KNOCK METER from Insane Import Performance

DOWNLOAD GUI
INSANE IMPORT PERFORMANCE

CONNECTIONS

If yours was sent assembled

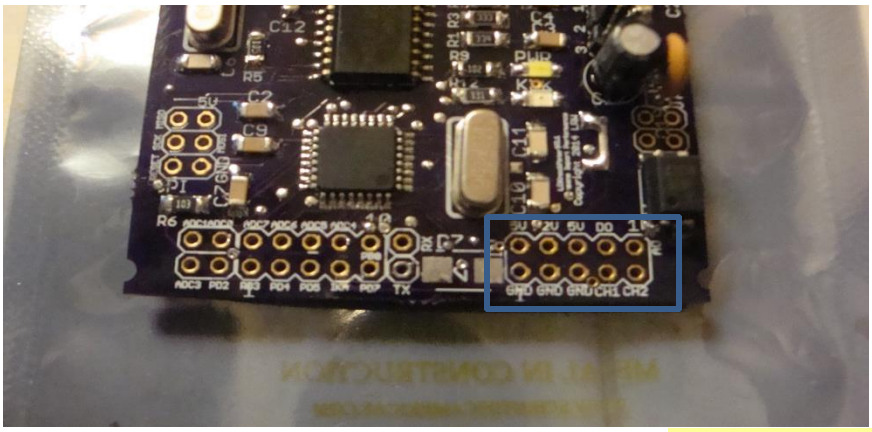
Red = 12v switched ignition on
Black = Ground/shielding/sensor
Blue = Digital out
Green = Knock sensor signal input (or if gray shielded with red and black wires inside after Oct 2014) RED = input from knock sensor, black is for 2 and 3 wire Bosch sensor ,
Bosch 2/3 wire (pin1/white goes to red)(pin2/brown goes to black)(pin3/black goes to shielding wire)
Yellow = Analog out

For USB converter

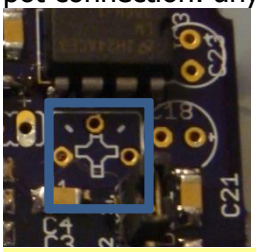
White = TX goes to RX on USB converter
Gray = RX goes to TX on USB converter
Black = Ground on USB converter

MAIN BOARD
power hookup: +12v to switched ignition, same as ECU hookup
ground: negative connection same as ECU
knock sensor input: one wire, must be shielded wire from knock meter OR two wire, input and ground, must be shielded wire or 3 wire same as two wire but shielding ends at pin 3
Labeled CH1 for sensor one and CH2 for sensor two

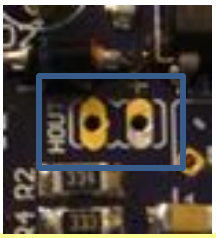
Starting Oct2014 1 ft shielded wire with 2 contacts already onboard (RED = knock sensor input black knock sensor ground)and shield is grounded at the board (leave other end of shielding open unless using the bosch 3 wire. For one, two and three wire hookup. For 1 wire hook up just connect the red to knock sensor output and trim back the black wire.



digital output: DO pin on power header 0 _¦¯5v (if using MS1 or MS2 connect to knock input)
analog output: AO pin on power header 0~5v used only for logging or with MSEXTRA Firmware 3.3.1 (using analog signal to signal knock depending on RPM in MSEXTRA firmware.)
pot connection: any 50K pot , connect pins L->R (1 2 3)

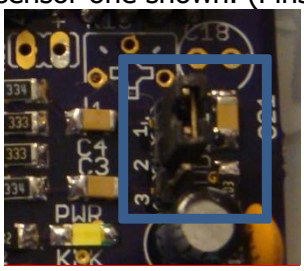


This is the pot connection



this is the headphone connection

head phone connection: mono output: connect positive to both + on headphone jack, negative to negative of jack
jumper for sensor: 1 or 2 1 audio 2 .If you have 2 sensors you can listen to either one. Jumper to sensor one shown. (Pins 1 & 2)



For sensor two place jumper on (Pins 2 & 3)

Added gain circuit to the audio incase you want add caps to C23(cuts feedback), C18 and R7 (on bottom). C18 and R7 are for the various gain adjustments. Low voltage sensors may need them installed

