



Engine and Vehicle Control Unit

For motorsport applications

For complete details contact :

Mectronik reserving to change the data without any reserve.
All values are referred to std conditions. (20° C, 100 KPa) and not binding
Hardware version : 3.2.4_1.0.0

MecTronik S.r.l. - Via dell'artigianato, 5 - 37053 - Cerea (VR)

Tel./Fax : +39-(0)442-329200 (lines r.a.)

<http://www.mectronik.com>

info@mectronik.com

APPLICATIONS

For High performance engine up to 4 Cylinders used in racing vehicles, with single or dual injectors bank. The ecu is equipped with the advanced features for dynamic vehicle control, and it's design around the last 32Bit INFINEON AUDOMAX © microcontroller with full Automotive AECQ100 certificate components. The products are subjected to full quality control, individually tested also during the assembly and production process with fly probe automatic test system, shaker plate and climate chamber

HIGHLIGHT

- High Current Ignition Power Stage
- Advanced Combustion control with Spark Ion-sensing current
- Integrated Wide Band Lambda Sensor controller
- High Speed configurable Can Bus Line
- Small Dimensions and Lightweight
- Internal Data logging
- WiFi 802.11 wireless connection
- 6D integrated accelerometers and gyroscopes
- Flexible inputs and outputs for easy integration with O.E.M. components
- Editing in Real Time of calibration parameters, for a quickly and fast mapping
- Advanced Power Supply management for Battery Less System
- Automotive 80 PINS high temperature connector (48+32)

INPUT

QT	FUNCTION	RANGE	EXCLUSIVE	NOTE
1	POWER SUPPLY UNIT	6.....18 V DC	YES	
1	ON-OFF KEY SENSING	6.....18 V DC	YES	FOR POWERLATCH
1	CRANK POSITION	+/- 100V AC	YES	
2	SYNC INPUT	0.....5V ANALOG	NO	FROM CAM OR MAP
4	SPEED WHEELS	0...5V or 0...12V	NO	SQUARE WAVE
1	LAP BEACON	0...5V or 0...12V	NO	
1	IGNITION COIL RETURN	up to 120V	YES	
1	WIDE BAND LAMBDA	0.....5V ANALOG	YES	
2	DBW THROTTLE	0.....5V ANALOG	NO	WITH DEDICATE P.S.
2	DBW PEDAL/GAS	0.....5V ANALOG	NO	WITH DEDICATE P.S.
1	FW UPGRADE ENABLE	0.....12V DC	YES	
1	CANBUS LINE	0....5V	YES	2.0 B
16	ANALOG INPUT	0....5V ANALOG	NO	
3	TEMPERATURE SENSOR	50.....100k Ohms	YES	

All input are embedded protected over S.C to battery and meet the ISO 7637-2 pulse3 testing .

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OUTPUT

QT	FUNCTION	RANGE	EXCLUSIVE	NOTE
12	INJECTORS OR PWM	2,2 A 50V	YES	O.D.
1	LAMBDA HEATER	3,5A 40V	YES	O.D.
4	IGNITION COIL	21A 400V 300mJ	YES	O.C.
2	H-BRIDGE	8,6A	YES	P.P.
1	STEPPER MOTOR	2,2A	NO	P.P.
4	VVT OR MOOG VALVE	Up to 8,6A	NO	P.P.
4	ON-OFF	1,1 A 45V	YES	O.D.
2	PWM	3 A 45V	YES	O.D.
1	HISIDE PWM	7A	YES	O.D. (HISIDE)
4	VREF SENSORS	150mA 5V	YES	
1	WARNING LAMP	500mA	NO	O.D.
4	VREF SPARE OR DBW	50mA 5V	YES	
7	GND SENSOR			

All output are embedded protected over S.C. to battery or Ground, and meet the ISO 7637-2 testing .
 O.D. = Open Drain (N channel if not otherwise specified)
 O.C. = Open Collector N channel
 P.P. = Push Pull

