

# **GX2 Digital Flight Instrument Trouble shooting**

## **1) Problem**

GX2 lights up with only four clocks on display with no engine functions.

## **Solution**

Make certain the engine management module is properly connected.

Next check the LED; it needs to be flashing when GX2 is switched ON.

If it remains OFF, use a voltmeter check the voltage between the DATA V+ connection and one of the ground connections, you should have 12V. If so the module is faulty and will need to be repaired or replaced. If no 12V check for breaks in the wire and that the connector is clamping on the copper wire not the sleaving.

If LED remains ON but does not flash the most common cause is humidity inside the engine management module. Open the module (four screws) and allow to dry. Close up and reconnect, should now be working correctly.

If LED does flash, switch GX2 OFF and measure the continuity between the DATA OUT connection of the engine module and pin 3 of the circular connector at the back of the GX2. If correct check the voltage DC between the DATA OUT connection and ground, you should have between 8 and 11volts. If not the engine module is faulty and will need to be repaired replaced. If you do have between 8 and 11volts the display module is faulty and needs to be replaced or repaired.

## **2) Problem**

Engine readouts jump around inconsistently when in flight.

## **Solution**

This is caused by a poor grounding of the engine module. The engine module needs a good grounding to the engine. Picking up the ground from the airframe is no good as vibrations caused by the engine running causes this ground to become intermittent. Pickup the ground directly from an engine bolt or battery that is well grounded to the engine. If problem persists replace the grounding wire and sand down all ground connections with sandpaper and reconnect.

All the senders get there ground directly from the engine so if there is a few Ohm's difference between a sensors ground and the engine module ground the readings will be incorrect.

### **3) Problem**

GX2 switches OFF for no reason.

### **Solution**

When on the ground the GX2 will automatically switch OFF after 5 min of inactivity (no RPM and no change in VSI). This is to prevent the battery from being drained if the GX2 is mistakenly left ON when not flying. If GX2 switches OFF in flight, supply voltage might become intermittent with vibrations. Check all wiring and connections; also open up the connections of the circular connector at the back of the GX2 a little, with a small screwdriver. If switching OFF is preceded by the engine functions fluctuating, then the ground on the engine module is poor (Look at solution to previous problem). If you get an “OVER VOLT” message flash once on the screen when you turn the GX2 back on, then the supply voltage exceeded 17V and the GX2 automatically turned itself OFF before getting damaged. If this is the case land as soon as possible and check/ replace the voltage regulator and most likely the battery as well.

### **4) Problem**

Alarm light goes off but I don't see any of my engine functions going black.

### **Solution**

Battery voltage too high or too low (below 11.8V or above 16V). If too high the regulator is no longer regulating the voltage and your battery is boiling, if you don't land quickly you will damage your electrical equipment if this has not already happened.

The level of the oil in your auto lube reservoir is too low on 2-stroke engines.

### **5) Problem**

Airspeed reads too high when on the ground and plane not moving.

### **Solution**

Turn GX2 OFF. While holding down the QNH(↓) button switch the GX2 ON. When ON release the QNH(↓). You should now be in the “View limits” page. Press and hold the QNH(↓) again and continue holding it down until you get the “SAVE LIMITS” message. Now release the QNH(↓) button. While you have the “SAVE LIMITS” message press quickly either QNH button, you should get a “DONE” message flash briefly on the screen. Switch GX2 OFF then back ON the airspeed should now be reading correctly.

### **6) Problem**

Airspeed reads too low when flying.

### **Solution**

Check pitot tube assembly for any leaks. Suck on the tip of the pitot tube, you should get a vacuum, if not there is a leak somewhere that you'll need to find. If you do get a

vacuum then the GX2 will need to be recalibrated. This can only be done with specialized equipment.

### **7) Problem**

When I adjust the QNH according to the control tower my altitude reads incorrectly.

