Avionics Reference Document

David Knight

July 2019

Contents

List of Tables

List of Figures

1 Introduction

1.1 Purpose

1.2 Scope

1.3 Definitions and Acronyms

2   Hardware

2.1   Pressure

Measurement	HE Tank Pressure
Extension board #	2
Model #	MLH05KPSB01G
Link	Mouser Page
Range	0 psig to 5000 psig
Accuracy	±0.25%
Temperature range	-40°C to +125°C
Input Voltage	8VDC to 30VDC
Output	1VDC to 5VDC
Data Rate	50Hz

2.2   Temperature

2.3   Electrical

2.4   Mechanical

3 EEPROM Layouts

3.1 Layout Version IDs

VersionID	Version Name
1	Sensor Board Layout Rev 1
2	Power Distro Board Layout Rev 1

3.2 Sensor Board Layout Rev 1

Sensor Board Layout Rev 1 Page #0					
Byte #	Usage	Byte #	Usage	Byte #	Usage
0	Board Status	48	Hall Effect 1 Current CanID	96	
1		49		97	
2		50		98	
3		51		99	
4	Board VIN Voltage CanID	52	Hall Effect 2 Data CanID	100	
5		53		101	
6		54		102	
7		55		103	
8	Board current CanID	56	Hall Effect 2 Current CanID	104	
9		57		105	
10		58		106	
11		59		107	
12	PT0 Data CanID	60	TC0 Data CanID	108	
13		61		109	
14		62		110	
15		63		111	
16	PT0 Current CanID	64	TC0 Current CanID	112	
17		65		113	
18		66		114	
19		67		115	
20	PT1 Data CanID	68	TC1 Data CanID	116	
21		69		117	
22		70		118	
23		71		119	
24	PT1 Current CanID	72	TC1 Current CanID	120	
25		73		121	
26		74		122	
27		75		123	
28	PT2 Data CanID	76	RTD0 Data CanID	124	
29		77		125	
30		78		126	
31		79		127	
32	PT2 Current CanID	80	RTD1 Data CanID		
33		81			
34		82			
35		83			
36	Hall Effect 0 Data CanID	84			
37		85			
38		86			
39		87			
40	Hall Effect 0 Current CanID	88			
41		89			
42		90			
43		91			
44	Hall Effect 1 Data CanID	92			
45		93			
46		94			
47		95			

3.3 Power Distro Board Layout Rev 1

Power Distro Board Layout Rev 1 Page #0					
Byte #	Usage	Byte #	Usage	Byte #	Usage
0		48		96	
1	Board Status	49		97	
2		50		98	
3		51		99	
4		52		100	
5	Offboard Battery	53		101	
6	Voltage CANID	54		102	
7		55		103	
8		56		104	
9	Offboard Battery	57		105	
10	Current CANID	58		106	
11		59		107	
12		60		108	
13	Onboard Battery	61		109	
14	Voltage CANID	62		110	
15		63		111	
16		64		112	
17	Onboard Battery	65		113	
18	Current CANID	66		114	
19		67		115	
20		68		116	
21	Helix Loop Voltage	69		117	
22	CANID	70		118	
23		71		119	
24		72		120	
25	Helix Loop Current	73		121	
26	CANID	74		122	
27		75		123	
28		76		124	
29		77		125	
30		78		126	
31		79		127	
32		80			
33		81			
34		82			
35		83			
36		84			
37		85			
38		86			
39		87			
40		88			
41		89			
42		90			
43		91			
44		92			
45		93			
46		94			
47		95			

4 CAN IDs

4.1 ID 0 - Clock Sync

Frequency: 50Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False	0 to 4294967295	Milliseconds	UTC time

4.2 ID 1 - Emergency Signal

Frequency: 50Hz

Byte	Bit	Signed	Range	Units	Description
0		False			Status
	0-1				System Status

4.3 ID 100 - Helium Pressure

Frequency: 50Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		False		PSIG	Helium Pressure

4.4 ID 101 - Lox Pressure

Frequency: 50Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		False		PSIG	LOX Pressure

4.5 ID 102 - Methane Pressure

Frequency: 50Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		False		PSIG	Methane Pressure

4.6 ID 103 - Chamber Pressure

Frequency: 50Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		False		PSIG	Chamber Pressure

4.7 ID 200 - Helium Fill Valve

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4		False		Open/Closed	Helium Fill Valve State

4.8 ID 201 - LOX Fill Valve

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4		False		Open/Closed	LOX Fill Valve State

4.9 ID 202 - Methane Fill Valve

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4		False		Open/Closed	Methane Fill Valve State

4.10 ID 300 - Helium Tank Temperature

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		Celcius	Helium Tank Temperature

4.11 ID 301 - LOX Tank Temperature

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		Celcius	LOX Tank Temperature

4.12 ID 302 - Methane Tank Temperature

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		Celcius	Methane Tank Temperature

4.13 ID 303 - Nozzle Temperature

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		Celcius	Nozzle Temperature

4.14 ID 304 - Upper Air Frame Temperature

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		Celcius	Upper Air Frame Temperature

4.15 ID 400 - Helium PT Current

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		milliamps	Helium PT Current

4.16 ID 401 - LOX PT Current

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		milliamps	LOX PT Current

4.17   ID 402 - Methane PT Current

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		milliamps	Methane PT Current

4.18   ID 403 - Chamber PT Current

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		milliamps	Chamber PT Current

4.19   ID 404 - Helium Fill Hall Effect Current

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		milliamps	Helium Fill Hall Effect Current

4.20   ID 405 - LOX Fill Hall Effect Current

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		milliamps	LOX Fill Hall Effect Current

4.21   ID 406 - Methane Fill Hall Effect Current

Frequency: 10Hz

Byte	Bit	Signed	Range	Units	Description
0-3		False		Milliseconds	UTC time
4-5		True		milliamps	Methane Fill Hall Effect Current