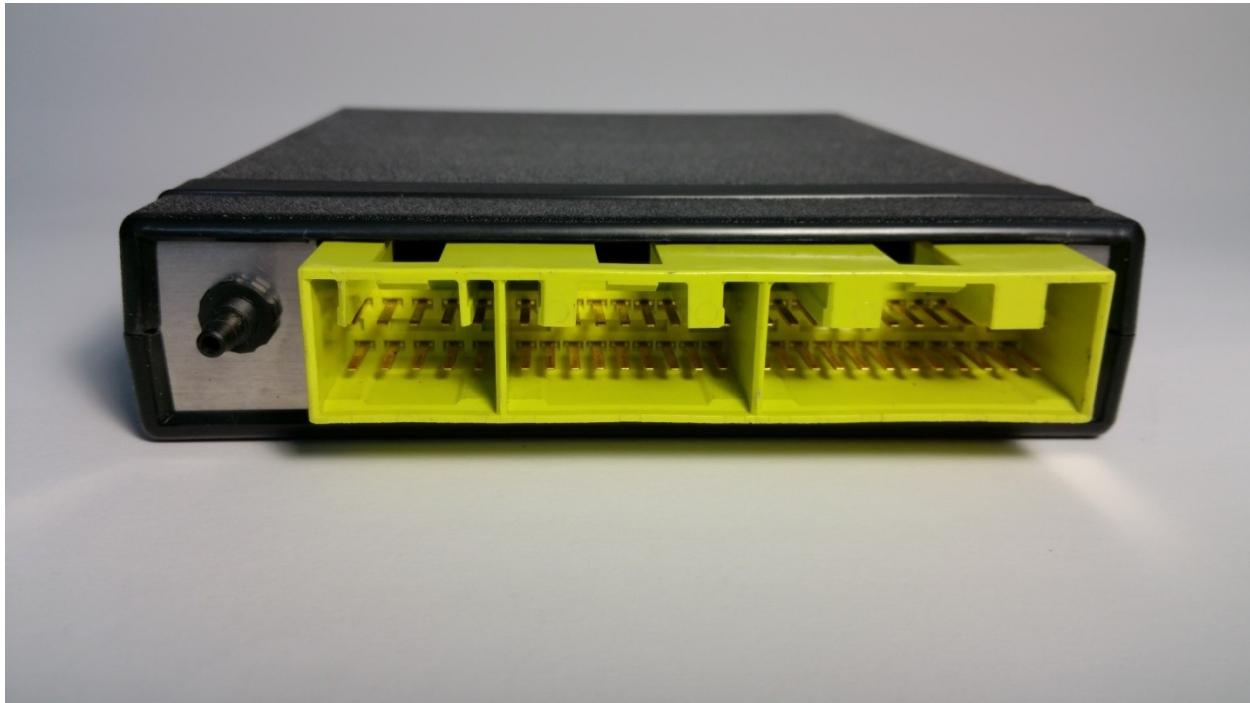


PERFECT TUNING.NET

MS3Pro-PNP

1986.5-1992 Toyota Supra 7MGE / 86.5-88 7M-GTE with yellow connector



User Manual

Hardware Revision 2

Table of content

Warning.....	3
Installation of TunerStudio and MegaLogViewer (for Windows, Mac and Linux).....	4
Software for Android devices.....	5
Software for Apple devices (iPhone, iPad).....	5
Installation of the MS3Pro Plug and Play.....	6
1. Connect the MS3Pro-PNP.....	6
2. Power Up the MS3Pro-PNP.....	7
3. Connection to the MS3Pro-PNP with TunerStudio and a USB or serial cable.....	8
4. Calibrate the «TPS» (throttle position sensor).....	8
5. Calibrate the IAT (intake air temperature) and CLT (coolant temperature).....	8
6. Calibrate the Wideband.....	9
7. *** IMPORTANT *** Check the timing and Check It Again!.....	9
What to do if the engine doesn't start.....	9
Connectors.....	10
Expansion connector.....	10
Wideband connector and controller.....	11
USB Connector.....	14
Serial Connector.....	14
Inputs and outputs.....	15
List of inputs and outputs.....	15
Injector outputs.....	16
Semi-Sequential to Full Sequential Injection Conversion.....	16
Ignition (spark) outputs.....	17
Full Sequential Ignition Conversion.....	17
A/C Control.....	17
Knock sensors inputs.....	18
Launch control / Flat-Shift / 2-step / Antilag.....	18
LED indicators.....	19
Extra VR sensors conditioner circuits.....	19
Internal Bluetooth module.....	20
Internal WIFI module (optional).....	21
Internal Data logging on SD Card.....	21

Internal MAP and Barometric sensor.....	22
Internal Bosch LSU 4.9 wideband controller (optional).....	22
Internal Real Time Clock.....	22
Traction control.....	23
Boost Control.....	23
Base map.....	23
Electronic controlled automatic transmission (ECT).....	23
How to Change the Engine Configuration (7MGE or 7M-GTE).....	24
12 Month Limited Warranty.....	24
MS3Pro-PNP dimensions.....	25
Contact.....	25
Accessories:.....	26

Warning

All parts are sold for OFF ROAD RACE-ONLY ground-vehicle use only, or vehicles that predate any federal and state emissions control requirements. Aftermarket EFI/EMS systems are not for sale or use on pollution controlled vehicles.

Race parts are inherently dangerous and may cause injury or damage if improperly modified or altered before use. Perfect Tuning will not be held liable for and will not pay you for any injuries or damage caused by misuse, modification, redesign, or alteration of any of our products. Perfect Tuning will not be held in any way responsible for any incidental or consequential damages including direct or indirect labor, towing, lodging, garage, repair, medical, or legal expense in any way attributable to the use of any item in our catalog or to the delay or inconvenience caused by the necessity of replacing or repairing any such item.

All supplied Perfect Tuning calibrations, Wizards and other tuning information are offered as potential starting points only. IT IS THE RESPONSIBILITY OF THE ENGINE TUNER TO ULTIMATELY CONFIRM IF THE CALIBRATION IS SAFE FOR ITS INTENDED USE. Perfect Tuning holds no responsibility for any engine damage that results from the misuse or mistuning of this product!

