

The logo for 14POINT7, featuring the text "14POINT7" in a bold, white, sans-serif font inside a black rectangular box with a serrated top and bottom edge.

UAFC User Manual

Caution !

UAFC is only compatible with 0-5[v] MAP/MAF sensors which output an analog voltage proportional to Manifold pressure or intake airflow. Frequency based sensors such as Karman Vortex airflow sensors are not supported.

During installation do not insert the screw terminal block into UAFC, once your wiring is complete then insert the screw terminal block into UAFC. Automotive upholstery is a fantastic static electricity generator, inserting the screw terminal block to UAFC only after wiring is complete will greatly reduce the chance of damage to the unit by static electricity.

On some computers the device driver will only be valid for the USB port that was used for initial driver installation. Plugging UAFC into a different USB port will prompt your Operating System to ask for a device driver again, you may install the driver again which will make the current USB port valid for UAFC, it will not invalidate the driver install for any prior USB ports.

Generally, do not attach USB connection between UAFC and your PC while your vehicle is in motion. Attach USB before your vehicle is in motion. When USB is attached, UAFC will momentarily stall, waiting for your PC to recognize UAFC, usually this is less than 1 second if the driver is properly installed for the USB port. However, if the driver is not installed, as in the previous paragraph, UAFC will stall and wait for upto 15 seconds for your PC to recognize UAFC. While UAFC is waiting for the PC to recognize it, the output will be static and will not change.

The maximum voltage of the MAP/MAF output is 5[v]. If for instance the MAP/MAF input voltage is 4[v] and the fuel correction scaling is 200%, the MAP/MAF voltage will not be 8[v], it will be 5[v].

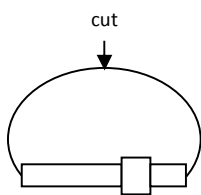
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1. UAFC Hardware Installation

1.1 Fuses

A fuse holder and 2x 250ma fuses are provided. You only need a single 250ma fuse, the extra is for replacement if required.

The fuse holder come with a single continuous wire connecting both ends of the fuse holder, cut the wire at the midpoint.

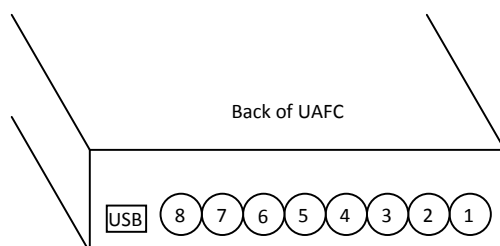


The fuse holders open easily by twisting and pulling, observe that locking mechanism on the fuse holder is open before attempting to pull.

Insert a 250mA fuse into the fuse holder.

“System Power” Connects to switched 12[v] through the 250ma fuse + fuse holder, see section 1.2.

1.2 UAFC Wiring



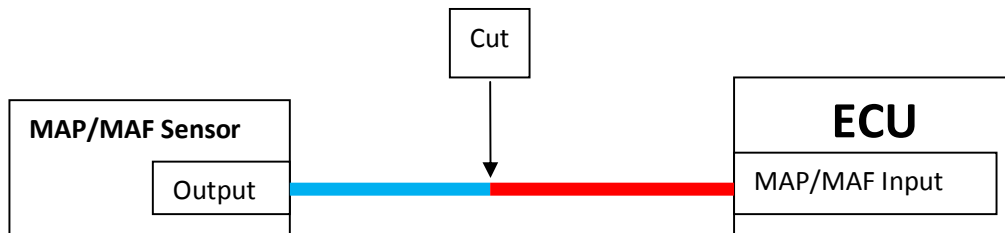
Connection Table:

UAFC Pin #	Name	Connects to	Note
1	System Power	Switched 12v through 250ma Fuse	Use Fuse, see section 1.1
2	System Ground	Ground	
3	MAP/MAF In	Output from MAP/MAF sensor	See next section for details
4	RPM In	Tachometer, low side of ignition coil	
5	MAP/MAF Out	ECU	See next section for details
6	Analog Input 1	0-5[v] sensor	Logs voltage of device connected
7	Analog Input 2	0-5[v] sensor	Logs voltage of device connected
8	External Trigger		>5v = Fuel Bank 2 selected, <5v = previous Fuel Bank restored

During installation do not insert the screw terminal block into UAFC, once your wiring is complete then insert the screw terminal block into UAFC. Automotive upholstery is a fantastic static electricity generator, inserting the screw terminal block to UAFC only after wiring is complete will greatly reduce the chance of damage to the unit by static electricity.

