



Science operations and flight procedures preparation

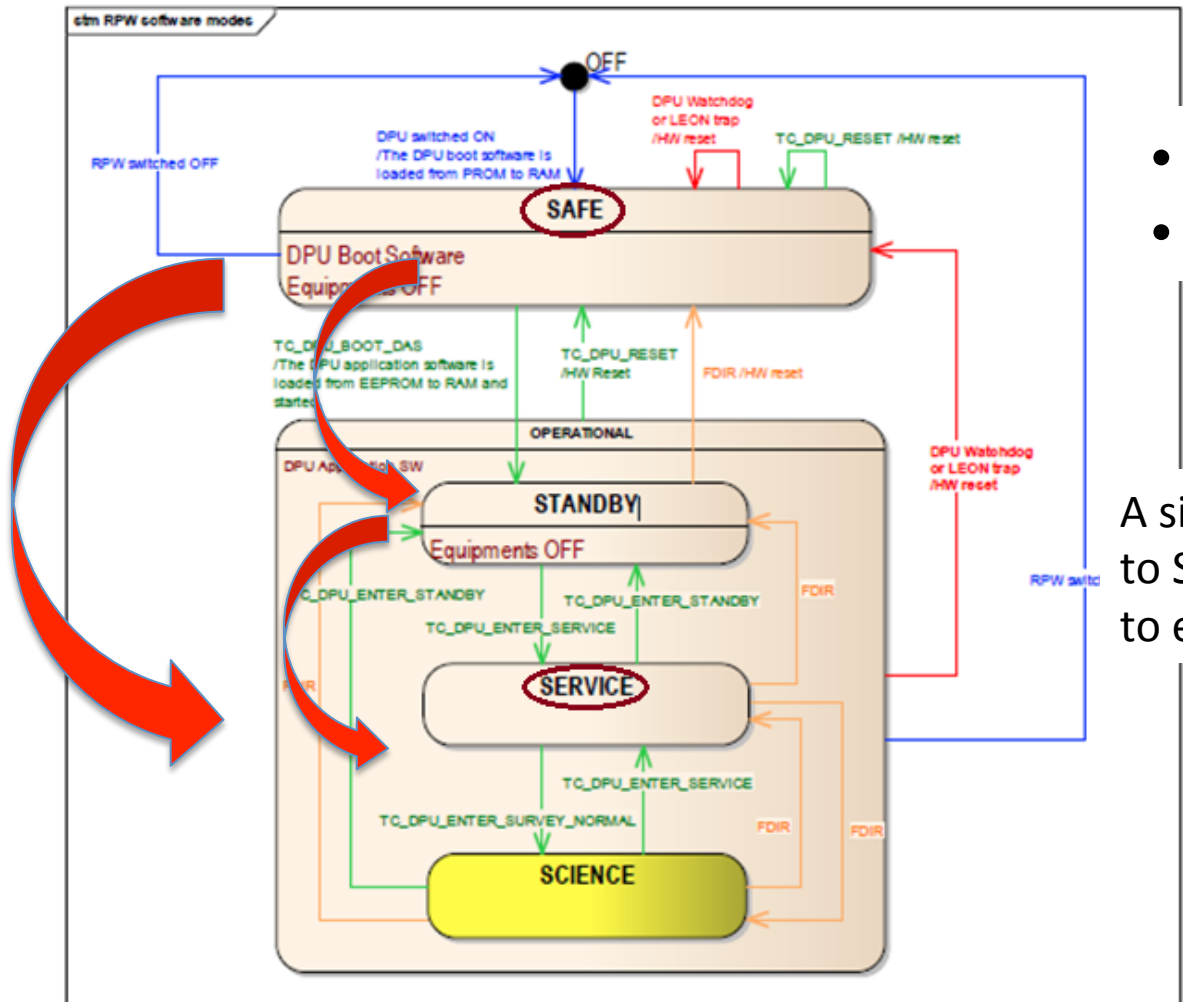
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RPW state model

- RPW Configurations → science default configurations
- RPW Flight Procedures
- RPW Telemetry
- RPW Power Budget

