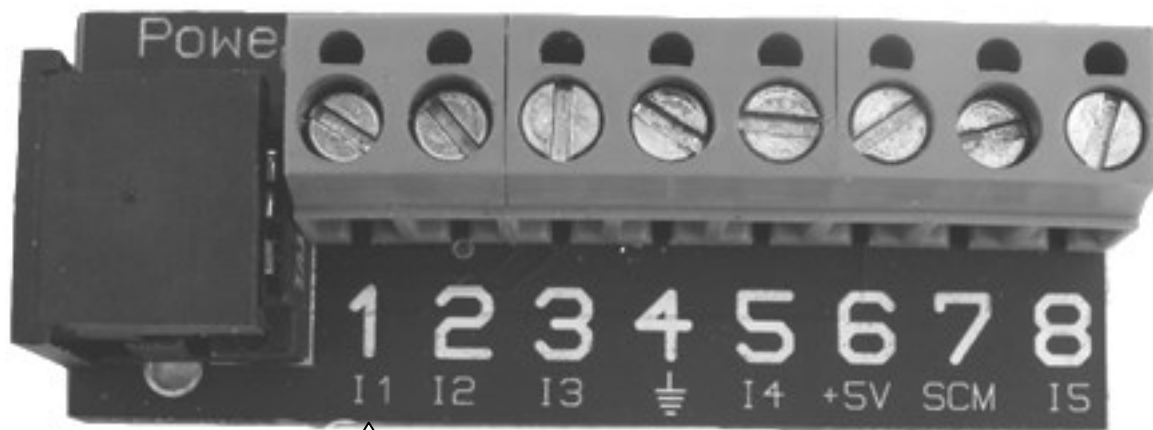


Wideband Connection and Setup Notes

Do not use this chip without reading these notes!

Powerlogger analog input block



This is the Powerlogger's **analog input** for the wideband.

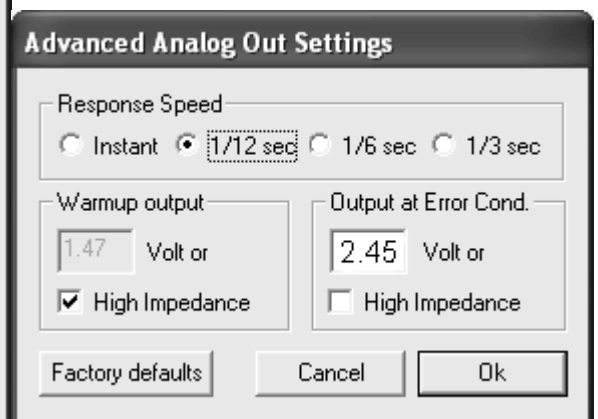
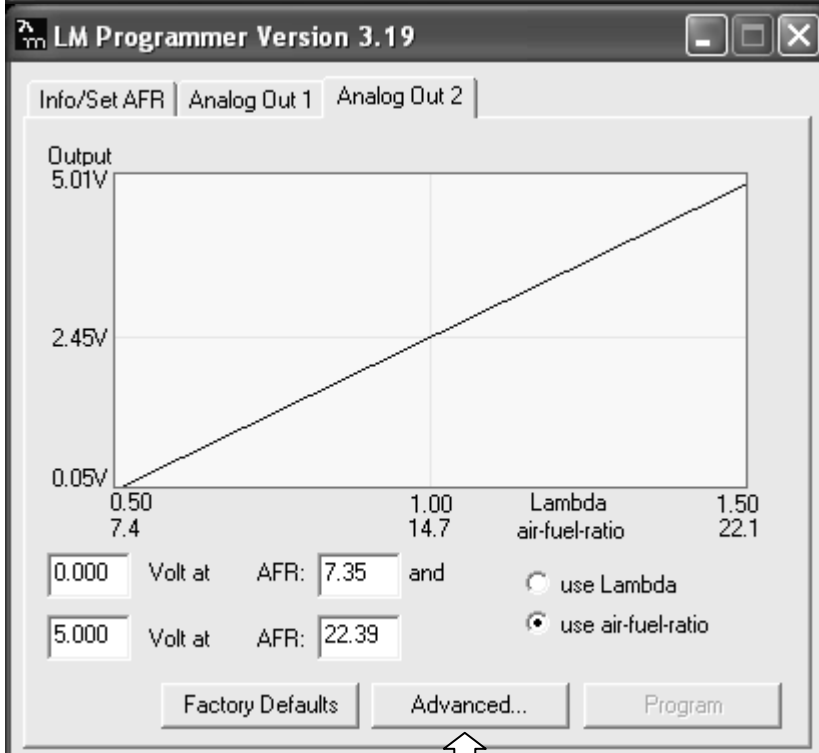
See the following pages for notes about your particular wideband system.