CORE

Infineon Tricore™ MCU 180 Mhz with DSP and FPU

MEMORY

2.5 MB for application code, 250KB for calibration data, 32MB for Logging Data

ION-SENS

Using the ionization current sensing technology, it's possible to measure a cylinder pressure value, for combustion analysis, knock detection, missfiring, engine efficiency and or performance. The unit is equipped with integrated driver for the specific ignition coil with secondary winding external termination, for measure the spark plug ion current.
 Contact MecTronik technical office for more information about the specific ignition coil

WIRE-COMUNICATION

The unit is capable to manage the external devices like calibration tools (PC) or on-vehicle device like Gps sensor, dashboard or other device over CAN BUS Line.

- CAN BUS Standard C (High speed) up to 1 Mbit/s , internal terminated (120 Ohm)

CANL line voltage (normal)	0.5.....3 V
CANH line voltage (normal)	2.0.....4.5 V
CAN Line max voltage (no destructive)	0.....13.5V

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WIRELESS-COMUNICATION

Wireless LAN module, for direct connection with PC / Tablet / Smartphone, and support the “AD HOC” and “INFRASTRUCTURE” networks.

- Secure WIFI authentication using : WEP-128, WPA-PSK, WPA2-PSK
 - Networking protocol : DHCP , UDP , DNS , ARP , ICMP , TCP , HTML client
 - 2,402.....2,480 Ghz IEEE 802.11b/g
 - Transmit power 10 dBm
 - Receive sensitivity -83 dBm
 - Transmission Rate for 802.11b = 1.....1 Mbps
 - Transmission Rate for 802.11g = 6.....54 Mbps
 - FCC/CE/IC certified
-

DATALOGGING

The unit is equipped with a data logging features, for recording the engine and bike data. The system is designed to manage the internal or external signal and channels (from can bus line) . The access to the data it's protect by a password for the safety and privacy

- Memory size 32MBytes
 - Channels up to 64
 - Data Throughput 10KBytes/s
 - Channels logging Frequency Events, 0.....1KHz
 - Data Download CANBUS, WIFI
-

GYROSCOPE

Integrated MEMS technology 3D accelerometers and 3D gyroscopes. The maximum acceleration without damage is guaranteed up to 3000g for 500uS. This capability ensures accurate measurements in extremely environments as the offroad situations or during the crash.

- 3 independent accelerometer for X,Y,Z axles with 4 acceleration range settable +/- 2g ; +/- 4g ; +/- 8g ; +/- 16g ;
 - 3 independent angular rate value for X,Y,Z axles with 3 range settable +/- 250 deg/sec ; +/- 500 deg/sec ; +/- 2000 deg/sec ;
 - Trigonometric function for calculating the correct position in the space
 - accelerometer sensitivity : from 1 to 12 mg
 - angular rate sensitivity : from 9 to 70 mdeg/sec
 - 6D orientation detection; Low pass and Band pass Digital programmable Filter
-

OPERATING TEMPERATURE

The operating unit temperature is : -40°C.....+125°C

If the temperature exceeds the threshold of 85 ° C, some internal devices for the communications can be switched in a quiescent state.

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INGRESS PROTECTION

IP68 Compliant

CALIBRATION DATA

There are two distinct areas of calibration data memory, both with a separate password protection access, one for vehicle or engine manufacturer like a main table, limits value, sensors calibration data etc. Another one for the data in use to the Team, like the vehicle control parameters, transmission/gear parameter, injection and ignition correction table (with limit fixed from engine manufacturer), wheels parameters etc.

It is guaranteed the free access without a password, only for verification of diagnostic parameters, for checking the firmware version, Hardware data ID, as well for reading the GUID (Globally Unique Identifier) code of the calibration data. These GUID codes allow unique identification and secure data on the ECU, enabling the staff of the manufacturer or the FIA-FIM-DORNA scrutineer, the verification of compliance with applicable regulations and approvals.