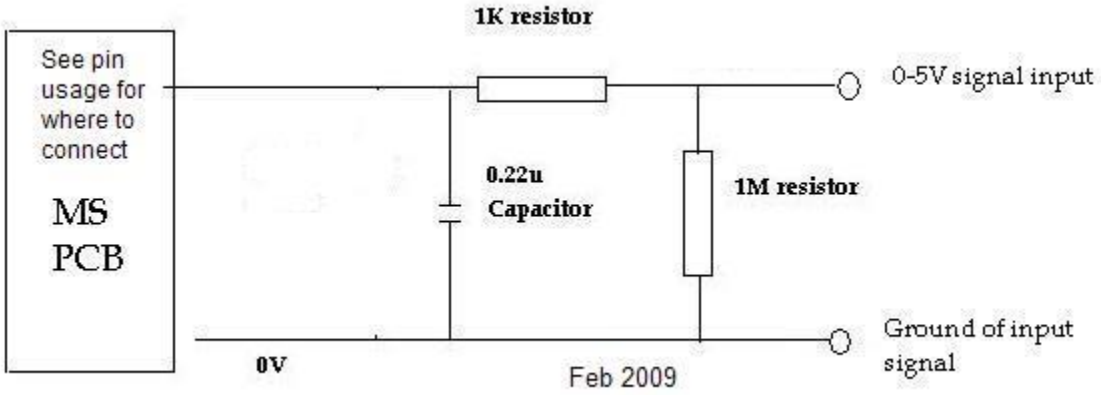
You can add a resistor (4.7k) to C23 instead and it will lower the highs and bring in the bass boost. Just alittle harder to hear the pinging.

DISPLAY BOARD

Power connections: 5v and ground to 5v and ground on MAIN power header
SER to PD7/pin 5 on MAIN board I/O header
SH to PD3/pin 1 on MAIN board I/O header
ST to PD4/pin 2 on MAIN board I/O header

USB CONVERTER
From USB Rx to TX on the MAIN board
From USB TX to Rx on the MAIN board
ground goes to any ground
5v is only connected when NO OTHER POWER is connected (meaning the MAIN board 12v power is not connected when the USB 5v power is in use)
If adjusting in the car with serial monitor open, connect ground and Tx & Rx only, no 5v connection

LOGGING
To log analog use second O2 wiring diagram to protect the MSII card



http://msextra.com/doc/ms2extra/MS2-Extra_Hardware.htm#secondo2

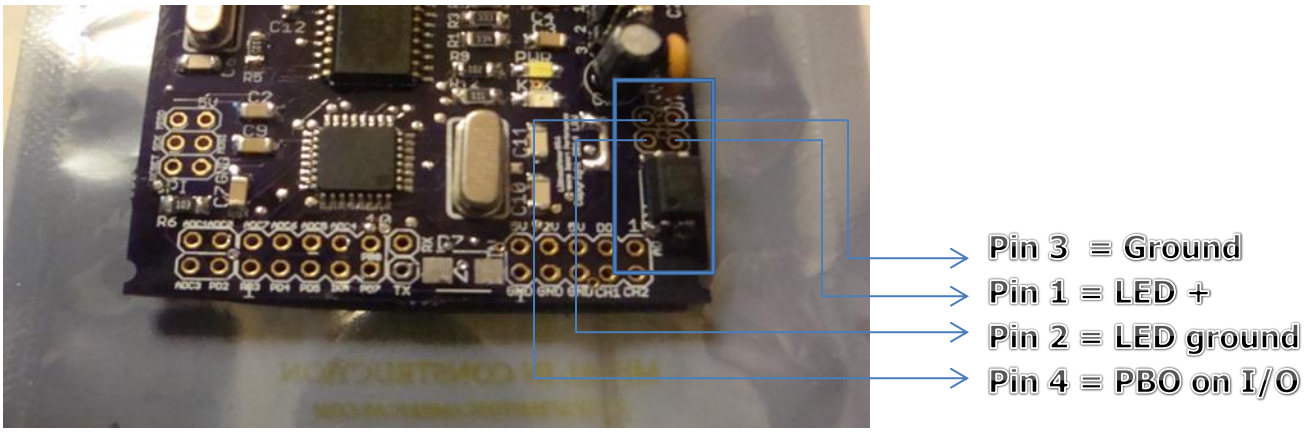
Use digital out just like the GM knock module but the Megasquirt settings are knock indicated by going high/pull down active. So if the MAIN board is disconnected it won't pull any timing.
With current GM knock module setup, if the module goes bad, timing is pulled down to your maximum settings.

