Avionics Reference Document

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

Sensor Board Layout Rev 1 Page #1					
Byte #	Usage	Byte #	Usage	Byte #	Usage
128 129 130 131	PT1 Polyfit p6	176 177 178 179	PT1 Min Value	224 225 226 227	PT1 Biquad Filter a2
132 133 134 135	PT1 Polyfit p7	180 181 182 183	PT1 Polyfit p1	228 229 230 231	Hall Effect 0 Data CanID
136 137 138 139	PT1 Biquad Filter b0	184 185 186 187	PT1 Polyfit p2	232 233 234 235	Hall Effect 0 Current CanID
140 141 142 143	PT1 Biquad Filter b1	188 189 190 191	PT1 Polyfit p3	236 237 238 239	Hall Effect 1 Data CanID
144 145 146 147	PT1 Biquad Filter b2	192 193 194 195	PT1 Polyfit p4	240 241 242 243	Hall Effect 1 Current CanID
148 149 150 151	PT1 Biquad Filter a1	196 197 198 199	PT1 Polyfit p5	244 245 246 247	Hall Effect 2 Data CanID
152 153 154 155	PT1 Biquad Filter a2	200 201 202 203	PT1 Polyfit p6	248 249 250 251	Hall Effect 2 Current CanID
156 157 158 159	PT2 Data CanID	204 205 206 207	PT1 Polyfit p7	252 253 254 255	TC0 Data CanID
160 161 162 163	PT2 Current CanID	208 209 210 211	PT1 Biquad Filter b0		
164 165 166 167	PT1 Max Voltage	212 213 214 215	PT1 Biquad Filter b1		
168 169 170 171	PT1 Min Voltage	216 217 218 219	PT1 Biquad Filter b2		
172 173 174 175	PT1 Max Value	220 221 222 223	PT1 Biquad Filter a1		

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