HISTORY BOOK

A read-only memory areas, is reserved to store events and conditions of danger for the engine, eg. like a time overlimit rpm and max value, minimum oil pressure, water temp max etc., operating time and a stress index of the engine. Additional recorded also events of danger related to the vehicle, such as falls or impacts

BUNDLED SOFTWARE

A free of charge MeCal ® Calibration software license it's supplied with a single ecu. This new tool is designed to make simple operations of setting the ECU to user without high skills, allowing the manufacturer to customize the menu structure and the layout of the user interface for example.

The sw tool for the acquisition data is provided from our partner 2D Datarecording ®. It's a specific version of the notorius Analyzer2D® with Calctool and specview .

DASHBOARD

The Ecu works fully integrated with a specific version of the Big Dash, developed in collaboration with the 2D Datarecording

OPTIONS

MANY FEATURES DESCRIBED IN THIS DOCUMENT ARE OPTIONAL. CONTACT THE MECTRONIK FOR COMPLETE DETAILS

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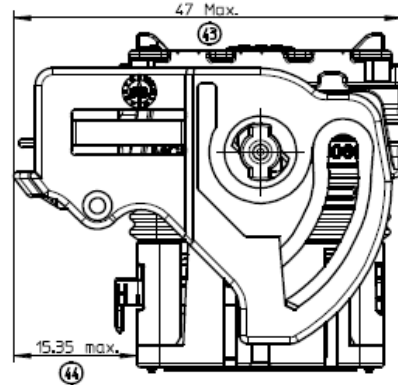
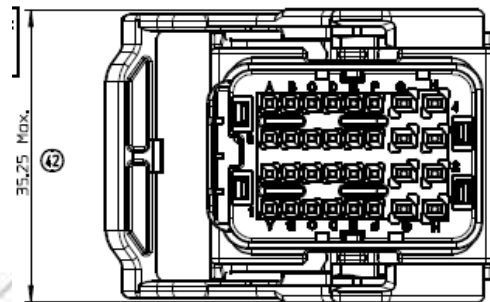
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CONNECTOR

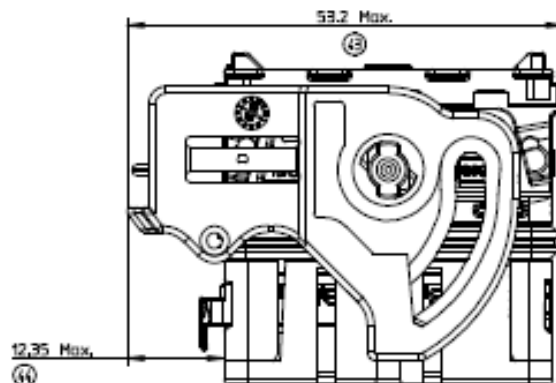
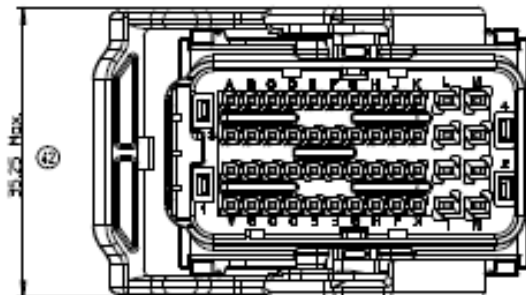
Automotive water proof Molex CMC Series, 80 pins.

For the wiring harness, use only the recommended connector :