*Documentation, technical support, discussion forums for all versions of MS3Pro is available at
<http://msextra.com>*

*The MS3Pro user manual is full of information for the Perfect Tuning MS3Pro-PNP as this MS3Pro-PNP
is based on the MS3Pro. <http://www.ms3pro.com/downloads.html>*

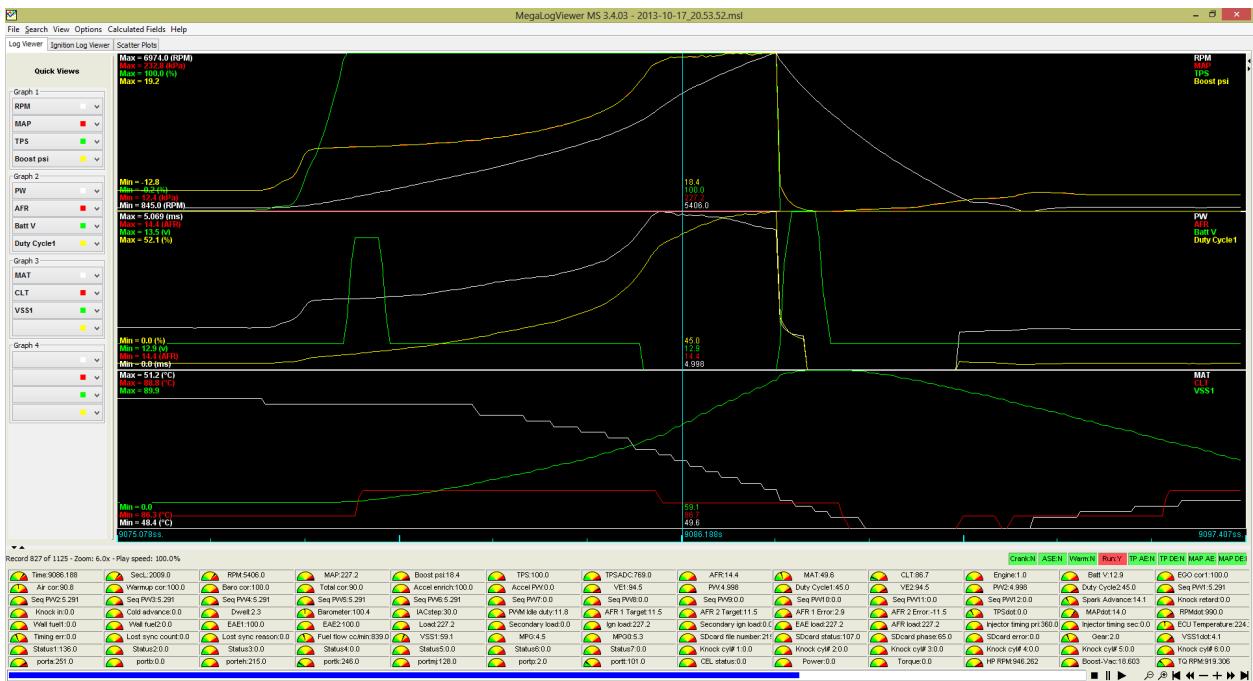
Installation of TunerStudio and MegaLogViewer (for Windows, Mac and Linux)

- **TunerStudio** is the software created by EFI Analytics used to configure all versions of the MS3Pro. The software with basic functionalities is free. For advanced features like custom dashboards, auto tuning and diagnostics you need to purchase the software. It's possible to download directly TunerStudio at: www.tunerstudio.com/index.php/downloads. When a computer is connected to a **MS3Pro** for the first time with an USB cable, a driver may be needed: <http://www.ftdichip.com/Drivers/VCP.htm>

Here is a custom dashboard created by users on MsExtra forum. You can see more dashboards in this thread at: <http://msextra.com/forums/viewtopic.php?f=122&t=36862&start=80> like these from different users:



- **MegaLogViewer** is the software used to view the data logs created by TunerStudio, internal MS3Pro memory or even the data logs created by the Android phone or tablet software. The software is also free but you need to purchase if you want to have access to nice features like Scatter plots. www.tunerstudio.com/index.php/downloads



Software for Android devices

- **Shadow Dash MS** is the Android TunerStudio version. You can download it here : <https://play.google.com/store/apps/details?id=com.efiAnalytics.shadowdash> for 9.99\$
- **MsDroid** display real-time data and it's also possible to edit the tune. The software is completely free! <https://play.google.com/store/apps/details?id=com.msroid>.
If MsDroid shows a connection error message go to <http://www.msextra.com/doc/ms3/files/release/> and download your MS3Pro software version (by default 1.4.0) and extract the ms3pro.ini file to the MsDroid/ini folder on your Android device.
- **RealDash** is a new application available for Android, iPhone and Windows that can display really nice dashes. Still in beta in April 2016.

Software for Apple devices (iPhone, iPad)

- **MobiSquirt** is available for iPhones but with limitations. The Bluetooth connection is not supported and you need the internal WIFI adapter. For more information please visit www.mobisquirt.org
- **RealDash** is a new application that will be available for iPhones with really nice dashes. Still no official releases in April 2016. This requires the internal WIFI module.

Installation of the MS3Pro Plug and Play.

The MS3Pro-PNP will work with 1986.5-1988 Toyota Supra with 7M-GTE engine or 1986.5-1992 7MGE (yellow ECU connector).

E01	No. 10	STA	STJ	NSW or N/C	ISC 1	ISC 2	G ()	G1	G2	NE	IGT	IGF	THW	OX	VSV 2	HT	M-REL	EGR	SPD	FPR	THA	HAC	VC	BATT	IG S/W	
E02	No. 20	No. 30	E1	IGDB	ISC 3	ISC 4	VF	T	VTA	IDL	IGDA	KNK 1	KNK 2		E2	L1	L2	L3	A/C	W	OIL	ECT	FC	KS	+B	+B1

1. Connect the MS3Pro-PNP

- Disconnect the battery
- The factory ECU is located over the glove box. Remove the glove box and plastic cover over the glove box.



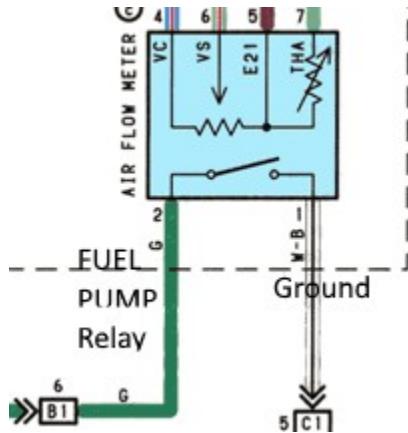
- Install the MAP Sensor vacuum hose/tube to the MS3Pro-PNP unit. Connect the vacuum tube to the port behind the intake manifold near the firewall. Ideally try to plug only the MS3Pro-PNP to this port.
- **7MGTE:** To remove the MAF (also called AFM) sensor (because the MS3Pro-PNP won't use it by default) you have to install another intake temperature sensor because the factory one is integrated in the MAF sensor. We recommend the GM open element IAT sensor available on our website.

