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HMP 1-C

Model:

0120.08

Rev doc: 00

Multi sensor and throttle tester

User Manual

Index by Sensors

There are 3 possible actions for each sensor.
[T] Test. Means that the HMP1 can check the functionality of sensor outside the car (or disconnected)
[R] Read. Means that the HMP1 can read the sensor without disconnect from car and read/monitor the sensor while is working.
[E] Emulate. Means that HMP1 will act like the sensor, so the injection will think that the sensor is placed and working.

Is important take care that not all sensors can be tested outside from car, not all can be emulated and not all can be readed.
Example 1: The Oxygen sensor (lambda) measure rest of oxygen in the exhaust but they need 300˚C(572˚F) to work. So for testing you need a place with more than above temperature and without exoygen.
So you can read and emulate the sensor but you cannot test it.
Example 2: The IAC valves have not feedback, so the injection never know the real position of valve. So you can see and watch the movement, but you cannot read or emulate.
Each sensor have require an individual analysis, but the following table resume what you can do with each sensor.

Connecting Power Supply

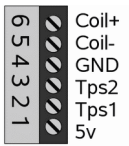
The device need 12Vdc continuous to work. Become with 2 crocodiles to allow connect to car battery. Anyway can be connected to a 12V@4A stabilized power supply like notebooks.
Do not use battery chargers without car battery.

Connecting probe cables

The device have 2 connectors in the rear part. The main have 6 contacts, used on most cases. And the extra with 14 contacts that you will use in fewer uses, normally when exercise the ECU.

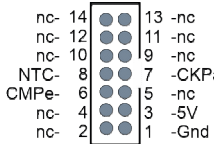
Main:

Uses a Terminal Block of 6 way with pitch of 5.08mm (0.2"). The main connections are as image and must take care when assemble of new throttle body and pedals. Other uses are detailed in appropriated section.
The image is looking the screw with the pluggable area at left and the wires in the right side.



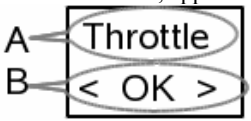
Extra:

You can use a IDC14 connector or pins of 0.1" (2.54mm) for the connections. (Normally sell for Arduino)



Select test Type

After connect 12v, appear the main menu.



Using the keys “+” and “-” you will see different test.
When you see into the screen the right test, press OK.

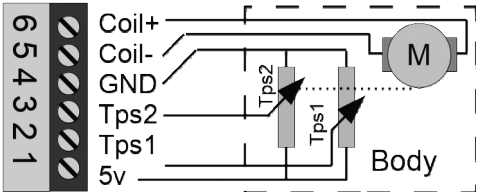
Testing an electronic throttle

There are 2 functions that allow test and move the throttle body. Both functions are completely different on their working mode but similar in the way to use.

“**Throttle**”, Every time that you press “+” or “**-**” the applied power to the motor will be greater or lower, and the movement is the result of this power. Is good to clean the body, test the gears, and see a smooth and easy movement. You can help the displacement with the hand.

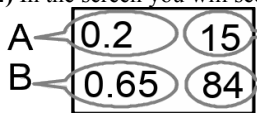
“**Search**”. Every time that you press “+” or “**-**” is applied to motor the required power to force a specific point of throttle. This allos a more accurate position of butterfly. The system read the position on TPS sensors, so any fail in the sensors can cause an erratic movement of butterfly. This test mode is good to check the TPS tracks to search for cuts or jumps. **Try to move with the hand will result on HMP1 damage**.

1) The engine must be OFF before any test. Doing with the engine running can damage the engine.
2) Search the appropriated connector and check the connections. Always verify that the coil is connected to the terminals COIL+ and COIL- and the rest of connections according the following diagram.
In the section “preassembled wires” you will found useful information for this verify process.



3) Connect the 12v, in the main menu search the word “Throttle” or “Search” and press ”OK”.

4) In the screen you will see 4 data similar to the image:



A=TPS differences
B=Motor current
C=TPS1 position (in %)
D=TPS2 position (in %)

The difference of TPS is the most important data that look the ECU to enter in emergency mode. Both sensors TPS1 & TPS2 must have a defined relation, a coherency, The HMP1 read both sensors and show the difference between ideal read (mathematically calculated) and the real reading taken from TPS.

The maximum difference tolerated by ECU change from car to car, but generally is up to 5% of difference.

5) Move from extreme to extreme the butterfly using “+” and “-” keys. The systems will be register all data coming from sensors with the finality of found and problem if exist.

6) Automatic mode:

In “Throttle” mode: if press “+” and “-” simultaneously the butterfly will start to move from extreme to extreme automatically. Will continue moving until you press any key.

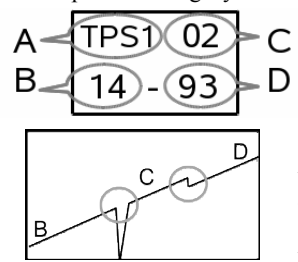
In “Search” mode: if press “+” and “-” simultaneously you can set the min and max position to be moved. Is god to check deeply one suspected zone of TPS.