32 PIN : 64319-3211 - MOLEX



48 PIN : 64320-3319 - MOLEX



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PINOUT

ENGINE 48WAY	A-A1	IN_PICKUP_P	IN
	A-A2	IN_PICKUP_N	IN
	A-A3	IN_FR1	IN_FREQ
	A-A4	IN_AN1_CAM1	IN AN 0-5V
	A-B1	IN_AN2	IN AN 0-5V
	A-B2	IN_AN3	IN AN 0-5V
	A-B3	IN_AN4	IN AN 0-5V
	A-B4	IN_AN5_CAM2	IN AN 0-5V
	A-C1	IN_LSU_UN	IN AN 0-5V/CJ
	A-C2	IN_AN7	IN AN 0-5V
	A-C3	IN_AN8	IN AN 0-5V
	A-C4	IN_AN9	IN AN 0-5V
	A-D1	IN_TEMP1	IN_NTC
	A-D2	IN_TEMP2	IN_NTC
	A-D3	IN_TEMP3	IN_NTC
	A-D4	IN_AN10	IN AN 0-5V
	A-E1	IN_IONING_COIL-IN_KNOCK	IN ION
	A-E2	IN_LSU_VM	IN ION / CJ
	A-E3	IN_LSU_IA	IN ION / CJ
	A-E4	IN_LSU_IP	IN ION / CJ
	A-F1	OUT_INJ5	OUT O.D. N
	A-F2	OUT_INJ6	OUT O.D. N
	A-F3	OUT_INJ7	OUT O.D. N
	A-F4	OUT_INJ8	OUT O.D. N
	A-G1	OUT_INJ1	OUT O.D. N
	A-G2	OUT_INJ2	OUT O.D. N
	A-G3	OUT_INJ3	OUT O.D. N
	A-G4	OUT_INJ4	OUT O.D. N
	A-H1	OUT_PWM8	OUT O.D. N
	A-H2	OUT_PWM12	OUT O.D. N
	A-H3	OUT_HTRLSU_PWM2	OUT O.D. N
	A-H4	GND_SEN	OUT GND
	A-J1	GND_SEN	OUT GND
	A-J2	GND_SEN	OUT GND
	A-J3	GND_SEN	OUT GND
	A-J4	GND_SEN	OUT GND
	A-K1	VREF	OUT VREF1
	A-K2	VREF	OUT VREF1
	A-K3	VREF_AUX	OUT VREF2
	A-K4	VREF_AUX	OUT VREF2
	A-L1	OUT_HB_A1-PWM4	OUT PP
	A-L2	OUT_HB_B1-PWM6	OUT PP
	A-L3	OUT_COIL1	OUT OC
	A-L4	OUT_COIL2	OUT OC
	A-M1	OUT_HB_A2-PWM3	OUT PP
	A-M2	OUT_HB_B2-PWM5	OUT PP
	A-M3	OUT_COIL4	OUT OC
	A-M4	OUT_COIL3	OUT OC

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VEHICLE 32WAY	B-A1	IN_FR2	IN FREQ
	B-A2	IN_FR3	IN FREQ
	B-A3	IN_AN11	IN AN 0-5V
	B-A4	IN_AN12	IN AN 0-5V
	B-B1	IN_AN13	IN AN 0-5V
	B-B2	IN_AN14	IN AN 0-5V
	B-B3	IN_AN15	IN AN 0-5V
	B-B4	IN_AN16	IN AN 0-5V
	B-C1	IN_AN17	IN AN 0-5V
	B-C2	OUT_MFO1	OUT O.D. N
	B-C3	OUT_MFO2	OUT O.D. N
	B-C4	OUT_MFO3	OUT O.D. N
	B-D1	OUT_MFO4	OUT O.D. N
	B-D2	GND_SEN	OUT GND
	B-D3	V_KEY	IN-OUT
	B-D4	IO_MFIO_FR4	IN ON-OFF
	B-E1	GND_SEN	OUT GND
	B-E2	GND_SEN	OUT GND
	B-E3	VREF	OUT VREF1
	B-E4	VREF_AUX	OUT VREF2
	B-F1	VREF	OUT VREF1
	B-F2	IN_PROG	IN PROG
	B-F3	CANA_H	CAN
	B-F4	CANA_L	CAN
	B-G1	OUT_PWM9	OUT O.D. N
	B-G2	OUT_PWM11	OUT O.D. N
	B-G3	OUT_PWM10	OUT O.D. N
	B-G4	OUT_PWM1	OUT O.D. N
	B-H1	OUT_HSD_PWM7	OUT O.D. P
	B-H2	V_POWER	IN BATTERY
	B-H3	GND_POWER	IN GND
	B-H4	GND_POWER	IN GND