### **Solution**

Remove GX2 from panel and remove the four screws holding the casing to the faceplate (back of instrument). Now separate the faceplate from the casing. Once open you'll see a row of six blue pot-meters (five on later versions). Now reconnect the circular connector at the back of the GX2 and switch ON. Adjust the QNH according to the tower. Now with the QNH correct turn the third pot-meter from the corner (has ALZ silk-screened in white next to it) until the altitude reads correct. Close up the GX2 and re-fit to the panel.

### **8) Problem**

Contrast too dark or too light

### **Solution**

The GX2 version is displayed at the bottom right hand corner of the screen, for the first few seconds, after switch ON.

On early versions V2 to V9,VA and VB you'll need to remove the GX2 from the panel and remove the four screws at the back holding the casing to the faceplate. Separate the casing from the faceplate. Inside you'll see a row of six blue pot-meters. Reconnect the circular connector at the back of the GX2 and switch ON. While GX2 is ON you'll need to turn the pot-meter furthest from the corner (has "CONT" silk-screened in white next to it) until the contrast is correct. Now close up GX2 and re-fit to the panel.

On later versions VO, VC and later, with GX2 OFF press and hold the QNH(↑) button then turn ON while holding the QNH(↑). Once ON release the QNH(↑). You will now have a screen with four clocks and one large bargraph in the middle to adjust the contrast. Use the QNH buttons to increase and decrease the contrast. When contrast is set to your liking turn GX2 OFF, the new setting has now been memorized.

### **9) Problem**

Coolant temperature or oil temperature is reading incorrectly.

### **Solution**

Check the grounding of the Engine module. (See Problem number 2)

### **2-Stroke engines (coolant temperature only)**

Make certain you have the correct sender, it needs to be a Volkswagen, Audi or Volvo sender. If not certain measure the resistance of the sender using a multimeter and the temperature with a thermometer. The resistance should correspond approximately to the temperatures on the table below. (You only need to measure at ambient temperature)

10°C (50°F) = ±1500 Ohms	15°C (59°F) = ±1300 Ohms
20°C (68°F) = ±1070 Ohms	25°C (77°F) = ±900 Ohms
30°C (86°F) = ±750 Ohms	35°C (95°F) = ±630 Ohms
40°C (104°F) = ±550 Ohms	45°C (113°F) = ±460 Ohms
50°C (122°F) = ±390 Ohms	55°C (131°F) = ±340 Ohms
60°C (140°F) = ±290 Ohms	65°C (149°F) = ±245 Ohms
70°C (158°F) = ±212 Ohms	75°C (167°F) = ±180 Ohms
80°C (176°F) = ±160 Ohms	85°C (185°F) = ±140 Ohms

If sender is correct but the readings on the GX2 are incorrect the engine module might be setup for a Rotax 912/4 or faulty and will need to be replaced. (Never had this problem before.)

#### 4-Stroke engine coolant and oil temperatures

Make certain you have the correct sender installed. It should be a VDO sender and the part number is 801/9/1 which should be stamped on the sender. Rotax 912/4 come fitted with this sender but Rotax use there own part number. To check if the sender has not gone faulty measure the resistance of the sender with a multimeter and the temperature with a thermometer. The resistance should correspond approximately to the temperatures on the table below.

10°C (50°F) = ±1850 Ohms	20°C (68°F) = ±1150 Ohms
30°C (86°F) = ±738 Ohms	40°C (104°F) = ±485 Ohms
50°C (122°F) = ±329 Ohms	60°C (140°F) = ±231 Ohms
70°C (158°F) = ±161 Ohms	80°C (176°F) = ±117 Ohms
90°C (194°F) = ±85 Ohms	100°C (212°F) = ±65 Ohms

If sender is correct but the readings on the GX2 are incorrect the engine module might be setup for a Rotax 582/503 or faulty and will need to be replaced.

### **10) Problem**

Oil pressure reading incorrect or showing short circuit.

### **Solution**

Check the grounding of the Engine module. (see Problem number 2)

Make certain you have the correct sender installed and the correct Engine module for your engine.