First disconnect the MAF connector (close to the air filter) and locate pin 1 and 2 of the connector (Brown wire and Light green wire) and connect the new IAT sensor to these wires.

Polarity is not important (the sensor is a variable resistor).



7MGE: We suggest to remove the MAF. But on the 7MGE the fuel pump relay is controlled by the MAF.



We suggest to control the fuel pump with the MS3Pro. To do that, connect green wire #2 to and spare output like INJ1 on the expansion connector (pin 17).

Another intake temperature sensor is needed when the MAF is removed because the factory one is integrated in the MAF sensor. We recommend the GM open element IAT sensor available on our website. Connect it between pin 5 and 7 (brown and light green wire).

2. Disconnect 12v wires on ISC Valve connector (idle valve).

The idle valve is a 6 pin connector that look like this. Disconnect or cut the two black/red wires on the middle pins. And tape them together to protect them from touching anything.



3. Power Up the MS3Pro-PNP

Put the key on when the ECU is connected and listen if you can hear the fuel pump running for around 3 seconds then turn off. This indicates that the MS3Pro-PNP is functional. Red LED will also turn ON when there is 12v at the MS3Pro-PNP.

4. Connection to the MS3Pro-PNP with TunerStudio and a USB or serial cable.

You have to install the software drivers for the MS3Pro if it does not install automatically. You can download it on the FTDI website at: <http://www.ftdichip.com/Drivers/VCP.htm>. If you are using a USB to serial adapter, please refer to the manufacturer website for the drivers.

1. Plug the USB cable to the MS3Pro-PNP and your computer
2. Open TunerStudio.
3. Press on **File, Project, New Project**
4. Give a project name.
5. Put the key in the ON position to power up the MS3Pro and click on **Detect**. TunerStudio will automatically detect the MS3Pro. If this step fails, put key in the off position and try again.
6. Press **Next**
7. The next window will let you choose between units you will want to use (Fahrenheit or Celsius). Leave the other options to default and press **Next**.
8. The next window is to connect TunerStudio to the MS3Pro. Be sure to select the right port. The baud rate will always be at 115 200.
9. Choose the desired dashboard. Click **Apply**.
10. You are now connected to your MS3Pro-PNP.

For more information please visit: <http://www.ms3pro.com/downloads.html>

5. Calibrate the «TPS» (throttle position sensor)

Turn the key to the ON position, and then connect TunerStudio to the MS3Pro-PNP. Go to **Tools, Calibrate TPS** then click on **Get Current** for the **closed throttle ADC count** while NOT touching the gas pedal. Now with the gas pedal fully pressed, click on **Get Current** for the **Full throttle ADC count**.

6. Calibrate the IAT (intake air temperature) and CLT (coolant temperature)

To calibrate the sensors, you have to connect TunerStudio to the MS3Pro then go to **Tools, Calibrate Thermistor Tables**. Select **Air Temperature Sensor** for Sensor Table and **3 Point Therm Generator** then in **Common Sensor Values**, select your sensor. Press on **Write to Controller**. Do that again for the other sensor.

7. Calibrate the Wideband

If a wideband is used and it's suggested, connect it to open TunerStudio. In TunerStudio, select **Tools**, **Calibrate AFR**. Select your wideband sensor in the list or select **Custom Linear WB** and enter the values manually with the manufacturer specifications.

If the internal wideband controller is used, select **Custom Linear WB** then enter 0v = 10 AFR, 5v= 20 AFR.

8. *** IMPORTANT *** Check the timing and Check It Again!

This step is very crucial for the **7M** engine because the timing signal comes from the CPS (cam position sensor) or distributor and the CPS can move. This step is here to ensure that the timing of the MS3Pro is synchronized with the engine. If you do not perform this step, **YOU CAN DAMAGE OR DESTROY YOUR ENGINE.**

Connect MS3Pro to TunerStudio then go to **Ignition Settings** and in the field **Fixed Advanced**, select **Fixed timing**. Enter the value **10** at the **Timing for Fixed Advance** field.

Start the engine with fixed timing at 10 degrees. Check with a timing light if the timing is right. If not, you need to adjust **Tooth #1 Angle**. Then, rev the engine and ensure that the timing stay at 10 degrees. If the timing drift, you can play with the setting **Spark Hardware Latency**. Something around 120 should be good.

Other info here: http://www.diyautotune.com/tech_articles/base_timing_how_to.htm

What to do if the engine doesn't start

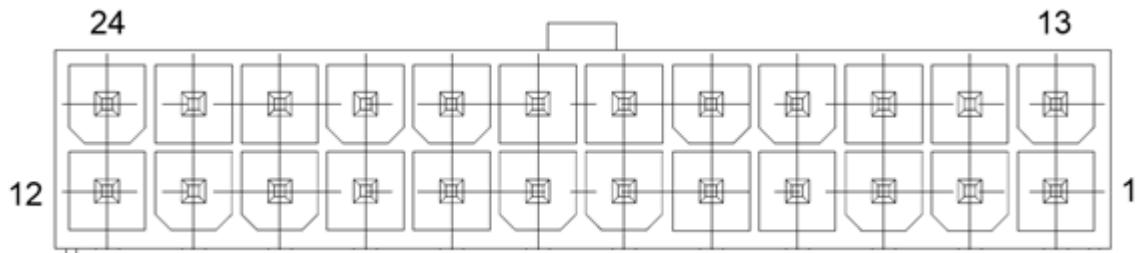
To prevent flooding the engine with fuel, it's possible to press on the gas pedal at the maximum when you turn the key on and during cranking. This activates the flood clear mode and completely stops gas injections. You can also edit the **Required fuel to 0** in **Basic/Load Settings, Engine and Sequential settings**. This will completely disable gas injection at all time. Please note that the 7M-GTE has a cold start injector that is NOT controlled by the MS3Pro. This will inject a small quantity of gas and it's not possible to stop it from the ECU. You have to disconnect the cold start injector to disable it.

1. Ensure that the **Crank** and **Cam** synchronization is good. The Synced indication in TunerStudio will turn green while cranking.
2. Ensure that the spark plugs are firing and you can check the timing while cranking.
3. If the engine seems like it wants to start, you can try to slightly press on the accelerator pedal to see if it helps. If the engine starts this mean that fine-tuning is required for startups.