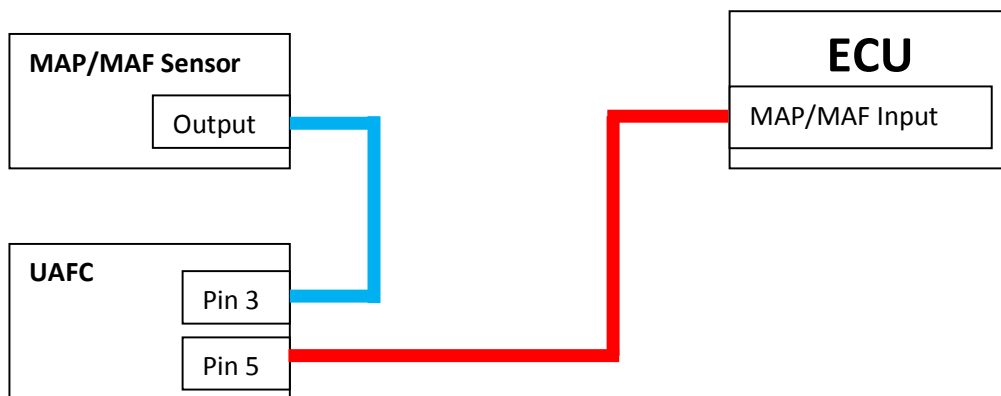
1.3 MAP/MAF-UAFC-ECU Connection

Factory Setup:



*Wire is shown in different colors for illustration purposes only.

UAFC Setup:



2. Install and Testing

From the factory, UAFC is programmed so that; MAP/MAF voltage output to ECU = voltage from MAP/MAF sensor, all Fuel Bank cells are 100%. This allows you to install UAFC and quickly confirm if UAFC is functioning properly before you begin tuning. The factory settings will allow your engine to function exactly the same as prior to installation, if your engine is not functioning the same, there might be a problem with your installation or the UAFC unit.

If your UAFC unit has previously been used, there is no guarantee that all Fuel Bank Cells are set to 100% and you will need to read section 5 to program UAFC with the safe default values to test your installation.

Initial installation and testing procedure:

- If your UAFC unit has previously been used; refer to section 5 to program UAFC with the safe default values
- Connect UAFC pins 1 to 5 according to section 1.2
- Start your engine and ensure your engine idle is same as prior to installation
- If engine idle is normal, put load on your engine to ensure your engine performance is same as prior to installation

3. Software Installation

The software can be found on the included installation CD. The filename is "UAFC_x_xx.exe". The software is compatible with windows XP/Vista/7 only.

For the most upto date software and documentation please visit <http://www.14point7.com/Support.php>

Double click "UAFC_x_xx.exe" to start the installation process.

3.1 USB Driver Installation and Usage

USB Power:

UAFC can be powered through the USB port or through UAFC pins 1 and 2, see section 1.2. Being able to be powered through the USB port is only intended to allow users without a laptop to be able to tune and download logs from UAFC. While operating an engine UAFC must be powered through UAFC pins 1 and 2, see section 1.2.

On some computers the USB port will not be able to provide enough current and or voltage to power UAFC, in that situation UAFC must be powered through UAFC pins 1 and 2, see section 1.2.

