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Emtron KV16 Motorsport Engine Control Unit

Brand: Emtron Australia
Product Code: EMKV16
Weight: 1.00kg
Dimensions: 15.00cm x 10.00cm x 8.00cm

Price: $4,200.00

Short Description

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Description

Emtron’s KV16 is a wire in ECU with extreme flexibility. Industry leading I/O count will ensure you do not have to make any sacrifices when configuring your engine and vehicle. This ECU will support up to 16 Channels of Fuel (8 cylinders fully sequential staged injection) and 12 Channels fully sequential Ignition. Every KV16 is housed in a durable billet Aluminium enclosure and includes up to 32MB permanent memory for on board logging, 4-channel oscilloscope function, DBW control up to 4 channels, dual LSU4.9 Lambda controllers, dual digital Knock control, Ethernet communications and 3 axis G-force sensing to name a few.

Specifications

Power Supply

- Operating voltage: 6.0 to 22.0 Volts DC (ECU shutdowns at 24.0V)
- Operating current: 400mA at 14.0V (excluding sensor and load currents)

- Reverse battery protection via external fuse
- “Smart” battery transient protection

Operating Temperature

- Max operating range: -30 to 110°C (-22 to 230°F)
- Recommended operating range: -30 to 85°C (-22 to 185°F)

Physical

- Aluminium 6061 grade CNC billet enclosure
- Enclosure size 134 mm x 162 mm x 27 mm
- Weight: 740g
- Connector system: 120-way Super Seal waterproof connectors with gold plated contacts, pin diameter of 1 mm
- Current rating: maximum 15A per pin (wire gauge dependant)

Internal

- Dual 100MHz processors
- 500Mb DDR RAM
- 32MB ECU logging memory, over 1200 channels available, 1Hz to 500Hz logging rate
- 4-Channel oscilloscope function
    - Sampling at 100k samples/second
    - Includes Crank and Cam sensor inputs
    - Includes Digital inputs 1-4
- On-Board barometric pressure sensor, range 40 – 115.0 kPa
- 3-Axis accelerometer, 16-Bit resolution, ±2g/±4g/±8g dynamically selectable full-scale

Communications

- 1x High Speed Ethernet 100Mbps for tuning software connection
- 2x CAN 2.0B 1Mbps/ 6 Channels per node, total 128 messages

The KV16 can control both modes of injection: Saturated and Peak & Hold up to 16 channels.

Peak and Hold Injector Control

- When using low impedance injectors (< 5 Ohms) the ECU uses a switch

mode current limiting technique to minimise heat dissipation in the Injector. This gives better injector control and helps maximize injector life by lower its operating temperature.
- Independently configurable Peak and Hold currents
- Flyback Voltage Clamp 70V
- Max Peak current 8A
- Max Hold current 4A
- Total current limited to 10A per output

Saturated Injector Control

- Required when injector resistance is greater than 5 Ohms.
- Flyback Voltage Clamp 70V
- Total current limited to 10A

Auxiliary Injection Mode

- Unassigned Fuel channels can be used to switch or modulate resistive and inductive load.
- Flyback Voltage Clamp 70V
- Total current limited to 10A
- Maximum Frequency: 5kHz
- No internal flywheel diodes. VVT and Idle solenoids require external flywheel diodes

Protection

- Over current / Short to Battery protection
- Electrostatic discharge (ESD) protection
- Flyback Voltage Clamp

The KV16 supports up to 12 Ignition channels.

Ignition Control

- Open collector outputs (low side) with active current source control to produce a logic level signal
- Adjustable Ignition drive current (35mA or 70mA)

Auxiliary Ignition Mode

- When the Ignition output is not configured to drive an ignitor, it can be

used to switch or modulate a resistive or inductive load to ground.
- Flyback Voltage Clamp 40V
- Continuous current limited to 1A
- Total current limited to 3A
- Maximum Frequency 5kHz
- No internal flywheel diodes. VVT and Idle solenoids require external flywheel diodes

Protection

- Over current / Short to Battery protection
- Electrostatic discharge (ESD) protection

The KV16 has 14 Digital Inputs providing Frequency and Switched based inputs into the ECU. These inputs have a high level of configurability allowing easy interface to all sensor types. Digital Inputs 1-8 can be used to measure frequency, while all channels can accept a switched input.

8x Digital/Speed Inputs (DI 1 – 8)

- Frequency range from 0.0Hz up the 30.0kHz on all 8 channels
- Magnetic and hall/optical effect sensor compatible with programable trigger edge(s)
- Independent programable frequency-based arming threshold control, range 0.0 – 12.0V
- Wheel speed, output shaft speed, turbo speed and other frequency-based signals
- VVT position(s) up to 4 channels available on DI 1- 4.
- Accepts a 0.0 – 20.0V analog input. Effective resolution is 4.88mV (10-Bit)
- On/Off switched inputs: AC request, launch enable, cruise switch, table control switching etc with programable switch-based arming threshold control, range 0.0 – 20.0V
- Switchable 4k7 ohm pull-up resistors on all 8 channels to 9.0V

6x Digital/Switched Inputs (DI 9 – 14)

- On/Off switched inputs: AC request, Launch enable, cruise switch, table control switching etc with programable switch-based arming threshold control, range 0.0 – 20.0V
- Accepts a 0.0 -20.0 V analog input. Effective resolution is 19.61mV (8-Bit)
- Switchable 4k7 ohm pull-up resistors on all 6 channels to 9.4V

Analog Voltage Input Mode

- When not used as frequency or switched inputs these channels can be used to measure analog signals. All channels have over voltage protection with an input range of 0.0 – 20.0V.