Connectors

Expansion connector

This connector contains the access to all the inputs and outputs to add more functionality to the MS3Pro-PNP. This is the view of the connector on the ECU. Note that the numbers are also noted on the connector plug. See Inputs and Outputs section for more information about the functionality of each pin.



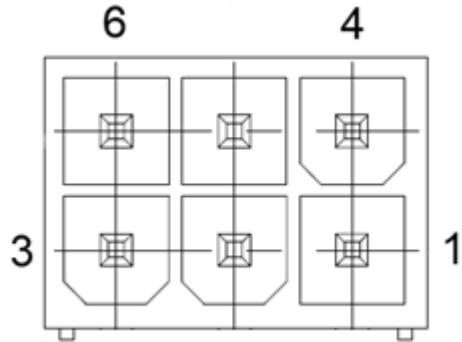
Description of the inputs and outputs pins.

	Name	Description
1	SPARK6	Spark D output for cylinder 6 in sequential mode
2	SPARK2	Spark E output for cylinder 2 in sequential mode
3	SPARK4	Spark F output for cylinder 4 in sequential mode
4	PWM2	PWM 2 Ground Output 3A max
5	PWM3	PWM 3 Ground Output 3A max
6	TachOut	Tach output 1A max
7	CAN H	CAN bus network +
8	CAN L	CAN bus network -
9	SGND	Sensor Ground. Do not connect this to engine ground
10	AIN3	Analog input 3, 0-5v
11	AIN2	Analog input 2, 0-5v
12	Wideband	0-5v wideband input signal if no internal wideband controller is used. Wideband output for an external gage if the internal wideband controller is used.
13	INJD	Injector D output for cylinder 6 in sequential mode
14	INJE	Injector E output for cylinder 2 in sequential mode
15	INJF	Injector F output for cylinder 4 in sequential mode
16	INJI	Injector output «I» 5A.
17	INJJ	Injector output «J» 5A.
18	PGND	Power Ground
19	DI2	Digital input 2 ground activated.
20	DI3	Digital input 3 ground activated.
21	VR DFIN2-	VR#2 negative input
22	VR DFIN2+	VR#2 positive input or direct connection to Digital frequency input 2 depending on the jumper position inside the MS3Pro-PNP.
23	VR DFIN3-	VR#3 negative input
24	VR DFIN3+	VR#3 positive input or direct connection to Digital frequency input 3 depending on the jumper position inside the MS3Pro-PNP.

Wideband connector and controller

The internal wideband Bosh LSU 4.9 controller is optional. To know if the controller is present inside your MS3Pro-PNP, look at the serial number sticker on the back of the MS3Pro-PNP. When the controller is present, the provided wideband sensor will connect directly to this connector and will output a 0-5v signal on the expansion connector pin #12; 0v = 10 gasoline AFR and 5v = 20 gasoline AFR.

If the internal wideband controller is not installed, it's possible to use any external wideband controller that output a 0-5v signal on the expansion connector pin #12.



Pin description

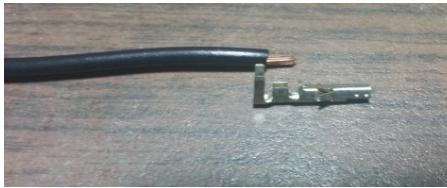
Pin	Function	Perfect Tuning wideband sensor.
1	LSU_W	White
2	LSU_Y	Yellow-Green
3	LSU_GR	Green
4	12v	Brown, 12v 3A fused output
5	LSU_BK	Black
6	LSU_R	Red

Inside the case, there is a small jumper that allows selecting if the MS3Pro-PNP needs to read the signal from the wideband connector pin #12 or the signal on the factory oxygen sensor (O2).



How to crimp a wire for the expansion or wideband connector without the right crimper.

1. Strip the wire like the picture:



2. Insert the wire into the connector:



3. With long-nose pliers fold the small edges.



4. Then fold the long edges:



5. After the connector should look like this:



6. Add a little bit of solder to the connector to ensure it will hold forever. After that you can use this crimp in the expansion connector.



USB Connector

Connector used to interface the MS3Pro-PNP with an USB “B” male type cable. Remember: only one connection at the time to the MS3Pro-PNP (USB, serial, Bluetooth, WiFi). A reboot might be required if you change the connection method while the MS3Pro-PNP is powered.

Serial Connector

Connector used to interface the MS3Pro-PNP with a DB-9 serial cable. Remember: only one connection at the time to the MS3Pro-PNP (USB, serial, Bluetooth, WiFi). A reboot might be required if you change the connection method while the MS3Pro-PNP is powered.

Inputs and outputs

List of inputs and outputs

Here are all the inputs and outputs for the MS3Pro-PNP that you will use in TunerStudio settings.

I/O	MS3Pro-PNP Module pin name	Location in the MS3Pro-PNP
Input	Digital Switched In 1	Factory ECU connector pin "NSW". Ground activated.
Input	Digital Switched In 2	Expansion connector pin #19. Ground activated.
Input	Digital Switched In 3	Expansion connector pin #20. Ground activated.
Input	Digital Switched 12v In	Factory ECU connector pin "A/C". 12v activated.
Input	Analog Input 1	Barometric sensor inside ECU.
Input	Analog Input 2	Expansion connector pin #11. 0-5v input.
Input	Analog Input 3	Expansion connector pin #10. 0-5v input.
Input	Digital Frequency In 1	Factory ECU connector pin "SPD" (Speed sensor)
Input	Digital Frequency In 2	Depending on the internal jumper position, this input is connected to the expansion connector pin #22 or the VR2 output conditioner chip. See the "Extra VR sensors conditioner" section for more information.
Input	Digital Frequency In 3	Depending on the internal jumper position, this input is connected to the expansion connector pin #24 or the VR1 output conditioner chip. See the "Extra VR sensors conditioner" section for more information.
Output	TachOut	Expansion connector pin #6.
Output	PWM 1	Factory ECU connector pin "EGR". The internal jumper "EGR" needs to be present.
Output	PWM 2	Factory ECU connector pin "VSV2" and expansion connector pin #4. The internal jumper "VSV2" needs to be present to connect this output to the VSV2 output.
Output	PWM 3	Expansion connector pin #5
Output	High current output 1	Factory ECU connector pin L1. If the internal jumper named "L1" is installed, this will enable a 12v pull-up resistor on this output.
Output	High current output 2	Factory ECU connector pin L2. If the internal jumper named "L2" is installed, this will enable a 12v pull-up resistor on this output.
Output	High current output 3	Factory ECU connector pin L3. If the internal jumper named "L3" is installed, this will enable a 12v pull-up resistor on this output.
Output	Injector A	Factory ECU connector pin "#10".
Output	Injector B	Factory ECU connector pin "#30".
Output	Injector C	Factory ECU connector pin "#20".
Output	Injector D	Expansion connector pin #13
Output	Injector E	Expansion connector pin #14
Output	Injector F	Expansion connector pin #15
Output	Injector G	Factory ECU connector pin "W" (check engine light)

