(Nb: The Stratomaster Ultra uses a 24-hour clock)

Hobbs meter

The hobbs meter contained the the Stratomaster Ultra is pre-settable. You can set the meter to any time you like, usualy this would be to your currently known engine time.

Use the Prev/Next keys to select the item and then use +/- to change it.

Maintenance meter

The maintenance meter can be viewed as a hobbs meter “in reverse”. It counts engine running time down instead of up. This timer is used to control engine maintenance times, for example spark plug changes or MPI’s. The maintenance timer is subject to the setting of the hobbs revs.

Use the Prev/Next keys to select the item and then use +/- to change it.

Aircraft registration

Enter your name or aircraft registration marks into this field to personalize your instrument.

You have 6 characters available.
Use the Prev/Next keys to select a character and then use +/- to change it.

Available characters:

Alphabet in capital letters
Alphabet in small letters
Numbers 0 - 9
Symbols:
! " # $ % & ' ( ) * + , . - . / : ; < = > ? @ [¥] ^ _ ` { | } ?

Altitude alarm

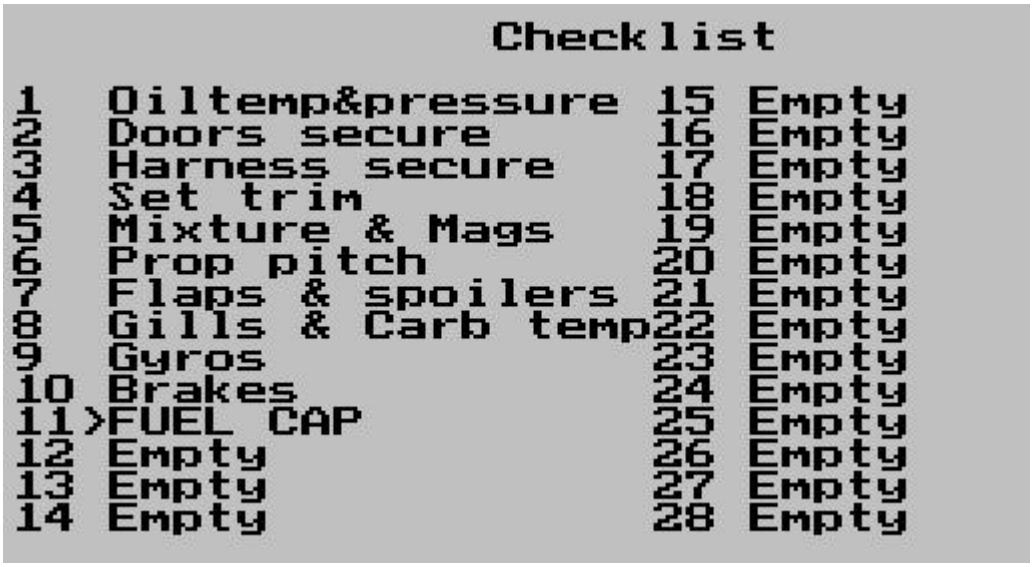
This function determines the maximum altitude that should be reached before the Stratomaster Ultra will activate the altitude alarm.

Note: Altitude alarm can be set in increments of 500 ft (152 m) to a maximum of 60 000 Ft (18 293 m).

Should you wish to switch the altitude alarm off continue pressing the plus or minus until the wording "altitude alarm off" appears.

Checklist

The Stratomaster Ultra contains a user definable pre-takeoff checklist. This checklist can be activated automatically after engine start (if not in flight) or you can activate it manualy from the main menu.



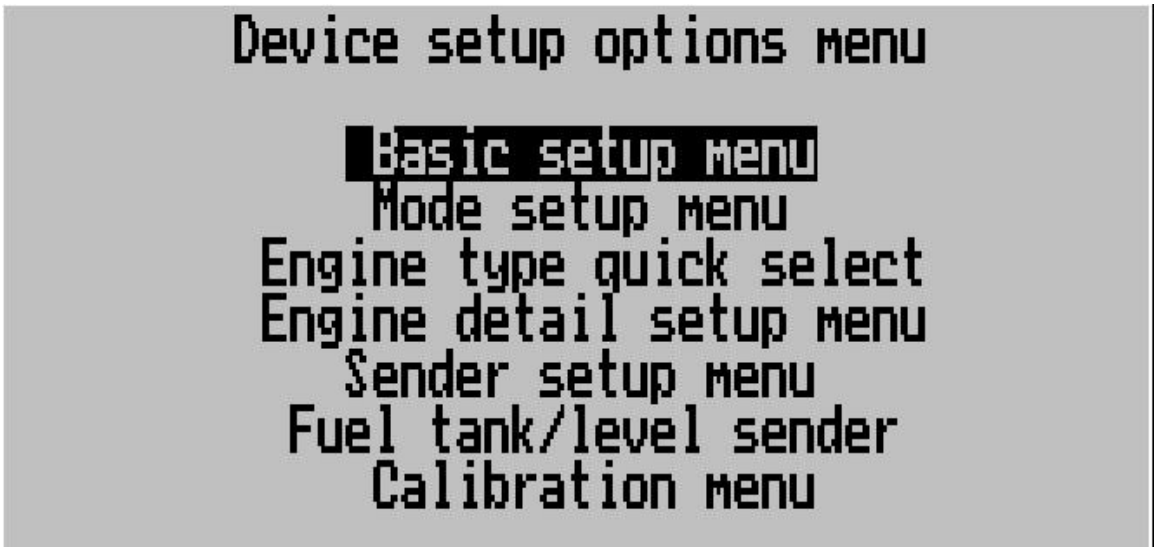
You have a total of 28 items in this checklist as shown above. The items will appear in the order as numbered.
Checklist items consist of predefined items an user defined items. The instrument allows you to choose from the following predefined items:

