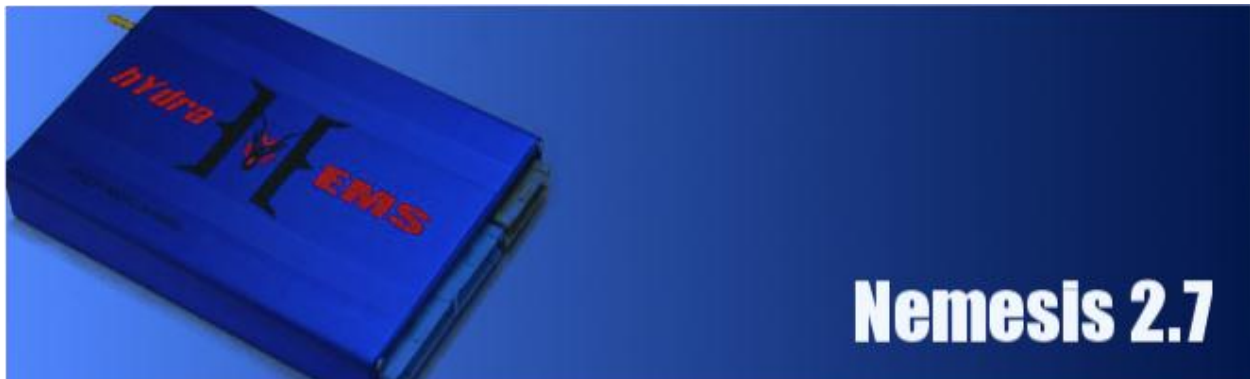


hYdra **Engine Management Systems**



The Hydra2.7 has complete new firmware and software along with new processors with onboard data logging and new idle, boost control, aux map and long term trim strategies.

The 2.7 will also have capability to configure for additional sensors as inputs with configurability.

Stage5 Epsilon has built in CAN Bus for use with external dashes, so you can run a dash and tune at same time.

Hydra2.7 will be firmware upgradeable remotely without sending the ecu back. Each stage will be upgradeable to the next remotely without sending the ecu back.

You can also just buy individual Capabilities if you do not want the next full stage upgrade.

Stage 1 Alpha and Stage 2 Beta will be stripped down versions with fewer outputs and inputs than the current Hydra 2.5 and 2.6.

To get equivalent Outputs as the Hydra 2.6, you will at least need the Stage 3 Gamma upgrade.

Alpha Stage 1 \$1250 Non DBW

- 4 injector
- 2 inputs,(1 analogue and 1 digital)
- 6 outputs
- Fuel and Ignition Map
- Knock control
- Internal Datalogging Fixed 8 channels

Beta Stage 2 \$1400 Non DBW

- 6 injector
- 6 inputs(4 analogue, 2 digital)
- 9 outputs
- Aux Fuel/Ignition Map
- Launch Control
- Intake VCT Control
- lambda Target (OEM Sensor)
- Tip-in Enrichment
- injector phasing
- Basic boost Control
- Staged Injection
- Internal Datalogging Fixed 8 channels
- Internal Wideband Logging

Gamma Stage 3 \$1600 Non DBW

- 8 Injectors
- 10 inputs (4 analogue, 6 digital)
- 14 outputs
- Knock control
- Aux Fuel/Ignition Map
- Launch Control
- Intake VCT Control
- lambda Target
- Tip-in Enrichment
- injector phasing
- Basic boost Control
- Staged Injection
- Internal Wideband Logging
- Antilag Fuel /Ignition Map
- Exhaust VCT
- Immobilizer request
- Valet Request
- Flat Shift
- Alternator Control
- VE Mode
- Alpha N Mode
- Boost Compensation
- Gear Correction
- Individual Fuel and Ignition Trim
- STT Ignition Trim
- Throttle derivative
- 3D maps
- Manifold Pressure delta trim
- Internal Datalogging Configurable 8 channels