7) Pressing the OK button, you will see a complete report with the

collected data.
Note: The throttle must be connected BEFORE of start the test.
Note: If the TPS relation is not recognized the “Search” mode do not will work.

Report on screen

After perform the test, the tester will have enough information to show a result on screen.
Press “OK” key, and the report will appear. Use + and – to change the parameters showed, and OK when you has seen everything.
TYPE: Used formula to check the consistency of TPS of throttle or pedal used. Are 4 possible data:"**T1&2=100**", "**T1=T2x2**", "**Toyota**".
"**Unknown**" mean that cannot be recognized the relationship, probably because a bad connection, critical failure of throttle or a new and unknown body for the HMP1.
TPS1: Report OF integrity of TPS1 with the following data.

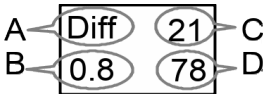


A=Tps1
C=Continuity
B=Minimum registered
D=Maximum registered

The device make 2000 read by seconds to the TPS, the continuity is the most greater jump between 2 consecutive measures, the objective is try to discover any damage in the track of sensor.

TPS2: Same as TPS1.
Maximum Difference: The TPS1 and TPS2 have a relationship (different according the car). The difference is the error between ideal relationship and the really measured in both sensors. The HMP1 monitor permanently this difference and record What was the

maximum difference and where was the position of TPS when they occur.



B=Max Difference found
C=Position TPS1
D=Position TPS2

Isens: Is the current that require the sensor to work,
Tps Swap: The device cant detect if the TPS1 and the TPS2 are inverted. This data generally is a permanent property of body, but a mistake in the connection can be exposed here.

"no-swap" Means TPS1=TPS1 and TPS2=TPS2

"swap" Means TPS1=TPS2 and TPS2=TPS1

I_coil max: Max current demanded by motor. To discard short circuit or gear damaged.

Pol coil: Motor Polarity.

M1+ M2- means that the throttle open when the voltage on M1 is greater than M2

M1- M2+ means that the throttle open when the voltage on M2 is greater that M1

Result: Result off analysis. This data must not been taken as absolute answer, only as orientation.

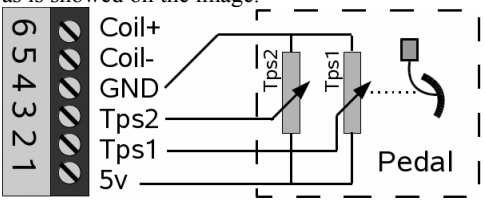
GOOD, the max difference is lower than 4%.

DOUBT, the max difference is between that 5 and 6%.

BAD the mas difference is greater and can cause problems.

Test of Electronic Peda

Connect the pedal using the appropriated connector, or use a crocodile to connect as is showed on the image.



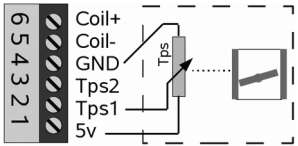
After that must use + and - until see PEDAL and press OK.
Now you will see 4 information's similar to the image:

A=Is testing a pedal
B=Difference between C and D
C=Position TPS1 (in %)
D=Position TPS2 (in %)

To test, always with the engine stopped, press slowly the pedal until reach the max, Avoid the hard movement.
The HMP1 will calculate the coherency of sensors TPS & TPS2, and will show in screen the difference between TPS1 & TPS2 real relationship and ideal. Is the most important data that read the ECU looks.
Pressing OK button you will see a complete report. Similar as throttle body except data related to motor

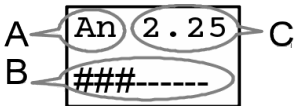
Analog sensor read

This function measure the voltage provided by the sensors. At difference of a regular multimeter the HMP1 make 2000 reads by second that allow found errors mostly on TPS. For the rest of sensors you will found useful the progress bar in the bottom of screen.
To start the read in the main menu press + and - until see SENS AN and press OK.



This function allow measure TPS, MAP, MAF and another sensors with analog output **between 0 and 5v**. The connection can be made using a wire puncturer to TPS1 input or making a complete harness like graphic.

In the screen will appear the following information:



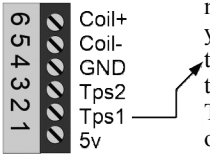
A=You are reading an analog sensor
B=Progress Bar
C=Voltage read from sensor

TPS: Normally have a voltage between 0.7 to 4.7v. Opening slowly the throttle searching fails like explained on throttles.
MAP: With the engine stopped must read 4.7v, with the engine on Idle must be 1.4v. Do a single hard throttle and then wait for the engine to come to idle. The voltage must be raise to 4v when is throttling, and a lower than idle value when engine RPM is decreasing.
MAF: With the engine stopped must read 0v, with the engine on idle must be 1.2V. In a hard throttle for a small moment will have 4v, after that a fall to 1.5v and finally start to grow the voltage like RPM is rising.
Pressing OK back to main menu.

