



MIB SEQUENCES WHITELISTED FOR VSTP

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APPROVAL

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CHANGE LOG

Reason for change	Issue Nr	Revision Number	Date
First version of the preliminary whitelist based on discussions with instrument teams, for review by MOC	0	1	05/05/2021
Update for PHI and EUI	0	2	29/07/2021

CHANGE RECORD

Issue Number	Revision Number	Date	Pages	Paragraph(s)
0	2			
Reason for change				
EUI whitelist updated with extra sequence AIUF492A, sequence AIUF491A got removed from whitelist. Remove any red text and TBCs in EUI section.		28/07/2021	5	2.1
PHI whitelist updated with extra sequence AIPF213A. The 3 sequences in red still have TBCs and will only be added in later versions of the whitelist.		28/07/2021	6	2.3

DISTRIBUTION

Name/Organisational Unit
Solar Orbiter FCT team, SOC team



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1. INTRODUCTION

Solar Orbiter has a Very-Short-Term Planning cycle that allows refining of some instrument commanding on very short timescales. It is called iVSTP and is restricted to RS windows and their precursor windows.

Instrument commanding at VSTP can only add additional commands to the timeline, there is no deletion of previously loaded commands involved. Also, it is only allowed for a limited set of instrument commands that follow the following rules:

- iVSTP commanding should not modify the resources as checked at STP, nor in terms of data nor for power (ideally also no EMC change),
- iVSTP commanding should not be critical as this is a single-shot operation and a pass may be missed.

In order to ensure the above rules at all times, the VSTP-allowed commanding will be white-listed, coordinated and agreed between the instrument team, MOC and SOC. Note that only sequences that are actually planned to be used during VSTP will be white-listed.

During STP, as part of the STP IORs (and PORs), instrument teams can reserve VSTP slots that can later be filled with extra commanding during the VSTP cycle.

During VSTP, the instrument teams will deliver VSTP IORs to SOC, to be converted into VDORs and delivered to MOC for upload to the S/C.

To ensure a fast turn-around time, SOC will only check that:

- the VSTP IOR is associated to a VSTP slot reserved earlier
- all command sequences in the VSTP IORs are whitelisted
- the number of commands in the VSTP IOR does not exceed the maximum as set in the VSTP reservation
- the sequence durations are fully contained within the pre-reserved VSTP slots

If any of these checks fail, the VSTP IOR will be rejected at SOC.

For the 4th check, SOC asked the teams for a worst-case duration for each whitelisted VSTP sequence. If the onboard activity takes longer than the sequence duration as specified in the MIBs `css.dat` file, then SOC will model the worst-case actual duration as part of the whitelist.

2. VSTP WHITELISTS

The sections below contain a first version of the instrument sequences proposed for VSTP-whitelisting. Note that several of the proposed sequences have some type of mode constraint defined. The instrument mode will however not be checked at SOC side and the instrument teams have been informed that it is their responsibility to make sure the instrument is in the correct mode for the VSTP sequences.

2.1. EUI

Sequence	Short description	(Worst-case) Duration
AIUF260A	DumpMemAbsAddress v06	18432s (*)
AIUF450A	Load Resource Neutral table v04	1s
AIUF451A	Dump Resource Neutral table v03	1s
AIUF453A	Load Resource Altering table v04	1s
AIUF454A	Dump Resource Alter v02	1s
AIUF456A	Load Compression Table v05	1s
AIUF457A	Dump Compression Table v02	1s
AIUF459A	Load Calib Table v04	1s
AIUF460A	Dump Calib Table v02	1s
AIUF462A	Load Event Trig Tab v04	1s
AIUF463A	Dump Event Trigger v02	1s
AIUF465A	Load Jitter Table v04	1s
AIUF466A	Dump Jitter Table v02	1s
AIUF470A	FSI Reg writes v04	1s
AIUF471A	EUV Reg writes v03	1s
AIUF472A	LYA Reg writes v03	1s
AIUF475A	Load bad pixel v02	50 mins (*)
AIUF492A	Change priority v02	90 mins (*)
AIUF501A	Sel gain/offset map v02	24 mins (*)
AIUF503B	Dump bad pixel table v02	1 min (*)
AIUF370A	Ping EUI v04	1s



The sequences with longer duration than specified in the MIB are highlighted with (*). Some actually have a variable duration in which case the worst-case duration is specified. The duration will be declared as part of the whitelist at SOC and taken into account during VSTP IOR processing.