Innovate LM-1 or LC-1

Attention! Before you use the 6.0 wideband chip, make sure your LC-1 or LM-1 is programmed properly. For the LM-1, you will need to reprogram the analog output to match the LC-1 settings. For the LC-1 and LM-1, connect to your wideband using the LM Programmer software. Make sure the settings match the screens shown

below. You will be using “Analog Out 2” to connect to your Powerlogger. If you have an LM-1, once you reprogram it, you will tell the Powerlogger software that you have an LC-1. Select “LC-1” for the wideband input in the Powerlogger software.

Set the “Output at Error Cond.” to 2.45 volts. That will make the LC-1 show an air/fuel ratio of 14.7 if it throws an error code, which will make the chip add fuel instead of subtract (safer).



↑
Press “Advanced” for next window

Autometer Widebands

See your Autometer instructions for setting the “BGD Range”. You will need to set the LO to 10.0 and the HI to 18.0. In other words, 0 volts will equal an A/F reading 10.0, and 4 volts will equal an A/F reading of 18.0. In the Powerlogger software, you will select “PLX” for the wideband input.

You’ll be connecting the blue wire from the Autometer gauge to the Powerlogger wideband input, and the blue/black wire to the Powerlogger ground input.

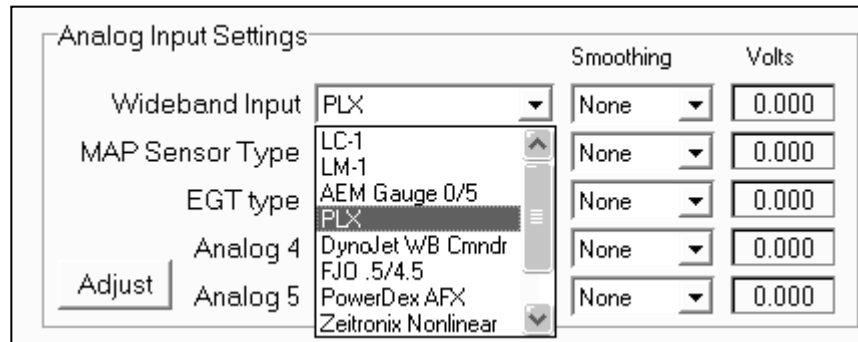
Be aware that the Autometer wideband is set up to require at least 13.5 volts before it will turn on the wideband sensor. If your car will not supply 13.5 volts, then you will have to change the “Heater Control Mode” on the wideband. See your Autometer instructions for this.

PLX Widebands

You will need to connect the 0-5v linear analog output wire to the Powerlogger wideband input. PLX supplies capacitors for the analog output to reduce electrical noise, but you **do not** need to use them. The Powerlogger has capacitors built in. Select “PLX” for the wideband input in the Powerlogger software.

Wideband Input Selection

Here is where you select which wideband you have in the Powerlogger software:



Please read before installing!