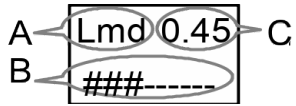
Reading Oxygen sensor (lambda)

In the main menu press + and - keys until see LAMBDA and press OK.

The Lambda probe read oxygen into exhaust tube, and only work at more than 300°c degrees (572°f). For this reason you only can check the lambda when is connected to car, the engine is running and only can check that is oscillating.



The voltage must be input on TPS1 as indicated on image. Best when use a cable puncturer or tester probe.



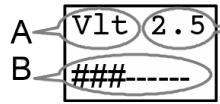
A) Lambda probe
B) Richness Bar
C) Incoming Voltage

Can read the probes with analog output between 0 and 5v, but the bar only show from 0 and 1v.

Voltmeter

In the main menu press + and - until see VOLT on screen and press OK.

You can measure voltages up to 20v incoming on TPS1. **BUT only after of choosing the volt option.**

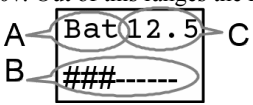


A) Voltmeter
B) Voltage Bar
C) Incoming Voltage
D)

NOTE: As soon as HMP1 have a lower impedance than conventional tester, this option is not useful to check resistives sensors as TPS, and another.

Battery charging system test

In the main menu use the + and - keys until see BATTERY on screen, and press OK.
The HMP1 measure the actual voltage more than 2000 times by second. Also remember the minimum and maximum reached by the system, you can see it in the final report. The objective is see how much go down and regulator stability when engine is running.
The signal is taken from power supply, so is not required any additional connection. And can read perfectly voltages from 7.4 to 20v. Out of this ranges the reads will be wrong.



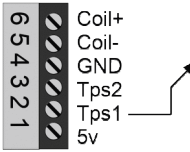
A) Is reading BATterys
B) Graphic Bar
C) Actual Voltage
D)

If press "OK" a small report will be showed with the following data:
Ini= Initial voltage before start
Ign= Minimum voltage reached while you are cranking the engine (Normally more than 9V)
Min/Max=Voltages minimum and maximum while charging time. (these 2 values should be very similar to each other)

Pulses reader

This function allow measure and analyze the pulses coming from different sensors and actuators.

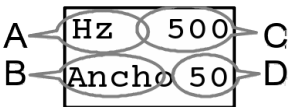
Injectors, EGR valves, HALL sensors, Smart alternator communication LIN or PWM, Electronic Turbos, and other pulses.



The HMP1 es capable to read pulses from 66mS to 166µS, with a minimum amplitude of 2v. Is the same to say from 15 Hz and 6000 Hz (cycles by second).

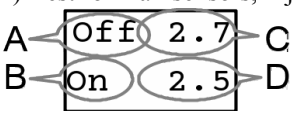
The voltage must be income by TPS1 pin as image said. The best is the use of a cable puncturer or a multimeter wire.

In the main menu, press + and - until see "Rd Pulses" on screen, and press the OK button.
The system have 3 screens, can switch from one to another with "+" and "-".
and "-".
1) Best for EGR valves, Alternators, MAP and Turbos.



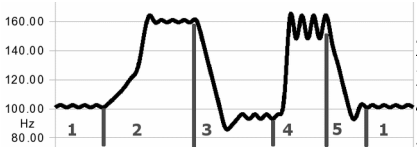
HZ = Incoming Frequency
Duty= Pulse width in %

2) Best for Hall sensors, Injectors, Ignition modules.



Off=Time in milliseconds with the input on 0V
On=Time in milliseconds with the input on more than 3v.

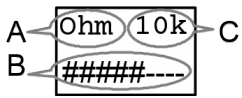
3) Best for Ignition modules, show the DWELL angle applied input of module, Is taken as active the presence of 0v.
NOTE: The max input voltage is of 20V, so you cannot connect to ignition coil directly.
Is is testing a MAP the following graphic will help to see the expected



1)Idle
2)Smooth acceleration
3)Fast Deacceleration
4)Fast Acceleration
5)Smooth deacceleration

Ohmmeter

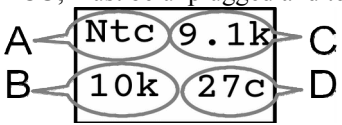
Measure the resistance between pin TPS1 and ground. Read with relative accuracy between 50KΩ and 10Ω. Don't pretend replace the regular multimeter.
In the main menu press + and - keys until see OMH on screen and press OK.



A) Is reading Resistances
B) Graphic Bar
C) Measured Resistance
The values are represented by their nomenclatures where a value of 10.000Ω is showed as 10K

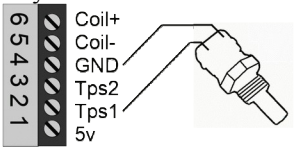
Comprobador de NTC

The NTC sensors cant be measured when are connected to the ECU, must be unplugged and test separately.



A) Are reading NTCs
B) NTC R_0 a 25°c (77°f)
C) Measured Resistance
D) Calculated Temperature
R_0 is the value in ohms that measure the probe at 25°C(77°F).