RPW Flight Procedures

<https://confluence-lesia.obspm.fr/display/ROC/RPW+Flight+Procedures>

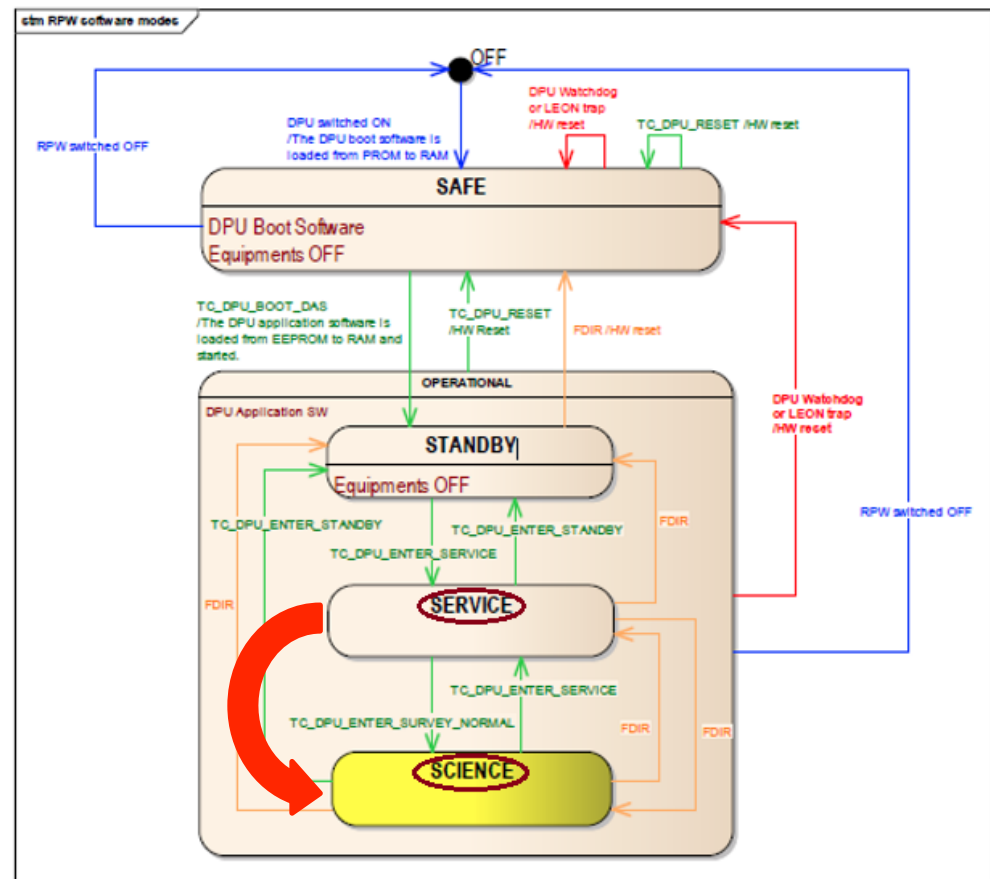


- RPW switch on
- RPW configuration

A single procedure for transition to SERVICE mode (from standby to equipments on)

