



## Rapporti Tecnici INAF INAF Technical Reports

<b>Number</b>	91
<b>Publication Year</b>	2021
<b>Acceptance in OA@INAF</b>	2021-05-31T13:00:05Z
<b>Title</b>	BC-SIM-TN-006 - XML2XLSX - User Manual - Version 1.1.0
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<b>Handle</b>	<a href="http://hdl.handle.net/20.500.12386/30963">http://hdl.handle.net/20.500.12386/30963</a> ; <a href="http://dx.doi.org/10.20371/INAF/TechRep/91">http://dx.doi.org/10.20371/INAF/TechRep/91</a>

# BC-SIM-TN-006

## XML2XLSX - User Manual

### Version 1.1.0

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Revision 0  
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## Approval

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## Document Change Record

Issue	Revision	Date	Affected Pages	Change description

## 1 Introduction

### 1.1 Scope

In this document we will describe the software used to convert the Telecommand history report from XML to XLSX format for the Spectrometers and Imagers for MPO BepiColombo Integrated Observatory SYStem (SIMBIO-SYS).

### 1.2 Reference Document

- [RD.1] BC-SIM-TN-003 – Reports and Notes Layout and Flow (DOI: <http://dx.doi.org/10.20371/INAF/TechRep/36>)
- [RD.2] BC-SIM-GAF-IC-002 - SIMBIO-SYS SOFTWARE INTERFACE CONTROL DOCUMENT - Revision 12
- [RD.3] EGOS-GEN-EDDS-ICD-1001 - EXTERNAL USER INTERFACE CONTROL DOCUMENT (EUICD)

### 1.3 Acronyms

<b>APID</b>	Application Process IDentifier
<b>CSV</b>	Comma Separated Values
<b>EDDS</b>	EGOS Data Disposition System.
<b>EGOS</b>	ESA Ground Operation System. Infrastructure SCOS-2000.
<b>ESA</b>	European Space Agency
<b>FOP</b>	Flight Operation Plan.
<b>FPA</b>	Focal Plane Assembly
<b>HK</b>	Housekeeping
<b>HRIC</b>	High spatial Resolution Imaging Channel
<b>ME</b>	Main Electronics
<b>NECP</b>	Near Earth Commissioning Phase
<b>PDS</b>	Planetary Data System
<b>PDOR</b>	Payload Direct Operation Request
<b>PE</b>	Proximity Electronics
<b>PNG</b>	Portable Network Graphics
<b>PSC</b>	Packet Sequence Control
<b>SIMBIO-SYS</b>	Spectrometers and Imagers for MPO BepiColombo Integrated Observatory SYStem
<b>SSC</b>	Source Sequence Count
<b>STC</b>	STereo imaging Channel
<b>TC</b>	Telecommand
<b>TM</b>	Telemetry
<b>VIHI</b>	Visible and Hyper-spectral Imaging channel
<b>XML</b>	eXtensible Markup Language

### 1.4 Document Format and Repository

This document is compliant with the SIMBIO-SYS Report and Note Layout and Flow [RD.1] **Errore. L'origine riferimento non è stata trovata.** and will be archived both on the INAF Open Access repository and the SIMBIO-SYS team Archive.

## 2 Software description

The XML2XLSX software is developed in Python 3.6 for the SIMBIO-SYS pipeline environment. Some tests demonstrated that it also works correctly in other LINUX distribution (Ubuntu and Fedora) and macOS (10.15.6 and earlier).

The software analyzes the Telecommand (TC) history report (provided by XXX from EDDS server) and convert it in Excel (XLSX) format.

### 2.1 Usage

The standard usage of the software is

```
$. /XML2XLS input.xml outout.xlsx
```

Where *input.xml* is the TC report downloaded from the EDDS server and *output.xlsx* is the output file in MS Excel format.

The option *-h* could be used for the online help.

### 2.2 Input format

The TC report used as input has two nested structure in the list of TC (*PktTcReportList*): the TC (*PktTcReportListElement*) and the TC parameters, if required, (*PktTcReportParameterList*, list of the parameters, and *PktTcReportParameterListElement*, each parameter). All the TC fields parameters are reported in [RD.3]

### 2.3 Output fields

Only the significant fields and parameters of each TC are reported into the output file.