You can test it following these steps:
1) You need remove the sensor of vehicle.
2) Connect in this way:



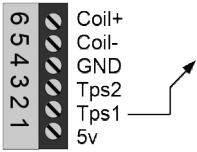
3) Verify that the sensor is an ambient temperature. Use the + and - keys until you the read match with ambient temperature. Take care that keep the sensor on hand implies heat with the body and when the bronze can take several minutes to reach ambient temperature.
4) Bring water to a boil in a pot
5) When it is boiling put the sensor in the water (do not remove the water from the fire). Electrical connections must be out of the water.
6) The HMP1 must show a temperature closer to 100˚C (212˚f)
7) Pressing OK end the test.
Note: Keep on mind that the water boil a less temperature when the place where you live is more high.

Hall sensor Reader

The effect HALL is based on the reception of a magnetic field. So you need a magnet before start the test or make rotate the engine (that already have their magnet). If you will use a hand magnet you will need remove the sensor to avoid interference from engine magnet.
This sensors have 3 different output type: A) 5V Pulses, B)12v pulses, and C)Open collector

Test:

1) Connection, puncture the signal cable and connect to terminal TPS1 of main connector of HMP1.



2) Zoom in and out of the magnet repeatedly while looking at the answer on the screen.
Normally you will see some of following changes:

A) 0v-12v,
B) 0v-5v,
C) 0v-Open,
D) Pulse - Open.

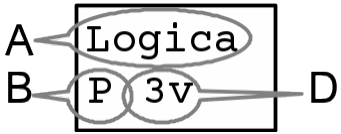
Pulse implies that the sensor is changed their output since less of a1 second. For example if you zoom in or out the magnet recently. The screen remain saying Pulse while you do this zoom.

Note that the magnet have 2 poles (north and south), and some sensors detect this, so if there is no output try invert the magnet, different angles and zones of sensor.

Logic Probe

This function is special to determine if a wire have voltage, pulses, ground or simply is disconnected. The measurement is read from TPS1 input.

In the main menu, use the + and - keys until see LOGIC on screen and press OK.



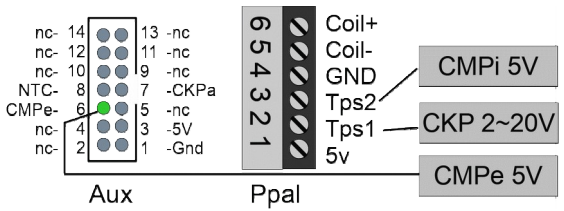
A) Logic probe
B) Input
C)
D) Pulse voltage

B) The input values can be “Open“=(cable not connected), ”Lo”=Ground, ”Hi”= Positive voltage, ”P”=Pulses.
D)In voltage can be: “3v”, “5v”, “12”.

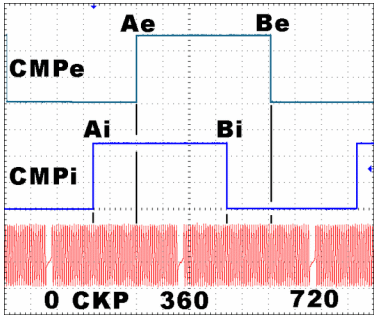
Double CMP & CKP Reader

The HMP1 can read simultaneously the pulses that send CKP sensor and up to 2 CMP sensor (Intake and exhaust) and make a sync map.

Sensor	Signal	Connection	Pin	Voltages
CKP	Crankshaft sensor	TPS1	main-2	2~20
CMPi	Intake Camshaft sensor	TPS2	main-3	3~5
CMPe	Exhaust Camshaft sensor	CMPe	aux-6	3~5



The CKP connection is mandatory, the CMPi only is required when the car have 2 or 3 sensors, and CMPe only is required when the car have 3 sensors.



When the engine is running the HMP read the pulses and make a map. As the reader must know the CMP signal repeat each 720 degrees (2 turns of CKP). Also note that the CMP are in phase with CKP and on this way the ECU know exactly in witch position is the engine.

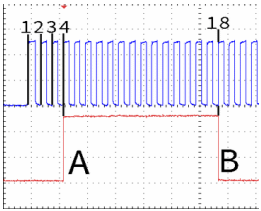
The point Ai is the amount of teeth of CKP counted from missing teeth until first change on intake camshaft. Bi is the amount of teeth for the second change on intake camshaft. Ae and Be are the first and second change for exhaust.

A Camshaft can have several points (A, B, C, etc) and the HMP can store internally up to 20 points in each camshaft (always even)

The set of point is called MAP, and if you want use the reading to generate pulses in the future is required look al points on the map. To observe the timing belt set-up the point A is probably sufficient.

Other example can be on the following image. There

Another example can be seen in the following image. There it is better appreciated how the teeth are counted up to point A

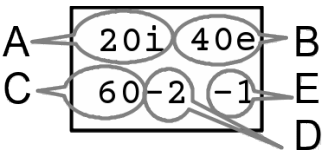


Each car have their own phase map, the HMP1 can read it with the engine rotating and store into the internal memory for generate the signal in the future.