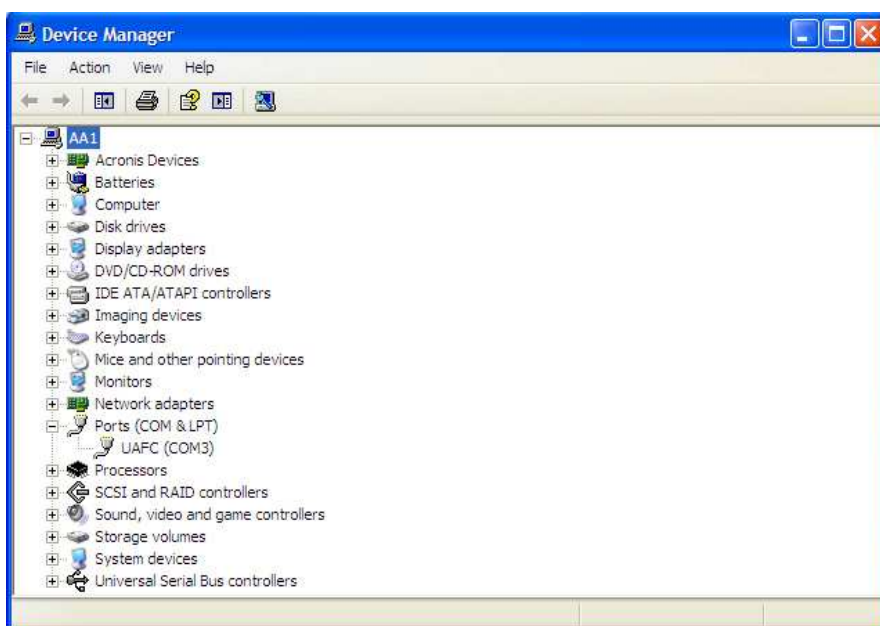
USB Driver Installation:

Connect UAFC to your PC's USB port using the supplied USB cable. Windows will notify you that it has detected a new device and ask you for the location of the driver. The driver location is in the "\Driver" directory of the software installation directory. If you used the default installation directory, the driver is located in "C:\Program Files\14Point7\UAFC\Driver".

If you are using the supplied CD, The driver is also located in the "\UAFC\Driver" directory of the CD.

ComPort#:

Once the driver is correctly installed and UAFC is connected to the USB port of your PC, Your Operating System will assign a Communications Port Number (ComPort#) to the device. You will need to know the ComPort# the Operating System has assigned to UAFC when using the UAFC Edit software. In Windows XP you can check in "Device Manager" to find the correct ComPort#.



In the above example, the correct ComPort# is "COM3".

On some computers the device driver will only be valid for the USB port that was used for initial driver installation. Plugging UAFUC into a different USB port will prompt your Operating System to ask for a device driver again, you may install the driver again which will make the current USB port valid for UAFUC, it will not invalidate the driver install for any prior USB ports.

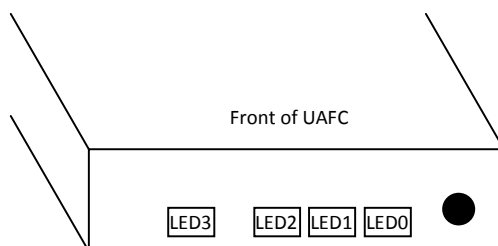
USB Usage:

On some computers the device driver will only be valid for the USB port that was used for initial driver installation. Plugging UAFUC into a different USB port will prompt your Operating System to ask for a device driver again, you may install the driver again which will make the current USB port valid for UAFUC, it will not invalidate the driver install for any prior USB ports.

Generally, do not attach USB connection between UAFUC and your PC while your vehicle is in motion. Attach USB before your vehicle is in motion. When USB is attached, UAFUC will momentarily stall, waiting for your PC to recognize UAFUC, usually this is less than 1 second if the driver is properly installed for the USB port. However, if the driver is not installed, as in the previous paragraph, UAFUC will stall and wait for upto 15 seconds for your PC to recognize UAFUC. While UAFUC is waiting for the PC to recognize it, the output will be static and will not change.

While UAFUC is waiting for your PC to recognize it, LED 0-2 will be light. Once your PC has recognized UAFUC or UAFUC has waited 15 seconds without recognition, UAFUC will resume normal operations and LED 0-2 will reflect your memory bank selection.

4. UAFC Hardware Usage



Memory Bank Selection:

Quickly pressing the button will select one of the 3 memory banks, each memory bank contains a 256 point Fuel Correction Table. When memory bank 0 is selected, LED0 will be light. When memory bank 1 is selected, LED1 will be light. When memory bank 2 is selected, LED2 will be light. You can change memory bank selection, while your vehicle is in motion.