Output	Injector H	Factory ECU connector pin ECT. If the internal jumper named "ECT" is installed, this will enable a 12v pull-up resistor on this output.
Output	Injector I	Expansion connector pin #16
Output	Injector J	Expansion connector pin #17
Output	IAC1A	Factory ECU connector «ISCV valve»
Output	IAC1B	Factory ECU connector «ISCV valve»
Output	IAC2A	Factory ECU connector «ISCV valve»
Output	IAC2B	Factory ECU connector «ISCV valve»
Other	CANH	Expansion connector pin #7
Other	CANL	Expansion connector pin #8

Injector outputs

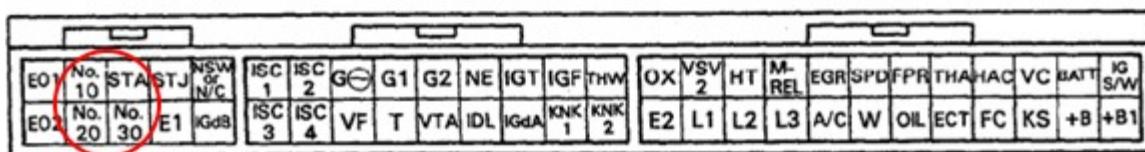
MS3Pro-PNP can only drive high impedance injectors with a maximum of 5 amperes per channel with thermal shutdown protection. If you are running low impedance injectors, you need to use a resistor box (contact Perfect Tuning) or peak and hold driver board. Unused injector outputs may be used as general purpose ground activated outputs EXCEPT injectors output D, E and F.

Semi-Sequential to Full Sequential Injection Conversion

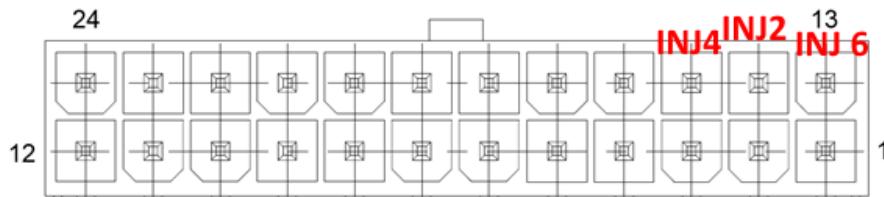
The advantage of this conversion is a smoother idle and fuel economy. This will not affect horsepower.

Injector 1 is the one at the front of the engine near the radiator.

Cut injectors 2, 3 and 4 wire near the injectors and add 3 new wire (16 awg) to the MS3Pro-PNP. Cut wire named **#20** on the stock ECU connector and keep long enough to solder a wire on it.



Expansion connector:



Injector 1 : Do nothing. (Already connected pin named No. 10).

Injector 2 : Add new wire and connect it to the INJ E pin (expansion connector pin 14).

Injector 3 : Add new wire and connect it to the pin named No.20 on the Toyota connector.

Injector 4 : Add new wire and connect it to the INJ F pin (expansion connector pin 15).

Injector 5 : Do nothing. (Already connected to pin named No. 30)

Injector 6 : Reuse wire #20 (from the harness) and extend it to connect it to the INJ D pin (expansion connector pin 13).

When wiring is done, open TunerStudio, click on **Basic/Load Settings, Engine and Sequential Settings**, and verify that **Sequential ON** is set to **Fully Sequential**.

Ignition (spark) outputs

MS3Pro-PNP use 5v logic level to drive an external ignition module or logic level coil packs. Do not connect ignition outputs directly to the negative terminal of an ignition coil. This will damage the MS3Pro. We recommend the 6 channel igniter module (see Accessories) to drive directly coils. Maximum current is 200mA per channel. Unused ignition outputs may be used as general purpose outputs.

Full Sequential Ignition Conversion

Is it possible to get rid of the factory Toyota multiplex igniter and convert to a fully sequential ignition on the 7M-GTE. There is a lot of options like using the 1JZ/2JZ-GTE non vvti coil on plug with a 1JZ/2JZ-GTE igniter, or using 1ZZFE pen coils with internal igniter or GM LQ9 coil on plug with internal igniter.

Remember that the MS3Pro-PNP cannot drive directly coils without an external igniter (like 1JZ/2JZ-GTE coils) but can be connected directly to coils that have integrated igniter like 1ZZFE pen coils or GM LQ9 coils.

Here is the list of the spark outputs and how to connect each output:

Factory ECU connector pin IGT. Connect to the cylinder #1.

Factory ECU connector pin IGdA. Connect to the cylinder #5.

Factory ECU connector pin IGdB. Connect to the cylinder #3.

Expansion connector pin #1 Spark6 . Connect to the cylinder #6.

Expansion connector pin #2 Spark 2. Connect to the cylinder #2.

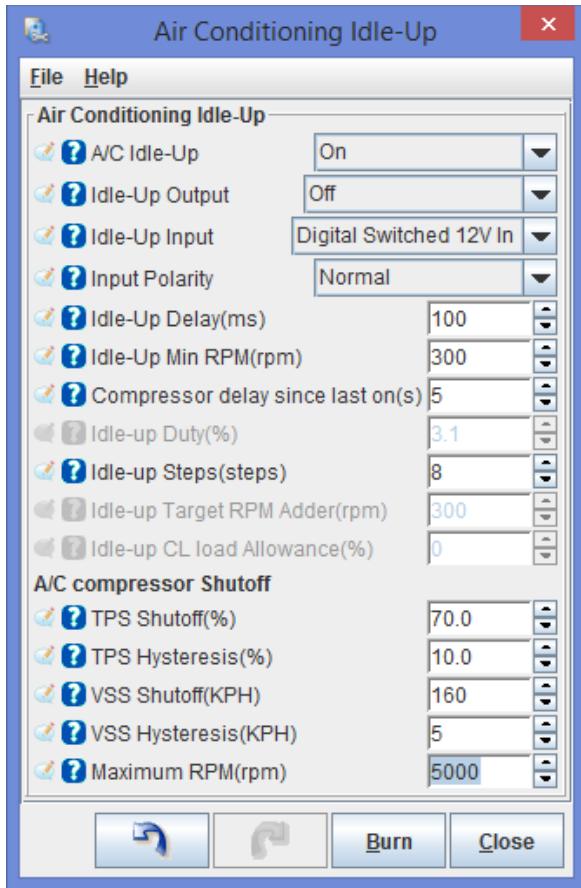
Expansion connector pin #3 Spark 4. Connect to the cylinder #4.