This read have 4 different uses:

1) Test if the CKP and CMP are working
2) Check the timing belt assembly
3) Compare different cars with same engine
4) Store up to 4 read and generate in the future.

Screen:



A) The point Ai is 20
B) The point Ae es 40
C) Teeth amount
D) Missing Teeth
E) Cuts by turn

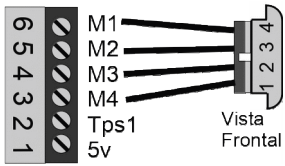
Pressing the + and - keys with a short touch will change the displayed point of the intake map (Ai, Bi, Ci, Di etc). A long touch will change the displayed point of the escape map (Ae, Be, Ce, De etc) When you press the OK button the reading will be recorded in memory, so it is necessary that the motor is turning when you press OK. The report will first show the full CMPi and then the full CMPe that the device has read, and you can scroll through them with the + and - keys. After the report it will ask you in which of the 4 memories you want to save the reading (0 = does not record anything)

IAC

The HMP1 can test up to 7 different IAC types. For the connection method is important that you plug the IAC AFTER choose the appropriated option.
In all cases with the + and - key the motor will move in or move out. In all except DC, pressing + and - simultaneously the IAC will start an automatic movement.
The connection change according the IAC type that you are testing. The images represent like if you are looking IAC from front.

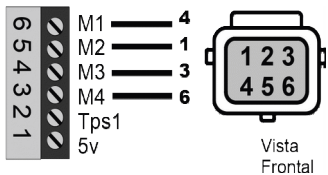
Marelli and GM:

Respect the connection on image.
On screen appear a number that is only a count about how many steps is moved.



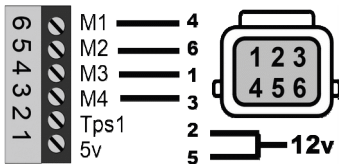
Rover:

Respect the connection on image. The pins 2 and 5 not be connected and must be isolated.
On screen appear a number that is only a count about how many steps is moved.

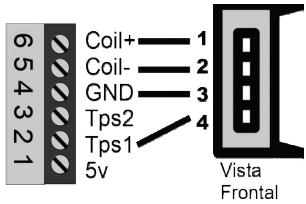


Mitsubishi:

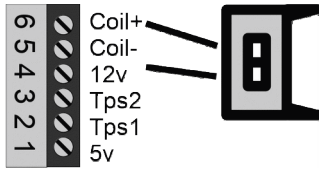
Respect the connection on image. The pins 2 and 5 not be connected to 12v
On screen appear a number that is only a count about how many steps is moved.



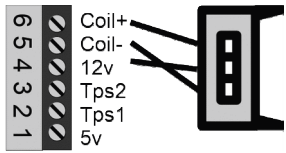
DC:
Respect the connection on image.
In the screen appear the motor consumption and switch state.



2 wire:
Many 2 wire type IAC have different connectors, but the most important is respect the connection.
On screen appear the coil consumption and duty applied.

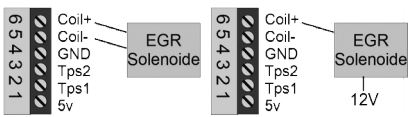


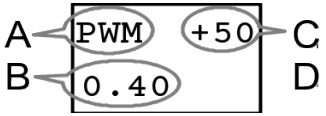
3 wire:
Respect the connection on image.
On screen appear the coil consumption and duty applied.



PWM

This function can test or run PWM actuators such as Turbo Actuators, EGRs, Canister Valves, Solenoids, Common Rail Relief Valves and other PWM type actuators up to a maximum current of 4.0A.
Connect as follows:





A) Is testing an PWM actuator.
B) Current consumption
C) Pulse width

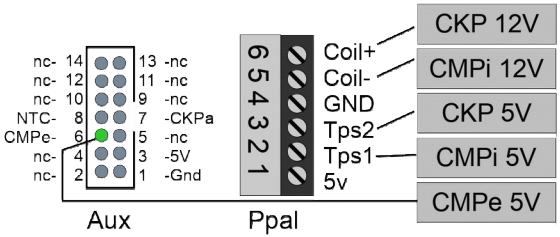
Use the + and - keys to increase or decrease the pulse width that will enter the valve and visually verify actuation. By pressing both at the same time the valve will move continuously.

CKP & double CMP pulses Generation

The HMP1 can generate pulses that simulate a synchronized CKP and double CMP signals according a timing map. This map can become from one of 4 preloaded programs or from a previous read or generate a new map yourself.

The map is explained on the section READ CKP, please read it for more deeply information.

1) Disconnect the original sensors and connect the HMP1.