'Hydraulics'
'Doors'
'Harness'
'Trim'
'Mixture & Mags'
'Prop pitch'
'Flaps'
'Gills & Carb temp'
'Gyros'
'Brakes'
'Fuel & Flow'
'EGT/CHT temps'
'Water temp'
'Oil temp & press.'
'Altimeter set'

In addition to the above you may create up to 16 items yourself. User defined items are marked in the above list with a “>” as shown in item 11.
Selecting any item is done by using the Prev/Next to move the cursor to the required item and then use the +/- key to select the item you require in that slot. Should a “>” appear to the left of the selection then you can edit that selection by pressing “select”. Now it is simply a matter of selecting the character position you want to change and then using the +/- keys to change it. Once you are finished, press select again to write your changes to permanent memory.

Device setup menu

The device setup menu combines the many setup and operation options that you can choose. The Stratomaster Ultra is a very versatile instrument that you can customize to operate the way you want it to. Typical setups are for example units of measure like altitude display in feet or meters but also settings that you can choose to customize the EIS (engine information system) part of the Stratomaster Ultra.



To get to the device setup menu, either choose the relevant entry from the main menu or press and hold “Menu” and then press “-“ while the main display is showing.

The following picture is the device setup menu. We will briefly discuss every menu item and then give full details for every item.

Basic setup menu

The basic setup menu combines basic calibration functions for airspeed, altimeter, rev counter and fuel flow sender settings. Here you will also find setups for the scales used on the airspeed and RPM indicators.

Mode setup menu

The mode setup menu allows you to choose certain operational modes as well as units of measurement.

Engine type quick select

This menu gives you a quick way to select a particular engine type for use with the instrument. This allows you to quickly configure the instrument for recommended monitoring parameters. Often, you would use this function to choose a particular engine and then use the Engine detail setup menu to refine settings to your liking or engines needs.

Engine detail setup menu

This menu allows you to choose a particular display mode by choosing a relevant engine type that comes closest to yours. You can then further adjust many parameters to cater for your

engines needs or your personal preferences. Often you will first use the Engine type quick select before changing any settings in the detail setup menu.

Sender setup menu

The sender setup menu allows you to choose temperature sender types for use by your instrument. The Stratomaster Ultra allows you to use a variety of different temperature senders for anything from oil or water temperature to CHT or EGT. It is important that you inform the instrument which type of sender(s) you are using so the instrument knows how to interpret the readings given by the sender(s). Incorrect sender type selections will result in incorrect temperature readings.

Fuel tank/level sender setup

This menu item allows you to calibrate a fuel level sender. You would normally only do this once, a procedure that will take you 10 to 30 minutes depending of your aircraft. After calibration the Stratomaster Ultra will be able to give you a tank level reading that has been corrected for tank shape and volume. You can then enjoy a tank level reading that accurately reflects your fuel level in liters or gallons (choose the latter in the "mode setup menu").

Calibration Menu

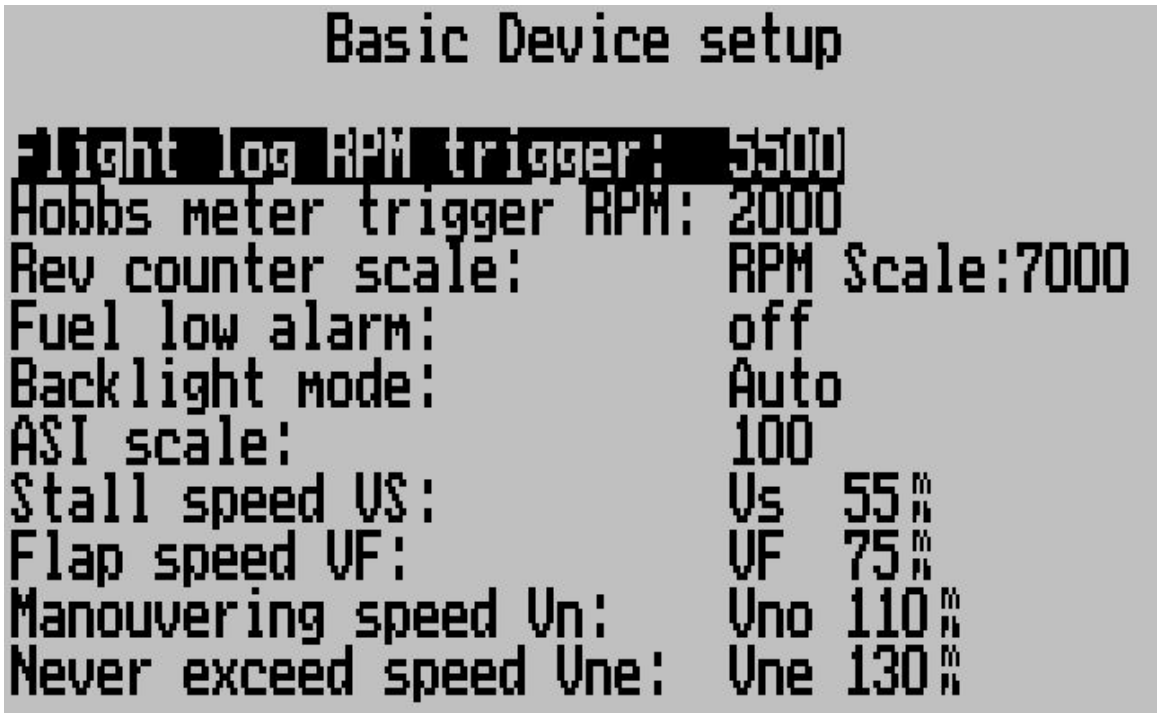
This menu contains calibration functions for your altimeter, ASI, rev counter etc.

