Product Specification

Document Number	PSAU0009	
Title	MoTeC M800 Set 1 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 1. This protocol is used between MoTeC products and may change between versions to encompass increased functionality. Changes are typically limited to adding more channels to the end of the data set, however this is not guaranteed.

A separate data set, that is common for all MoTeC ECU, is recommended for 3rd party systems that wish to support all MoTeC ECU's with a common data set.

Protocol Description

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

72:73	Lambda 2 long term trim	0.1%	
74:75	Aim Lambda 1	0.001La	
76:77	Aim Lambda 2	0.001La	
78:79	Fuel Cut Level	*100/255 = 0.1%	
80:81	Ignition Cut Level	*100/255 = 0.1%	
82:83	Ignition Advance	0.1dBTDC	
84:85	Load Point	0.1	
86:87	Efficiency Point	0.1	
88:89	Fuel Used	0.01L*	
90	Auxiliary O/P 1 Duty Cycle	1%	
91	Auxiliary O/P 2 Duty Cycle	1%	
92	Auxiliary O/P 3 Duty Cycle	1%	
93	Auxiliary O/P 4 Duty Cycle	1%	
94	Auxiliary O/P 5 Duty Cycle	1%	
95	Auxiliary O/P 6 Duty Cycle	1%	
96	Auxiliary O/P 7 Duty Cycle	1%	
97	Auxiliary O/P 8 Duty Cycle	1%	
98:99	Fuel Actual Pulse Width	0.5 µs	
100:101	Fuel Effective Pulse Width	0.5 µs	
102:103	Fuel Injector Duty Cycle	0.1%	
104:105	Gear	/10 = gear	
106:107	Sync Position	0.1%	
108:109	Fuel Comp 1	0.1%	
110:111	Fuel Comp 2	0.1%	
112	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
113	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
114	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
115	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
116	Diagnostic Error Group 5	-	
117	Diagnostic Error Group 6	LOW_BAT_ERR	1
		OVER_BOOST_ERR	2
		NO_SYNC_ERR	4

		SYNC_ERR	8
		NO_REF_ERR	16
		REF_ERR	32
		RPM_OVER_ERR	64
		F_MAX_DTY_ERR	128
118	Diagnostic Error Group 7	MEM_ERR	1
		DELTA_BAT	2
		LA1_HEATER_ERR	4
		LA2_HEATER_ERR	8
		LA1_OT	16
		LA2_OT	32
		LA1_SENS_ERR	64
		LA2_SENS_ERR	128
119	Diagnostic Error Group 8	-	
120	Diagnostic Error Group 9	RESET_TESTMOD	1
		RESET_SYS	2
		RESET_NOXTAL	4
		-	8
		RESET_HALTMON	16
		-	32
		-	64
		RESET_EXT	128
121	Diagnostic Error Group 10	INJ1_ERR	1
		INJ2_ERR	2
		INJ3_ERR	4
		INJ4_ERR	8
		INJ5_ERR	16
		INJ6_ERR	32
		INJ7_ERR	64
		INJ8_ERR	128
122	Diagnostic Error Group 11	INJ1_SHORT	1
		INJ2_SHORT	2
		INJ3_SHORT	4
		INJ4_SHORT	8
		INJ5_SHORT	16
		INJ6_SHORT	32
		INJ7_SHORT	64
		INJ8_SHORT	128
123	Diagnostic Error Group 12	INJ1_OPEN	1
		INJ2_OPEN	2
		INJ3_OPEN	4
		INJ4_OPEN	8
		INJ5_OPEN	16
		INJ6_OPEN	32
		INJ7_OPEN	64
		INJ8_OPEN	128
124	Diagnostic Error Group 13	INJ1_PEAK	1
		INJ2_PEAK	2
		INJ3_PEAK	4
		INJ4_PEAK	8
		INJ5_PEAK	16
		INJ6_PEAK	32
		INJ7_PEAK	64
		INJ8_PEAK	128
125	Diagnostic Error Group 14	SYNC_LOW	1
		SYNC_RNT	2
		SYNC_TRIG	4
		SYNC_ARM	8
		REF_LOW	16
		REF_RNT	32
		REF_TRIG	64

		REF_ARM	128
126	Diagnostic Error Group 15	-	
127	Diagnostic Error Group 16	-	
128	Diagnostic Error Group 17	-	
129	Diagnostic Error Group 18	-	
130	Diagnostic Error Group 19	-	
131	Status Flags Group 1	RPM Limit Exceeded Launch Control Gear Change Ign Cut REF/SYNC Synched Closed Loop La 1 Closed Loop La 2 Lambda 1 Cold Lambda 2 Cold	1 2 4 8 16 32 64 128
132	Status Flags Group 2	Overrun Boost Alternator Off Overrun Fuel Cut - - - - -	1 2 4 8 16 32 64 128
133	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
134	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
135	Status Flags Group 5	- - Spray Bar - - Telemetry Control Power Steer OvLd Ground Speed Limit	1 2 4 8 16 32 64 128
136	Status Flags Group 6	-	
137	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
138	Status Flags Group 8	-	
139	Number of Data Bytes	139	
140	Marker Byte 1	FC	
141	Marker Byte 2	FB	
142	Marker Byte 3	FA	
143	CHKSUM		

NOTE:

1. CHKSUM is the sum of all bytes of the structure up to and including marker byte 3
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