2) Load a type of pre-recorded phonic wheel (0 does not load anything)

3) Choose the type of CKP tone wheel

3.1) Teeth (10 ~ 100),

3.2) Missing (1 ~ 3),

3.3) Cuts per turn of the wheel. (1 ~ 3)

3.4) Type of sensor to emulate: 0 = Hall, 1 = Inductive

4) Choose the rotation RPM. 400-800-1200-1600 RPM

5) Edit the intake camshaft phase map (CMPi). Choose which tooth of the CKP coincides with point A on the intake phase map.

5.1) Use the + and - keys until you see A = 0 (or another number)

5.2) Press OK

5.3) Use the + and - keys until choosing which tooth of the CKP point A of the phase map coincides with.

5.4) Press OK

5.5) Repeat steps 5.1 to 5.4 with points B, C and all those that correspond to the car to be verified.

5.6) As an example, the image map in the Read CKP section is: A = 20, B = 80, C = 0.

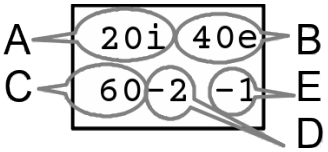
5.7) Maps always end in 0.

5.8) You must select 0 in the last item to continue

6) Edit the phase map of the exhaust camshaft (CMPe) Choose which tooth of the CKP coincides with point A of the phase map.

The procedure is the same as with the admission tree, in case it is not needed simply put A = 0;

7) Once the editing is finished and the pulses will begin to be generated and the following appears on the screen:

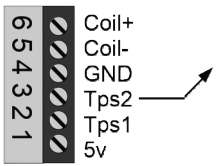


A) Point Ai is 20
B) Point Ae is 40
C) Number of teeth
D) Missing teeth
E) Cuts per turn

8) A short touch on the + and - keys alters the intake phase (CMPi) of all points on a tooth, which is equivalent to moving the timing belt on the intake cam.
9) A long touch (more than 1 second) on the + and - keys alters the exhaust phase (CMPe) of all points on a tooth, which is equivalent to moving the timing belt on the exhaust cam.
NOTE 1: It is very important to know that in most cases the ECU will start to emit gasoline and spark, so make sure they are not connected.
NOTE 2: The motor will not start, because the pulses are not related to the actual mechanical position of the motor.

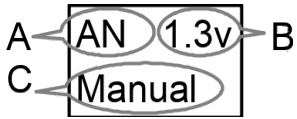
Generation of Analog Voltage GEN AN)

The HMP1 can generate analog voltages to simulate analog sensors. The test can be with a manually generated voltage or use one of the 5 curves built into the HMP1.
The voltage comes out through the TPS2 pin and is injected by disconnecting the true sensor.
The purpose of these tests is to inject the voltage and monitor the ECU's response and reading of the input voltage / signal. This verifies both the wiring and the ability



of the ECU to read the signal.

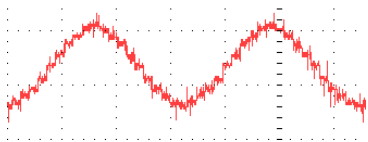
After selecting GEN An from the main menu, you must choose one of the 6 different operating modes listed below and the screen will look like this:



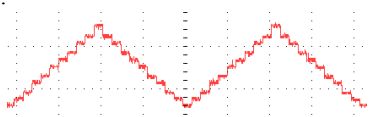
A) It is generating tension
B) Voltage generated
C) Working mode

Manual:
A continuous voltage is generated between 0 and 5v. With the + and - keys you raise or lower the voltage.

Lambda:
A voltage is generated that oscillates between 0.2 and 0.8v continuously.
With the + and - keys change the cycling speed.

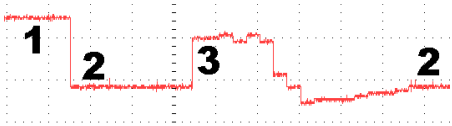


TPS (Throttle Position Sensor):
A voltage that oscillates between 0.8 and 4.7v is generated as if the butterfly were opening and closing continuously over and over again.
With the + and - keys change the cycling speed.

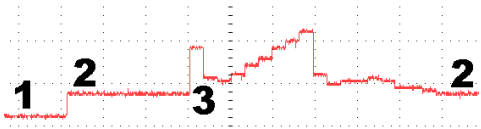


MAP (Manifold Air Pressure):
A signal is generated as if doing a full throttle.
1) When the test starts it emits a voltage as if the motor was stopped.
2) Pressing + outputs a voltage as if the engine was idling.

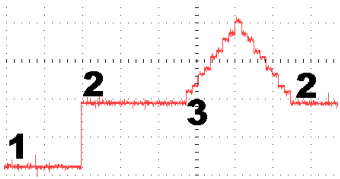
3) Pressing + again generates a signal as if you had made a sudden acceleration. At the end of the accelerated cycle, the signal returns to idle.



MAF (Mass Air Flow):
A signal is generated as if it were doing a full throttle.
1) When the test starts it emits a voltage as if the motor was stopped.
2) Pressing + outputs a voltage as if the engine was idling.
3) Pressing + again generates a signal as if you had made a sudden acceleration. At the end of the accelerated cycle, the signal returns to idle.