For complete details contact :

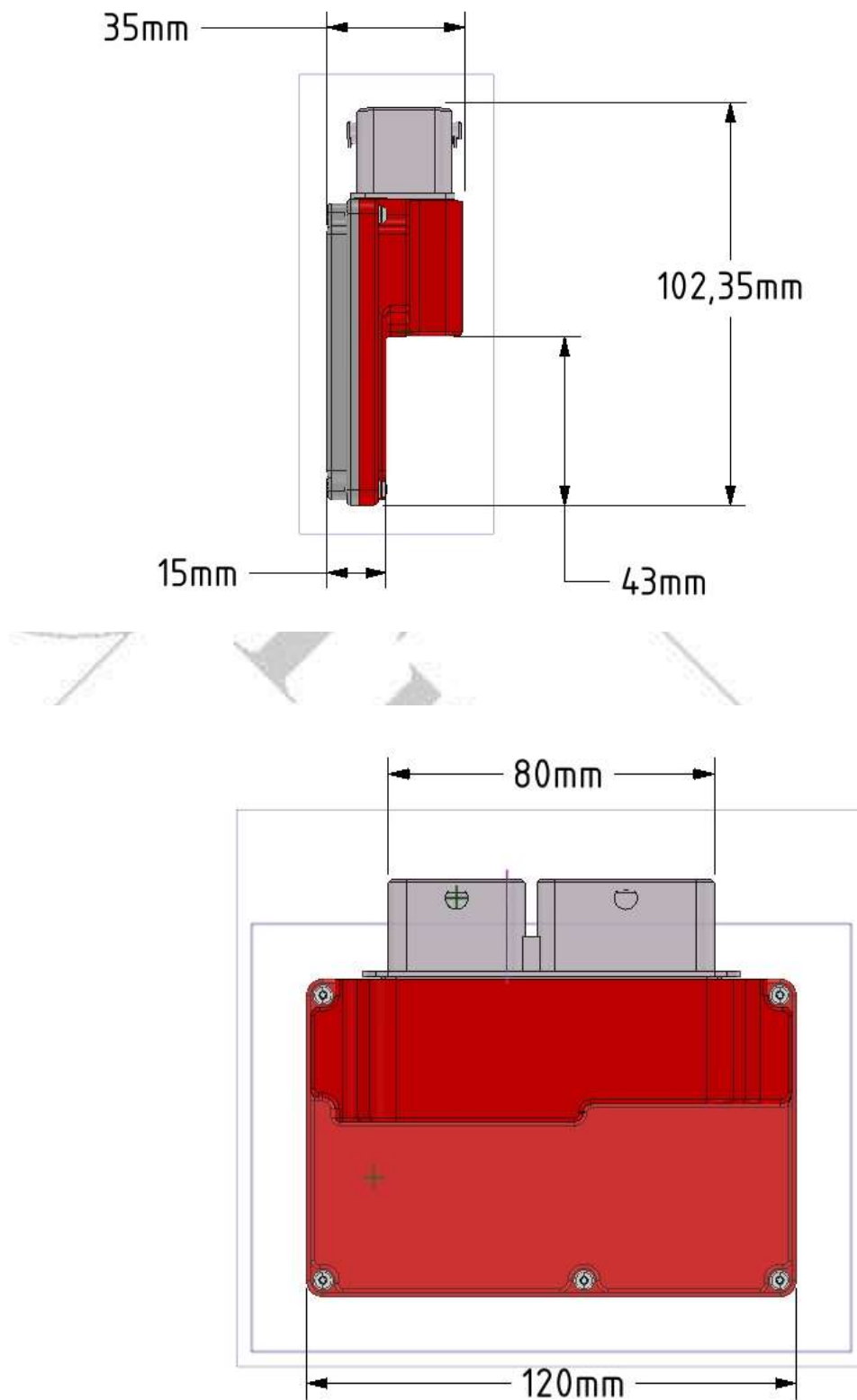
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DIMENSIONS



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