KNOCKOUT = 850 which is 85%
RPM & CYL# are not crucial can be used with terminal to log by itself

The optoisolator (LTV816) located next to the main header can be used to log the rpm with a hyperterminal or to display in the GUI. Uses basic trigger, one pulse per cyl fire.

The 4 pin header next to it is connected . LED + to 5 volt trigger via 220 resistor, or 12volt trigger via 680 resistor, LED ground to ground on board. Or if negative trigger, LED + to 5V on board via 220 resistor LED – connect to trigger.

Pin 1 and 2 trigger the ltv816. (INSERT 5V,12V and Grounding trigger SCHEMATICS)



FREQ is the center of the peak of the curve, the display maxes out to the center of your current KHz, anything above that triggers D0 (digital out)
GAIN is the volume, where low = lower readings and high = higher readings. It depends on the amount of voltage the knock sensor produces. Bosch sensors (the wideband through hole type) need more GAIN. Nissan/ GM/Toyota/Mitsubishi /Toyota tuned sensors (screw-in type) need less GAIN.
KNOCKOUT can be lowered to just above max noise @ little less than max rpm

TO ADJUST SETTINGS
connect USB converter to MAIN board

(1) knock meter off
(2) plug in USB
(3) Open LilKnockMeter™ GUI or open a terminal program like Hyperterminal and comm port to USB converter
(4) select com port in GUI and press connect.If com port not shown , click connect if the usb converter is connected . The GUI will update the com port. Then press connect again.
(5) turn on KNOCK METER (MAIN board)
(6) select your settings in the dropdown menus
(7) click send and the new values will save in the eeprom.

If not connected to 12v power you can connect USB 5v to board (to adjust settings on the bench). If 12v power is connected can connect USB BUT ground only! DO NOT connect the 5v from the USB. Ground must be connected or you'll get gibberish in the terminal.

V2.1 boards use the GUI.

If you bought an older board I can either update it for you. I would need it shipped to me. Or if you have and Arduino and know how to use it , I can send the code. There's only about 5 that didn't get code to communicate with the GUI.

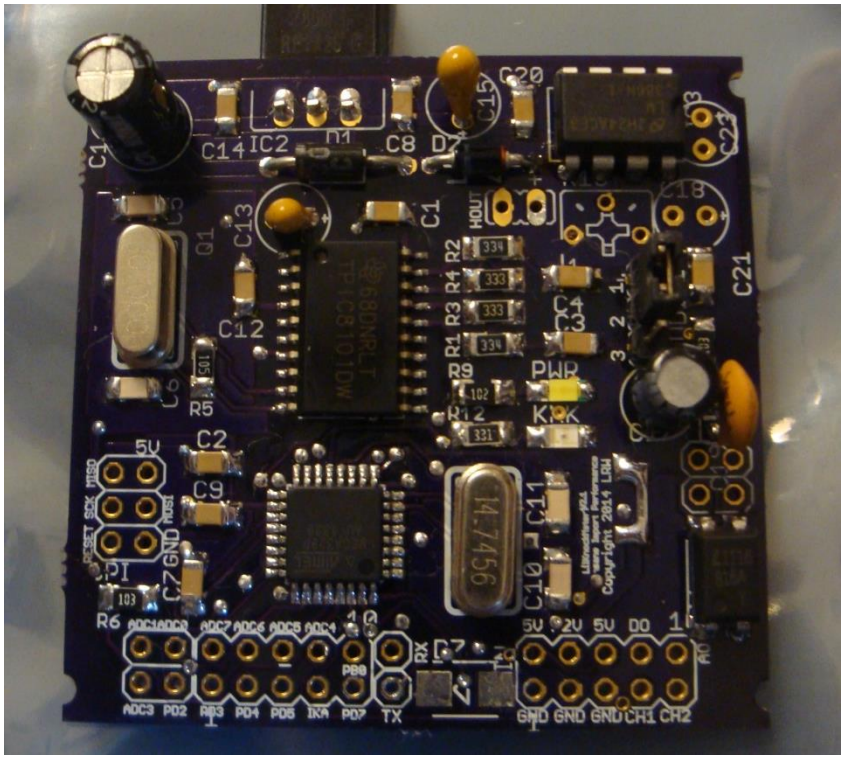
It will display current setting and ask if you want to change them "y" for yes, "n" for no, not case sensitive

Once you have entered new settings it will display what you entered. Enter "y" for update, or "n" to use old settings. A "y" saves the new settings in EEPROM on the KNOCK METER, and will remain after power is removed. If you put the wrong values in and want to do it again, press "n" and reenter what you wanted to input.

