



Product Specification

Document Number	PSAU0015	
Title	MoTeC M800 Set 3 Data Protocol	
Revision Date	Prepared By	Approved By
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Introduction

This document describes the data protocol implemented in the MoTeC M800 ECU as Telemetry data set 3. This format is published for use by third party systems that need to receive data from a MoTeC ECU.

Protocol Description

Byte	Name	Value / Scaling
0	Header 0	\$82
1	Header 1	\$81
2	Header 2	\$80
3	Data Length	1 – 255 Channels (currently 84)
4:5	RPM	1RPM
6:7	Throttle Position	0.1%
8:9	Manifold Pressure	0.1kPa
10:11	Air Temperature	0.1C
12:13	Engine Temperature	0.1C
14:15	Lambda 1	0.001La
16:17	Lambda 2	0.001La
18:19	Exhaust Manifold Pressure	0.1kPa
20:21	Mass Air Flow	0.1*
22:23	Fuel Temperature	0.1C
24:25	Fuel Pressure	0.1kPa
26:27	Oil Temperature	0.1C
28:29	Oil Pressure	0.1kPa
30:31	Gear Voltage	0.01V
32:33	Knock Voltage	0.01V
34:35	Gear Shift Force	0.1kg
36:37	Exhaust Temperature 1	1C
38:39	Exhaust Temperature 2	1C
40:41	User Channel 1	0.1*
42:43	User Channel 2	0.1*
44:45	User Channel 3	0.1*
46:47	User Channel 4	0.1*
48:49	Battery Voltage	0.01V
50:51	ECU Temperature	0.1C
52:53	Digital Input 1 Speed	0.1km/h
54:55	Digital Input 2 Speed	0.1km/h
56:57	Digital Input 3 Speed	0.1km/h
58:59	Digital Input 4 Speed	0.1km/h
60:61	Drive Speed	0.1km/h
62:63	Ground Speed	0.1km/h
64:65	Slip	0.1km/h
66:67	Aim Slip	0.1km/h
68:69	Launch RPM	1RPM
70:71	Lambda 1 short term trim	0.1%
72:73	Lambda 2 short term trim	0.1%
74:75	Lambda 1 long term trim	0.1%
76:77	Lambda 2 long term trim	0.1%

78:79	Aim Lambda 1	0.001La	
80:81	Aim Lambda 2	0.001La	
82:83	Fuel Cut Level	*100/255 = 0.1%	
84:85	Ignition Cut Level	*100/255 = 0.1%	
86:87	Ignition Advance	0.1dBTD	
88:89	Load Point	0.1	
90:91	Efficiency Point	0.1	
92:93	Fuel Used	1*	
94:95	Auxiliary O/P 1 Duty Cycle	1%	
96:97	Auxiliary O/P 2 Duty Cycle	1%	
98:99	Auxiliary O/P 3 Duty Cycle	1%	
100:101	Auxiliary O/P 4 Duty Cycle	1%	
102:103	Auxiliary O/P 5 Duty Cycle	1%	
104:105	Auxiliary O/P 6 Duty Cycle	1%	
106:107	Auxiliary O/P 7 Duty Cycle	1%	
108:109	Auxiliary O/P 8 Duty Cycle	1%	
110:111	Fuel Actual Pulse Width	0.5 μ s	
112:113	Fuel Effective Pulse Width	0.5 μ s	
114:115	Fuel Injector Duty Cycle	0.1%	
116:177	Gear	/10 = gear	
118:119	Sync Position	0.1%	
120:121	Fuel Comp 1	0.1%	
122:123	Fuel Comp 2	0.1%	
124:125	Diagnostic Error Group 1	TP_ERR	1
		MAP_ERR	2
		AT_ERR	4
		ET_ERR	8
		LA1_ERR	16
		LA2_ERR	32
		EMAP_ERR	64
		MAF_ERR	128
126:127	Diagnostic Error Group 2	BARO_ERR	1
		FT_ERR	2
		FP_ERR	4
		OT_ERR	8
		OP_ERR	16
		LAT_G_ERR	32
		LONG_G_ERR	64
		SLIP_V_ERR	128
128:129	Diagnostic Error Group 3	GEAR_V_ERR	1
		KNOCK_ERR	2
		EGT1_ERR	4
		EGT2_ERR	8
		USER1_ERR	16
		USER2_ERR	32
		USER3_ERR	64
		USER4_ERR	128
130:131	Diagnostic Error Group 4	BATV_ERR	1
		ECUT_ERR	2
		VERT_G_ERR	4
		GEAR_FORCE_ERR	8
		DBW_CONT	16
		DBW_ERR	32
		DBW_AIM	64
		DBW_FB	128
132:133	Diagnostic Error Group 5	-	