Datalogging to Internal Memory:

Holding the button for 2 or more seconds will trigger datalogging to internal memory, while UAFC is datalogging to internal memory LED3 will be light. There is enough memory onboard UAFC to log roughly 27 minutes of data @ 10 samples per second, once the memory is full, datalogging to internal memory will stop and LED3 will turn off. While UAFC is datalogging to internal memory, hold the button again for 2 or more seconds and datalogging to internal memory will stop, LED 3 will turn off.

Each time datalogging to internal memory is triggered, the current datalogging session will overwrite the previous one.

External Trigger:

Pin 8 is the External Trigger pin, see section 1.2, when the External Trigger pin is greater than 5[v] UAFC will select memory bank 2, when voltage is less than 5[v] UAFC will restore previous bank selection. The maximum voltage that can be applied to the External Trigger pin is 20[v].

This feature is intended to support nitrous applications, the External Trigger pin is connected to a 12[v] solenoid switch, when the solenoid is powered UAFC will select memory bank 2, once the solenoid is switched off UAFC will restore the previous bank selection. For nitrous applications, memory bank 0 and 1 are meant for normal vehicle operations and memory bank 2 should be reserved only for when the nitrous is active.

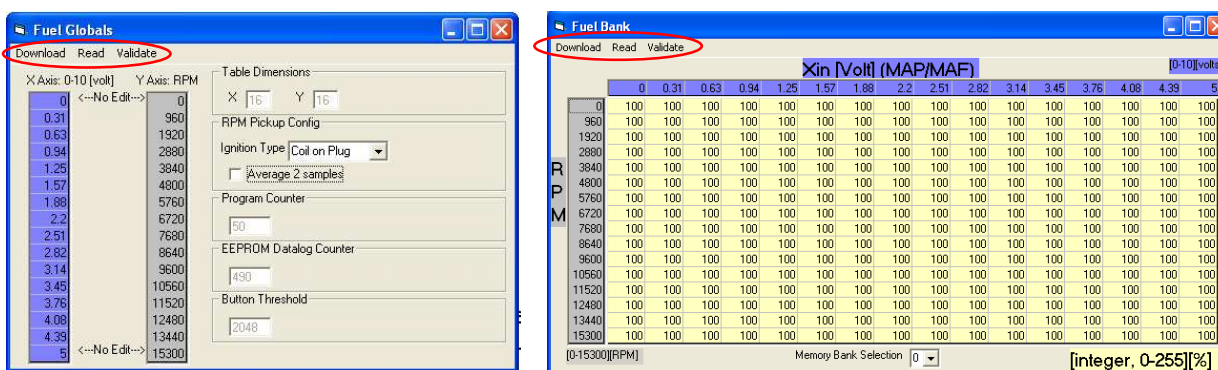
4. UAFC Edit

4.1 Establishing Communications



Select the correct ComPort, see section 3.1, and hit the “Get Device info”, UAFC Edit will query UAFC and fetch hardware and firmware IDs. It is a good idea to hit the “Get device info” to test the communications link before attempting to download settings to UAFC.

4.2 Download, Read, Validate



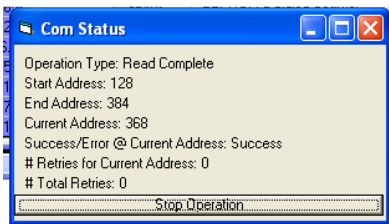
Fuel Globals and Fuel Bank forms have; Download, Read, and Validate, menu items.

Download: This will download the current settings on screen to UAFC. After download, UAFC Edit will automatically validate the data by reading the data back from UAFC and comparing it with what is on the screen.

Read: This will read the settings stored on UAFC to the screen, this will overwrite current values displayed on screen.

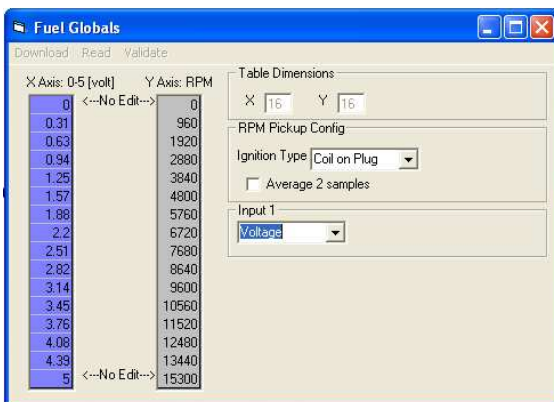
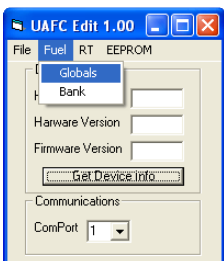
Validate: This will compare the settings stored on UAFC with the contents on screen. This will not overwrite any values currently displayed on screen.