Technical items

This menu item may show if it has been enabled (Press + and – and hold these keys down when you switch the unit on).

The items available under this menu may change between releases of the firmware and are not normally used by the user of this instrument. They are functions that are used in the factory for testing and calibration of your unit. **Please do not alter any of the settings as this may affect the accuracy of your instrument**.

The basic device setup menu



Flight log RPM Trigger (Take-off RPM)

This is the rev limit to use for automatic take-off detection. Take-off detection is relevant for the automatic logbook. The instrument uses a combination of take-off revs exceeded and airspeed above 30 mph (48 kph or 26 knots) to detect the start of the flight.

Note: Once a flight is started, revs are ignored. Only airspeed is relevant then.

Hobbs meter trigger RPM

This is the rev limit above which engine running time is added to the hobbs meter and maintenance meter. This setting allows you to choose whether or not to add engine idle speed time to the hobbs meter. Should you wish to have engine idle count towards the hobbs meter time, set the Hobbs revs value to less than your normal engine idle speed.

Rev counter scale

Select the maximum RPM for the analog RPM indicator here. You can choose from 3000,4000,5000,6000,7000,8000 or 9000 RPM.

For example, a typical Rotax two-stroke would need a setting of 7000 RPM. A Rotax four stroke would need a setting of 6000 while most other four stroke engines may need a setting of 4000 or 5000.

Fuel low alarm

Set the minimum fuel level below which the unit will generate an alarm.

If you select a value of zero, the fuel level alarm is off.

In order to use the fuel level alarm you must have either a fuel tank level sender installed or you must use a fuel flow sender (in which case the fuel level can be calculated from a starting value).

Please note that we recommend that you calibrate your system in such a way that you have reserve fuel at all times. It is not considered good airmanship to fly your tank empty!

Make allowance that any type of fuel flow or fuel level sensor may malfunction for whatever reason. Should you find unusual, unexpected fuel economy reported by your system, you most likely are getting incorrect readings. Always backup your fuel management with manual inspections and plan your flights using known fuel burn rates of your power plant.

Back light mode

The back light can be used in one of three ways. Permanently on. Permanently off or in "Auto mode". In auto mode the back light will switch on if the engine is running or if any key on the instrument is pressed. The back light will automatically switch off is there is the engine is not running or no keys have been pressed for a period of ten minutes.

ASI scale

Here you select what scale to use for your analog ASI (airspeed) indicator. You have a choice of 100,200,300 or 400 units of measure. Units of measure may be miles per hour, kilometers per hour or knots.

Please note that standard instruments are made for a speed range up to 200 miles per hour (approximately 320 km/h).

Stall speed Vs

The Stall speed or minimum speed setting for your speed arc. Also sets the limit for the low speed alarm.

Flap speed Vf

The maximum speed you may operate with flaps. Used for the speed arc.