The KV16 has 16 Auxiliary Outputs with a wide variety of driver types to suit all applications. These drives are suitable for controlling relays, resistive and inductive loads, stepper motors, DC servo motors and electronic throttles. All outputs are short circuit and over current protected.

Auxiliary Outputs 1-8 (low or high side)

- Auxiliary 1-8 drivers can be configured for Low Side or High Side driving
- Maximum Frequency: 15kHz
- Flywheel diodes integrated into all outputs. Flywheel recirculation to the ECU Supply
- Auxiliary 1-4: Low Side 4A continuous, 8A limit
- Auxiliary 5-8: Low Side 2.5A continuous, 5A limit
- Auxiliary 1-8: High Side 4A continuous, 9A limit

Auxiliary Outputs 9-16 (half bridge)

- Auxiliary 9-16 are all half-bridge drivers
- Maximum Frequency: 15kHz
- Auxiliary 9-12: Half Bridge 5A continuous and 8A limit. Can be H-bridge configured for DC motor control (DBW)
- Auxiliary 13-16: Half Bridge 15.0A continuous (pin limited)

Applications

- Variable Valve Timing (VVT), Variable Valve Timing Electric (VTiE), Drive by Wire (DBW) up to 2 throttle bodies, boost control solenoids, gearshift solenoids, stepper motor, nitrous solenoids and many more

Auxiliary Output Protection

- Over current / Short to Battery/Thermal overload protection
- Electrostatic discharge (ESD) protection
- Reverse battery protection

Analog input channels 1-16 are sampled using high resolution 12-bit analog to

digital converters with a 0.0 -5.000V input range. All channels support ratiometric and absolute 3-wire based sensors such as MAP, Throttle position(s) and pressures etc. Channels 7-12 also support thermistor 2-wire sensors such as engine temperature, inlet air temperature with switchable 1k ohm pullup resistor control.

16x Analog Voltage/Temperature Inputs

- Fully configurable including custom calibrations
- Switchable 1k ohm pull-up resistors on ANV 7-12 for temperature inputs (available on 6 channels)
- Accepts a 0.0 – 5.000V analog input range. Resolution is 1.22mV (12-Bit)
- Input Impedance 100k Ohms to ground

Crank and Cam sensor inputs

- Two Independent channels with Magnetic, Hall effect and Logic options
- Switchable Pull-up resistor = 4k7 Ohm to 5.0 V
- “True” Zero crossing detection on magnetic based signals
- Programmable Independent arming threshold control, range 0.1V to 12.0V
- Maximum signal amplitude +/-80V
- Input Resistance = 39k Ohms to ground
- OEM patterns supported

Knock Control

This ECU supports dual Knock control using inputs from a piezoelectric sensor. Each knock input is fully differential, giving superior common-mode noise rejection in the harsh automotive environment.

- 2 Independent knock input channels with fully differential inputs.
- Using Bosch, Digital Knock Integrated Circuit Technology with programmable FIR filter
- Center frequency from 500Hz – 25kHz
- Bandwidth window from 100Hz – 5kHz
- Digital filter window; Hamming or Blackman
- Gain control(x1, x2, x4, x8)
- Cylinder selectable knock input
- Knock control available on ALL Ignition modes (Direct, Wasted, Distributor etc)

Lambda Control

This ECU supports on-board dual Lambda controllers using the Bosch LSU4.9 wide band oxygen sensor.

- x2 independent on-board channels supporting Bosch LSU4.9 sensor
- Using Bosch, Integrated circuit technology for sensor control
- Nernst cell temperature measurement for precise PID heater and temperature control
- Lambda range: 0.580 La to 10.000 La

Protection

- Short to ground
- Short to Vbat
- Open Load.

Voltage Supply Outputs

The KV series regulated supplies are designed for the harsh automotive environment. They include protection from reverse battery, jump starting transient voltage surges and automatic shutdown when the output is shorted to ground.

5.0V VRef1

- Main sensor 5.0V supply
- Continuous current 0.4 Amps
- Accuracy: +/- 1.0 % at 25 °C
- Short circuit, Reverse battery protection, Thermal overload protection

5.0V VRef2

- Secondary sensor 5.0V supply
- Continuous current 0.4 Amps
- Accuracy: +/- 1.0 % at 25 °C
- Short circuit, Reverse battery protection, Thermal overload protection

8.0V CAS

- Continuous current: 0.6 Amps
- Accuracy: +/- 1.0 % at 25 °C
- Short circuit, Reverse battery protection, Thermal overload protection

- Short circuit, Thermal overload protection.

Voltage Supply Inputs

ECU Supply

- Operating Range 6.0V – 22.0V
- Power Supply for Auxiliary Channels 1- 8 High Side Drivers
- Flywheel supply for Injector channels when Peak & Hold mode is active
- Flywheel supply for Auxiliary channels 1- 8

Aux 9-12 Supply

- Dedicated power supply for Auxiliary Channels 9-12 half bridge drivers

Aux 13-16 Supply

- Dedicated power supply for Auxiliary Channels 13-16 half bridge driver

EFI Relay Control

This ECU supports the control of an EFI relay, allowing for management of its own power supply. To achieve this a dedicated Ignition Switch input and dedicated EFI Relay output are used.

Dedicated EFI Relay Control

- Provides a relay ground, 200mA Limit
- Short circuit, Thermal overload protection

Dedicated Ignition Switch

- Used to control Main EFI Relay circuit at key-on
- Input Analog Voltage Range: 0 – 20.0V
- Input Impedance 100k Ohms to ground
- Adjustable ON/OFF thresholds. Resolution = 0.1V

Downloads

KV16 ECU Pinout Rev 2

KV16 ECU Data Sheet