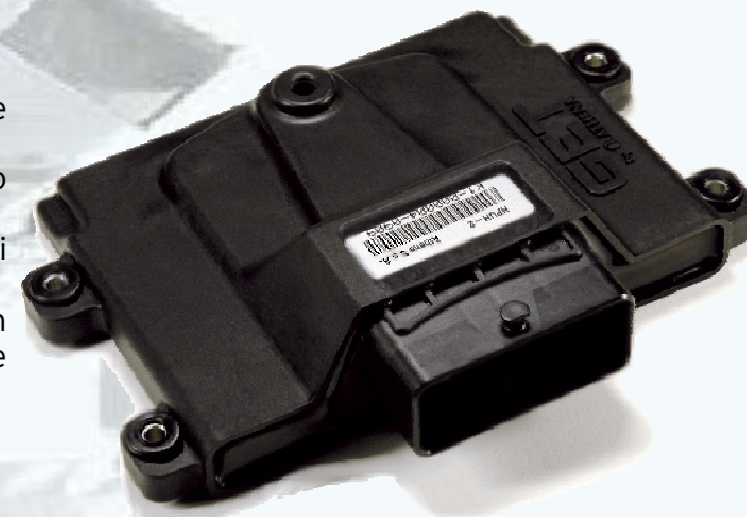


HPUH : UNITÀ DI CONTROLLO MOTORE AD ALTE PRESTAZIONI PER APPLICAZIONI 2-4 TEMPI

La **HPUH** e' una centralina di Controllo Motore derivata dalla **ECUH** e dedicata alla gestione di motori anche complessi a 2 e 4 Tempi ad Iniezione Elettronica. La **HPUH** può controllare motori fino a 6 Cilindri eventualmente equipaggiati con Corpo Farfallato Motorizzato. In alcune condizioni e' anche possibile gestire motori fino ad 8 cilindri. E' anche possibile la gestione di motori a 4 Cilindri e 8 Iniettori (2 Iniettori per cilindro). Data la grande flessibilità della **HPUH** le diverse configurazioni applicative sono proposte attraverso diversi Firmware applicativi, configurazioni Hardware e diverse configurazioni di pinout.

- **HPUH2** Hardware e **H2DUCAx** Firmware sono dedicati alla gestione di molte motorizzazioni Ducati fino all'ultimo 1198.
- **HPUH4** o **HPUH6** Hardware e **H4FSAEx** Firmware sono dedicati al Controllo Motore generico per configurazioni fino a 6 Cilindri or 4 Cilindri con 8 Iniettori.
- **HPUH4CBR** Hardware e **H4FSAEx** Firmware sono dedicati al controllo dei motori Honda CBR 600 and 1000.
- **HPUH5** Hardware e **H5AUTOx** Firmware sono dedicati ad applicazioni Auto con motori fino a 4 Cilindri con Controllo Variabile Fasatura Valvole (Variable Valve Timing VVT) e controllo dei solenoidi di controllo della valvole Wastegate.



Su tutti i dispositivi della famiglia **HPUH** l'accesso alle Variabili, Tabelle e Piani di calibrazione e' possibile con i diritti Basic del software Maya senza l'utilizzo di Licenze avanzate. I dispositivi della famiglia **HPUH** vengono forniti senza mappa. File di mappa a titolo esemplificativo sono distribuiti se disponibili.



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Electrical and CPU Data

Power:

- Nominal supply voltage 13,5 V
- Supply voltage range 6 to 18 V
- Max Current Sink without Loads <300 mA
- CPU 32 Bit RISC 80 MHz 100 MIPS

Inputs:

- 1 Input for Inductive Crankshaft Sensor (Trigger Wheel)
- 1 Hall-effect Camshaft Sensor (Hardware Modification for some application)
- 2 Hall-effect Wheel Speed Sensors
- Internal Barometric Pressure Sensor
- 4 Digital Inputs :
 - Gear Cut Switch
 - Tipover
 - Sidestand
 - Map Change
- 11 Analog Inputs :
 - TPS1
 - TPS2
 - PEDAL1
 - PEDAL2
 - MAP
 - LAMBDA
 - AIRT
 - ENGINET
 - SPARE 1
 - SPARE 2
 - SPARE12V



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Output:

- 6 or 8 Low Side Injector Power Stage
- 6 IGBT Ignition Coil Power Stage
- 2 Low Side Power Stage [1]
- 1 Low Side Power Stage for Custom Function
- 1 H-Bridge 6A for ETC control
- 1 Stepper Motor Driver
- 6 Low Side protected Power Stages :
 - ECR Relay Driver
 - Light/ETC Relay Driver [2]
 - Tachometer
 - MIL Lamp
 - Solenoid 1 / Pump Relay [3]
 - Solenoid 2 / Pump Relay [3]
- 2 Protected Sensors Supply Voltage (5V)