Some of the whitelisted sequences have a long worst-case duration. In several of the cases (e.g. AIUF492A), other commanding can run in parallel, but these sequences will delay any flush commands commanded at STP, which implies that the VSTP window should fully encompass them to make them resource neutral.

2.2. Metis

Sequence	Short description	(Worst-case) Duration
AITF107A	Configures the possible polarisation angles in the visible light channel, without changing their number	1s
AITF370A	Metis connection test	1s

Note that there are several more Metis sequences still under discussion with the instrument team. Some of the originally proposed ones are not fully resource neutral in their current definition and are therefore not covered in this preliminary list.

2.3. PHI

Sequence	Short description	(Worst-case) Duration
AIPF213A	Reset science output buffer TC(21,3): to clear the current science queue	2s (*)
AIPF216A	PHI Schedule Dataset v01: to select different datasets	1min (*)
AIPF217A	PHI consecutive data v02: to select different datasets	TBC (*)
AIPF903A	PHI Select FS Partition v01: if datasets are on a different partition	2s (*)

AIPF706A	PHI Crop Dataset: adapt cropping FOV in case S/C changes pointing	2mins (*)
AIPF710A	PHI Crop multiple Datasets: adapt cropping FOV in case S/C changes pointing	TBC (*)
AIPF704A	PHI pack dataset to 16bits: in case of raw data download	2mins (*)
AIPF709A	PHI Pack Multiple Sets to 16bits: in case of raw data download	TBC (*)
AIPF470A	Set Tip Tilt Offset v01: if S/C changes pointing	5s (*)
AIPF518A	PHI Set CTC ROI v01	10s (*)
AIPF519A	PHI RollShutterOffset v01	10s (*)
AIPF450A	PHI HRT X-Talk Context v01	10s (*)
AIPF451A	PHI HRT Calib Context v01	10s (*)
AIPF452A	PHI FDT X-Talk Context v01	10s (*)
AIPF453A	PHI FDT Calib Context v01	10s (*)
AIPF454A	PHI Compression Context	10s (*)
AIPF455A	PHI Set Proc Env v01	2s (*)
AIPF371A	PHI Connection Test v02	1s

The sequences with longer duration than specified in the MIB are highlighted with (*). Some actually have a variable duration in which case the worst-case duration is specified. The duration will be declared as part of the whitelist at SOC and taken into account during VSTP IOR processing.

For the three sequences in red the worst-case duration is still TBC. They will not be used in the VSTP on-ground tests nor in RS checkout window 4 and will be added in later versions of the whitelist.

2.4. SoloHI

SoloHI will not make use of the VSTP concept for now. We would like to just whitelist the SoloHI connection test listed below.

Sequence	Short description	(Worst-case) Duration
AIHF370A	SOLOHI Perf ConnTest v02	1s

2.5. SPICE

SPICE's main use cases for iVSTP would be to change the position of the slit, either the start position of the raster, or the position of the sit'n'stare observations.

Sequence	Short description	(Worst-case) Duration
AICF435A	Move Scan Mechanism in Closed loop	31s (*)
AICF370A	SPICE Connection Test v01	1s

The sequences with longer duration than specified in the MIB are highlighted with (*).

2.6. STIX

STIX will not make use of the VSTP concept for now. We would like to just whitelist the STIX connection test listed below.

Sequence	Short description	(Worst-case) Duration
AIXF370A	STIX Connection test v01	1s

2.7. IS payload

For now, IS payload is assumed not to take part in iVSTP but we propose to whitelist a connection test sequence for each IS instrument to keep the option open of IS instruments taking part in the on-ground tests or dress rehearsal.

Sequence	Short description	(Worst-case) Duration
AIAF370A	SWA Connection Test v01	1s
AIDF370A	EPD Ping v01	1s
AIMF370A	MAG connection test v01	1s
AIWF370A	RPW ping v02	1s