

VEI Systems Installation Instructions

V1-FQM-Mx – Fuel Level Gauge (firmware version 5.x+)

This document covers V1-FQM-Mx version 5.x. For versions 300.x and prior, refer to the appropriate instruction document for that.

Please read these instructions completely before beginning installation to ensure that you have the tools and skills necessary for installation and operation of this instrument. If you are not sure that you can perform the installation safely, then consult a qualified installer. Further instructions available at www.VEISystems.com/technical.html.

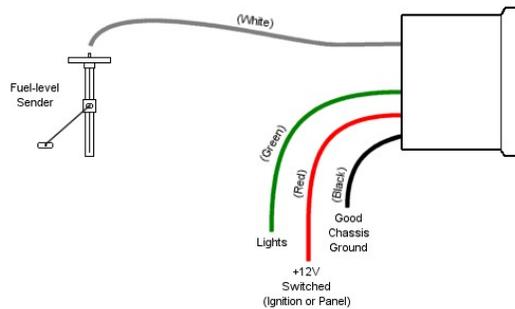
MOUNTING

Install the unit through the front of the mounting hole in the dash pod or panel. If you are making a custom dash panel, you will need to drill a 2-1/16" hole. Slide the clamp onto the 2 studs on the back of the instrument. Secure with the 2 thumb-nuts. Use a small drop of threadlocker or nail polish on the thumb-nuts to prevent them from loosening under vibration.

This gauge is designed to work with most stock senders, or we can provide a sender if required. One side of the sender should be grounded (usually the body).

WIRING

The wires should be connected as below using crimp-on butt-splice connectors, or soldered and sealed with heat-shrink tubing. Before connecting any wires, you should either disconnect the battery power, or carefully connect the wires in the order shown. If not, you may damage the instrument. Use an existing fuse in the fuse panel, or an external fuse to supply power to the instrument. The V1 series instruments use an 105mA of current avg. and 175mA max, so ensure the fuse is sized appropriately. For a typical 6- or 7-gauge setup, a single 5 Amp fuse is good.



- BLACK -- connect to a solid chassis ground under the dashboard, or directly to the battery. You may need to expose the metal connection point under the dash by scraping or lightly sanding it. A ring terminal and a screw should work well in most cases.
- RED -- connect this to a source of **switched** +12V power. This will usually be found at or near the ignition switch, and will usually have a relay wired through the ignition switch. An alternate source of this is a switched power line from a nearby light or accessory (radio, etc). If you are unsure that the wire can supply the power required for the instrument, then use an external relay.
- GREEN -- connect this wire to the positive line (+12V) from the headlight switch. When this line receives a positive voltage, the gauge will use the "park-lights" brightness setting. Alternatively, if setting up a racing-mode display, this can be connected to a separate mode switch (12V or 0V signal).
- WHITE -- connect this wire to top stud on the fuel-level sender. CAUTION: Do not connect this to any source of positive voltage.

OPERATION

Press and hold the button for a few seconds to change the mode. Press and release quickly (tap the button) to change the setting in any mode. Modes are as follows:

MODE	DISPLAY	SETTINGS
Normal	(Fuel level percentage)	Tap to turn off audible alarm.
Set low-fuel warning level	LO / 5	Display shows percentage warning level from 0 to 30%.
Brightness regular	Br . 9	Last digit shows regular brightness level from 1 to 9.
Brightness park-lights on	BP . 1	Last digit shows brightness level with lights on from 1 to 9.
Set startup mode	run / Cfg	Setting this to "Cfg" will cause the gauge to enter configuration mode on next power-up.

CALIBRATION & CONFIGURATION

Since this gauge is designed to be used with almost any stock fuel-level sender, you will need to calibrate it to your specific sender, and you can set the damping and update rates to track fuel-level changes as closely as possible yet reduce tracking variation due to sloshing of the fuel in the tank. At this point don't change the damping or update rates. You need to first set the sensor end-points to match your sensor. Start off by setting the start mode to "Cfg" as shown in the mode table above. Then power the gauge off and back on (once only). The gauge will now be in calibration mode. At this point, choose the level you wish to set by cycling thru the calibration modes (see the table below). With the sender at that level, tap the button to set the level. Note that it is best to fill the tank almost full with fuel, set the full level in that calibration

mode, then drive the vehicle until it runs out of fuel (take a spare gallon so you can get to a station), and re-enter calibration mode to set the empty level. Then you can set the low-warning level from the main modes.

NOTE: for gauge v5.01 through 5.66, the damping rate, display-update rate, and limiting option settings are in the main modes.

CALIBRATION MODE	DISPLAY	SETTINGS
Set FULL level	FUL	Tap to mark the current sender level as the full point.
Set EMPTY level	Ety	Tap to mark the current sender level as the empty point.
Set rate	RtE. / 2	Controls damping rate. Higher is more damping rate (slower changes)
Set display update rate	Upd / 3	Adjusts time between display updates (higher is slower)
Set change limiting option	Opt / 1	Turns on/off display change-limiting option (1 is on)

Note that after being in calibration mode, the gauge returns to regular operational mode after powering it off and back on. To re-enter calibration mode for setting another fuel-level, simply set the startup mode to “Cfg” again and power off and on as before.

After driving the car for a tank or more, you can start tweaking the damping and display update rates so that the gauge tracks the fuel level properly, but is not so fast that it shows the sensor bouncing as the fuel sloshes around in the tank. The next section explains this in more detail.

FINE-TUNING / TRACKING

Once you have the calibration points set, you can, if you feel necessary, change the damping rate. If the displayed value varies up and down during driving, increase the damping rate. Generally you should change this by only plus or minus one at a time, and drive for a couple tanks of fuel to assess if it’s good enough. It is also helpful to temporarily reduce the display-update rate (smaller numbers, which means quicker updates), so you can see the effects of a damping-rate change easier.

With a decent damping rate dialed in, you can then gradually increase the display-update rate, driving a couple tanks of fuel between each change to assess the effects. Ideally you should set the display-update rate as high as possible, yet ensuring it’s not so high as to not track fuel consumption properly. This can be tested as follows: after a long drive, say a quarter or half tank of fuel, note the fuel level, then power-cycle the gauge and note the displayed value again once it settles. If the value is noticeably lower after the gauge has been power-cycled, then you should lower the display update value. This could be a problem as you wouldn’t want the gauge to tell you that you have more fuel than you actually do.

Finally, the limiting option is a feature that tells the display to change by only plus or minus one of each update, to help prevent sloshing from showing values that are varying up and down wildly. It helps to keep this off when fine-tuning the damping rate and the display-update rate, then you can turn this on afterwards.

WARRANTY & LIABILITY

Neither VEI Systems, nor its dealers or agents shall be liable in any way, for any damage, loss, injury or other claims, resulting from the installation or use of this product. By purchasing or installing this product, you assume all liability of any kind connected with the use and/or application of this product. If you are unsure that you can safely install and use this product, consult a qualified installer or mechanic. The warranty on this product covers only the product itself for a period of 1 year from the date of purchase, and it will be at our discretion to repair or replace the affected parts. No user serviceable parts inside. Warranty void if product enclosure opened.