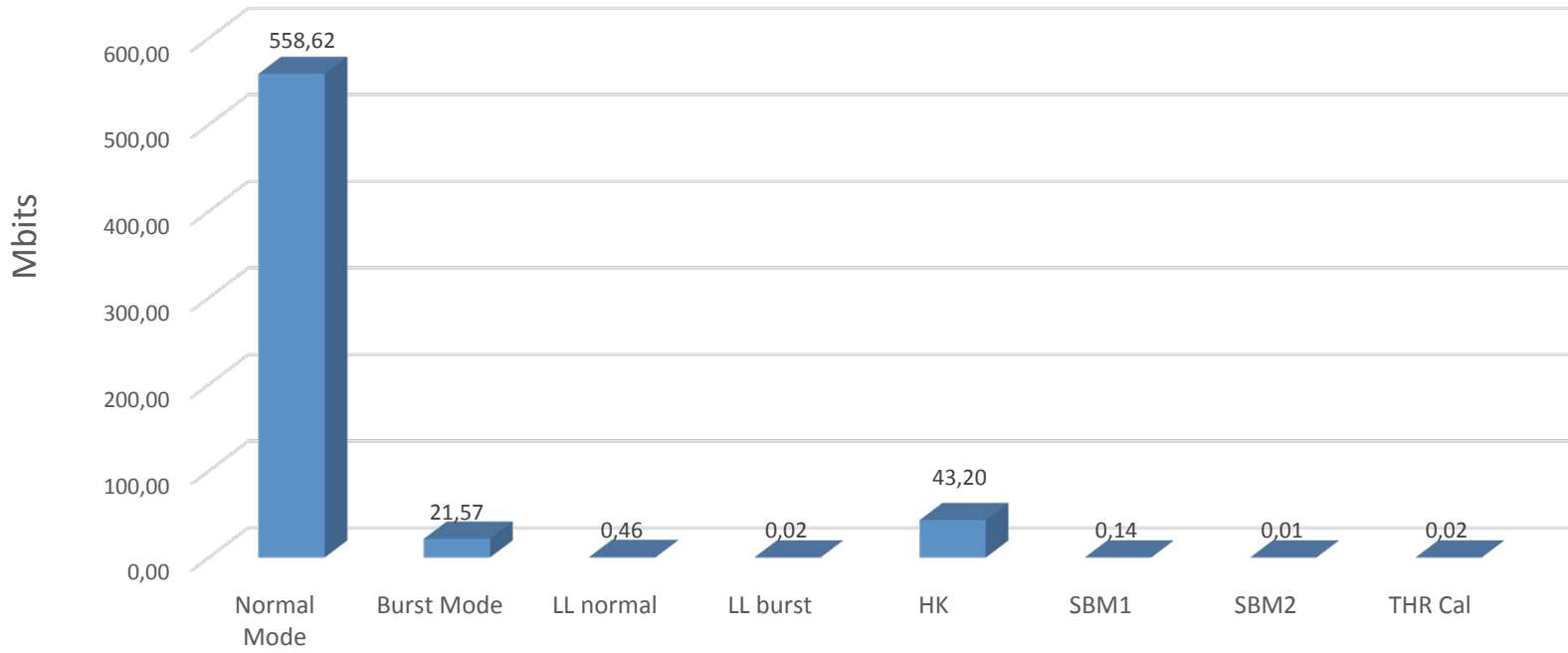
RPW Flight Procedures

- Switch from normal to burst modes
- Specifications provided by instrument teams
- In-flight calibration
- Bias sweep
- Transition to RPW_SURVEY-BACKUP



Daily RPW TELEMETRY (OLD VERSION)

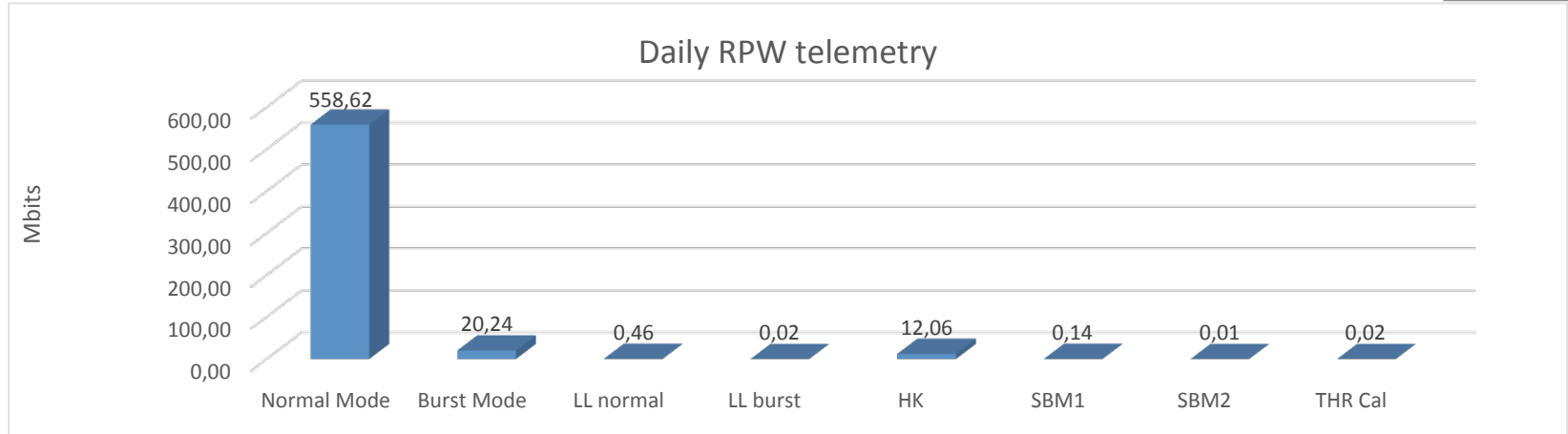
Daily RPW data



Total weekly telemetry
LFR+THR+TDS+CAL+LL+HK

- 7.22 kbits/s uncompressed
- 4.94 kbits/s compressed (compression factor 2)