4.3 Com Status



A Com Status screen will appear during; Download, Read, Validate, and EEPROM download, operations. This screen is for information only, you can close the Com Status screen at anytime you please.

4.4 Fuel -> Globals



Settings in the Fuel Globals screen are applied to all 3 memory banks. After downloading new Global settings to UAFC you must cycle power to UAFC for the settings to take place, because UAFC can be powered from the USB port, to ensure a proper power cycle; disconnect both USB and 12[v] supply.

MAP/MAF Voltage Axis (X Axis):

This holds your X axis entries, the valid range is any decimal 0-5 inclusive. The First and the last entries are non- editable

RPM Axis (Y Axis):

This holds your Y Axis entries, the valid range is any integer 0-15300 inclusive. The First and the last entries are non-editable. Entries should be a multiple of 60. If your entry is not a multiple of 60, during download to UAFC the data will be rounded to the nearest multiple of 60.

RPM Pickup Config:

This allows you to configure UAFC for your specific ignition type. The "Average 2 samples" is meant for cylinders which fire at 2 different angles.

Input 1:

If you have a Wideband Lambda controller connected to Analog Input 1, UAFC Pin 6, you can select "AFR" to display Air to Fuel Ratio in the Real time display. The connected Lambda controller must output; 0[v] @ 10 AFR linear to 5[v] @ 20 AFR, to be compatible with UAFC. 14Point7's SLC lambda controllers output a compatible Voltage vs. AFR curve by default, many other Lambda controllers can be user adjusted to output a compatible Voltage vs. AFR curve.

4.5 Fuel -> Bank

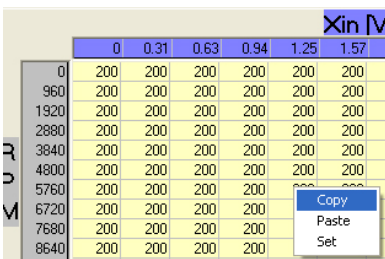


RPM	Xin [Vol] (MAP/MAF)															
	0	0.31	0.63	0.94	1.25	1.57	1.88	2.2	2.51	2.82	3.14	3.45	3.76	4.08	4.39	5
0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
960	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1920	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2880	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
3840	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
4800	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
5760	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
6720	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
7680	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
8640	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
9600	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10560	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
11520	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
12480	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
13440	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
14400	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
15300	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

This screen allows you to edit the 256 point Fuel Correction Table, yellow area. The blue area is the MAP/MAF Axis (X Axis), you can not directly edit it in this screen, it must be edited in the Globals screen. The grey area is the RPM Axis (Y Axis), you can not directly edit it in this screen, it must be edited in the Globals screen.

A valid entry into the Fuel Correction Table is any integer between 0 to 255, inclusive. These values represent a % scaling of the MAP/MAF voltage. A “25” would mean that the ECU will see 25% of the voltage from MAP/MAF sensor, or a 75% reduction of the MAP/MAF voltage. “100” would mean no scaling. “150” would mean that the ECU will see 150% of the MAP/MAF voltage, or 1.5 times the MAP/MAF voltage.

The maximum voltage of the MAP/MAF output to your ECU is 5[v]. If for instance the MAP/MAF sensor voltage is 4[v] and the fuel correction scaling is 200%, the output voltage to your ECU will not be 8[v], it will be 5[v].



Right clicking with your mouse over the yellow area will bring up the; copy, set, and paste menu, for easy data editing.