1. This chip is designed to be used with a Powerlogger. A wideband O2 can be connected to the Powerlogger and used for fuel corrections if desired. The chip needs to be calibrated for specific wideband systems (Innovate, PLX, FAST, etc), so make sure that was specified when the chip was ordered. You *could* use the chip without a Powerlogger if you keep the wideband correction turned off, and tune manually.
2. Before installing the chip, disconnect the power to the ECM by unplugging the orange wire with the black connector by the battery. This resets the ECM's memory so it can re-learn with the new chip.
3. After gaining access to the ECM and removing the cover, remove the old chip, and carefully insert the new chip. Sometimes you may have to squeeze the sides of the chip slightly for it to fit into the socket. The chip will only go in one way. The notch on one end of the chip should be the same direction as the notch in the ECM socket.
4. Reconnect the ECM power wire. (**Important!** Always reset the ECM when changing chips, even from one TurboTweak chip to another TurboTweak chip.)
5. For cars with a stock type MAF, it must have at least one screen in it. If you have a basic Translator, the switches inside the Translator box must be set correctly to work with this chip. The "MAF BASE" must be set for your MAF sensor (the settings should be listed on the back of the Translator cover), "MAF WOT" should be set to "0" (it will have little affect with this chip). The four small on/off switches should be ON, ON, ON, OFF. If you have a Translator+, its spark adjustments will work normally.
6. Turn the key on. The "Service Engine Soon" light should come on, blink once and stay on. If, after installing the new chip and turning the key on, the "Service Engine Soon" light flashes on and off rapidly, do not start the car. Try to re-insert the chip, checking for bent pins. Also, check the ECM chip socket for any pins that are bent in too far, possibly making poor contact with the chip. The ECM socket pins can be carefully bent back out with a pin or needle. If the SES light still flashes, then the chip may be defective, or damaged during shipment, and will need to be replaced.
7. Set the fuel pressure to 43psi (vacuum line off) to start with and tune from there.
8. The very first time you start the car with a new chip, the idle may flare up to around 2000rpm. This is common, as the ECM has lost track of the idle air control motor's position. Simply turn the car off and wait about 5 seconds, then restart. The idle should return to normal.
9. This chip utilizes an open loop idle mode for smoothness. The first time the car is run after the ECM is reset, open loop idle mode will not be enabled. This is to allow the BLM's to learn quicker. Once the car is warmed up and driven around, the next time the car is started, open loop idle will be enabled for a smoother idle.
10. The car may need to be warmed up and driven around for the ECM to re-learn, in order for it to run its best. Once the car is warmed up (160°F), most of the learning can be done in about 15 minutes of city driving. Open loop idle will not be enabled until the ECM has "learned" and the car is restarted the 2nd time.

This product is intended for off-road use. TurboTweak cannot be held responsible for any damage resulting from the use of this product.

Adjustment Procedure

To adjust the programmable features, you will need a scantool that can display LV8 and BLM (L8 and BL on Scanmaster).

Select a parameter:

1. With key on/engine off, look at LV8 on your scantool. It will display the parameter you will be adjusting. It should display "0" to begin with.
2. Press the gas pedal fully and release 3 times, *except* on the 3rd press, hold it to the floor. Like this:
 1. Press/Release
 2. Press/Release
 3. Press/Hold -- don't let go!
 You must complete this sequence in under 3 seconds! If not, you'll have to turn the key off, then back on to start over.
3. Keep holding the gas pedal. After about 2 seconds, LV8 will start to cycle from 1 to 8, over and over again.

- 1 = WOT A/F Ratio - 1st/2nd gear
- 2 = WOT A/F Ratio - 3rd/4th gear
- 3 = Mid Boost A/F Ratio - all gears (part throttle)
- 4 = Base WOT fuel - all gears
- 5 = Spark Timing Offset - 1st/2nd gear
- 6 = Spark Timing Offset - 3rd/4th gear
- 7 = WOT TCC Lock MPH
- 8 = Base Mid Boost fuel (3 to 14psi)

Parameters on the BLM grid on Power Logger			
128	128	128	128
128	128	128	128
1	2	3	4
5	6	7	8

3. When you get to the parameter you want to adjust, release the gas pedal. Wait a couple seconds to make sure the number stopped on the parameter you wanted.

Adjust the parameter you just selected:

4. Switch your scantool over to BLM. This will show you what the current setting is of the parameter you selected.
5. If you want to change the setting, press the gas pedal a little over half way and the number should start rising. When it gets to its maximum, it will start over at its minimum and keep going. When you get to the number you want, release the gas pedal. If you push the pedal all the way to the floor, it will increase faster (too fast for some scantools), which is good for users of Powerlogger, which has a much faster update rate.
6. Key off and the process is complete. If you want to adjust another parameter, key off and back on, and start the process over. The key off/key on motion can be very quick. You do not have to wait any certain amount of time.

