

SwissCube housekeeping parameters

Space Center EPFL, 14/09/2009

EPS - SID 97 (0x61)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
COM last report time	32	s	3	14	$Y = 62.5 * X$
ADCS last report time	32	s	3	14	$Y = 62.5 * X$
CDMS last report time	32	s	3	14	$Y = 62.5 * X$
Payload last report time	32	s	3	14	$Y = 62.5 * X$
Battery 1 voltage	8	V	3	4	$Y = 16/819 * X$
Battery 1 redundancy voltage	8	V	3	4	$Y = 16/819 * X$
Battery 2 voltage	8	V	3	4	$Y = 16/819 * X$
Battery 2 redundancy voltage	8	V	3	4	$Y = 16/819 * X$
Battery 1 temperature	8	°C	4	4	-
Battery 2 temperature	8	°C	4	4	-
Digital power bus voltage	8	V	3	4	$Y = 16/819 * X$
Analog power bus voltage	8	V	3	4	$Y = 16/819 * X$
External temperature	8	°C	4	4	-
Frame temperature	8	°C	4	4	-
Microcontroller temperature	8	°C	4	4	-
Board temperature	8	°C	4	4	-
Motherboard temperature	8	°C	4	4	-
Solar cell -X current	8	A	3	4	$Y = 16/4095 * X$
Solar cell +X current	8	A	3	4	$Y = 16/4095 * X$
Solar cell -Y current	8	A	3	4	$Y = 16/4095 * X$
Solar cell +Y current	8	A	3	4	$Y = 16/4095 * X$
Solar cell -Z current	8	A	3	4	$Y = 16/4095 * X$
Solar cell +Z current	8	A	3	4	$Y = 16/4095 * X$
Face -X temperature	8	°C	4	4	-
Face +X temperature	8	°C	4	4	-
Face -Y temperature	8	°C	4	4	-
Face +Y temperature	8	°C	4	4	-
Face -Z temperature	8	°C	4	4	-
Face +Z temperature	8	°C	4	4	-
Payload enable/disable	1		2	1	Enabled/Disabled
ADCS enable/disable	1		2	1	Enabled/Disabled
ADS 1/2 status	1		2	1	On/Off
Payload status	1		2	1	On/Off
ADCS status	1		2	1	On/Off
CDMS status	1		2	1	On/Off
Beacon status	1		2	1	On/Off
COM status	1		2	1	On/Off
Payload error flag	1		2	1	Error/Ok
ADCS error flag	1		2	1	Error/Ok
CDMS error flag	1		2	1	Error/Ok
COM error flag	1		2	1	Error/Ok
EPS error flag	1		2	1	Error/Ok
Spare 2 bits (not used)	2		2	2	-
Spacecraft mode	1		2	1	Nominal/Safe
Error code	8		2	8	-
Software watchdog timeout	8	ms	3	4	$Y = 4 * 62.5 * X$
	TOTAL	360	bits		
		45	bytes		

EPS Min/Max - SID 81 (0x51)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
Battery 1 temperature minimum	8	°C	4	4	-
Battery 1 temperature maximum	8	°C	4	4	-
Battery 2 temperature minimum	8	°C	4	4	-
Battery 2 temperature maximum	8	°C	4	4	-
External temperature minimum	8	°C	4	4	-
External temperature maximum	8	°C	4	4	-
Frame temperature minimum	8	°C	4	4	-
Frame temperature maximum	8	°C	4	4	-
Microcontroller temperature minimum	8	°C	4	4	-
Microcontroller temperature maximum	8	°C	4	4	-
Board temperature minimum	8	°C	4	4	-
Board temperature maximum	8	°C	4	4	-
Motherboard temperature minimum	8	°C	4	4	-
Motherboard temperature maximum	8	°C	4	4	-
Face -X temperature minimum	8	°C	4	4	-
Face -X temperature maximum	8	°C	4	4	-
Face +X temperature minimum	8	°C	4	4	-
Face +X temperature maximum	8	°C	4	4	-
Face -Y temperature minimum	8	°C	4	4	-
Face -Y temperature maximum	8	°C	4	4	-
Face +Y temperature minimum	8	°C	4	4	-
Face +Y temperature maximum	8	°C	4	4	-
Face -Z temperature minimum	8	°C	4	4	-
Face -Z temperature maximum	8	°C	4	4	-
Face +Z temperature minimum	8	°C	4	4	-
Face +Z temperature maximum	8	°C	4	4	-
Solar cell -X current minimum	8	A	3	4	Y = 16/4095 * X
Solar cell -X current maximum	8	A	3	4	Y = 16/4095 * X
Solar cell +X current minimum	8	A	3	4	Y = 16/4095 * X
Solar cell +X current maximum	8	A	3	4	Y = 16/4095 * X
Solar cell -Y current minimum	8	A	3	4	Y = 16/4095 * X
Solar cell -Y current maximum	8	A	3	4	Y = 16/4095 * X
Solar cell +Y current minimum	8	A	3	4	Y = 16/4095 * X
Solar cell +Y current maximum	8	A	3	4	Y = 16/4095 * X
Solar cell -Z current minimum	8	A	3	4	Y = 16/4095 * X
Solar cell -Z current maximum	8	A	3	4	Y = 16/4095 * X
Solar cell +Z current minimum	8	A	3	4	Y = 16/4095 * X
Solar cell +Z current maximum	8	A	3	4	Y = 16/4095 * X
Battery 1 voltage minimum	8	V	3	4	Y = 16/819 * X
Battery 1 voltage maximum	8	V	3	4	Y = 16/819 * X
Battery 2 voltage minimum	8	V	3	4	Y = 16/819 * X
Battery 2 voltage maximum	8	V	3	4	Y = 16/819 * X
Digital power bus voltage minimum	8	V	3	4	Y = 16/819 * X
Digital power bus voltage maximum	8	V	3	4	Y = 16/819 * X
TOTAL		352	bits		
		44	bytes		