The screenshot shows the 'Fuel Bank' software interface. At the top, there are buttons for 'Download', 'Read', and 'Validate'. Below these is a title bar 'Fuel Bank' and a window control bar. The main area is a table with the following structure:

		XIn [Volt] (MAP/MAF)															[0-10][volts]	
		0	0.31	0.63	0.94	1.25	1.57	1.88	2.2	2.51	2.82	3.14	3.45	3.76	4.08	4.39	5	
R P M	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	960	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	1320	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	2880	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	3840	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	4800	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	5760	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	6720	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	7680	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	8640	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	9600	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	10560	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	11520	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	12480	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
	13440	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
15300	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100		

At the bottom of the window, there is a 'Memory Bank Selection' dropdown menu with the value '0' selected, and a label '[integer, 0-255][%]'.

Before you download a new Fuel Correction Table to the unit make sure the Memory Bank Selection is correct. UAFC has room for 3 sets of Fuel Correction Tables; Bank0, Bank1, Bank2.

You do not have to cycle power to UAFC for newly downloaded Fuel Correction Tables to take effect, they take effect immediately.

4.6 Real Time Display and Datalogging



Parameter	Value
MAP/MAF In [v]	3.059
RPM	0
Scale [%]	100
Bank	0
MAP/MAF Out [v]	3.059
Col Index LB	4
Col Index UB	5
Row Index	0
Row Index	1
Input 1 [v]	3.059
Input 2 [v]	0.804

RTD ... 0 TO 0 Rows Cap

MAP/MAF In [v]: MAP/MAF voltage from MAP/MAF sensor.

RPM: RPM.

Scale [%]: Amount of MAP/MAF voltage scaling from Fuel Correction Table.

Bank: Which memory bank is currently selected; 0,1,2.

MAP/MAF Out [V]: Scaled MAP/MAF voltage to ECU.

Col Index LB: The lower Bound column Index of the Fuel Correction Table Cell.

Col Index UB: The upper Bound column Index of the Fuel Correction Table Cell.

Row Index LB: The lower Bound row Index of the Fuel Correction Table Cell.

Row Index UB: The upper Bound row Index of the Fuel Correction Table Cell.

Input 1 [v]: Analog input 1.

Input2 [v]: Analog input 2.

Capture Data:

This will capture the data displayed on screen to memory, only data that has been “captured” can be saved to disk.

Save Data:

This will save the data captured in memory to disk in “CSV” format. This data can be easily imported into Microsoft Excel, the data field separator is a comma “,”.

“TO”, bottom middle, shows the number of communication timeouts.

“Rows Cap”, bottom right, shows the number of data rows captured to memory which can be saved to disk.

The image shows two overlapping software windows. The 'Fuel Bank' window on the left displays a data table with the following structure:

		Xin [Volt] (MAP/MAF) [0-10][volts]															
		0	0.31	0.63	0.94	1.25	1.57	1.88	2.2	2.51	2.82	3.14	3.45	3.76	4.08	4.39	5
R P M	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	960	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	1920	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	2880	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	3840	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	4800	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	5760	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	6720	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	7680	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	8640	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	9600	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	10560	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	11520	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	12480	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	13440	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	15300	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

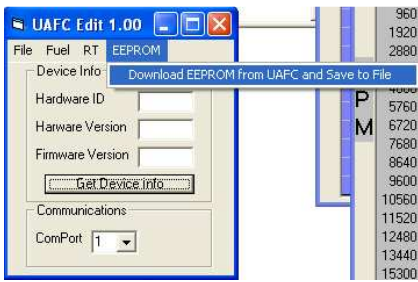
The 'Real-Time' window on the right displays the following parameters:

MAP/MAF In [v]	0.961
RPM	0
Scale [%]	100
Bank	2
MAP/MAF Out [v]	0.961
Col Index LB	3
Col Index UB	4
Row Index LB	0
Row Index UB	1
Input 1 [v]	0.961
Input 2 [v]	0.961

At the bottom of the Real-Time window, there are fields for 'RTD ---' (0 TO), '0 Rows Cap', and a 'Memory Bank Selection' dropdown set to '0'. The status bar at the bottom of the Fuel Bank window shows '[integer, 0-255][%]'.

If the Fuel Bank form is open while the Real Time Display is active, the current Fuel Correction Cell being used will be highlighted in blue.