Notes:

If the battery or ECM is disconnected, the memory will be erased and your settings will be lost (they will return to the default 128). I recommend periodically looking at the saved values to make sure they have been retained. Sometimes bad battery cables, a bad starter, bad ignition switch, etc. can cause the ECM to lose its memory when starting the car.

Troubleshooting:

If you can't get the adjustable parameters to work, then the TPS is probably not adjusted correctly. Make sure the TPS voltage reads .40-.46 in the throttle closed position, and 4.20-4.60 when your foot is to the floor (engine off/key on).

TurboTweak

Adjustable Parameter Summary - WB Chip

Parameter (LV8)#:

Description:

Actual Range:

Default:

Scantool Shows (BLM):

1	2	3	4
WOT A/F Ratio 1st/2nd	WOT A/F Ratio 3rd/4th	Mid Boost A/F Ratio	Base WOT Fuel
9.7 to 12.5	9.7 to 12.5	9.7 to 12.5	-23% to +23%
Varies by chip	Varies by chip	Varies by chip	0%
97 to 125	97 to 125	97 to 125	99 to 157, Default 128

This sets the target A/F ratio at WOT for the lower gears (above approx 13psi boost). Any setting 9.9 or lower turns off closed loop for 1/2 only.

This sets the target A/F ratio at WOT for the higher gears (above approx 13psi boost). Any setting 9.9 or lower turns off closed loop for 3/4 only.

This sets the target A/F ratio for mid boost only (approx 3-13psi boost). Any setting 9.9 or lower turns off closed loop for mid boost only.

Use this to get WOT closed loop correction closer to 128. This adjustment is for WOT fuel only (above 13psi boost). If closed loop correction is turned off, use this for manual fuel control.

Parameter (LV8)#:

Description:

Actual Range:

Default:

Scantool Shows (BLM):

5	6	7	8
Spark Offset 1st/2nd	Spark Offset 3rd/4th	WOT TCC Lock MPH	Base Mid Boost Fuel
-10° to +10°	-10° to +10°	30 to 105 MPH	-23% to +23%
0°	0°	128 MPH (OFF)	0%
99 to 157, Default 128	99 to 157, Default 128	30 to 105, Default 128	99 to 157, Default 128

Adjusts WOT timing higher or lower than the default timing in 1st/2nd gear only. By default, the scantool will display 128, which is 0° change. Higher than 128 adds timing, less than 128 subtracts timing. Moving the number to 157 adds 10° timing. Moving it to 99 subtracts 10° timing. For this adjustment, 1 number = .35° timing.

Your default timing should be written on the chip.

Adjusts WOT timing higher or lower than the default timing in 3rd/4th gear only. By default, the scantool will display 128, which is 0° change. Higher than 128 adds timing, less than 128 subtracts timing. Moving the number to 157 adds 10° timing. Moving it to 99 subtracts 10° timing. For this adjustment, 1 number = .35° timing.

Your default timing should be written on the chip.

Set the MPH at which the torque converter will be forced to lock at WOT. Any setting over 100 turns off WOT lock.

Use this to get mid boost closed loop correction closer to 128. This adjustment is for mid boost fuel only (3-13psi boost). If closed loop correction is turned off, use this for manual fuel control.

Tuning with the 6.0 Chip

This chip will attempt to maintain the target WOT Air/Fuel ratio that you set in the chip parameters. However, the program can only add or subtract a certain amount of fuel. This is the “correction factor”. The correction factor is displayed in the BLM location on a Scanmaster, or on the Powerlogger, it is displayed in the BLM cell just above the BLM grid on the data page. It is allowed to reduce fuel by up to 10% (BLM of 115), and add fuel up to 33% (BLM of 170). We’ll call this the “correction window”. Therefore, the correction window is -10% to +33%. We need to keep the correction factor within this window, preferably around 128 (0%), in order for the closed loop operation to work correctly. It’s ok if it’s not exactly at 128, just somewhere in that area, maybe +/- 5. It’s best to monitor closed loop correction after the boost has stabilized. As long as the correction factor has not hit the upper and lower limit, then it should hold your air/fuel ratio pretty close to the target, typically +/- .2 once at full boost. You might see more variance during spoolup.