[1] Light Relay only when ETC Control is not used

[2] Light Relay only when ETC Control is not used

[3] Pump and Fan Relay when 8 Injectors configuration is used

Communications Interfaces:

- 1 CAN Bus (Terminal Bus resistor not mounted)
- 1 RS232

System Layout:

- Trigger Wheels : N-2, N-2 with CAM Reference, N-2 on Camshaft, Honda CBR (modified Hardware)
- alpha/n and/or MAP compensated
- Load indicated by Throttle Position ("TPS") and/or MAP
- Cam sensor elimination with sequential injection and ignition (depend on the engine layout)

Mating Connector and Terminal:

- 64 Ways FCI Female Housing PPI0001501
- 64 Ways FCI Cover PPI0001526
- Large Female Terminal PPI0001484
- Small Female Terminal PPI0000489



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Standard Functions [*]

- Ignition and Injection timing configurable parameters over 32 x 16 calibration setpoints
 - (1) Main fuel injection time
 - (6) Fuel correction per cylinder
 - (1) Injector Bank Ratio
 - (1) End-of-Injection timing
 - (1) Main ignition timing
 - (6) Ignition timing correction per cylinder
- Compensation provided for
 - Battery Voltage
 - Engine and Air Temperature
 - Barometric Pressure
- Acceleration and Deceleration Correction for Injection, Ignition and Bypass
- Cranking fuel adjustment table
- Adjustable engine speed limiter with pre-limiter offset
- Closed loop lambda control (narrow band or wide band externally amplified)
- Adjustable cooling fan control
- Adjustable Load calibration table points
- Adjustable RPM calibration table points
- Configurable for air and engine temperature and lambda Sensors
- End of Line Calibration:
- Using the appropriate tool, setting the following parameters is possible without the need to flash the entire calibrations:
 - TPS Limits
 - Overall Injection and Ignition correction
 - ETC Sensor Limits
 - Pedal/Twistgrip Sensor Limits
 - Chassis and Engine identification number and Assembly date
 - Unlocking Code

Special Features and Functions:

- GearCut for Clutchless up shift
- Vehicle "Safe Operation" control (tilt, etc)
- "Dual Calibration" Maps

[*] Calibration Plane, Tables and Variables are different accessible depending on Maya License type



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The following Pinout descriptions are different Pinout configurations to be used with different Hardware/Firmware devices. To avoid any doubt please refer to the website documentation where schematic and pinout documentation are updated every time a new version is available.

HPUH PIN Layout for H4FSAE Firmware Family:

PIN #	HPUH Function	Note
A1	COIL5	Inductive Coils Driver
B1	SENSORS GND	
C1	SENSORS GND	
D1	VBB1 Key	12 Volts Ignition Switch
E1	VBB2 ECR	12 Volts After ECR Relay
F1	SPEED1/FRONT	Frecuence 0 to 5V (12 V Protected)
G1	STEPPER D	Stepper Motor Drive
H1	STEPPER A	Stepper Motor Drive
J1	STEPPER B	Stepper Motor Drive
K1	STEPPER C	Stepper Motor Drive
L1	INJ5	High Impedance Injector Driver
M1	INJ4	High Impedance Injector Driver
N1	INJ3	High Impedance Injector Driver
O1	INJ1	High Impedance Injector Driver
P1	DC1 (+)	6 Amps Full "H" Bridge
Q1	DC2 (-)	6 Amps Full "H" Bridge

A2	COIL4	Inductive Coils Driver
B2	SENSORS GND	
C2	CANL	CAN Bus
D2	CANH	CAN Bus
E2	GEARCUT	CUT on FALLING EDGE
F2	MAPCHANGE	Digital 0 to 5V (12 V Protected)
G2	PUMP Relay	2 Amps Output Low Freq. PWM
H2	VREF 2	5 Volts Sensors Supply 2
J2	PTPS1	Analog 0 to 5V
K2	TAIR	Analog 0 to 5V
L2	LAMBDA	Analog 0 to 5V
M2	SMOT (-)	VRS Sensor (-)
N2	INJ6	High Impedance Injector Driver
O2	INJ2	High Impedance Injector Driver
P2	VBB3 DBW	12 Volts After DBW Relay
Q2	PUMP – INJ7 (**)	4 Amps (8 Amp Peak)

(**) For 4 Cylinder 8 Injector Only

PIN #	HPUH Function	Note
A3	COIL3	Inductive Coils Driver
B3	COIL6	Inductive Coils Driver
C3	TX	Communication and Programming
D3	RX	Communication and Programming
E3	MIL Lamp	2 Amps Output Low Freq. PWM
F3	NC	Not Connected
G3	SPEED2/REAR	Frecuence 0 to 5V (12 V Protected)
H3	SCAM	Frecuence 0 to 5V (12 V Protected)
J3	PTPS2	Analog 0 to 5V
K3	MAP	Analog 0 to 5V
L3	TPS2	Analog 0 to 5V
M3	SMOT (+)	VRS Sensor (+)
N3	SPARE2/TOIL	Analog 0 to 5V
O3	PRG	Communication and Programming
P3	GNDPOW	
Q3	FAN – INJ8 (**)	4 Amps (8 Amp Peak)