Maneuvering speed Vno

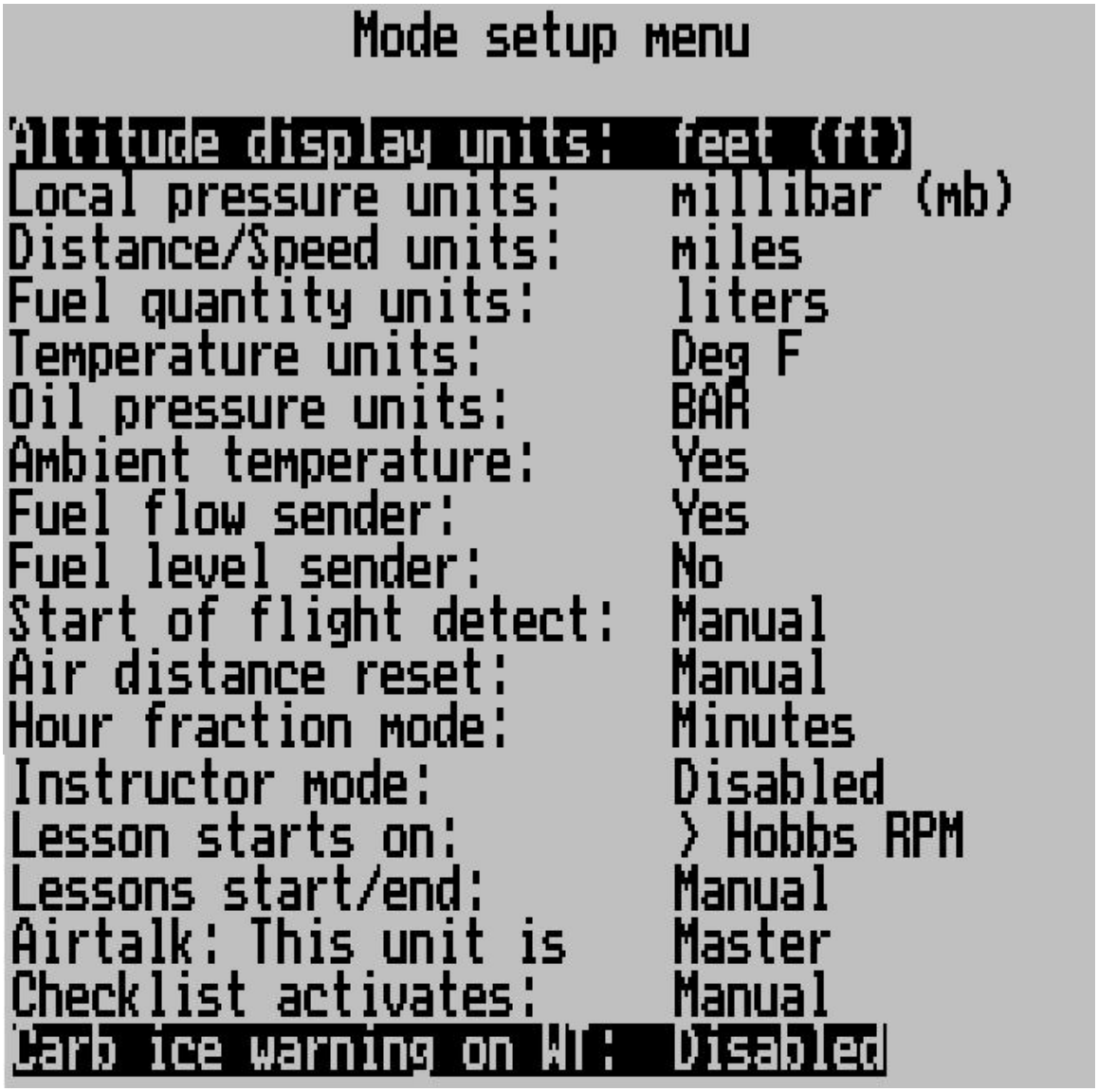
Your maximum free maneuvering speed, often your maximum cruise speed. Used for the speed arc.

Never exceed speed Vne

Your maximum allowable speed. Used as limit for the high speed alarm. Also used for the speed arc.

The mode setup menu

The mode setup menu allows you to choose certain operational modes as well as units of measurement.



Altitude display units

Select whether you would like to display the altitude in meters or feet. This setting also influences the units used for the VSI. This will be selected to either feet/minute or meters/second.

Local pressure units

Select your units of local pressure. Options are MilliBar (Hecto-Pascal) or Inches of Mercury.

QNH is the local pressure setting of your airfield as given to you by your ATC. Be sure to use the correct QNH to ensure that your altitude is displayed correctly according to local conditions. This will keep your ATC happy as you will be flying your assigned altitude.

Distance/Speed units

Select how you want to display your distance. You can choose between Nautical miles (Nm), Statute miles (m) and Kilometers (Km). This setting also influences your airspeed display, resulting in the display of Knots, mph, or kph.

Distances are displayed by the distance traveled indication and range estimate.

Fuel quantity units

Select if you want fuel quantity displayed in liters, imperial gallons, U.S. gallons, Kilograms or lbs. This setting also influences the fuel flow display.

Temperature units

Select if you would like temperature displayed in degrees Fahrenheit or Celsius. This setting influences all temperature displays such as ambient, water or oil, EGT, CHT etc.

Oil Pressure units

Select if you would like oil pressure displayed in Bar or PSI.

Ambient temperature

Normally you should have the ambient temperature sender that is included with the instrument installed. This setting switches the sender on (default). The sender is required for density altitude calculations.

Should you switch this item off, the unit will use an internal temperature sensor to obtain a less accurate temperature reading. It is much preferable to measure the temperature at the outside of your aircraft or instrument pod.

Fuel flow sender

Select whether or not you have a fuel flow sender installed. The unit will make certain adjustments to the main display to accommodate the additional fuel flow related displays if this item is switched on.

You can use the fuel flow sender to display a calculated fuel level should you not have a fuel level sender installed.

The fuel flow sender is required to calculate range (if the remaining fuel quantity and true airspeed (TAS) is known).

Fuel flow and remaining fuel quantity are used for the fuel bingo estimate.