COM - SID 65 (0x41)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
Microcontroller temperature	8	°C	4	4	-
Board temperature	8	°C	4	4	-
Beacon board temperature	8	°C	4	4	-
Maximum length of telemetry frames I-Field	8	bytes	3	4	$Y = X + 1$
Number of flags between two frames transmission	8	flags	3	4	-
Timeout of virtual channel 1 (real-time acks)	8	s	3	4	$Y = 62.5 * X$
Timeout of virtual channel 2 (archived acks)	8	s	3	4	$Y = 62.5 * X$
Timeout of virtual channel 4 (payload data)	8	s	3	4	$Y = 62.5 * X$
Timeout of virtual channel 6 (archived HK)	8	s	3	4	$Y = 62.5 * X$
Timeout of virtual channel 7 (real-time HK)	8	s	3	4	$Y = 62.5 * X$
General timeout of reception	8	s	3	4	$Y = 4 * 62.5 * X$
General timeout of transmission	8	s	3	4	$Y = 4 * 62.5 * X$
TX DAC low value	12	V	3	8	$Y = 7.5/4095 * X$
TX DAC high value	12	V	3	8	$Y = 7.5/4095 * X$
TOTAL		120			bits
		15			bytes

Payload - SID 113 (0x71)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
Detector temperature	8	°C	4	4	-
Microcontroller temperature	8	°C	4	4	-
Board temperature	8	°C	4	4	-
Current mode of the camera	1		2	1	On/Off
Read/write error of internal registers of the detector	1		2	1	Error/Ok
Image present in SRAM and ready to be transmitted	1		2	1	Yes/No
Spare 1 bit (not used)	1		2	1	-
Current program location being executed	4		2	4	-
TOTAL		32			bits
		4			bytes

ADCS - SID 17 (0x11)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
Sun Sensor Face X-, Angle A1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face X-, Reference R1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face X-, Angle A2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face X-, Reference R2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face X+, Angle A1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face X+, Reference R1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face X+, Angle A2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face X+, Reference R2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y-, Angle A1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y-, Reference R1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y-, Angle A2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y-, Reference R2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y+, Angle A1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y+, Reference R1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y+, Angle A2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Y+, Reference R2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z-, Angle A1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z-, Reference R1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z-, Angle A2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z-, Reference R2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z+, Angle A1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z+, Reference R1 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z+, Angle A2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Sun Sensor Face Z+, Reference R2 Measurement	12	mV	3	8	$Y = 0.6105 * X$
Spare 1 bit (not used)	1		2	1	
Gyroscope X On/Off Flag	1		2	1	On/Off
Gyroscope Y On/Off Flag	1		2	1	On/Off
Gyroscope Z On/Off Flag	1		2	1	On/Off
Sun Sensor X- On/Off Flag	1		2	1	On/Off
Sun Sensor X+ On/Off Flag	1		2	1	On/Off
Sun Sensor Y- On/Off Flag	1		2	1	On/Off
Sun Sensor Y+ On/Off Flag	1		2	1	On/Off
Sun Sensor Z- On/Off Flag	1		2	1	On/Off
Sun Sensor Z+ On/Off Flag	1		2	1	On/Off
Magnetotorquer X Current Sign	1		2	1	Postive/Negative
Magnetotorquer Y Current Sign	1		2	1	Postive/Negative
Magnetotorquer Z Current Sign	1		2	1	Postive/Negative
Magnetotorquer X On/Off Flag	1		2	1	On/Off
Magnetotorquer Y On/Off Flag	1		2	1	On/Off
Magnetotorquer Z On/Off Flag (LSB)	1		2	1	On/Off
Magnetometer X Measurement	16	uT	4	12	$Y = 0.1 * X$
Magnetometer Y Measurement	16	uT	4	12	$Y = 0.1 * X$
Magnetometer Z Measurement	16	uT	4	12	$Y = 0.1 * X$
Gyroscope X Measurement	16	mrad/s	4	12	-
Gyroscope Y Measurement	16	mrad/s	4	12	-
Gyroscope Z Measurement	16	mrad/s	4	12	-
Bdot Gain	16		3	12	$Y = 1e-6 * X$
Bdot Lambda	16		3	12	$Y = 1e-3 * X$
Bdot Rotation Speed of Command	16	rad/s	3	12	$Y = 1e-4 * X$
Magnetotorquer X Offset	8	uA	4	4	$Y = 100 * X$
Magnetotorquer Y Offset	8	uA	4	4	$Y = 100 * X$
Magnetotorquer Z Offset	8	uA	4	4	$Y = 100 * X$
Gyroscope X Temperature Measurement	8	°C	4	4	-
Gyroscope Y Temperature Measurement	8	°C	4	4	-