Daily RPW TELEMETRY (NEW VERSION)



	size		time (s)	bps
TM_DPU_DAS_HK Packet	274	DAS Housekeeping Parameter Report.	60	36,53
TM_DPU_DAS_STATISTICS_HK Packet	590	DAS Housekeeping Parameter Report (failure statistics).	300	15,73
TM_DPU_DBS_HK Packet	172	DBS Housekeeping Parameter Report	0	
TM_DPU_PDU_HK Packet	70	PDU Housekeeping Parameter Report.	60	9,33
TM_DPU_BIA_HK Packet	50	BIAS Housekeeping Parameter Report	60	6,67
TM_DPU_OBC_HK Packet	50	Telemetry transmission of data to OBC for monitoring	60	6,67
TM_DPU_S20_HK Packet	50	HK report containing data to be shared with other Solo instruments	0	
TM_DPU_IIT_HK Packet	108	Inter-instrument communication snapshot.	0	
TM_DPU_DAS_SBM1_HK Packet	120	DAS SBM1Housekeeping Parameter Report.	0	
TM_DPU_RWF_HK Packet	101	Reaction wheel filtering data reporting.	0	
TM_LFR_HK	136	LFR Housekeeping Parameter Report.	60	18,13
TM_TDS_HK	206	TDS Housekeeping Parameter Report.	60	27,47
TM_THR_HK	143	THR Housekeeping Parameter Report.	60	19,07
TM_THR_PARAMETER_DUMP	1010	HFR List1 and List2 in both normal and burst mode	0	

Total weekly telemetry
LFR+THR+TDS+CAL+LL+HK

- 6.97 kbits/s uncompressed
- 4.69 kbits/s compressed (compression factor 2)

Power budget

Operational hot phase (the heating average power is considered)

Mode	Cons. (W)	Transition to Mode via Sequence	Transition from Mode	Transition to Mode	Remarks
IW_PW_OFF	0				RPW off antenna PAs and SCM heaters are controlled by the S/C
IW_PW_SAFE	4.6	AIWF001A AIWF002A	IW_PW_OFF	IW_PW_SAFE	Only the power of SCM heaters is included since controlled by RPW
IW_PW_STANDBY	5.4	AIWF011A	IW_PW_SAFE	IW_PW_STANDBY	
IW_PW_SERVICE_EQ_ON	15.2	AIWF010A	IW_PW_STANDBY	IW_PW_SERVICE_EQ_ON	
IW_PW_SURVEY_NORMAL	17.7	AIWF032A	IW_PW_SERVICE_EQ_ON	IW_PW_SCIENCE	
IW_PW_SURVEY_BURST	17.7	AIWF037A	IW_PW_SCIENCE	IW_PW_SCIENCE	
IW_PW_SBM_DETECTION	17.7		IW_PW_SCIENCE	IW_PW_SCIENCE	This is the power of IW_PW_SBM DETECTION+DUMP The power of IW_PW_SBM2_ACQUISITION is the same 17.7 W
IW_PW_SURVEY_BACKUP	16.1	AIWF046A	IW_PW_SCIENCE	IW_PW_SCIENCE-BACKUP	

Power budget

Operational cold phase (the heating average power is considered)

Mode	Cons. (W)	Transition to Mode via Sequence	Transition from Mode	Transition to Mode
IW_PW_OFF	0			
IW_PW_SAFE	6	AIWF001A AIWF002A	IW_PW_OFF	IW_PW_SAFE
IW_PW_STANDBY	6.8	AIWF011A	IW_PW_SAFE	IW_PW_STANDBY
IW_PW_SERVICE_EQ_ON	16.6	AIWF010A	IW_PW_STANDBY	IW_PW_SERVICE_EQ_ON
IW_PW_SURVEY_NORMAL	19.1	AIWF032A	IW_PW_SERVICE_EQ_ON	IW_PW_SCIENCE
IW_PW_SURVEY_BURST	19.1	AIWF037A	IW_PW_SCIENCE	IW_PW_SCIENCE
IW_PW_SBM_DETECTION	19.1		IW_PW_SCIENCE	IW_PW_SCIENCE
IW_PW_SURVEY_BACKUP	17.5	AIWF046A	IW_PW_SCIENCE	IW_PW_SCIENCE-BACKUP

Power budget

Details of the sequence for the transition IW_PW_STANDBY → IW_PW_SERVICE_EQ_ON

The sequence **AIWF010A**, through which all instruments are turned on, is made by a succession of procedures, each associated to a well-defined power budget. In the following tables the power budget of these procedure is showed

AIWF010A	Description	Cons. (W)
AIWF019A	Transition to SERVICE mode (from standby to equipment off)	3.2
AIWF017A	Switch on converter	4.3
AIWF012A	Switch on LFR	2.1
AIWF013A	Switch on THR	2.7
AIWF014A	Switch on TDS	2.7
AIWF015A	Switch on BIAS	0.8
AIWF016A	Switch on PA	0.4
AIWF018A	Switch on SCM	0.7
		Total 15.1
	SCM Heater cons. Average hot case	0.1
	SCM Heater cons. Average cold case	1.5