On older Rotax 912/4 (before 2008) and most other engines you should have the VDO sender 0 to 10 bar.

On Jabiru engines you should have the VDO sender 0 to 5 bar.

On newer Rotax 912/4 (from 2008 onwards) you'll need a 4..20mA sender.

If you have an older GX2 and a newer Rotax engine you will have to buy the old type sender from VDO.

If you have an older engine with a newer GX2 you will need to buy the new type sender from Rotax, the part number is 956 413. The new sender has two wires coming out of it, the white wire goes to the OP connection of the engine module and the red wire connects together with the Data V+.

Most GX2's will give a short circuit reading when the engine is not running. VDO specifications give an operating range of 10 ohms at 0 bar upto 180 ohms at 10 bar for there sender but the resistance of the sender often falls below 10 ohm when the engine isn't running resulting in the GX2 giving a short circuit reading. You should only be worried if this continues showing with the engine running. Some senders have a slow response time and might take a few seconds to show pressure on engine startup. If you continue getting a short circuit reading with the engine running, disconnect the lead from the sender and measure the resistance of the sender with the engine running (between the terminal and the casing of the sender) . You should have between 30 and 80 Ohms. If reading much lower replace sender, If correct replace engine module.

### **11) Problem**

EGT and CHT reading incorrectly

#### **Solution**

Check the grounding of the Engine module. (See Problem number 2) If the grounding is not solved quickly this can cause permanent damage to the CHT and EGT amplifier chips. If you have problems with the CHT on a 912/4 refer to problem 9 as 912/4 use oil temperature type senders to measure the CHT.

If EGT or CHT are reading consistently about 30% too high you are using J-type thermocouple senders instead of K-type, replace EGT senders with K- type thermocouple senders. For the CHT replace with K-type sender or if you have difficulty finding the correct sender add a 22 Ohm resistor in series with one of the inputs of each sender.

If EGT or CHT are reading zero, measure the resistance of the sender, you should measure less than 6 Ohm (can change depending on the length of the sender) if resistance is a lot higher replace sender.

If EGT reads consistently low make sure the tip of the sender is situated in the middle of the exhaust gas flow and that the sender is situated 100mm (4 inches) from the piston skirt on two stroke engines. On four stroke engines you will need to find out from the manufacturers where to fit the EGT senders. (On 912/4 it needs to be 50mm or 2 inches from the gasket surface.)

### **12) Problem**

Engine RPM reading is reading consistently too high or too low.

#### **Solution**

Dipswitches not correctly setup for the engine.

For Rotax 912/4 and BMW engines switches 1& 2 must both be ON.

For Rotax Dual ignition 2-stroke engines, HKS, Simonini and Hirth switch 1 ON and 2 OFF.

For Rotax single ignition 2-stroke engines, most Volkswagen and Subaru conversions switch 1 OFF and 2 ON.

For Jabiru engines switch 1 & 2 must both be OFF.

### **13) Problem**

Engine RPM is erratic.

### **Solution**

Check the grounding of the Engine module. (See Problem number 2)

If not the grounding, then add a 1N4007 diode in series with the RPM input, of the engine module, on 912/4 engines. (The cathode, white stripe, must face toward the connector.)

On 582 / 503 check the RPM coil in the engine. Using a mutimeter first check the resistance of the coil between the grey and brown wires. Should be about 39 Ohms, with engine not running (Can change a little with temperature). If the resistance is a lot higher there is a break in the winding, or if the resistance is a lot lower there is a short in the winding and in both cases the magneto will need to be replaced. If this is correct next measure the voltage AC of the coil with the engine running. At idle you should read  $\pm 20V_{ac}$ , at 5000 - 5500RPM you should read  $\pm 70V_{ac}$  and at 6500RPM you should read  $\pm 50V_{ac}$ . If the readings differ there is arcing going on between the windings of the coil and the magneto will need to be replaced.