Fuel level sender

Select this item if you have installed a fuel level sender. Note: once you have installed the sender you need to calibrate it. The calibration procedure is outlined further on in the device setup menu. Alternatively, you may elect to have fuel level calculated from fuel flow. We recommend however that you install a fuel level sender. This is not subject to incorrect fuel level reporting which may be a factor if incorrect starting fuel level is entered if only the fuel flow sender is used.

Hour fraction mode

Select whether you want hour fractions to display in decimal fractions of an hour or in minutes. This applies for the display of hobbs meter and flight time. Time of day always displays minutes.

Start of flight detect

Select here if you want the instrument to detect the start of a flight automatically or if you want to manually start and stop a flight.
This setting is relevant for the automatic logbook and the flight timer display. If you choose automatic flight detection, a flight starts if airspeed is above 30 mph (48 Kph or 26 Kn) and engine revs above the limit set in the take-off revs setting (basic setup menu).

Flights are logged automatically if a flight duration of at least a minute has been detected.

In the manual flight detect mode, you can start and stop flights for logging purposes yourself using the main menu. We recommend you use the automatic flight detect mode.

Air distance reset

Select if you would like the air distance trip counter to reset to zero automatically when you start a flight. In any case you can reset this trip counter at any time manually from the main menu.

Instructor mode

Select if you would like to use the flight log in a way suitable to log lessons rather than individual flights.

Lesson starts on

Select which criteria to use to start a lesson (instructor mode only). Eg. either hobbs revs or take-off revs.

Lesson start/end

Select if you want to enable automatic lesson start and end detections.

Airtalk This unit is

If you have two Stratomaster units interconnected within your cockpit using the airtalk link, you must set one unit to be the slave while the other is the master. This is relevant for the QNH setting. If both instruments power up at the same time, the QNH from the master is transferred to the slave.

You can interconnect any Stratomaster Flight, Ultra and Ultra models, even in a mixed batch.

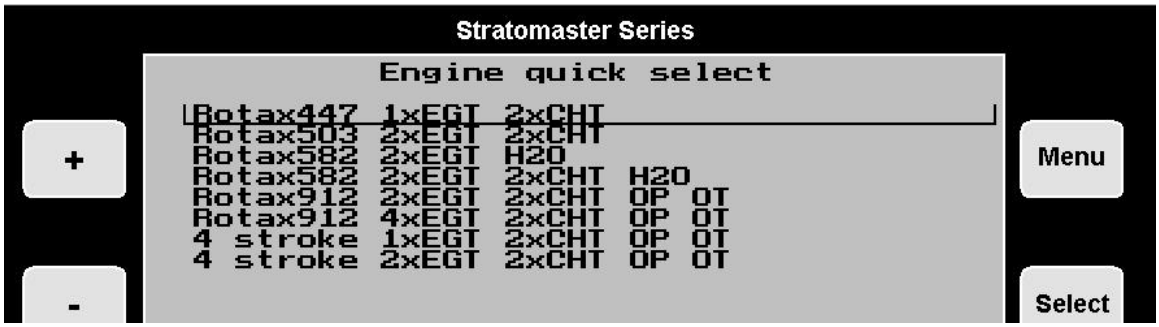
Checklist activates

Select if you want the checklist to be activated automatically once you start your engine. Note this will not happen if you start your engine while you are in flight.
Should you disable this function, you can still activate your checklist from the main menu.

Carb ice warning on WT

This function selects if you want to use the RDAC CHT1/WT input to accept a LM335 temperature sender as ice warning. This feature can only be used if you don’t need to monitor coolant temperature or are not using a CHT sender connected to the CHT1 input.