Gyroscope Z Temperature Measurement	8	°C	4	4	-
Magnetometer Temperature Measurement	8	°C	4	4	-
MSP Temperature Measurement	8	°C	4	4	-
Magnetotorquer X Current Measurement	8	mA	4	4	-
Magnetotorquer Y Current Measurement	8	mA	4	4	-
Magnetotorquer Z Current Measurement	8	mA	4	4	-
Magnetotorquer X Current Command	8	mA	4	4	-
Magnetotorquer Y Current Command	8	mA	4	4	-
Magnetotorquer Z Current Command	8	mA	4	4	-
Spare 2 bits (not used)	2		2	2	-
MSP ADCS Mode	1		2	1	On/Off
Magnetometer ADC Error Flag	1		2	1	Error/Ok
Gyroscope ADC Error Flag	1		2	1	Error/Ok
Magnetometer X On/Off Flag	1		2	1	On/Off
Magnetometer Y On/Off Flag	1		2	1	On/Off
Magnetometer Z On/Off Flag (LSB)	1		2	1	On/Off
Bdot Maximum Output Current	8	mA	3	4	-
MSP Measurement Counter	8		3	4	-
Magnetometer ADC GND Voltage Measurement	8	mV	3	4	$Y = 11.7248 * X$
Magnetometer ADC Vcc Voltage Measurement	8	mV	3	4	$Y = 22.4223 * X$
Gyroscope ADC Gnd Voltage Measurement	8	mV	3	4	$Y = 19.53.15 * X$
Gyroscope ADC Vcc Voltage Measurement	8	mV	3	4	$Y = 22.4223 * X$
MSP (Vcc-Vss)/2 Voltage Measurement	8	mV	3	4	$Y = 9.768 * X$
MSP Vref+ Voltage Measurement	8	mV	3	4	$Y = 9.768 * X$
MSP Vref- Voltage Measurement	8	mV	3	4	$Y = 9.768 * X$
TOTAL	640	bits			
	80	bytes			

EPS archive - temperatures - SID 98 (0x62)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
Battery 1 temperature	8	°C	4	4	-
Battery 2 temperature	8	°C	4	4	-
External temperature	8	°C	4	4	-
Frame temperature	8	°C	4	4	-
Board temperature	8	°C	4	4	-
Motherboard temperature	8	°C	4	4	-
Face -X temperature	8	°C	4	4	-
Face +X temperature	8	°C	4	4	-
Face -Y temperature	8	°C	4	4	-
Face +Y temperature	8	°C	4	4	-
Face -Z temperature	8	°C	4	4	-
Face +Z temperature	8	°C	4	4	-
	96	bits	repeated 19 times (interval = 300s)		
	12	bytes			

EPS archive - currents - SID 99 (0x63)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
Solar cell -X current	8	A	3	4	$Y = 16/4095 * X$
Solar cell +X current	8	A	3	4	$Y = 16/4095 * X$
Solar cell -Y current	8	A	3	4	$Y = 16/4095 * X$
Solar cell +Y current	8	A	3	4	$Y = 16/4095 * X$
Solar cell -Z current	8	A	3	4	$Y = 16/4095 * X$
Solar cell +Z current	8	A	3	4	$Y = 16/4095 * X$
	48	bits	repeated 38 times (interval = 150s)		
	6	bytes			

EPS archive - voltages - SID 100 (0x64)			CCSDS/PUS		
Description	Bits	Units	PTC	PFC	Calibration
Battery 1 voltage	8	V	3	4	$Y = 16/819 * X$
Battery 2 voltage	8	V	3	4	$Y = 16/819 * X$
Digital power bus voltage	8	V	3	4	$Y = 16/819 * X$
Analog power bus voltage	8	V	3	4	$Y = 16/819 * X$
	32	bits	repeated 57 times (interval = 150s)		
	4	bytes			