When at full boost (WOT), monitor closed loop correction and see where it ends up. If the correction is too far away from 128, then you can change the Base WOT Fuel (parameter #4), to get the correction closer to 128. For example, if the correction ends up around 145, then increase the Base WOT Fuel to 145. If the correction is too low, say 117, then decrease the Base WOT Fuel to 117. If the correction is stuck at the upper or lower limit no matter what, then you’ll need to stop and figure out what’s going on.

Once you go through this process, you should not have to adjust the Base WOT Fuel much more, unless you make some type of radical change to the setup of the car.

There is also a Mid Boost Air/Fuel setting in the chip. In general, I typically leave this OFF (set it to 9.9). The reason is the boost typically moves very rapidly through this area, and it makes it difficult to hold the target A/F. For some cars that are in that boost area for longer periods, then it might be beneficial to turn it on. It works better on some cars than others. I would experiment with it and see what works best for you. If you decide to use it, it works the same way as the WOT adjustments. You would use the Base Mid Boost Fuel to keep the correction factor in the correction window.

Regarding target air/fuel ratios, I find that around 10.8-11.0 is a good place to start for WOT A/F in most situations whether it’s street, race, or with alcohol injection. Start there and monitor for knock and performance. If the car is knocking at 10.8, then you may have to go richer, however you may want to evaluate your octane level or alcohol spray volume. Typically the idea is to go as lean as you can without knocking, but I wouldn’t go much leaner than 11.5. Some cars can go leaner if running low boost, say 15-16psi, or on some race cars with very high octane.

If you are seeing a rich spike or lean spike when the boost first comes up and peaks, then you may need to adjust the Base WOT Fuel or Base Mid Boost Fuel. Especially with alcohol injection, you might see a rich spike as the boost first comes up. You should consider experimenting with the settings on your alcohol system in that case.

Quick Reference for User Adjustments (Base WOT fuel and Spark Timing)

Base WOT fuel user adjustment	
Number on scantool	Change to WOT fuel
157	+22.7%
156	+21.9%
155	+21.1%
154	+20.3%
153	+19.5%
152	+18.8%
151	+18.0%
150	+17.2%
149	+16.4%
148	+15.6%
147	+14.8%
146	+14.1%
145	+13.3%
144	+12.5%
143	+11.7%
142	+10.9%
141	+10.2%
140	+9.4%
139	+8.6%
138	+7.8%
137	+7.0%
136	+6.3%
135	+5.5%
134	+4.7%
133	+3.9%
132	+3.1%
131	+2.3%
130	+1.6%
129	+0.8%
128	0.0%
127	-0.8%
126	-1.6%
125	-2.3%
124	-3.1%
123	-3.9%
122	-4.7%
121	-5.5%
120	-6.3%
119	-7.0%
118	-7.8%
117	-8.6%
116	-9.4%
115	-10.2%
114	-10.9%
113	-11.7%
112	-12.5%
111	-13.3%
110	-14.1%
109	-14.8%
108	-15.6%
107	-16.4%
106	-17.2%
105	-18.0%
104	-18.8%
103	-19.5%
102	-20.3%
101	-21.1%
100	-21.9%
99	-22.7%

Spark timing user adjustments	
Number on scantool	Change to timing
157	+10.1°
156	+9.8°
155	+9.5°
154	+9.1°
153	+8.8°
152	+8.4°
151	+8.1°
150	+7.7°
149	+7.4°
148	+7.0°
147	+6.7°
146	+6.3°
145	+6.0°
144	+5.6°
143	+5.3°
142	+4.9°
141	+4.6°
140	+4.2°
139	+3.9°
138	+3.5°
137	+3.2°
136	+2.8°
135	+2.5°
134	+2.1°
133	+1.8°
132	+1.4°
131	+1.1°
130	+0.7°
129	+0.4°
128	0.0°
127	-0.4°
126	-0.7°
125	-1.1°
124	-1.4°
123	-1.8°
122	-2.1°
121	-2.5°
120	-2.8°
119	-3.2°
118	-3.5°
117	-3.9°
116	-4.2°
115	-4.6°
114	-4.9°
113	-5.3°
112	-5.6°
111	-6.0°
110	-6.3°
109	-6.7°
108	-7.0°
107	-7.4°
106	-7.7°
105	-8.1°
104	-8.4°
103	-8.8°
102	-9.1°
101	-9.5°
100	-9.8°
99	-10.1°