Engine type quick select

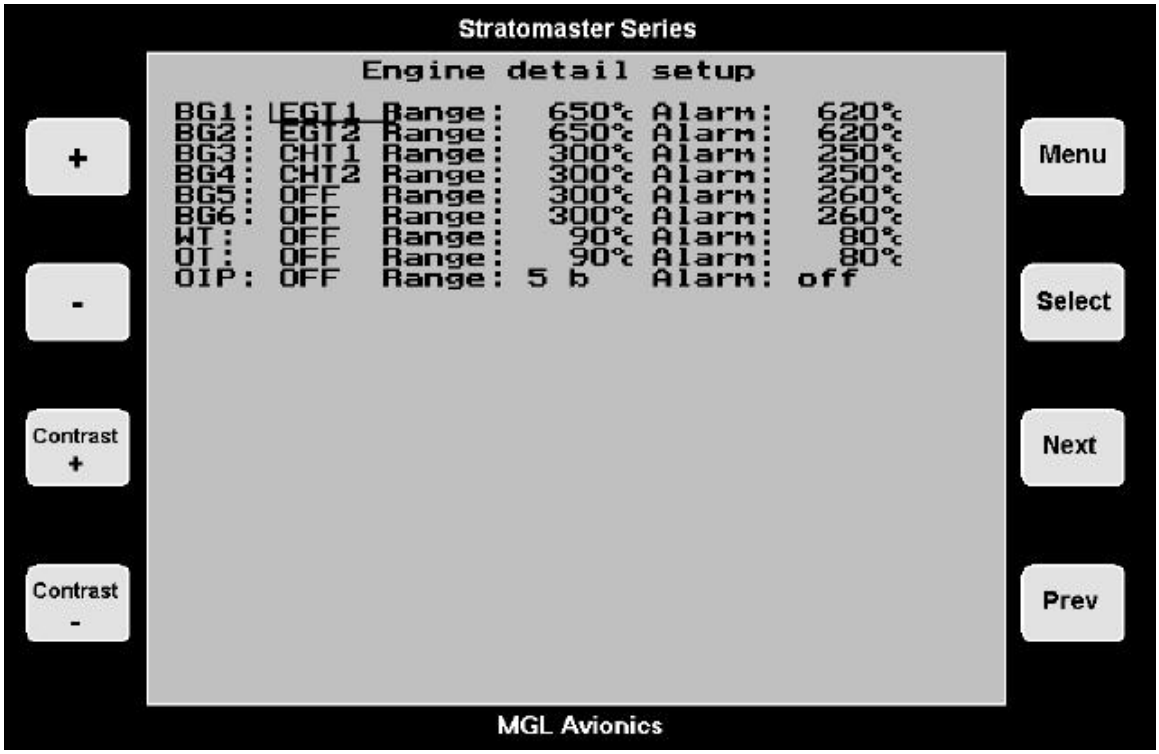


This menu allows you to quickly select an engine type for your Ultra setup. This selection presets many of the programmable items to our recommended values for the selected engine. The engine types presented should be seen as samples. If you have an engine not in the list, select a type that is closest and use the Engine detail setup to modify relevant settings.

As example, many operators with a 503 engine may select the 582 engine in this menu as they prefer to rather have two large EGT/CHT bargraph indicators in a scanning mode than four smaller ones in a non-scanning mode. The water temperature indicator is then switched off in the Engine detail setup.

Once you have selected a basic engine from the list presented, please view the engine detail setup and verify that all settings are as you would like them. Feel free to change anything you like according to your engines needs.

Engine detail setup menu



This page sets the display and alarm characteristics that define most of your Stratomaster Ultra EIS system. EIS stands for “Engine Information System”, a standard acronym used in aviation for this type of instrument.

The top four lines define the settings of up to six bargraphs used for engine temperature monitoring. Typical uses are EGT or CHT monitoring (Exhaust gas or Cylinder head temperature).

Each bargraph consists of a label, which appears below the bargraph. This is used to identify what the bargraph is indicating. The Stratomaster Ultra gives you a choice of labels that you can use. The label itself does not determine anything about how the channel operates. It is just a label without any function. The label can be set to "off”. With certain displays this can be used to suppress drawing of the bargraph.

The temperature range setting sets the maximum temperature the bargraph should be able to display. Choose a value that is close to your maximum operating temperature for the type of item to be monitored (EGT or CHT). Choosing a value too large will give poor resolution of the bargraph. A value too small will result in the bargraph displaying maximum reading before the maximum temperature has been reached.
Please note that all temperature related bargraphs start reading at half the value entered as range. This means that a bargraph with a range of 700 degrees C (1 292 degrees F) will display values from 350 to 700 degrees C (662 – 1 292 degrees F). This has been done to increase usable resolution of the bargraph.

The alarm setting sets the level over which the alarm mechanism will be activated (note: the oil pressure gauge alarm sets the low level under which the alarm will be activated).

Should you set an alarm level outside of the visible range of the gauge, this will not disable the alarm. Select the alarm level to be above the maximum expected level in order to disable the alarm.

Oil pressure bargraph should be set for range in bar (5-8 bars is typical for most engines). The alarm level is typically set to 2 bars, below which the alarm will be activated. Should you not use an oil pressure indication, please turn the bargraph off by setting the label to read “off”.

The various settings, ranges and levels you select here will determine the way the gauges are drawn on the display.

The top 6 bargraph settings relate directly to the four thermocouple inputs and two Rotax 912 type CHT channels available on the RDAC IV unit.
The first four lines (BG1 to BG4) are equivalent to RDAC channels TC1 to TC4. BG5 is CHT1 and BG6 is CHT2.

Please note that it is not possible to enable CHT1 (BG5) and the Water temperature bargraph at the same time. This is because these two items share the same physical connection on the RDAC IV unit.

Sender type selection

The sender type selection menu is used to select the kind of senders you have connected.

The RDAC unit supports 4 thermocouple inputs as well as two N-Type inputs intended for use with 912/914 engines that have two built in NTC CHT senders.

EGT senders are practically always K type thermocouples. CHT senders (the types used on spark plug bases) are mostly K types as well but sometimes J types are used. J types are found mostly for U.S. made instruments.

The characteristics of J and K types are very different so it is important that you select the correct thermocouple type.

All thermocouples supplied by MGL Avionics are type K.

The top four entries can only assume either J or K type thermocouples. These are equivalent of RDAC thermocouple input channels 1,2,3 and 4.

The next two channels may be set to N Type, M type or MGL precision. N types are only used with Rotax 912/914 CHT. These senders are fitted to the 912 engine as standard. The M type refers to a sender available from MGL Avionics for special applications. For a description of the MGL precision sender see below.

The H2O entry selects which probe you have connected as water temperature probe.
You can select the M type probe (MGL supplied NTC probe) or the MGL precision temperature probe (see below).

