MOTORSPORT | **MAGNETI MARELLI**

WRE-460

Professional engine control unit
Internal data logger

Description

WRE460 Engine and Vehicle Control Unit is a powerful and complete concentrated system capable of controlling high performance engines up to 6 cylinders. It incorporates a powerful data acquisition unit tailored to racing applications which require high resolution data, high bandwidth and a large number of channels.

The unit can drive both ON-OFF and current-controlled injectors, inductive ignition coils and a large number of additional loads.

An integrated six degree of freedom inertial platform can be used to monitor manage life of the ECU.

The communications capability is assured by 5 CAN lines, 1 Flexray line, 1 full-speed USB line and 1 Gb Ethernet line for fast data download and data transfer to other units.

The logic architecture consists of a powerful dual-core processor for data logging, telemetry and communications, while calculation, control and actuation are managed by a high performance microcontroller for a total computation power of over 2500 Dhrystone MIPS.

WRE460 is equipped with a variety of analogue inputs including single-ended, temperatures, differential and knock together with digital inputs for lap trigger, VRS/Hall rate and Hall inputs.

Main Features

- *42 single-ended @ 12-bit resolution*
- *6 differential @ 12-bit resolution*
- *10 PT1000/NTC temperature @ 12-bit resolution*
- *2 lambda UEGO sensor*
- *2 knock interfaces*
- *12 pick-ups, Hall effect, VRS or rate input*
- *4 wires LVDT sensor input*
- *2 lap trigger*
- *10 ON/OFF digital inputs*
- *8 GB internal storage for data logger*
- *up to 1024 logged channels*
- *up to 1MByte/s logging rate*
- *sampling rates up to 2000 Hz*
- *5 CAN communication buses*
- *1 full-speed 2.0 USB host line (12 Mb/s)*
- *1 Flexray line (10 Mb/s)*
- *1 Ethernet line (1 Gb/s)*
- *1 RS-232*

Benefits

- *Complete engine (6 cylinder) and vehicle management*
- *Data download via Ethernet link*
- *6 D.O.F. inertial platform (3-axis accelerometer, 3-axis gyro)*
- *SW-selectable VRS, Hall and Rate input*
- *SW-selectable NTC/PT1000 temperature sensor*
- *Floating-point data management*
- *Direct management of Marelli dashboard displays*
- *Pick-up inputs for wheel speed and distance measurement*
- *WinTAX4 data analysis tool and SYSMA setup tool*
- *Robust design, easy to install*

Typical Applications

Professional circuit and rally applications
Formula series

WRE-460-08331434348300

Technical Characteristics

Inputs

Analogue single-ended (12-bit resolution)	42
Differential (12-bit resolution)	6
Knock interface (12-bit resolution)	2
NTC/PT1000 temperature sensor (*)	10
LVDT sensor (4 wires type)	2
NTC internal temperature sensor	4
Lambda UEGO (12-bit resolution)	2
Injector rail supply (12-bit resolution)	1
VRS, Hall effect or rate inputs (*)	12
Lap trigger (*)	2
ON/OFF Digital input	10
"Code Load" enable pin	1

(*) Configurable by software

Outputs

Inductive coil drivers (up to 30A)	6
On-Off injector drivers (up to 3A) (*)	12
Lambda heater (up to 3A)	2
H-Bridge driver (up to 5A – 7A peak)	2
On-Off low side drivers (up to 3A)	6
PWM low side drivers (up to 3A)	10
PWM low side drivers with current monitor (up to 3A)	6
Moog valve driver (+/- 10mA)	2
Voltage references (5V, 120mA)	6
Battery unregulated supply (100mA)	3

(*) 8 could be 6A controlled current on request

Communications

CAN line (1 Mbit/s or lower, configurable)	5
Flexray line (10 Mbit/s – dual line)	1
Full Speed USB line (12 Mbit/s)	1
Ethernet line (1 Gb/s)	1
RS232 line	1

Logic Core

Strategy, Data Logging & Comm. Processor (1920DMIPS)	1
DDR2 RAM memory (x32)	512MB
NOR flash Memory (x16)	12MB
MRAM memory (x16)	512KB
Synchronous dual port SRAM (x16)	128KB
Flash disk (SDIO)	8GB
Actuation microcontroller @264MHz (623DMIPS)	1
Flash EEprom (x32 internal))	4MB
RAM memory (x32 internal)	256kB
Synchronous SRAM (x32) (external)	2MB
MRAM memory (x16)	512KB
Time keeper	1

Logging

Flash disk memory	8 GB
Logged channels	up to 1024
512 channels ACT and 512 channels STR/TLM	
Logging rate	up to 1 MB/s
512 kB/s ACT and 512 kB/s STR/TLM	
Sampling rate	up to 1 kHz

ENGINE CONTROL UNITS

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Other Characteristics

Power supply	8 to 16 V
Operating temperature range (internal)	- 20 to 85 °C
Temperature range during data download	0 to 70 °C
Protection class	IP 64
Dimensions without connectors (* Connector face)	166* x 129 x 44.5 mm
Weight (approx.)	1300 g

Dimensions
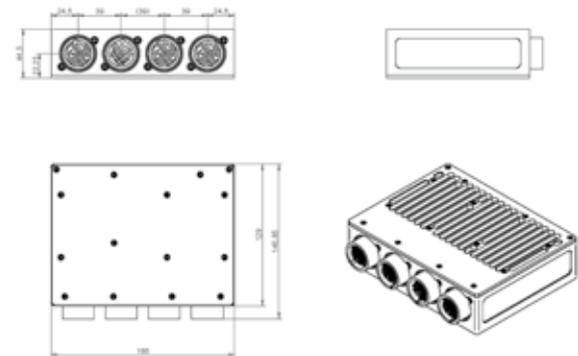
Dimensions in millimetres

Application Schematics