In the following tables the field name together with its description are listed with the reference column in the output spreadsheet for the TC (see Table 1) and TC parameters (see Table 2).

Field Name	Description	Column
<b>SSC</b>	Source Sequence Counter	A
<b>Command Name</b>	Name of the TC	B
<b>Description</b>	Description of the TC	C
<b>Sequence Name</b>	Name of the TC sequence	D
<b>APID</b>	Application Process Identifier of the TC packet	E
<b>PID</b>	Process Identifier	F
<b>Execution Time</b>	Time of the execution of the TC	G

Table 1: Field for the TCs reported in the output file.

Note that the Execution Time does not represent the execution time by SIMBIO-ME but the execution by the satellite which means that it should be as immediate as possible with the acceptance time of the SIMBIO-ME.

Field Name	Description	Column
Parameter Name	Name of the TC parameter	H
Parameter Description	Description of the parameter	I
Parameter Value	Raw Value of the parameter	J
Parameter Unit	Units of the parameter value	K
Parameter Type	The type of the parameter	L
ParameterRep	Representation of the parameter	M
FixEdit	Flag as to whether this parameter is fixed or editable	N
HasChanged	Flag as to whether this parameter has changed	O
Radix	Radix of the parameter	P
IsEditable	Flag as to whether this parameter is editable	Q
Manually Edited	Flag as to whether this parameter has been manually edited	R

Table 2: Field for the TC parameters reported in the output file.

### 2.3.1 Example

Starting from the following HRIC Science TC an example of the produced output is shown in Figure 2.

SSC	CommandName	Description	Sequence Name	APID	PID	ExecutionTime
30	ZSS17102	SIMB HRIC SCIENCE	ASSF101A	812	50	2019-11-27T05:35:30.000000Z

Figure 1: Example of a TC in the output file.

In Figure 2 is shown the parameters list for the previous TC.

ParameterName	Parameter Description	Parameter Value	Parameter Unit	Parameter Type	Parameter Rep	FixEdit	HasChanged	Radix	isEditable	ManualEditing
PSS01501	integration time	4	ms	Unsigned Int	Raw	false	false	Dec	true	true
PSS01601	repetition time HRIC	200	5ms	Unsigned Int	Raw	false	false	Dec	true	true
PSS01602	NbrAcq	65535		Unsigned Int	Raw	false	false	Dec	true	true
PSS00202	binning factor w2	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00201	binning factor w1	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00301	number of windows	1		Unsigned Int	Raw	false	false	Dec	true	true
PSS00204	binning factor w4	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00203	binning factor w3	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS01101	start row pixel w1	920		Unsigned Int	Raw	false	false	Dec	true	true
PSS00501	start strip pixel w1	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS01102	end row pixel w1	1559		Unsigned Int	Raw	false	false	Dec	true	true
PSS00502	end strip pixel w1	31		Unsigned Int	Raw	false	false	Dec	true	true
PSS01103	start row pixel w2	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00503	start strip pixel w2	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS01104	end row pixel w2	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00504	end strip pixel w2	1		Unsigned Int	Raw	false	false	Dec	true	true
PSS01105	start row pixel w3	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00505	start strip pixel w3	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS01106	end row pixel w3	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00506	end strip pixel w3	1		Unsigned Int	Raw	false	false	Dec	true	true
PSS01107	start row pixel w4	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00507	start strip pixel w4	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS01108	end row pixel w4	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00508	end strip pixel w4	1		Unsigned Int	Raw	false	false	Dec	true	true
PSS00205	Compression box dime	3		Unsigned Int	Raw	false	false	Dec	true	true
PSS00601	Compression ratio w1	32		Unsigned Int	Raw	false	false	Dec	true	true
PSS00602	Compression ratio w2	0		Unsigned Int	Raw	false	false	Dec	true	true
PSS00603	Compression ratio w3	0		Unsigned Int	Raw	false	false	Dec	true	true

Figure 2: Example of the list of parameters for a HRIC science TC.



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## 2.4 Dependencies

The software requires the installation of the following Python libraries:

- argparse
- xlswriter

## 3 History

1.1.0 Fixed bug – TC without parameters was ignored.

1.0.0 Original Version.