The OILT entry selects which probe you have connected as oil temperature probe.
You can select the N type probe (Rotax type oil temperature probe as fitted to the 912/914) or the MGL precision temperature probe (see below).

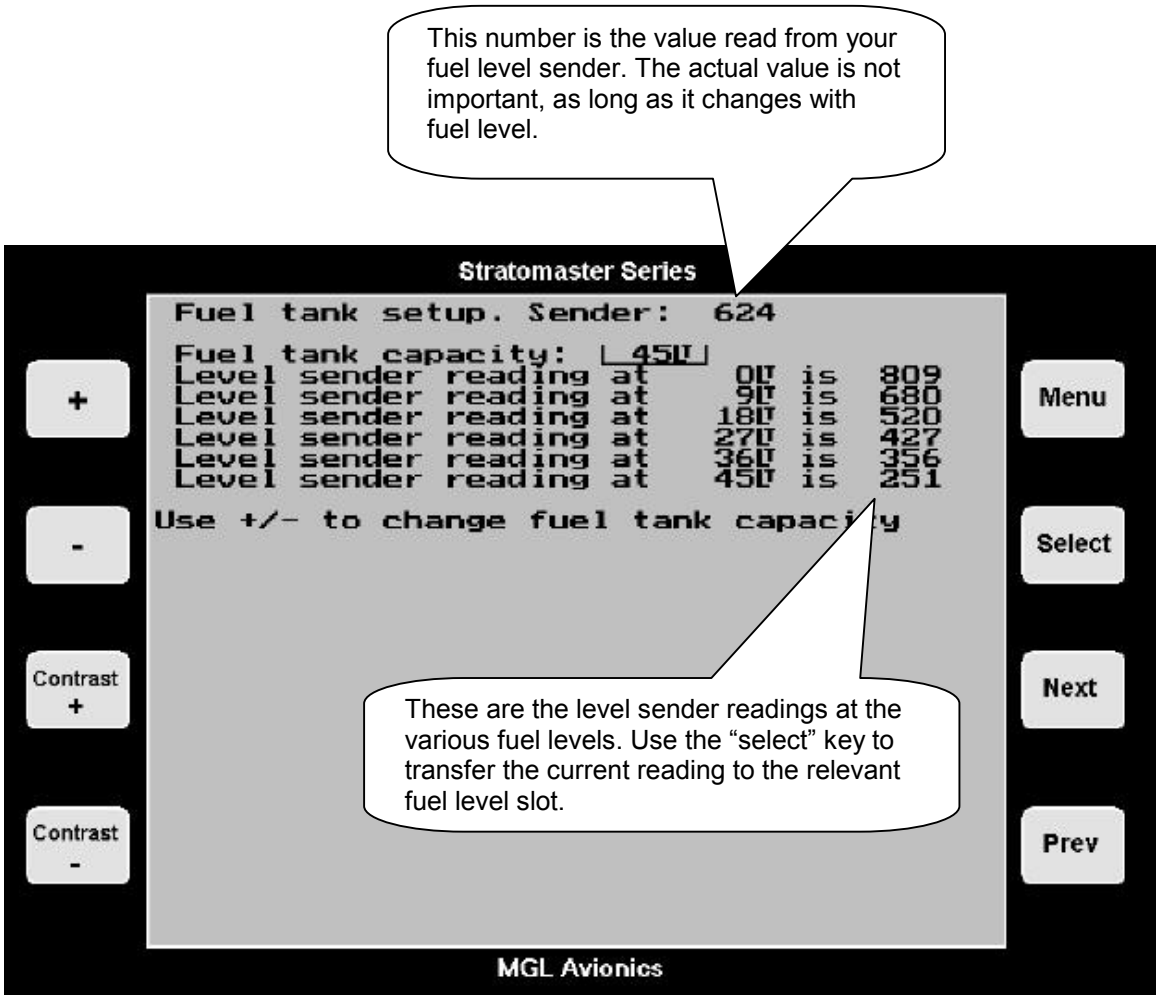
Oil pressure resistance refers to the resistance the oil pressure sender will exhibit at maximum pressure of 10 bars (145 PSI). 200 ohms is the reading for the oil pressure sender fitted as standard to Rotax 912 and 914 engines. You can adjust the setting over a wide range to allow use of the instrument with a large variety of oil pressure senders. Oil pressure senders supported must increase resistance fairly linearly with pressure. This is the case with most standard automotive senders.
Most available automotive senders will be in the range of 100 to 400 ohms. We recommend the oil pressure senders available from VDO.

The MGL precision temperature probe

MGL Avionics manufactures a precision temperature probe based on an accurate and well proven semiconductor chip. This sender is more expensive compared to the ordinary automotive senders used in standard applications but offers outstanding accuracy and as additional advantage is completely electrically isolated from the engine it is fitted to. This is an advantage in some installations as the temperature reading is not influenced by electrical currents flowing in the engine. This sender can be used to measure temperatures from zero degrees Celsius to about 180 degrees Celcius. The sender is suitable for water or oil temperature measurements to an accuracy of +/-1 degree over the full temperature range.