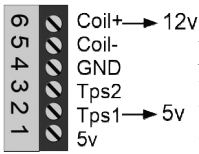
MAFd (Mass Air Flow in Diesel):
A signal is generated as if doing a full throttle.
1) When the test starts it emits a voltage as if the motor was stopped.
2) Pressing + outputs a voltage as if the engine was idling.
3) Pressing + again generates a signal as if you had made a sudden acceleration. At the end of the accelerated cycle, the signal returns to idle.



NOTE: This output supports very very low consumption, therefore it simulates sensors and cannot be used to power devices.

5V and 12V Pulses Generation

This pulses allow generate 5v pulses between 3Hz and 5700Hz (1Hz=1 pulse by second), the utility is to perform general testings. Simulate a frequency based MAP, ABS sensors (is possible that require extra signal conditioning) Smart alternators based on 5v or 12v pulses.



The 5v pulses out from TPS1 pin and the 12v pulses out for pin COIL+.

Note that the pulses are for small signals and cant be used for coils/solenoids/valves. In addition to not working, it can burn the device and the coils, etc.

With the + and - keys the frequency go up or down, leaving the key pressed, the movement will be more faster. Press OK when the test are done.

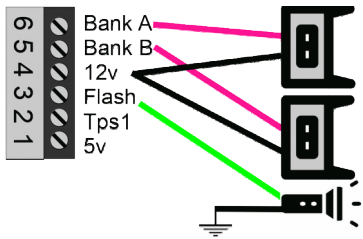
Injector testing with flash

This function allows testing up to 8 injectors in a bench operation. This means that first open the 4 injectors of bank **A** open and then the 4 injectors of bank **B**. The injectors opening time is configurable between 2 and 14mS, The RPM are configurable RPM between 1000 and 4000. The system has a Timer, which allows you to work continuously or for a specific number of minutes. (0 ~ 7min)

Flash: The HMP has an output to turn on a 12v LED light and up to 15w. The light will turn on for a few milliseconds after the injector opens (0 ~ 14mS)

The intermittent lighting of the flash allows you to see the spray resulting from the opening by means of the stroboscopic effect. The flash on time is set in the setup section.

1)Connect the injectors as image show.

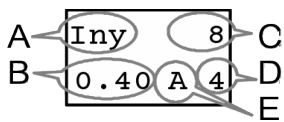


2) RPM: Choose RPM: 1000, 2000, 3000, 4000

3) Timer: Select the test time (great for measure injectors. 0=No time limit (Best for cleaning).

4) Duty: Opening time, is a time from 2 to 14 milliseconds. This question only will be shown when the Timer is active.

5) Start working and appears on screen.

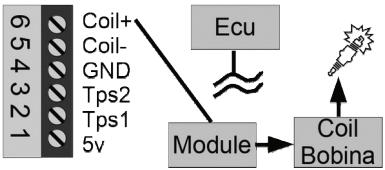


A.1) Is testing injectors
A.2) Seconds left of timer
B) Injectors current consumption
C) Duty, opening time of injectors
D) Flash, time difference from injector opening and flash start.
E) Bank assigned to flash

6) A short touch in the keys + or - increase the duty to the injectors (2~14mS).
7) A long touch of + or - change the flash delay
8) A long touch on Ok button, switch the flash bank.
9) The Ok button en the injector test

Ignition modules Test

This function do NOT test ignition coil directly, allow test TFI, modules and coils only when have incorporated the module. The test generate 12v pulses with width between 6mS and 30mS. The idea is simulate the hall of distributors and so force to the ignition modules to generate sparks. On this way you can test the modules.



The signal out by the pin COIL+ and must be disconnected the signal coming from ECU

With + and - keys ups and down the charge time. The device generate an DWELL angle of 50%. Press OK when is done.

Setup

You can configure some parameters of HMP1. Into main menu use + or – to select CONFIG or SETUP and press OK.

Inside use + and – to search what parameter do you want change and press OK to assign a new one.

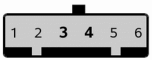
Parameter	Options	Description
Lang	**En**, Es	Language (English or Spanish)
Unit	**%**, V	Sensors in percentage or Voltage
Degree	**C**, F	Celsius or Fahrenheit degrees
Flash	1, **2**, 3, 4	Time in milliseconds that the flash is ON when test injectors
Plug	0s,2s,4s, Bt	Time in seconds that connection help is displayed on screen. BT=wait for OK
Exit		Write new options and return

Choosing the right cable

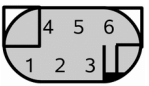
Before test any throttle body, the first is choose the right cable. For this you must search in the following list, not only the right form, also must check right connections.

This images are front view, seeing the throttle body.