134:135	Diagnostic Error Group 6	LOW_BAT_ERR OVER_BOOST_ERR NO_SYNC_ERR SYNC_ERR NO_REF_ERR REF_ERR RPM_OVER_ERR F_MAX_DTY_ERR	1 2 4 8 16 32 64 128
136:137	Diagnostic Error Group 7	MEM_ERR DELTA_BAT LA1_HEATER_ERR LA2_HEATER_ERR LA1_OT LA2_OT LA1_SENS_ERR LA2_SENS_ERR	1 2 4 8 16 32 64 128
138:139	Diagnostic Error Group 8	-	
140:141	Diagnostic Error Group 9	RESET_TESTMOD RESET_SYS RESET_NOXTAL - RESET_HALTMON - - RESET_EXT	1 2 4 8 16 32 64 128
142:143	Diagnostic Error Group 10	INJ1_ERR INJ2_ERR INJ3_ERR INJ4_ERR INJ5_ERR INJ6_ERR INJ7_ERR INJ8_ERR	1 2 4 8 16 32 64 128
144:145	Diagnostic Error Group 11	INJ1_SHORT INJ2_SHORT INJ3_SHORT INJ4_SHORT INJ5_SHORT INJ6_SHORT INJ7_SHORT INJ8_SHORT	1 2 4 8 16 32 64 128
146:147	Diagnostic Error Group 12	INJ1_OPEN INJ2_OPEN INJ3_OPEN INJ4_OPEN INJ5_OPEN INJ6_OPEN INJ7_OPEN INJ8_OPEN	1 2 4 8 16 32 64 128
148:149	Diagnostic Error Group 13	INJ1_PEAK INJ2_PEAK INJ3_PEAK INJ4_PEAK INJ5_PEAK INJ6_PEAK INJ7_PEAK INJ8_PEAK	1 2 4 8 16 32 64 128

150:151	Diagnostic Error Group 14	SYNC_LOW SYNC_RNT SYNC_TRIG SYNC_ARM REF_LOW REF_RNT REF_TRIG REF_ARM	1 2 4 8 16 32 64 128
152:153	Diagnostic Error Group 15	-	
154:155	Diagnostic Error Group 16	-	
156:157	Status Flags Group 1	RPM Limit Exceeded Launch Control Gear Change Ign Cut REF/SYNC Synched Closed Loop La 2 Closed Loop La 1 Lambda 2 Cold Lambda 1 Cold	1 2 4 8 16 32 64 128
158:159	Status Flags Group 2	Overrun Boost Alternator Off Overrun Fuel Cut - - - -	1 2 4 8 16 32 64 128
160:161	Status Flags Group 3	Digital Input 1 Digital Input 2 Digital Input 3 Digital Input 4 - Nitrous Air Con Request Dual RPM Limit	1 2 4 8 16 32 64 128
162:163	Status Flags Group 4	Traction Ctrl Disable Clutch Logging Enable Beacon Mark Overrun Boost Enable Gear Chg Cut Request Ignition Switch Brake	1 2 4 8 16 32 64 128
164:165	Status Flags Group 5	- - Spray Bar - - Telemetry Control Power Steer OvLd Ground Speed Limit	1 2 4 8 16 32 64 128
166:167	Status Flags Group 6	-	
168:169	Status Flags Group 7	Digital Input 5 Digital Input 6 Digital Input 7 Digital Input 8 Digital Input 9 Digital Input 10 - -	1 2 4 8 16 32 64 128
170:171	Status Flags Group 8	-	
172	CRC byte 1 (HI Byte)		

173	CRC byte 2	
174	CRC byte 3	
175	CRC byte 4 (LO Byte)	

NOTE:

1. Error Checking is a CRC32 of the header and data bytes
2. All units specified assume the ECU is calibrated in the recommended default units (metric). Changes to the ECU units will be reflected in the values transmitted
3. For channels marked '*' there are no default units - the units are dependent on ECU configuration
4. All channel values are signed quantities
5. For compatibility with later versions, do not assume the number of data bytes is a constant.
6. Data channels are in 16 bit Motorola byte order, high byte first, then low byte.
7. Data can be received at nominal baud rates of 19200, 8N1 (actual rate 19231) or 38400 (actual rate 38461)
8. the M800 transmits data at RS232 levels.