



ENGINE CONTROL UNIT

MARVEL12

12 cylinders, 12 injectors

Internal data logger

Engine and Gear control

Description

Marvel12 is dedicated to race applications that need high performances in a limited range of costs.

Marvel12 is a modular design engine and gear control system which includes an internal data logger and a high number of Inputs/Outputs to allow a flexible setup.

It integrates two microprocessors and a DSP plus two FPGA to achieve great computation power. A very high speed Ethernet line is dedicated to data download, while an ARCNet line and four full CAN lines allow connections with others control devices.

It is thought to be compatible with a very wide range of actuators/sensors, especially F1 products, such as coils, injectors and sensors, and it's intended for universal installation from single up to 12 cylinders engine applications. It's possible to select overcurrent and feedback threshold with regard to the type of coils used.

Output stages provide also a triple DC-motor control such as simple Drive by Wire or trumpets control. Proportional PWM allow you to drive gear box electrovalves. Marvel12 is provided with some analogue inputs with 12 bit resolution, integrated UEGO linear lambda with heater and knock controllers that provide full engine diagnostics and controls.

Main Features

- 24 Single-ended (4 @ 12 bit resolution)
- 4 Differential (@ 12 bit resolution)
- 3 Pick-ups or Hall effect
- 4 Hall effect
- 12 Inductive ignition drivers
- 12 On/Off injector drivers
- 3 H-Bridges: for DC-Motor driver
- 6 PWM: proportional PWM for gear box control
- 2 Linear Lambda sensor
- 4 Knock input for detonation control accelerometers
- 128 Mbyte internal data logger
- Up to 512 logged channels
- Up to 64 Kbyte/s logging rate
- Sampling rates up to 1000 Hz
- 4 CAN communication buses
- 1 ARCNet line
- 1 Ethernet line



Benefits

- No need of external data logger
- Great computation power, precise actuations and gear control
- High number of Inputs/Outputs allows a flexible setup
- Extremely reduce data download time by means of Ethernet link
- Some sensors acquire with high accuracy
- Compatible with F1 products (injectors, coils, sensors etc.)
- SW adjustable coil's overcurrent and feedback threshold
- Floating point data management
- Direct management of Marelli dashboard display
- Pick-up inputs for wheel speed and distance measurement
- Requires Wintax3 analysis software (compatible Win2K/XP)
- Requires Axon logging setup tool
- Very compact design and easy to install

Typical Applications

Professional circuit and rally applications

IRL

Formula2

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Technical Characteristics

Inputs

Analogue Single-ended (4 @ 12 bit resolution)	24
Linear Lambda sensor	2
Knock sensor	4
K-type thermocouple	2
Differential (@ 12 bit resolution)	4
NTC/PT1000 temperature sensor (selectable)	6
NTC internal temperature sensor	1
V battery injector	1
VR Pick-ups or Hall effect (exclusive)	3
Hall effect	4
On/Off digital	4
Lap Trigger	1
"Code Load" enable pin	1

Outputs

On/Off injector drivers	12
Inductive ignition drivers	12
H-Bridges	3
Lambda heater drivers	2
PWM (proportional)	6
Voltage references	6

Communications

CAN line* (1 Mbit/s)	4
ARCNet line (10 Mbit/s)	1
Ethernet line (10/100 Mbit/s)	1
Serial current loop or RS 485 (exclusive)	1

* Configurable on request

Logic Core

Microcontroller (40 MIPS RISC)	2	
DSP (80 MFLOPS)	1	
Dual port RAM (16 Kword)	1	
FPGA (10k gates)	1	
FPGA (100k gates)	1	
Flash E2PROM (microcontroller)	2 x 512	Kbyte
RAM memory (microcontroller)	2 x 32	Kbyte
RAM memory (DSP)	512	Kbyte
Flash E2PROM	2 x 512	Kbyte
RAM memory	2 x 512	Kbyte
E2PROM	512	Kbyte
Time keeper	1	

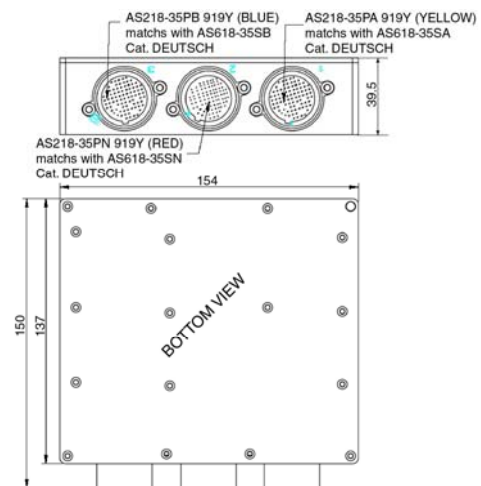
Logging

Flash disk memory	128	Mbyte
Logged channels	up to 512	
Logging rate	up to 64	Kbyte/s
Sampling rate	up to 1000	Hz

Other Characteristics

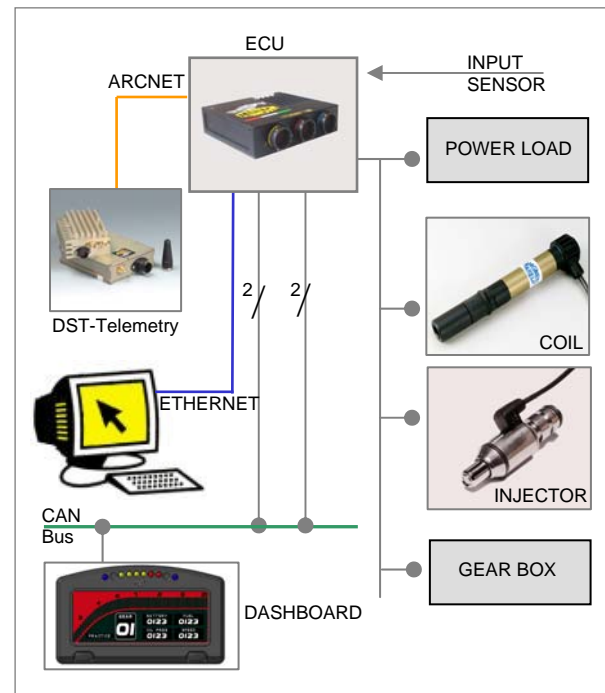
Power supply		
total system operating	8 to 16	V
logic core operating	6 to 16	V
Operating temperature range (internal)	-20 to 85	°C
Protection class	IP 54	
Dimensions		
without connectors	154 x 137 x 39.5	mm
Weight (approx.)	870	g

Dimensions



Dimensions in millimetres

Application Schematics



For further information, please contact:



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