A4	COIL1	Inductive Coils Driver
B4	COIL2	Inductive Coils Driver
C4	ECR Relay	ECR Relay
D4	LIGHT/ETC Relay	2 Amps Output Low Freq. PWM
E4	FAN Relay	2 Amps Output Low Freq. PWM
F4	TACHO	2 Amps Output Low Freq. PWM
G4	SIDESTAND	Launch Control
H4	TIPOVER	Digital 0 to 5V (12 V Protected)
J4	TENG	Analog 0 to 5V (Passive Type Sens.)
K4	VREF 1	5 Volts Sensors Supply 1
L4	TPS1	Analog 0 to 5V
M4	SPARE12V	Analog 0 to 12V
N4	SPARE1/LAMBDA2	Analog 0 to 5V
O4	SOLENOID 1	On-Off Valve Driver
P4	GNDPOW	
Q4	GNDPOW	



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HPUH PIN Layout for H5AUTO Firmware Family:

PIN #	ECUH5 Function	Note
A1	COIL5	Inductive Coils Driver
B1	SENSORS GND	
C1	SENSORS GND	
D1	VBB1 Key	12 Volts Ignition Switch
E1	VBB2 ECR	12 Volts After ECR Relay
F1	SPEED1/FRONT	Frequence 0 to 5V (12 V Protected)
G1	STEPPER D	Stepper Motor Drive
H1	STEPPER A	Stepper Motor Drive
J1	STEPPER B	Stepper Motor Drive
K1	STEPPER C	Stepper Motor Drive
L1	VVT INTAKE	Intake VVT Driver
M1	INJ4	High Impedance Injector Driver
N1	INJ3	High Impedance Injector Driver
O1	INJ1	High Impedance Injector Driver
P1	DC1 (+)	6 Amps Full "H" Bridge
Q1	DC2 (-)	6 Amps Full "H" Bridge

A2	COIL4	Inductive Coils Driver
B2	SENSORS GND	
C2	CANL	CAN Bus
D2	CANH	CAN Bus
E2	GEARCUT	CUT on FALLING EDGE
F2	MAPCHANGE	Digital 0 to 5V (12 V Protected)
G2	SOLENOID 1 – WG1	Waste Gate Solenoid 1
H2	VREF 2	5 Volts Sensors Supply 2
J2	PTPS1	Analog 0 to 5V
K2	TAIR	Analog 0 to 5V
L2	LAMBDA	Analog 0 to 5V
M2	SMOT (-)	VRS Sensor (-)
N2	VVT EXH	Exhaust VVT Driver
O2	INJ2	High Impedance Injector Driver
P2	VBB3 DBW	12 Volts After DBW Relay
Q2	PUMP	4 Amps (8 Amp Peak)

PIN #	ECUH5 Function	Note
A3	COIL3	Inductive Coils Driver
B3	COIL6	Inductive Coils Driver
C3	TX	Communication and Programming
D3	RX	Communication and Programming
E3	MIL Lamp	2 Amps Output Low Freq. PWM
F3	NC	Not Connected
G3	SPEED2/REAR	Frequence 0 to 5V (12 V Protected)
H3	SCAM	Frequence 0 to 5V (12 V Protected)
J3	PTPS2	Analog 0 to 5V
K3	MAP	Analog 0 to 5V
L3	TPS2	Analog 0 to 5V
M3	SMOT (+)	VRS Sensor (+)
N3	SPARE2/TOIL	Analog 0 to 5V
O3	PRG	Communication and Programming
P3	GNDPOW	
Q3	FAN	4 Amps (8 Amp Peak)

A4	COIL1	Inductive Coils Driver
B4	COIL2	Inductive Coils Driver
C4	ECR Relay	ECR Relay
D4	ETC Relay	2 Amps Output Low Freq. PWM
E4	SOLENOID 2 – WG2	Waste Gate Solenoid 2
F4	TACHO	2 Amps Output Low Freq. PWM
G4	SIDESTAND	Launch Control
H4	TIPOVER	Digital 0 to 5V (12 V Protected)
J4	TENG	Analog 0 to 5V (Passive Type Sens.)
K4	VREF 1	5 Volts Sensors Supply 1
L4	TPS1	Analog 0 to 5V
M4	SPARE12V	Analog 0 to 12V
N4	SPARE1/LAMBDA2	Analog 0 to 5V
O4	SOLENOID 1	On-Off Valve Driver
P4	GNDPOW	
Q4	GNDPOW	