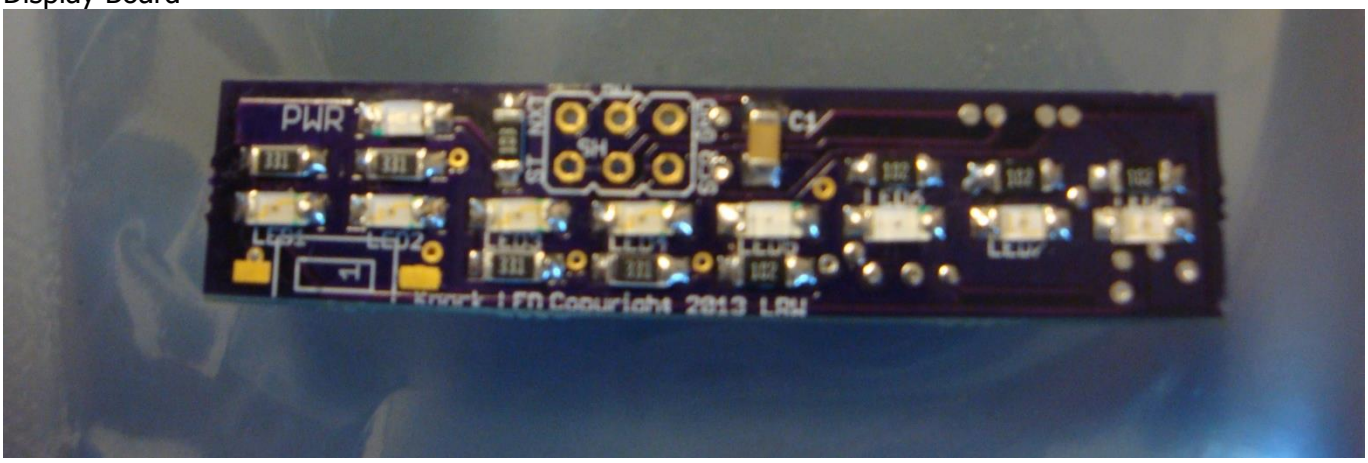
When the engine is cold it will be louder when warm.
Unshielded wire will be very noisy with headphones.
The lower frequency will pickup a lot of engine noise up top.
Frequency is set first ,then rev motor 2/3 of rev limit and adjust gain to light the lower part of the gauge (around 200-300).

Inside a SERPAC M6 Case

MAINBOARD



Display Board



USB Converter

Table for changing settings

Decimal Value	Time integration	Frequency kHz	Gain	Decimal Value	Frequency kHz	Gain
0	40	1_22	2_000	32	4_95	0_421
1	45	1_26	1_882	33	5_12	0_400
2	50	1_31	1_778	34	5_29	0_381
3	55	1_35	1_684	35	5_48	0_364
4	60	1_4	1_600	36	5_68	0_348
5	65	1_45	1_523	37	5_90	0_333
6	70	1_51	1_455	38	6_12	0_320
7	75	1_57	1_391	39	6_37	0_308
8	80	1_63	1_333	40	6_64	0_296
9	90	1_71	1_280	41	6_94	0_286
10	100	1_78	1_231	42	7_27	0_276
11	110	1_87	1_185	43	7_63	0_267
12	120	1_96	1_143	44	8_02	0_258
13	130	2_07	1_063	45	8_46	0_250

14	140	2_18	1_000	46	8_95	0_236
15	150	2_31	0_944	47	9_50	0_222
16	160	2_46	0_895	48	10_12	0_211
17	180	2_54	0_850	49	10_46	0_200
18	200	2_62	0_810	50	10_83	0_190
19	220	2_71	0_773	51	11_22	0_182
20	240	2_81	0_739	52	11_65	0_174
21	260	2_92	0_708	53	12_10	0_167
22	280	3_03	0_680	54	12_60	0_160
23	300	3_15	0_654	55	13_14	0_154
24	320	3_28	0_63	56	13_72	0_148
25	360	3_43	0_607	57	14_36	0_143
26	400	3_59	0_586	58	15_07	0_138
27	440	3_76	0_567	59	15_84	0_133
28	480	3_95	0_548	60	16_71	0_129
29	520	4_16	0_5	61	17_67	0_125
30	560	4_39	0_471	62	18_76	0_118
31	600	4_66	0_444	63	19_98	0_111