

Avionics Reference Document

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1.1 Purpose

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2 Hardware

2.1 Pressure Transducers

Model Number	MLH05KPSB01G
Serial Number	F8CEA38AA5
Datasheet Link	Link
Sensing Units	PSIG
Pressure Port Type	1/4-18 NPT (ANSI B1.20.1)
Accuracy	±0.25%
Pressure Range	0PSIG to 5000PSIG
Data Frequency	50Hz
Output Voltage Range	1.0 to 5.0 Volts
Input Voltage Range	8.0 to 30.0 Volts
Temperature Range	-40°to +125°Celcius

Model Number	ASUHGP1K55A1AA1A20000
Serial Number	E5C0ADEA35
Datasheet Link	Link
Sensing Units	PSIG
Pressure Port Type	3/8 Inch 24 UNF Dash 3 (SAE J514)
Accuracy	±0.25%
Pressure Range	0PSIG to 1500PSIG
Data Frequency	50Hz
Output Voltage Range	0.5 to 4.5 Volts
Input Voltage Range	8.0 to 16.0 Volts
Temperature Range	-40°to +150°Celcius

2.2 Thermocouples

Model Number	240-080
Serial Number	BB510C3CE3
Datasheet Link	Link
Type	K
Sensing Units	Celcius
Data Frequency	10Hz
Temperature Range	-73°to +150°Celcius

2.3 RTDs

Model Number	1PT100K2515
Serial Number	8105874731
Datasheet Link	Link
Type	PT100
Sensing Units	Celcius
Data Frequency	10Hz
Temperature Range	-200°to +150°Celcius

2.4 Hall Effect Sensors

Model Number	TCS40DPR
Serial Number	6D65BA9367
Datasheet Link	Link
Sensing Units	mT
Output Type	Push-Pull
Trip	$\pm 4.4\text{mT}$
Release	$\pm 0.9\text{mT}$
Input Voltage Range	8.0 to 16.0 Volts
Data Frequency	10Hz
Temperature Range	-40° to +150° Celcius

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

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