



GOLDS-UFSC Documentation

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GOLDS-UFSC Documentation
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CHAPTER 1

Introduction

1.1 Mission Description

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1.2 Mission Objectives

1. To serve as a host platform for the EDC payload.
2. Validate the EDC payload in orbit.
3. Validate EDC functionality in orbit.
4. Validate core-satellite functions in orbit.
5. Evaluate the behavior of the core modules.
6. Perform experiments on radiation effects in electronic components in orbit.
7. Serve as relay for amateur radio communications.

CHAPTER 2

Mission Requirements

CHAPTER 3

Mission Schedule

Phase/Activity	Period													
	2020												2021	
	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Flatsat test OBDH + EDC	■	■												
Protoflight - Design	■	■	■	■	■	■	■	■	■	■	■	■	■	■
GS & RF regulation procedures	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Critical Design Review (CDR)			■	■	■	■	■	■	■	■	■	■	■	■
Protoflight - Procurement			■	■	■	■	■	■	■	■	■	■	■	■
Protoflight - Boards fabrication			■	■	■	■	■	■	■	■	■	■	■	■
Flatsat test - Subsystems + EDC				■	■	■	■	■	■	■	■	■	■	■
Protoflight - Stack integration					■	■	■	■	■	■	■	■	■	■
Fit check							■	■	■	■	■	■	■	■
Verification & validation	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Environmental tests (LIT	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Acceptance Review (AR)											■	■	■	■
Export to launch country											■	■	■	■
Flight Readiness Review (FRR)												■	■	■
Integration to launch vehicle													■	■
Launch														■
Start commissioning														■
End commissioning														■
Start operation														■

Table 3.1: Mission schedule.

CHAPTER 4

Overall Description

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4.1 General Diagrams

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4.2 General Behaviour

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4.3 Power Budget

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4.4 Link Budget

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4.5 PC-104 Bus

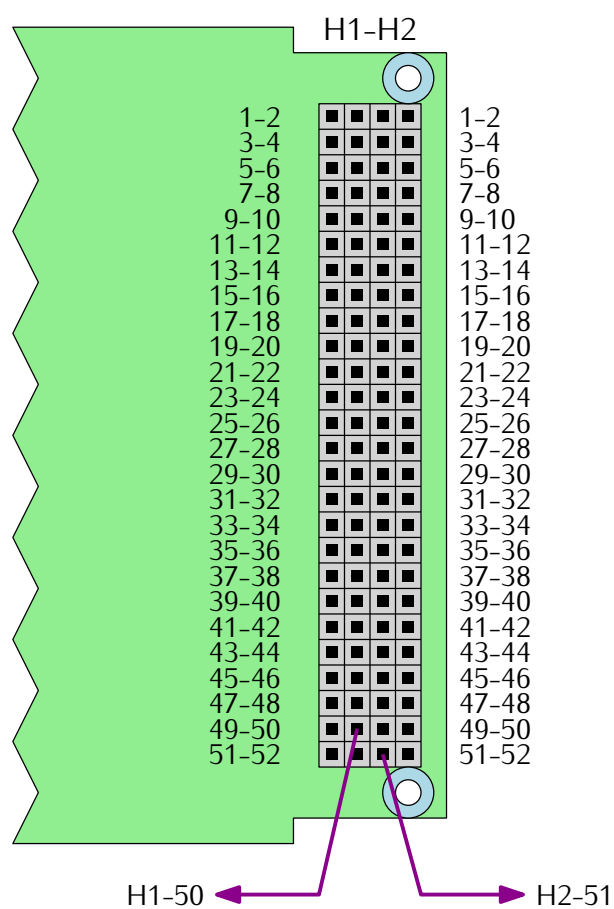


Figure 4.1: Reference diagram of the PC-104 bus.

