KiwiEFI K44 ECU CONFIGURATION INSTRUCTIONS V1.2

The K44 is a Speeduino 0.4 compatible ECU using the Mega2560, it uses the Speeduino open source firmware and being 100% compatible with the official hardware version 0.4 it will be able to use all future firmware upgrades written for the 0.4 board.

For documentation and installation instructions for Speeduino ECUs in general please visit wiki.speeduino.com. The following is configuration information specific to the KiwiEFI V44 version of the official Speeduino 0.4 design.
Support and help for Speeduino firmware/hardware can be found at forum.speeduino.com, support and help for the specific KiwiEFI hardware can be obtained via email through our website at KiwiEfi.nz.

KiwiEFI K44 Specifications
- 48-pin connector and splash proof case
- 4 injector channels with internal diagnostic LEDs
- 4 Ignition outputs with internal diagnostic LEDs
- CLT, IAT, TPS and O2 inputs
- Inbuilt Hall Effect Sensor blocking diodes and pullups for crank and Cam inputs
- Socket for VR conditioner module(crank and cam input conditioning)
- Inbuilt Baro sensor
- External MAP sensor as standard with internal Map sensor available as a optional extra.
- Socket for DRV8825 stepper module (stepper idle valve control)
- 8 medium-current spare outputs for Fuel pump relay, Fan relay, Boost control, VVT1, VVT2, Idle1, Idle2, Tach + the 4 stepper module outputs.
- Clutch switch digital input.
- Flex fuel digital input.
- 2 spare unassigned digital inputs.
- 2 spare unassigned analog inputs.
- Speeduino v0.4 board compatible pin definition, select as board type V0.4 in Tuner Studio
- 2x Serial output, TTL level (Ser0) for Bluetooth on internal connector and RS232 level driver on Secondary Serial (Ser3) TXD and RXD on ecu connector for sending data to dashes etc.
- Uses the same case as the Speeduino Dropbear ECU and is mostly pin compatible with the Dropbear., (the only pinout differences are 1: IG5-IG8 pins are used for digital outputs, as there are only 4 ignition outputs,   2: INJ5-INJ8 pins are fed in parallel with INJ1-INJ4 for paired injectors on a 6/8 cyl, and   3: the CAN bus pins are used for Serial3 RS232 data)

Board Configuration

The K44 Ecu is compatible with the v0.4 Speeduino configuration, in Tuner Studio setup select board=v0.4.

VR Conditioner – for when using VR crank/cam sensors

Depending on the type of crank and cam sensors you have, there are jumpers that may need to be set. The factory configuration is for Hall effect sensors and Medium signal filtering.

Some VR sensors can send very high AC voltage into the ECU. If you are unsure of your sensor type identify it before connecting it. Using a VR sensor without a VR conditioner may cause damage to the board.

Jumper Configuration

S1 – PROG-RUN SWITCH
     – PROG set to this to update firmware
     - RUN set to this for normal operation (default)

J2 – BLUETOOTH CONNECTOR
The Bluetooth connector provides a connection point for a HC-05 Bluetooth module, it is strongly recommended to mount the module or at least its antenna outside the ECU case as the metal case will seriously impact on the range and reliability of the connection.

PIN
1 – HC-05 module (not used)   – connects to MCU D3
2 – HC-05 module pin2   – connects to VCC
3 – HC-05 module pin3   – connects to GND
4 – HC-05 module pin4 TXD – connects to MCU D0 RXD
5 – HC-05 module pin5 RXD -- connects to MCU D1 TXD
6 – HC-05 module (not used)   -- No Connection

See Speeduino Wiki for Bluetooth configuration details.

Note: the Arduino Mega2560 Pro mini used in this ECU requires 2 resistors to be changed in order to use the Bluetooth option. If your K44 Ecu is purchased as a completed unit from the KiwiEfi.NZ website this modification will have already been done. For details of this modification please contact KiwiEFI.

Jumpers on Top side of circuit board

Solder jumpers on the top side of the circuit board configure options that may be required to configure the ECU to a specific engine.

JP10 – IGN DRIVE – connect   1-2 = 5V drive voltage (default)
                                             2-3 = 12V drive voltage

JP13 – MAP SENSOR – connect   1-2 = External sensor (default)
                                           2-3 = Internal sensor if fitted
We recommend using an external sensor, a wired sensor with short hose to the manifold is faster acting than a long hose to the ECU. An internal sensor of 1bar, 2.5bar, or 4bar is a option available at time of order, or can be fitted later if required.

JP3 & JP5 – HALL SENSOR SELECT
  – JOINED = Crank and Cam sensors are Hall effect sensors (default)
  – OPEN = Crank and Cam sensors are conditioned by a VR conditioner module
NOTE: Make sure these jumpers are OPEN before installing a VR Conditioner module.