4.7 Downloading Datalogs from UAFC Internal Memory

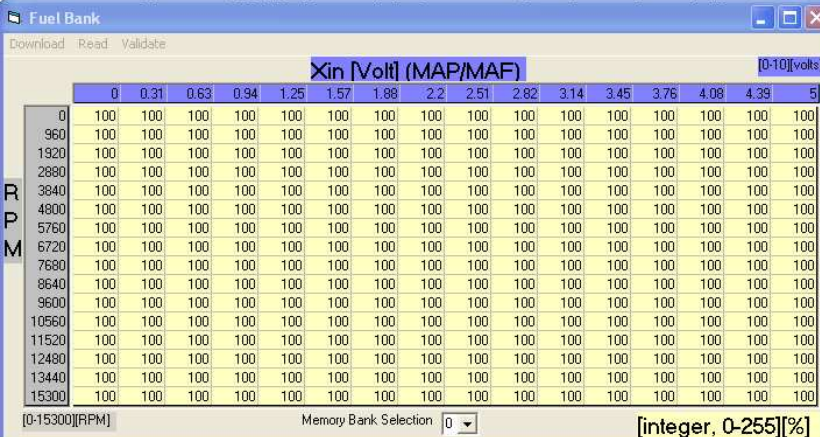


UAFC has enough non-volatile EEPROM memory for saving up to 27 minutes of datalogging. By accessing the “EEPROM” menu item you can download datalogs stored in UAFC EEPROM to disk in “CSV” format. This data can be easily imported into Microsoft Excel, the data field separator is a comma “,”.

5. Programming UAFC with Factory settings

If your UAFC unit has previously been used, you should Program UAFC with safe factory settings before you test your installation, see section 2.

Every time UAFC Edit is launched, all forms are by default filled with Factory settings.



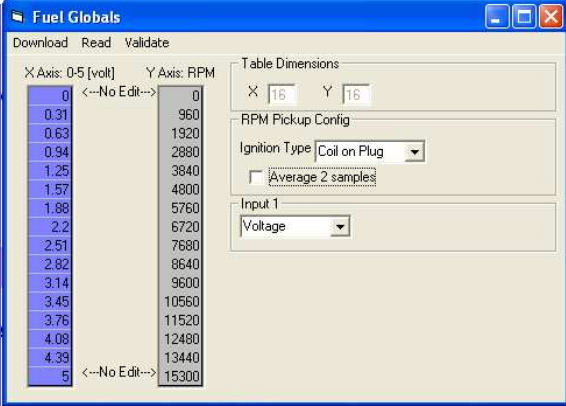
Fuel Bank

Download Read Validate

Xin [Volt] (MAP/MAF) [0-10][volts]

	0	0.31	0.63	0.94	1.25	1.57	1.88	2.2	2.51	2.82	3.14	3.45	3.76	4.08	4.39	5
0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
960	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1920	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2880	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
3840	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
4800	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
5760	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
6720	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
7680	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
8640	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
9600	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
10560	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
11520	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
12480	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
13440	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
15300	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

[0-15300][RPM] Memory Bank Selection: 0 [integer, 0-255][%]



Fuel Globals

Download Read Validate

X Axis: 0-5 [volt] Y Axis: RPM

X: 0 <--No Edit--> 5

Y: 0 960 1920 2880 3840 4800 5760 6720 7680 8640 9600 10560 11520 12480 13440 15300

Table Dimensions: X: 16 Y: 16

RPM Pickup Config: Ignition Type: Coil on Plug

Average 2 samples

Input 1: Voltage

Factory settings.

Above are the factory settings. Download "Fuel Globals", and download "Fuel Bank" to all 3 memory banks; 0,1, and 2.

6. Warranty

14Point7 warrants this product to be free from defects for 1 year. Sensors if purchased from 14Point7 carry no warranty whatsoever. Warranty does not cover user error and abuse. Warranty period is based on date of purchase, if no proof of purchase date is provided; warranty will be based on the Program Date label on the underside of the PCB. In the event that neither proof of purchase date can be provided and the Program Date label is illegible or removed; no warranty will be provided. Warranty is transferrable so long as proof of original purchase date can be provided or Program Date label is legible.

7. Disclaimer

14Point7 is liable for damages only up to the purchase price of its products. 14Point7 products should not be used on public roads.