

# Adaptronic e420c ECU

## Physical Information

<b>Connectors</b>	1 16-way OEM style plug for triggering and low current outputs 1 20-way OEM style plug for analogue and digital inputs 1 8-pin SIP connector for power and injector drives 1 6-pin SIP connector for high current auxiliary outputs 2 DE9 connectors for serial communications (One for PC and One for Wide Band O2)
<b>Dimensions</b>	174mm X 92mm X 50mm
<b>Mass</b>	0.4 Kg
<b>Looms available</b>	0.5m long (for connection to existing loom) 2.0m long (for wiring directly to engine) Various plug-in looms (plug directly into factory wiring, contact for details)

## Sensor Interfaces

<b>Crank Angle Sensor</b>	3 programmable inputs, configurable as triggering ignition timing, injector drive, ignition timing during cranking, or cylinder 1 marker. Reluctor and optical/Hall effect inputs, with configurable edge selection, internal pull-ups on optical/Hall effect inputs
<b>Crank Angle Sensor Waveforms</b>	Sync / trigger / multitooth / missing tooth (versatile programmability) Nissan optical Mitsubishi style with 2 sync pulses <i>Virtually all factory triquering systems</i>
<b>Manifold absolute pressure input</b>	0 - 5V, 2-point linear calibration, range 0 to 400 kPa (requires external sensor, 5V supplied by ECU)
<b>Air, water and aux temp inputs</b>	4k7 pull-up (requires separate thermistor connected to ground), 32-point linearly interpolated calibration, range -30 to 125°C
<b>EGO input</b>	0 - 1V factory narrowband, or Bosch "wideband" - input impedance 10 MOhm. Can connect 0-5V linearised sensor (eg PLX, M&W UEGO) to aux input Can connect 0-3V Zietronix sensor to analogue input Can connect M&W UEGO, TechEdge V2, TechEdge 2J1, Innovate LC-1, FJO Gen II, AEM UEGO to second serial port
<b>Knock Sensor</b>	High impedance input band pass filtered
<b>Throttle Position Sensor</b>	0-5V (5V supplied by ECU), 2-point calibration
<b>Auxiliary digital inputs</b>	8 inputs, each configurable as active-high or active-low, 12V tolerant inputs

## Actuator Interfaces

<b>Number of Injector Drivers</b>	4
<b>Injector driver waveforms</b>	Full sequential Batch Semi-sequential every period or semi-sequential every second period Half/third/quarter speed full sequential Fire all at once every cylinder 1 (as on Swift GTi, Alpine Renault) Optional batch fire during cranking
<b>Injector driver current</b>	Optional constant current or peak-hold drive, selectable steady-state current of 0.5A, 0.9A, 1.5A or 1.9A
<b>Number ignition outputs</b>	3 (4 optional)
<b>Ignition output waveforms</b>	Selectable as firing on rising edge or falling edge
<b>Ignition output type</b>	Open-collector with 560Ohm pull-up (allows direct connection to OEM transistor or separate igniter box)
<b>Number of auxiliary outputs</b>	8: 4 high-current, 4 low-current
<b>High current outputs</b>	Max current 7A (or 3A inductive), 3 of these PWM capable, PWM frequency selectable (23Hz - 2kHz)
<b>Low current outputs</b>	Max current 200mA - suitable to drive relay coils

## Control Characteristics

<b>Map points</b>	512 - selectable every 200-250-300-500 RPM and 1/15th of maximum load (TPS or MAP) (2 ignition and 2 fuel maps)
<b>Load determination</b>	TPS or MAP TPS using 2nd map as MAP backup MAP using 2nd map as TPS backup Both maps MAP or TPS, digital input to select MAP and TPS map, digital input to select MAP and TPS map, use MAP on closed throttle, otherwise TPS Use max/min/average/sum (MAP, TPS) Read TPS from map and multiply by value in MAP table
<b>Injector pulse width resolution</b>	0.7µs (0 - 44ms)
<b>Ignition resolution</b>	0.2° (0 - 51°)
<b>Dwell time resolution</b>	0.1ms (0.1ms - 5ms) Dwell time reduction for high RPM with high dwell time
<b>Accelerator pump</b>	TPS and/or MAP based (configurable proportionality) as well as asynchronous accelerator pump (function of RPM) Works with TPS pot or switch
<b>Fuel control strategies</b>	Open loop, closed loop, and two configurable auto tune modes
<b>Fuel correction</b>	Open loop, engine temperature, air temperature, accelerator pump, post-crank enrich, cranking enrichment, WOT
<b>Ignition control strategies</b>	Open loop, closed loop, and two configurable auto tune modes
<b>Idle control strategies</b>	Open loop values for 32 temperature points Target speeds for 32 temperature points Throttle cracker (VSS increase and change to open loop) Extra effort for electrical load and air conditioning Post crank idle-up Idle effort correction for air temperature
<b>Main loop speed</b>	200Hz