A/C Control

The MS3Pro-PNP is connected to the A/C input on the 7M-GTE and this input is connected to the “Digital Switched 12v In”.

To enable it, go to the “Startup/Idle” menu in TunerStudio and then go to Air Conditioning Idle-up menu.

For the 7M-GTE it should be configured like this:



Knock sensors inputs

The factory knock sensors are connected to the MS3Pro-PNP. To try this option, you need to enable it in **Ignition Settings**, **Knock Sensor Settings**, **Knock Control** and **set Input type to Internal**. This feature should be used for safety and not for tuning. Here is the resonance frequency of each engine (useful in the other window settings):

7M-GTE bore = 83mm and resonance frequency = 6.9 kHz

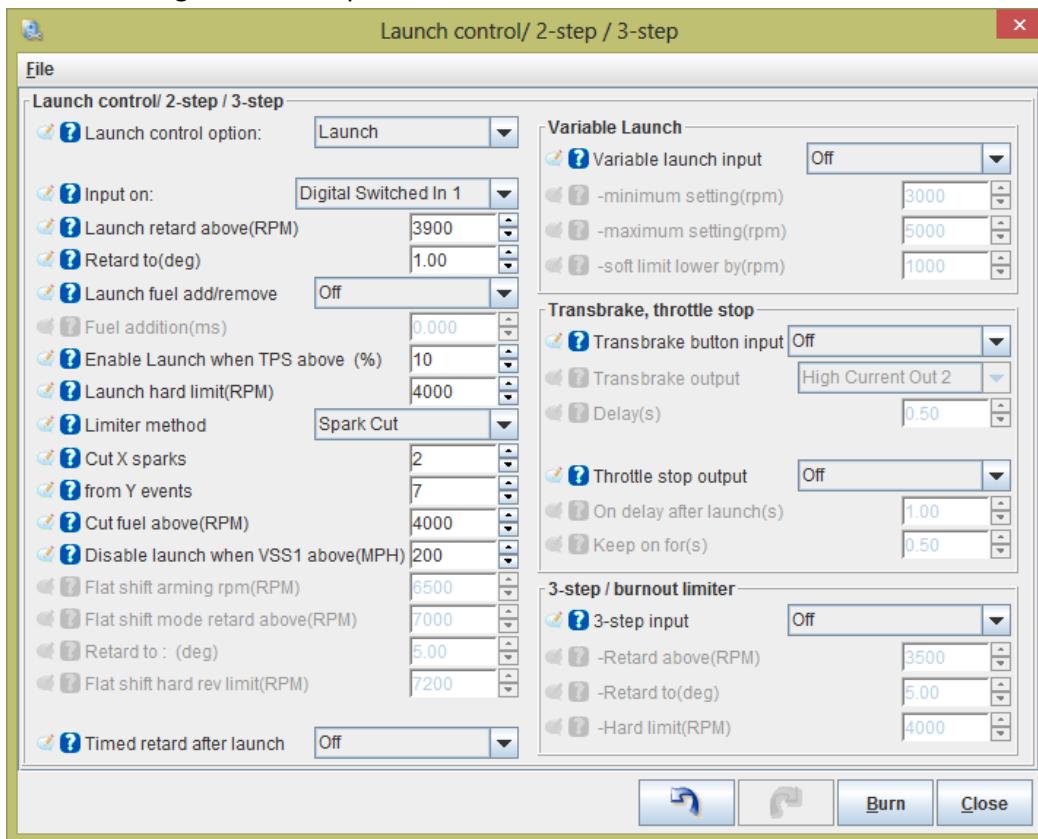
For more information, refer to the MS3Pro user manual.

Launch control / Flat-Shift / 2-step / Antilag

The MS3Pro-PNP uses the factory clutch switch pin **NSW** from the Toyota connector and it's connected to the **Digital Switched In 1** input. This pin needs to be grounded to be active.

If the **NSW** pin cannot be used, it's possible to use any other digital input like the any **Digital Inputs** from the expansion connector. Connect this pin to ground to enable the launch control with a clutch switch or a push button.

Here is a configuration example:



For more information on this option, refer to the MS3Pro user manual.

LED indicators

- Red LED: This red led indicate that there is 12v power on the MS3Pro.
- Green LED: Connected to the Fuel pump output of the MS3pro and will light up when the fuel pump is running.

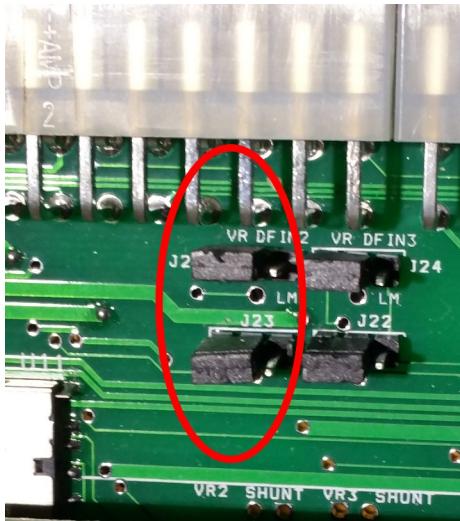
Extra VR sensors conditioner circuits

The MS3Pro-PNP also includes two extra variable reluctance conditioner circuits. The 2 circuits are useful to monitor 2 wire ABS sensors, or any 2 wire shaft speed sensors. They are connected to "Digital Frequency Input 2" and Digital Input Frequency Input 3".

The conditioner circuits are the same as the crank and cam conditioners.

There are four (4) jumpers (2 for each input) inside the MS3Pro-PNP that are used to route the signals to the VR conditioner circuits or directly connected to the Digital Frequency Input.

If both jumpers are on the left in the red circle (see image below), at the VR position, it means that the pin on the expansion connector #22 will be connected to the VR circuit. If the jumper is on the right, this means the expansion connector pin #22 will be connected directly to the “Digital Frequency Input 2”. The expansion connector pin #21 named “VR DFIN2 –“ is normally connected to the second wire of the VR sensor.