Delta Stage 4 \$1700 Non DBW

- 8 Injectors
- 10 inputs (4 Analogue, 6 Digital)
- 14 outputs
- Knock control
- Aux Fuel/Ignition Map
- Launch Control
- Intake VCT Control
- lambda Target
- Tip-in Enrichment
- injector phasing
- Basic boost Control
- Staged Injection
- Internal Wideband Logging
- Antilag Fuel /Ignition Map
- Exhaust VCT
- Immobilizer request
- Valet Request
- Flat Shift
- Alternator Control
- VE Mode
- Alpha N Mode
- Boost Compensation
- Gear Correction
- Individual Fuel and Ignition Trim
- STT Ignition Trim
- Throttle derivative
- 3D maps
- Manifold Pressure delta trim
- Internal Datalogging Configurable 8 channels
- Steering Load
- Traction Control
- Coolant Temp RPM Trim
- External Map sensor
- Engine Speed Delta Trim
- Idle speed Error Trim
- Calibration Input Maps
- Fuel Pressure correction
- TPS Position Trim
- Barometric Compensation
- Fuel Temperature Compensation

Epsilon Stage 5 \$1900 Non DBW

- 8 Injectors
- 10 inputs (4 Analogue, 6 Digital)
- 14 outputs
- Fuel and Ignition Map
- Knock control
- Aux Fuel/Ignition Map
- Launch Control
- Intake VCT Control
- lambda Target
- Tip-in Enrichment
- injector phasing
- Basic boost Control
- Staged Injection
- Internal Wideband Logging
- Antilag Fuel /Ignition Map
- Exhaust VCT
- Immobilizer request
- Valet Request
- Flat Shift
- Alternator Control
- VE Mode
- Alpha N Mode
- Boost Compensation
- Gear Correction
- Individual Fuel and Ignition Trim
- STT Ignition Trim
- Throttle derivative
- 3D maps
- Manifold Pressure delta trim
- Internal Datalogging Configurable 8 channels
- Steering Load
- Traction Control
- Coolant Temp RPM Trim
- External Map sensor
- Engine Speed Delta Trim
- Idle speed Error Trim
- Calibration Input Maps
- Fuel Pressure correction
- TPS Position Trim
- Barometric Compensation
- Fuel Temperature Compensation

- On Board CANBUS Control(for CAN expansion Box and Dash Support)
- Two Internal feedback outputs
- Humidity Correction
- EGT Correction(requires CAN Expansion Box)
- Flex Fuel Support
- External Wideband Support
- Vehicle Speed Pit Limiter

Optional Capabilities

- Sensor Calibration maps
- Advanced Output Configurations

Hardware

Injectors

The Nemesis 2.7 is capable of running cars up to 8 Cylinders sequentially. Injection modes are sequential, batch fire and throttle body injection. When not used for injection, outputs 2 - 8 can be used for staged injection or general purpose switching. Outputs 2 - 8 can be used for PWM control. Outputs 5-8 can be used for Tachometer or DIS Ignition Control.

Ignition

Igniter signals are fully sequential 5V ignition triggers. Firing mode is positive only (voltage output to charge coil). Output options are direct fire, wasted spark and distributor signal.

Auxiliary outputs

Up to 11 general purpose switch to ground 1A current limited outputs, 3 general purpose switch to power 1A current limited outputs and 2 internal feedback outputs with various Frequencies. 5 outputs have optional free-wheeling diodes for linear control of variable solenoids. All PWM channels have 33V flyback limiting.

Auxiliary inputs

Up to 10 Auxiliary inputs .Aux 1, 2, 3 and 4 are 0 - 5V analog or 0 - 12V digital inputs. In digital mode, the switch point is below 2.5V. Aux 5-10 are digital only inputs. Inputs 5-8 with a switch point of above 2.5V and inputs 9 and 10 with a switch point below 2.5V

NTK L2H2 Wideband Closed Loop Long Term Trim

All Nemesis 2.7 ECUs have an L2H21 driver as standard equipment. There is no need to use an external uego driver module. The L2H2 , a newer more robust version of the L1H1 Sensor is a state-of-the-art Nernst Cell sensor with a rapid response and far more useful rich end output characteristics than older, non-planar sensors. Heater current is limited for a controlled warm up, and voltage limited for constant temperature.

