moved and resized on the screen. It can also be enclosed again in the visualization frame by clicking on the button on the upper right corner of the window.

A window of graphical data is able to display the following information:

- A main title
- X-axis including labels, tick and title
- Y-axis including labels, tick and title
- A legend
- The cursor position on the plot in the X-Y units. This feature only works if the current window is active.
- If the plot is an image (e.g., dynamical spectrum), a colour bar providing the intensity scale.
- A grid along X- and or Y-axis.

Some of these features can be controlled from the “Options frame”.

A window of tabular data is able to display the following information:

- A main title
- Columns well separated and with the name in the first row.
- When the table is large, two scroll bars to go down-up or left-right.

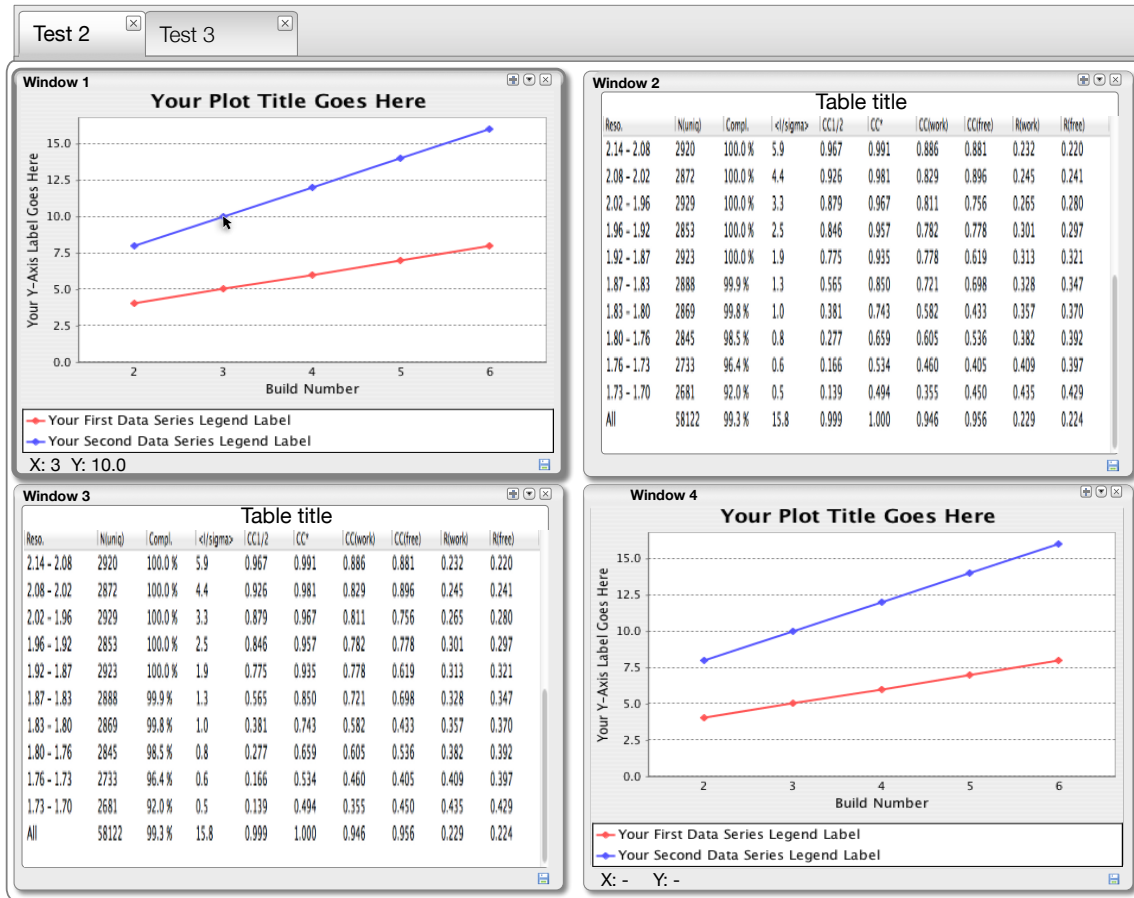


Figure 10. Example of several windows in the data visualization frame.

5.4.1 Status window

The status window gives the general status of the instrument and the sub-systems for a test.

5.4.2 Statistics window

The Statistics window gives statistical data about the test packets (e.g., number of TM+TC, number of type of packets in a test, etc.)

5.4.3 Info window

The Info Window provides information about the test(s) loaded.

5.4.4 Log window

The Log Window displays the messages returned by the ROC-SGSE log in real-time

5.5 Options frame

This frame provides options concerning the data visualization. Depending of the data, it permits to:

- Select between tabular or graphical view
- Change the units of the x- and/or y-axis
- Change the scale of the x- and/or y-axis (i.e., log or linear scale)



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- Plot a given range along x- and/or y-axis by performing a zoom (a reset button should be available).

5.6 Menu bar

The menu bar is composed of the following items:

- About
- Help

5.6.1 About

The “About” sub-menu gives general information about the TV-SGSE S/W, such as the release version number and date, the team or person in charge with a valid email address, copyrights, link to the RPW web portal.

5.6.2 Help

The “Help” sub-menu provides a link to the help menu: typically the (online?) S/W user manual, as well as contacts of the developer team.



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6 DISTRIBUTION LIST

<p style="text-align: center;">LISTS</p> <p>See Contents lists in “Baghera Web”: Project’s informations / Project’s actors / RPW_actors.xls and tab with the name of the list or NAMES below</p>	Tech_LESIA
	Tech_MEB
	Tech_RPW
	[Lead-]Cols
	Science-Cols

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LESIA CNRS		

LESIA CNRS		

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