And this is the same thing for the expansion connector pin #24 with the “Digital Frequency Input 3. The expansion connector pin #23 named “VR DFIN3 –“ is normally connected to the second wire of the VR sensor.



Internal Bluetooth module

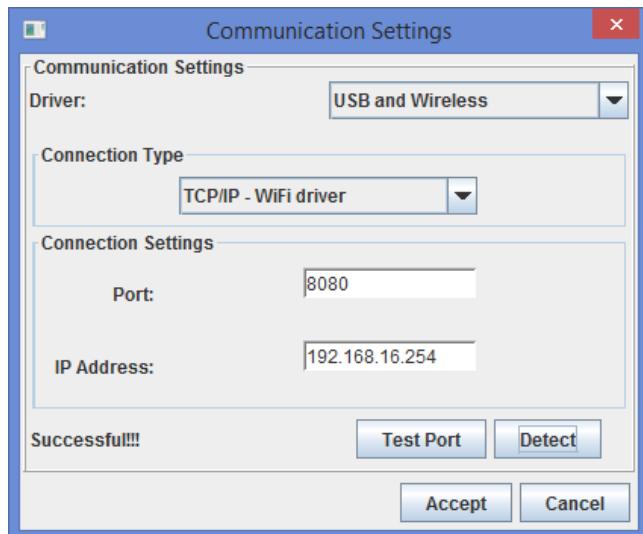
The MS3Pro-PNP has an internal Bluetooth module inside for wireless communication.

The Bluetooth module is powered by the red dip switch on the back. To enable Bluetooth module, slide the switch #1 to the ON position. To use the Bluetooth module, you need to pair with the module called **PERFECT_TUNING_MS3PNP** and enter the password 1234.

Note that in every situation, **only one** connection to the MS3Pro-PNP can be made at the same time (one device, with serial, USB, Bluetooth, WiFi).

Internal WIFI module (optional)

The MS3Pro-PNP can have an internal WIFI module for wireless communications. This module is optional. To see if the MS3Pro-PNP is equipped with the WIFI module, look at the serial number tag on the back. To power up the WIFI module, slide the red switch #2 to the ON position. A new WIFI hotspot named **PerfectTuningMS3ProPNP** will appear and the password is : "12345678" without the quotes. The IP address is 192.168.11.254 and the port is 8080.



Internal Data logging on SD Card

An 8GB SD card is included with each MS3Pro-PNP. It is possible record many days of logs in this internal memory. All logs are time stamped so it's easy to find the right data log of a specific moment.

The SD card is removable for faster downloading of the logs. It's also possible to browse the SD card with TunerStudio but it takes more time to download all the logs.

Internal MAP and Barometric sensor

There is a 4 bar (44 psi of boost maximum) map sensor inside the MS3Pro-PNP that is connected on the bulkhead fitting on the side of the factory ECU connector and it use the MPX6400 configuration. The barometric sensor is a 1.15 bar sensor and use the MPX4115 configuration.

Internal Bosch LSU 4.9 wideband controller (optional)

The MS3Pro-PNP can include an internal Bosch 4.9 wideband controller to be used with the Bosch wideband sensors. To see if the wideband is included in your MS3Pro-PNP, refer to the serial number sticker on the back of the ECU.

The provided sensor with 6-foot cable is plug and play in the 6 pin wideband connector on the side of the ECU.

If the internal wideband controller is installed, the expansion connector pin #12 will output a 0-5v signal (0v = 10.0 AFR, 5v = 20.0 AFR). It's possible to connect an external gage to this signal.

The WB jumper inside the ECU needs to be in the WB position.



Internal Real Time Clock

The RTC module (real time clock) is used to assign a timestamp to all the logs on the SD card. The module uses a CR1220 that is included and installed in the MS3Pro-PNP. This battery is designed to last many years.

Traction control

The MS3Pro-PNP includes many types of traction control algorithm. More information is available in the MS3Pro user manual.

If your car is equipped with ABS system, it's possible to tap the front and rear wheel speed sensor signal to the MS3Pro-PNP. The front wheel ABS sensors on a MKIII Supra are VR sensors. The signal needs to be connected to the Extra VR sensors circuits on the expansion connector and the signal from the rear wheel comes from the sensor inside the transmission which is a hall sensor (can be connected directly to a digital input).

Boost Control

Connect the boost control valve to any of the PWM outputs or injector "I" or "J" outputs.

The MS3-Pro has multiple boost control strategies. Refer to the MS3Pro user manual for more information.

Refer to www.perfecttuning.net for an electric boost solenoid.

Base map

All MS3Pro-PNP comes with a default base map that is able to start and run your engine but tuning **will be required**.

Electronic controlled automatic transmission (ECT).

The MS3Pro-PNP do not control the automatic transmission, but can replicate the signals sent from the factory 7M-GTE ECU to the ECT ECU. This way, it's possible to control an automatic transmission with the MS3Pro-PNP and the ECT ECU.

The MS3Pro-PNP can send signals to the factory automatic ECT ECU that is available with the 7M-GTE engine.

How to Change the Engine Configuration (7MGE or 7M-GTE)

***** IMPORTANT: NEVER CONNECT A MS3Pro-PNP CONFIGURED TO RUN WITH 7MGE ENGINE ON A 7M-GTE ENGINE WITHOUT RECONFIGURE IT. YOU NEED TO OPEN THE MS3Pro-PNP FIRST AND CHANGE THE JUMPERS POSITION. *****

1. Disconnect the MS3Pro-PNP from everything.
2. Open MS3Pro-PNP enclosure. There are two screws at the bottom.
3. Change the list below of jumpers to the right (near the ECU connector) to run 7MGE engine and to the LEFT (far from the ECU connector) for 7M-GTE.
 - a. FP
 - b. KNK1
 - c. IGdA
 - d. G2
 - e. IGdB

After that, only thing that left to do is to reload a good configuration with TunerStudio into the MS3Pro and repeat steps 5 to 8 in this manual to check your timing.

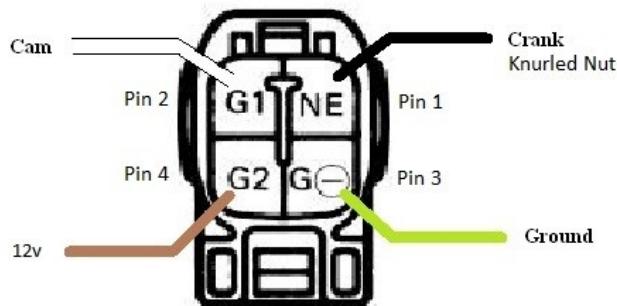
Converting to HALL CPS

Converting this MS3Pro-PNP to use Hall sensors for the Cam Position Sensor is possible, but it requires permanent PCB modifications that will prevent the use of the factory CPS.

