Autronic
FUEL INJECTION — ADVANCED CONTROLS

DYNO DATA STREAM PROTOCOLS FOR INPUT TO AUTRONIC PC SOFTWARE rev 05 Jan 2020

BAUD RATE: 19200 baud (SM3/4 ECU family software, 9600 baud (SMC / SM2 ECU family software)
PROTOCOL: RS232 Async, 10 bits, comprising 1 start bit, 8 data bits (LSB first) and l stop bit .
UPDATE RATE: 20Hz

Notes:
1. Data uses INTEL byte ordering (low byte first)
2. Checksum uses MOTOROLA byte ordering (high byte first)
   CHECKSUM (16 bit) = -(DATA LENGTH + ∑ data bytes)
3. PC requires an additional RS232 communication port for this data reception
   Select com port using software invocation command line parameter: E=(com port No.)
   eg: Command line for input to port 7: ECUCAL.EXE E=7
4. Protocols 1, 2 & 3 are detected automatically and accepted by all Windows ECU software (SM3/4 & SMC/SM2 families)
   Protocol 4 is only accepted by SM3/4 ECU family software from version "sm4v030g", if a parameter is added to the software invocation command line (see below)

PROTOCOL 1. DYNO CHASSIS

BYTE NO.	SIZE	TYPE	DESCRIPTION	SCALING
1	8 bit		PACKET I.D. = 24 hex (36 decimal)	ASCII "$"
2	8 bit	unsigned	DATA LENGTH = 04 hex (4 decimal)	Data byte count
3-4	16 bit	signed	POWER	1 count = 0.1 kw
5-6	16 bit	signed	TORQUE	1 count = 0.1 Nm
7-8	16 bit	unsigned	DATA CHECKSUM	See note 2

PROTOCOL 2. DYNO ENGINE

BYTE NO.	SIZE	TYPE	DESCRIPTION	SCALING
1	8 bit		PACKET I.D. = 24 hex (36 decimal)	ASCII "$"
2	8 bit	unsigned	DATA LENGTH = 06 hex (6 decimal)	Data byte count
3-4	16 bit	signed	POWER	1 count = 0.1 kW
5-6	16 bit	signed	TORQUE	1 count = 0.1 Nm
7-8	16 bit	signed	BFSC (Brake Specific Fuel Cosumption)	1 count = 1, undefined units
9-10	16 bit	unsigned	DATA CHECKSUM	See note 2

PROTOCOL 3. DYNO GAS - ANALYSER

BYTE NO.	SIZE	TYPE	DESCRIPTION	SCALING
1	8 bit		PACKET I.D. = 24 hex (36 decimal)	ASCII "$"
2	8 bit	unsigned	DATA LENGTH = 0C hex (12 decimal)	Data byte count
3-4	16 bit	signed	CO %	1 count = 0.1 %
5-6	16 bit	signed	CO2 %	1 count = 0.1%
7-8	16 bit	signed	HC ppm	1 count = 1 ppm
9-10	16 bit	signed	O2 %	1 count = 0.01 %
11-12	16 bit	signed	LAMBDA	1 count = 0.001 λ
13-14	16 bit	signed	NOx ppm	1 count = 1 ppm
15-16	16 bit	unsigned	DATA CHECKSUM	See note 2

PROTOCOL 4. COMBINED DYNO & GAS ANALYSER
(SM3/4 Family software from versions sm4v030g ONLY!!)

BYTE NO.	SIZE	TYPE	DESCRIPTION	SCALING
1	8 bit		PACKET I.D. = 24 hex (36 decimal)	ASCII "$"
2	8 bit	unsigned	DATA LENGTH = 12 hex (18 decimal)	Data byte count
3-4	16 bit	signed	POWER	1 count = 0.1 kW
5-6	16 bit	signed	TORQUE	1 count = 0.1 Nm
7-8	16 bit	signed	BFSC (Brake Specific Fuel Cosumption	1 count = 1, undefined units
9-10	16 bit	signed	CO %	1 count = 0.1 %
11-12	16 bit	signed	CO2 %	1 count = 0.1%
13-14	16 bit	signed	HC ppm	1 count = 1 ppm
15-16	16 bit	signed	O2 %	1 count = 0.01 %
17-18	16 bit	signed	LAMBDA	1 count = 0.001 λ
19-20	16 bit	signed	NOx ppm	1 count = 1 ppm
21-22	16 bit	unsigned	DATA CHECKSUM	See note 2

COMMAND LINE PARAMETER FOR PROTOCOL 4

VALUE	FUEL SELECTED	Stoic A/F Ratio
ALCOHOL	METHANOL	6.38:1
DIESEL	DIESEL	14.50:1
PETROL	GASOLINE	14.57:1
GAS	PROPANE	15.50:1
value	Setting for custom fuel	Stoichiometric value of fuel

This setting controls λ to A/F ratio conversion for PC display & Autotune function

Command line examples for input to PC com port 8:

For Methanol use:	ECUCAL.EXE E=8 AFSource=ALCOHOL
For fuel with stoic A/F of 11.50:1 use:	ECUCAL.EXE E=8 AFSource=11.50
For E100 use::	ECUCAL.EXE E=8 AFSource=9.00
For E85 use:	ECUCAL.EXE E=8 AFSource=9.77

!!!! IMPORTANT !!!! Spaces are not allowed after "AFSource"