Sensors

Analog sensor inputs are coolant temp, air temp, throttle position, twin knock sensor, twin ego sensor and on-board 3 bar map sensor. Temperature sensors can be configured for the 2 most common types, and knock sensor inputs can be amplified. 4 Additional analogue inputs can be configured for additional sensors*

Digital trigger inputs are vss, trig and sync. These inputs are magnetic retractor, Hall effect or optical sensor compatible.

Support

Nemesis 2.7 includes many support options that make seamless plug-and-play possible, and wire in trouble free.

Advanced support features include a dedicated variable speed fuel pump signal for the WRX, Honda multiplex bus support (for climate control and gauges), dedicated circuit opening relay ground signal and dedicated sensor ground connections that reduce harness ground wire splicing.

Specifications

- ❖ Extruded Aluminum Enclosure
- ❖ Plug and Play With 5 New stages w/ upgradeable Capabilities
- ❖ Firmware Field Upgradeable (no need to send ecu back for upgrades)
- ❖ Dual Motorola CAN Enabled Processors with Onboard CAN Bus Capability* (*Run external dashes and tune at same time and connection to our Upcoming CAN Expansion Box*)
- ❖ The 2.7 will have capability to configure for additional sensors as inputs*
- ❖ Endless combinations of 2D and 3D outputs (*Staged injection, intercooler spray, water spray, turbo timer, shift light, VTEC, fuel pump, etc...*)
- ❖ Windows programmable Software w/ Direct Serial cable Connection(including Win7)
- ❖ Uses All Factory Sensors (*Might need additional sensors, e.g.: 1990 to 1993 Miata will need air temp sensor and knock sensor*)
- ❖ Retains all factory functions (*ie. Purge, boost control, AC, Intercooler spray, Tach, etc...*)
- ❖ 256K Onboard Data logging (*does not require laptop*)
- ❖ Password Protection for Intellectual Property
- ❖ Drive By Wire Throttle control
- ❖ Fuel map 32 by 32 grid styled
- ❖ Ignition Map 32 by 32 grid styled
- ❖ Quad Variable 3D Cam Control with Dual Maps 32 by 32 grid styled (*VTC/AVCS/VVTi/Vanos*)
- ❖ Aux 3D Fuel and Ignition Map 32 by 32 Grid Styled with switched input (*For Dry NOS or Race Gas*)
- ❖ Multiple Anti-lag Fuel and Timing Maps with Switched Input**
- ❖ Idle Speed (Both Solenoid and Stepper Types and Drive by Wire Throttles)
- ❖ Multiple Starting Compensation maps
- ❖ Multiple Acceleration and Deceleration Enrichment
- ❖ Wideband O2 Air/fuel Long and Short term Control
- ❖ Continuous Closed Loop Long Term Trim Air / Fuel Correction 32 by 32 Grid Style (*requires Optional software upgrade and NTK L2H2 Wideband Oxygen Sensor*)
- ❖ Programmable Closed Loop Knock Control
- ❖ Definable Knock Control (*two setting amplification with definable threshold*) with adjustable fuel compensation
- ❖ Check Engine Light Control
- ❖ built-in 3 bar map sensor replaces all MAF or AFM with Speed Density for up to 45psi(*up to 75psi with optional map sensor upgrade*)
- ❖ Full Sequential Fuel injection and Ignition control for up to 8 cylinders
- ❖ Drives all types of injectors without the need of a ballast box (*peak & hold and Saturated*)
- ❖ Individual Fuel Injector Trim and Timing Trim
- ❖ Injector Phasing
- ❖ Coolant temperature and Air Temperature correction for Fuel, Timing and Boost.
- ❖ Soft-Cut and Hard-Cut Rev Limits
- ❖ Gear Correction for Fuel, Timing and Boost
- ❖ Electronic Boost Control with boost Limit

- ❖ Expanded 2-step launch control
- ❖ Backup Spark map strategy when excessive lean condition or detonation is detected
- ❖ Barometric Compensation for normally aspirated cars *(with optional 1 bar map sensor)*
 - *Additional Sensor Calibration and CAN Bus is enabled for Stage 5 Epsilon ECU , optional for all other 4 stages*
 - **May require Additional Hardware, e.g. Idle Bypass valve, etc...*