Hall Cam Position Sensor wiring according to Driftmotion

Driftmotion 7M Digital CPS Connector Pinout

These colors are on the male CPS connector side



Steps to convert the MS3Pro-PNP to use the Driftmotion Hall CPS:

Change cam signal from G2 to G1

Driftmotion uses G1 for the cam signal, but the MS3Pro-PNP uses G2 by default.

Open the MS3Pro-PNP ECU and move the CAM jumper inside the ECU to the G1 position (as shown in the green rectangle).



2. Remove the MS3Pro IC module

The MS3Pro IC module (blue or black board) must be removed.

Before touching any electronic components, ground yourself to avoid static discharge. Gently and evenly pull on each corner until the board pops out.

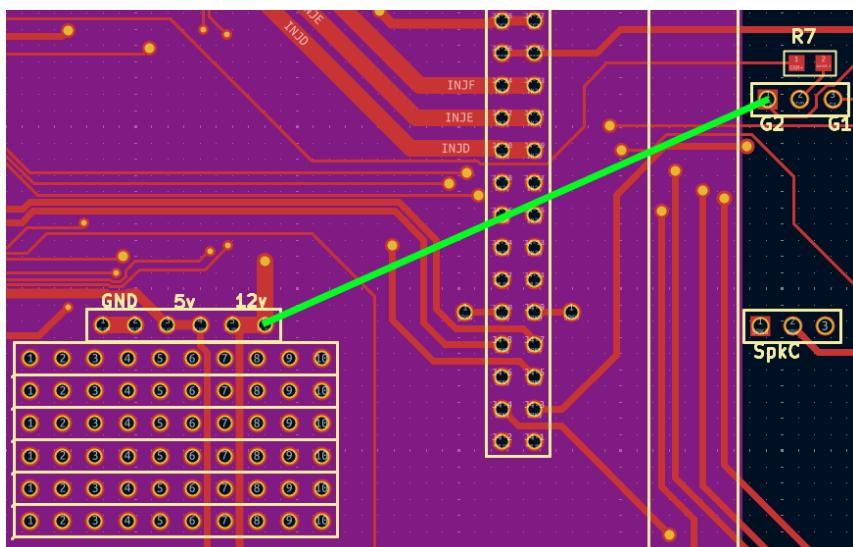
On the back of the blue board, cut the **CAM-** and **CRANK-** pins using small flush cutters so they no longer make contact with the green PCB.

The pins are labeled on the front of the board, so count carefully before cutting.

3. Provide 12V power to the Hall sensors

Hall sensors require 12V. There are two options:

- If you have soldering skills, install a jumper inside the MS3Pro-PNP between the 12V and G2 pins.
- Alternatively, make this modification directly in the wiring harness.



4. Ground connection

On the MS3Pro-PNP ECU, G- is already grounded. No modification is required for this pin.

5. Reinstall the MS3Pro IC board

Carefully align all pins, double-check the alignment, and re-install the enclosure.

7. Update settings in TunerStudio

Since the cam signal was changed from G2 to G1, you must add 360° to the **Tooth #1 angle** in *Ignition Settings* → *Ignition Options*.

The value should change from around 7° to about 367°.

Then, connect a timing light, set **Fixed Advance** to *Fixed Timing* at 10°, and verify the timing. Adjust either the CPS position or the Tooth #1 angle until the timing reads exactly 10°, as described in the initial steps of this manual.

12 Month Limited Warranty

Perfect Tuning warrants to the consumer that all products will be free from defects in material and workmanship for a period of twelve (12) months from date of the original purchase. Products that fail within this 12-month warranty period will be repaired or replaced at Perfect Tuning's option, when determined by Perfect Tuning that the product failed due to defects in material or workmanship. This warranty is limited to the repair or replacement of the Perfect Tuning part. In no event shall this warranty exceed the original purchase price of the Perfect Tuning part nor shall Perfect Tuning be responsible for special, incidental or consequential damages or cost incurred due to the failure of this product. Warranty claims to Perfect Tuning must be transportation prepaid and accompanied with dated proof of purchase. This warranty applies only to the original purchaser of product and is non-transferable. All implied warranties shall be limited in duration to the said 12-month warranty period. Improper use or installation, accident, abuse, unauthorized repairs or alterations voids this warranty. Perfect Tuning disclaims any liability for consequential damages due to breach of any written or implied warranty on all products manufactured by Perfect Tuning. Warranty returns will only be accepted by Perfect Tuning when accompanied by a valid Return Merchandise Authorization (RMA) number. Product must be received by Perfect Tuning within 30 days of the date the RMA is issued. Oxygen sensors are considered wear items and are not covered under warranty. Please note that before Perfect Tuning can issue an RMA for any electronic product, it is first necessary for the installer or end user to contact the us at support@perfecttuning.net to discuss the problem. Under no circumstances should a system be returned or a RMA requested before the above process transpires. Perfect Tuning will not be responsible for electronic products that are installed incorrectly, installed in a non-approved application, misused, or tampered with. Any Perfect Tuning electronics product can be returned for repair if it is out of the warranty period. There is a minimum charge of \$50.00 for inspection and diagnosis of Perfect Tuning electronic parts. Parts used in the repair of Perfect Tuning electronic components will be extra. Perfect Tuning will provide an estimate of repairs and receive written or electronic authorization before repairs are made to the product

MS3Pro-PNP dimensions

185mm X 159mm X 38mm (7 ¼ x 6 ¼ x 1 ½ inches)

Contact

If you have any issues, or questions, you can take a look on www.msextra.com or contact me at support@perfecttuning.net. I can give remote desktop and phone support. Just contact me by email first.

Accessories:

Please visit <http://perfecttuning.net> for more information.

- Wideband Bosch LSU 4.9.
- Fast response GM intake air temperature sensor (open element IAT)
- GM intake air temperature sensor or coolant temperature sensor (close element).
- Exhaust gas temperature sensor. Up to 1250 Celsius with interface board.
- USB-Serial cable for a computer or an Android device.
- Resistor box for low impedance injectors
- 6 channel igniter box to direct drive coil packs.
- Boost control solenoid valve.

Visit <http://perfecttuning.net> for more information or contact us at support@perfecttuning.net.