CRANK SENSOR FILTER
JP2 joined – TRIGGER FILTER – Crank sensor Level 1 filter
JP7 joined – TRIGGER FILTER – Crank sensor Level 2 filter (default)
BOTH JP2 & JP7 joined   – Crank sensor Level 3 filter

CAM SENSOR FILTER
JP9 joined – TRIGGER FILTER – Cam sensor Level 1 filter
JP4 joined – TRIGGER FILTER – Cam sensor Level 2 filter (default)
BOTH JP9 & JP4 joined   – Cam sensor Level 3 filter

Jumpers on Underside of circuit board
FACTORY SET - Usually Wont Ever Need To Be Changed

JP11 – DIGIN1 -   1-2 = connected to function controlled by Arduino pin A10
                    2-3 = connected to function controlled by Arduino pin D20 (default) (VSS)

JP12 – DIGIN2 -   1-2 = connected to function controlled by Arduino pin A9
                    2-3 = connected to function controlled by Arduino pin D21 (default)

JP1 – BLACK ECU PLUG pin A4 – 1-2 = connected to HC o/p controlled by Arduino pin D43
                              2-3 = connected to +12V (for sensors requiring 12V pwr)
                    (default is Connected to D43)

K44 48-PIN ECU CONNECTOR PINOUT

GREY CONNECTOR

C1	C2	C3	C4	C5	C6	C7	C8
BOOST HC4	FAN LC2	STEP-B2	STEP-B1	STEP-A1	STEP-A2	FP LC1	GND
B1 IGN1	**B2** IGN2	**B3** IGN3	**B4** IGN4	**B5** IDL2 HC1	**B6** IDL1 HC3	**B7** VVT1 HC2	**B8** VVT2 HC5
A1 INJ1	**A2** INJ2	**A3** INJ3	**A4** INJ4	**A5** INJ5	**A6** INJ6	**A7** INJ7	**A8** INJ8

BLACK CONNECTOR

C1	C2	C3	C4	C5	C6	C7	C8
GND SENSOR	AN IN1	AN IN2	OXY	CTS	IAT	TPS	MAP
B1 TAC	**B2** CNK+ TRIG1	**B3** CNK- TRIG1	**B4** CAM+ TRIG2	**B5** CAM- TRIG2	**B6** DIG IN1	**B7** LAUNCH	**B8** FLEX
A1 +12V POWER	**A2** GND POWER	**A3** +5V OUT	**A4** O/P PIN43	**A5** DIG IN2	**A6** RXD SERIAL3	**A7** TXD SERIAL3	**A8** GND DIGITAL

NOTE: VIEW LOOKING INTO ECU BOX CONNECTORS. (PIN NUMBERS ARE MOLDED INTO REAR OF LOOM CONNECTOR)

Pin	Type	Description
A1	OUTPUT	INJECTOR 1
A2	OUTPUT	INJECTOR 2
A3	OUTPUT	INJECTOR 3
A4	OUTPUT	INJECTOR 4
A5	OUTPUT	INJECTOR 5
A6	OUTPUT	INJECTOR 6
A7	OUTPUT	INJECTOR 7
A8	OUTPUT	INJECTOR 8
B1	OUTPUT	IGNITION 1
B2	OUTPUT	IGNITION 2
B3	OUTPUT	IGNITION 3
B4	OUTPUT	IGNITION 4
B5	OUTPUT	IDL2 when configured for 3-wire idle valve
B6	OUTPUT	IDL1 SOLENOID gnd active drive
B7	OUTPUT	VVT1 SOLENOID gnd active drive
B8	OUTPUT	VVT2 when configured for dual VVT
C1	OUTPUT	BOOST SOLENOID gnd active drive
C2	OUTPUT	FAN RELAY gnd active drive
C3	OUTPUT	IDLE STEPPER B2 OUTPUT
C4	OUTPUT	IDLE STEPPER B1 OUTPUT
C5	OUTPUT	IDLE STEPPER A1 OUTPUT
C6	OUTPUT	IDLE STEPPER A2 OUTPUT
C7	OUTPUT	FUEL PUMP Gnd active Relay Drive
C8	POWER GROUND	(Ground at engine block with its own 1mm wire)

Pin	Type	Description
A1	POWER	+12V POWER INPUT From ignition relay
A2	POWER GROUND	(ground at engine block with its own 1mm wire)
A3	POWER	+5V SENSOR POWER (MAX CURRENT 100mA)
A4	OUTPUT	SPARE OUTPUT DEFAULT SET TO MCU PIN 43
A5	INPUT	DIGITAL INPUT 2
A6	COMMS	SERIAL3 DATA RXD
A7	COMMS	SERIAL3 DATA TXD
A8	DIGITAL I/P GROUND	GROUND FOR DIGITAL INPUTS AND SERIAL DATA
B1	OUTPUT	TACH OUTPUT Pulled up to +12v
B2	TRIGGER	CRANK SENSOR +ve
B3	TRIGGER	CRANK SENSOR -ve (only for VR, for Hall use pin A8)
B4	TRIGGER	CAM SENSOR +ve
B5	TRIGGER	CAM SENSOR -ve (only for VR, for Hall use pin A8)
B6	INPUT	DIGITAL INPUT 1
B7	INPUT	CLUTCH SWITCH INPUT
B8	INPUT	FLEX FUEL SENSOR INPUT
C1	SENSOR GND	
C2	INPUT	ANALOG INPUT 1
C3	INPUT	ANALOG INPUT 2
C4	INPUT	OXY SENSOR INPUT 0-5V
C5	INPUT	COOLANT TEMPERATURE SENSOR
C6	INPUT	INTAKE AIR TEMPERATURE SENSOR
C7	INPUT	THROTTLE POSITION SENSOR
C8	INPUT	EXTERNAL MAP SENSOR INPUT (internal Map switch set to EXT.)