

Avionics Reference Document

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1.1 Purpose

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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	$\pm 0.25\%$
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	Layout Rev Number	48	PT0 Polyfit p2	96	PT1 Current CanID
1		49		97	
2		50		98	
3		51		99	
4	EEPROM Layout Compile Time	52	PT0 Polyfit p3	100	PT1 Max Voltage
5		53		101	
6		54		102	
7		55		103	
8	Board Status	56	PT0 Polyfit p4	104	PT1 Min Voltage
9		57		105	
10		58		106	
11		59		107	
12	Board VIN Voltage CanID	60	PT0 Polyfit p5	108	PT1 Max Value
13		61		109	
14		62		110	
15		63		111	
16	Board current CanID	64	PT0 Polyfit p6	112	PT1 Min Value
17		65		113	
18		66		114	
19		67		115	
20	PT0 Data CanID	68	PT0 Polyfit p7	116	PT1 Polyfit p1
21		69		117	
22		70		118	
23		71		119	
24	PT0 Current CanID	72	PT0 Biquad Filter b0	120	PT1 Polyfit p2
25		73		121	
26		74		122	
27		75		123	
28	PT0 Max Voltage	76	PT0 Biquad Filter b1	124	PT1 Polyfit p3
29		77		125	
30		78		126	
31		79		127	
32	PT0 Min Voltage	80	PT0 Biquad Filter b2		
33		81			
34		82			
35		83			
36	PT0 Max Value	84	PT0 Biquad Filter a1		
37		85			
38		86			
39		87			
40	PT0 Min Value	88	PT0 Biquad Filter a2		
41		89			
42		90			
43		91			
44	PT0 Polyfit p1	92	PT1 Data CanID		
45		93			
46		94			
47		95			

Sensor Board Layout Rev 1 Page #1					
Byte #	Usage	Byte #	Usage	Byte #	Usage
128	PT1 Polyfit p4	176	PT1 Min Voltage	224	PT1 Biquad Filter b2
129		177		225	
130		178		226	
131		179		227	
132	PT1 Polyfit p5	180	PT1 Max Value	228	PT1 Biquad Filter a1
133		181		229	
134		182		230	
135		183		231	
136	PT1 Polyfit p6	184	PT1 Min Value	232	PT1 Biquad Filter a2
137		185		233	
138		186		234	
139		187		235	
140	PT1 Polyfit p7	188	PT1 Polyfit p1	236	Hall Effect 0 Data CanID
141		189		237	
142		190		238	
143		191		239	
144	PT1 Biquad Filter b0	192	PT1 Polyfit p2	240	Hall Effect 0 Current CanID
145		193		241	
146		194		242	
147		195		243	
148	PT1 Biquad Filter b1	196	PT1 Polyfit p3	244	Hall Effect 1 Data CanID
149		197		245	
150		198		246	
151		199		247	
152	PT1 Biquad Filter b2	200	PT1 Polyfit p4	248	Hall Effect 1 Current CanID
153		201		249	
154		202		250	
155		203		251	
156	PT1 Biquad Filter a1	204	PT1 Polyfit p5	252	Hall Effect 2 Data CanID
157		205		253	
158		206		254	
159		207		255	
160	PT1 Biquad Filter a2	208	PT1 Polyfit p6		
161		209			
162		210			
163		211			
164	PT2 Data CanID	212	PT1 Polyfit p7		
165		213			
166		214			
167		215			
168	PT2 Current CanID	216	PT1 Biquad Filter b0		
169		217			
170		218			
171		219			
172	PT1 Max Voltage	220	PT1 Biquad Filter b1		
173		221			
174		222			
175		223			

Sensor Board Layout Rev 1 Page #2					
Byte #	Usage	Byte #	Usage	Byte #	Usage
256	Hall Effect 2 Current CanID	304	TC1 Biquad Filter a2	352	RTD1 Biquad Filter a2
257		305		353	
258		306		354	
259		307		355	
260	TC0 Data CanID	308	RTD0 Data CanID	356	
261		309		357	
262		310		358	
263		311		359	
264	TC0 Biquad Filter b0	312	RTD0 Biquad Filter b0	360	
265		313		361	
266		314		362	
267		315		363	
268	TC0 Biquad Filter b1	316	RTD0 Biquad Filter b1	364	
269		317		365	
270		318		366	
271		319		367	
272	TC0 Biquad Filter b2	320	RTD0 Biquad Filter b2	368	
273		321		369	
274		322		370	
275		323		371	
276	TC0 Biquad Filter a1	324	RTD0 Biquad Filter a1	372	
277		325		373	
278		326		374	
279		327		375	
280	TC0 Biquad Filter a2	328	RTD0 Biquad Filter a2	376	
281		329		377	
282		330		378	
283		331		379	
284	TC1 Data CanID	332	RTD1 Data CanID	380	
285		333		381	
286		334		382	
287		335		383	
288	TC1 Biquad Filter b0	336	RTD1 Biquad Filter b0		
289		337			
290		338			
291		339			
292	TC1 Biquad Filter b1	340	RTD1 Biquad Filter b1		
293		341			
294		342			
295		343			
296	TC1 Biquad Filter b2	344	RTD1 Biquad Filter b2		
297		345			
298		346			
299		347			
300	TC1 Biquad Filter a1	348	RTD1 Biquad Filter a1		
301		349			
302		350			
303		351			

3.3 Power Distro Board Layout Rev 1

Power Distro Board Layout Rev 1 Page #0					
Byte #	Usage	Byte #	Usage	Byte #	Usage
0	Board Status	48		96	
1		49		97	
2		50		98	
3		51		99	
4	Offboard Battery Voltage CANID	52		100	
5		53		101	
6		54		102	
7		55		103	
8	Offboard Battery Current CANID	56		104	
9		57		105	
10		58		106	
11		59		107	
12	Onboard Battery Voltage CANID	60		108	
13		61		109	
14		62		110	
15		63		111	
16	Onboard Battery Current CANID	64		112	
17		65		113	
18		66		114	
19		67		115	
20	Helix Loop CW Voltage CANID	68		116	
21		69		117	
22		70		118	
23		71		119	
24	Helix Loop CW Current CANID	72		120	
25		73		121	
26		74		122	
27		75		123	
28	Helix Loop CCW Voltage CANID	76		124	
29		77		125	
30		78		126	
31		79		127	
32	Helix Loop CCW Current CANID	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