Pin Row	H1 Odd	H1 Even	H2 Odd	H2 Even
1-2	-	-	-	-
3-4	-	-	-	-
5-6	-	-	BE_UART_RX	-
7-8	-	-	BE_UART_TX	-
9-10	-	-	-	-
11-12	-	-	BE_SPI_MOSI	BE_SPI_CLK
13-14	-	-	BE_SPI_CS	BE_SPI_MISO
15-16	-	-	-	-
17-18	-	PLX_EN	-	-
19-20	-	-	-	-
21-22	-	-	-	-
23-24	-	-	-	-
25-26	EDC_UART_TX	-	-	-
27-28	EDC_UART_RX	-	-	-
29-30	GND	GND	GND	GND
31-32	GND	GND	GND	GND
33-34	-	-	-	-
35-36	RD_SPI_CLK	-	ANT_VCC	ANT_VCC
37-38	RD_SPI_MISO	-	-	-
39-40	RD_SPI_MOSI	RD_SPI_CS	-	-
41-42	PLX_I2C_SDA	-	-	-
43-44	PLX_I2C_SCL	-	-	-
45-46	OBDH_VCC	OBDH_VCC	BAT_VCC	BAT_VCC
47-48	EDC_VCC	EDC_VCC	-	-
49-50	RD_VCC	RD_VCC	EPS_I2C_SDA	-
51-52	BE_VCC	BE_VCC	EPS_I2C_SCL	-

Table 4.1: PC-104 bus pinout.

Signal	Pin(s)	Used By	Description
GND	H1-29, H1-30, H1-31, H1-32, H2-29, H2-30, H2-31, H2-32	All	Ground reference
BAT_VCC	H2-45, H2-46	EPS	Battery terminals (+)
ANT_VCC	H2-35, H2-36	EPS, ANT	Antenna power supply (3.3 V)
OBDH_VCC	H1-45, H1-46	EPS, OBDH	OBDH power supply (3.3 V)
EDC_VCC	H1-47, H1-48	EPS, EDC	EDC power supply (5 V)
RD_VCC	H1-49, H1-50	EPS, TTC	Main radio power supply (5 V)
BE_VCC	H1-51, H1-52	EPS, TTC	Beacon power supply (5 V)
RD_SPI_CLK	H1-35	OBDH, TTC	CLK signal of the main radio SPI bus
RD_SPI_MISO	H1-37	OBDH, TTC	MISO signal of the main radio SPI bus
RD_SPI_MOSI	H1-39	OBDH, TTC	MOS signal of the main radio SPI bus
RD_SPI_CS	H1-40	OBDH, TTC	CS signal of the main radio SPI bus
EPS_I2C_SDA	H2-49	OBDH, EPS	SDA signal of the EPS I2C bus
EPS_I2C_SCL	H2-51	OBDH, EPS	SCL signal of the EPS I2C bus
BE_UART_RX	H2-5	EPS, TTC	EPS TX, Beacon RX (UART bus)
BE_UART_TX	H2-7	EPS, TTC	EPS RX, Beacon TX (UART bus)
EDC_UART_TX	H1-25	OBDH, EDC	OBDH RX, EDC TX (UART bus)
EDC_UART_RX	H1-27	OBDH, EDC	OBDH TX, EDC RX (UART bus)
PLX_EN	H1-18	OBDH, Payload X	Payload X enable (GPIO)
PLX_I2C_SDA	H1-41	OBDH, Payload X	SDA signal of the Payload X I2C bus
PLX_I2C_SCL	H1-43	OBDH, Payload X	SCL signal of the Payload X I2C bus

Table 4.2: PC-104 bus signal description.

CHAPTER 5

Subsystems

5.1 On-Board Data Handling

OBDH

5.2 Telemetry, Tracking and Command Module

TTC

5.3 Electrical Power System

EPS

5.4 Attitude Determination and Control System

ADCS

5.5 Mechanical Structure

5.6 Payloads

5.6.1 Environmental Data Collection

EDC

CHAPTER 6

Ground Segment

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CHAPTER 7

Operation Planning