A) Bosch

Peugeot/Citroën				
	1	C+	4	T2
	2	C-	5	5V
	3	GND	6	T1

B)Bosch

Dodge,Jeep,Honda				
	1	C+	4	C+
	2	GND	5	T2
	3	5v	6	T1

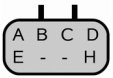
C) M. Marelli-Bosch-Siemens-Vdo

VW,Audi,Dodge,Audi				
	1	T1	4	T2
	2	5v	5	C+
	3	C-	6	GND

D)Marelli

Fiat				
	1	GND	4	C+
	2	T1	5	5V
	3	C-	6	T2

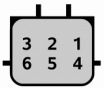
E) Delphi-General Motors

Chevrolet				
	A	5V	D	GND
	B	T2	E	C+
	C	T1	H	C-

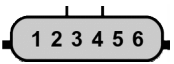
F)Delphi

Chevrolet				
	A	C-	D	T2
	B	C+	E	5V
	C	GND	F	T1

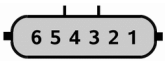
G) Hyundai

Hyundai, Kia				
	1	5v	4	T1
	2	T2	5	GND
	3	C-	6	C+

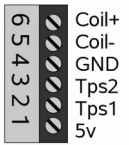
H)Nissan

Nissan,Kia,Renault				
	1	C+	4	T2
	2	C-	5	5V
	3	GND	6	T1

I) Toyota

Toyota									
	1	C-	4	T2					
	2	C+	5	5V					
	3	GND	6	T1					

New Cables



In the future you will need add new connectors.
Normally there are 6 wires in total.
1) Identify the engine. Is a coil that measure aproximately 2Ω. Both terminals must be connected to COIL+ (pin 6) and COIL- (pin5) in any order, the HMP detect autmatically if this cables are inverted.
2) Identify the TPS power supply. With the car in contact in one of 4 remain pins there are 5v. This go to pin 1 marked as 5v on HMP.
3) Identify the TPS ground . With the car completely off, search a terminal that is in short to ground. This go to pin 4 marked as GND on HMP.
4) The remaining 2 pins connect to TPS1 and TPS2 (pins 2 and 3) in any order, the HMP detect automatically if are inverted.

Most common trouble and solutions

The device does not power up.
- Verify the right connection to 12V.

The butterfly close and the screen show ”Icoil Error”.
-A short circuit was detected. The system remain frozen until you pres OK.

The butterfly close and screen show ”Fuse Error”.
-The internal fuse open by over current. Wait a few seconds and press OK the fuse will restore automatically.

Say ”NO motor”.
-The coil of motor is not detected between pins 5 and 6 of HMP. Probably you are using the wrong connector (specially Marely vs Bosh that use the same connector with different wiring.

Say ”NO motor”.
-At least one of TPS is disconnected or completely damaged.
-Connector or wiring bad assembled.
-wron cable used

The HMP, say UNKNOW type.
-Is possible that throttle works but have a relationship different to the pre programmed in the device: T1+T2=100, x2, and Toyota.

Short circuit protection

The device have an over consumption protection that abort the test and show on screen until you press the “OK” button.

The device can be damaged in short circuits, and this damages will void the warranty.

General Warnings

-Do not wet the device, do not use chemicals to clean. Only a slightly damp cloth.
-This device must do not enter in touch with hydrocarbons. (Oil, Gas, Diesel, alcohol, etc etc etc)
-Do not connect the device to any voltage different to 12V.
-Do not plug more than one throttle body at once.
-Do not connect more than 5V without a previous selection of a test that support it.
Note: The content of this manual can be changed in any moment without notice. ---- SCHlabs take all rights to make the all changes that consider convenient to the manual and product with the end to improve.

Note 2: All mentioned trademarks in this manual are propriety of their respective owners and only are mentioned with the only idea that the customer identify correctly the components.

Warranty conditions

-General condition of warranty
SCHlabs, warrant the right working of this product.
The warranty is for the following 3 (three) months starting in the purchase date, this cover the materials and had handwork defects.
If while warranty is running, the device fail, SCHlabs will repair the product. The repair work is done into SCHlabs placement and the shipping cost will be charged to the customer.
All accessories that not are manufactured by SCHlabs, the warranty are keeped by the respective providers.
This warranty is the only gived by SCHlabs, so any other claim are excluded.

- Conditions
The warranty only will be recognized with the presentation of this certificate with the date of purchase, or the bill of purchase. The present warranty only will work with the customer that are at day with the payments.
- Execution of warranty
1.- Periodic controls, maintenance, reparations, and pieces substitutions of pieces or spare parts as result of normal usage.
2.- Any malfunction due bad usage, shocks, or usage out of specifications and any defect not produced by defect of construction.
3.- Product, installed, modified, repaired, mounted or handled by personal unauthorized by SCHlabs.
4.- Accidents due to force major or other causes (water, fire, lightning, electromagnetic fields, etc.) that do not depend SCHlabs.

Other SCHlabs products

MAU-GPS: Engine parameter reader for GPS modules
TAU2: Engine temperature reader and protector.
TAU2+: Double temperature meter, oil meter, and volt meter w/ engine protector
LPA4: Lights turn on reminder

SCHlabs
http://www.schlabs.com.ar
Tel : +54 11 4639-5945
Whatsapp : +54 9 11 5616-3749
El araucano 1389 Cap Fed - Argentina.