Fuel tank/level sender setup

This function is used to setup and calibrate you fuel level sender. You would use this function partially even if you do not have a fuel level sender installed but are using a fuel flow sender. In this case the instrument can provide you with a tank level display as well as it will calculate the remaining fuel by subtracting fuel used (after you have given it a starting value). In this case all you have to do in this menu is to enter the capacity of your fuel tank so that the fuel level bargraph can show the correct level. You should also note that it is not possible to enter a fuel level greater than the tank capacity even if you only use the fuel flow sender and not a tank level sender.



Regardless of your use of a fuel flow sender, you can install a fuel level sender into your fuel tank. These level senders are inexpensive and are available as after market replacement fittings from a car spares outlet. We recommend the senders available from VDO. **Be aware** that some makes of cheap level senders can prove troublesome, as the lever arms tend to be sticky. This prevents the floats from floating on the surface of the fuel at all times. As a consequence, this will lead to incorrect fuel level indication.

Once you have installed a fuel level sender into your tank, make sure the float can travel all the way from empty to full position without hindrance of any kind.

The calibration procedure should be carried out with your aircraft in flight attitude. This means you need to lift the tail if you have a tail-dragger or lift the nose wheel if you have a weightshift trike. You start the calibration procedure with an empty tank.

Your first determination should be how much reserve fuel you should carry. Reserve fuel would be fuel that is not taken into account by the fuel level sender. We recommend at least 10% of your fuel tank capacity as reserve fuel, preferably even more.

To illustrate the calibration procedure, let us assume we have a weightshift trike with a tank capacity of 50 liters without reserve.
We decide to use a five-liter reserve, leaving us with a usable fuel capacity of 45 liters.

Our first step is now to enter this capacity into the instrument. Use the "prev" and "next" keys to move the highlight to the "fuel tank capacity" item. Then use the + and – keys to set the entry to read 45 liters.

Our next step would be to raise the nose gear of the trike to flight position. An upturned bucket or similar item is normally all that is required.

We now start with the empty tank. Add five liters of fuel (our reserve quantity) using a suitable measure. Make sure the measure is suitably accurate.
This is now the "level sender reading at 0 Lt" position. Move the highlight to this position and wait until the sender reading has stabilized (You will see the sender reading at the top line). This could take up to a minute so have patience.

Should this number not react to changes of your level sender position, then you have a problem. Please check your wiring according to the installation section of this manual.

If you see the number changing then everything is well. Once it has stabilized and the highlight is on the 0 Lt position, press the "select" key to transfer the reading from the sender to the calibration point.

Now you are ready for the next step. Add the required amount of fuel to get to the next level (In our case 9 Lt – this is 20% tank capacity). Once done, wait for the reading to stabilize and press "select" again after you have moved the highlight to the "9 Lt" position.

Proceed in a similar manner until you have reached the last calibration position at 100% tank capacity.

You are done !

Press "Menu" to exit this function. This will write the new calibration to permanent memory in the instrument. You can repeat this calibration many times so do not worry if you do not get it right the first time.

The instrument uses the 6 calibration points to work out a correction curve that takes into account the tolerances of your fuel level sender and the shape of your fuel tank. This results in an incredibly accurate and usable fuel level display that far exceeds that available from ordinary dial type gauges.

Note:

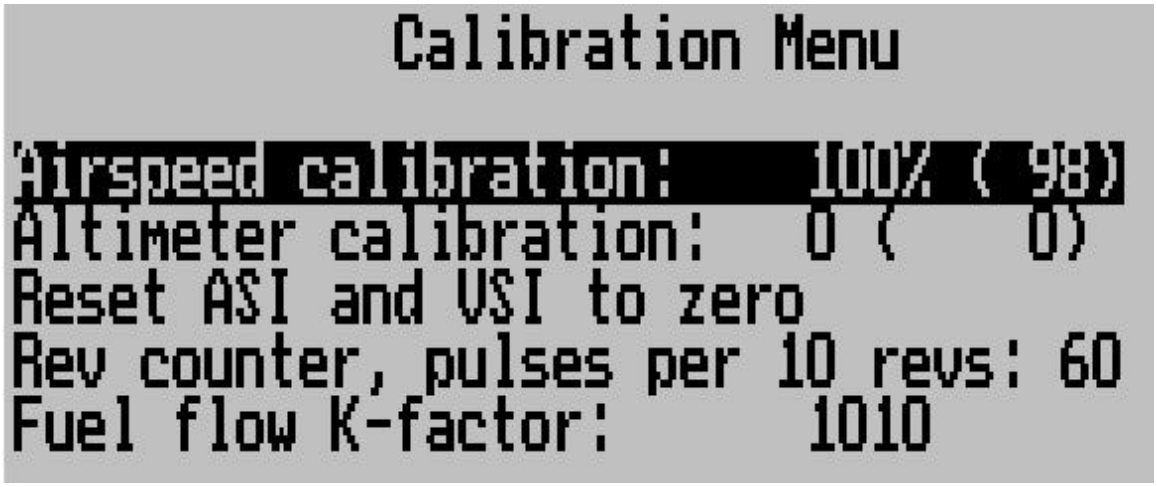
The calibration positions may be edited by using the + and – keys. This allows you, in theory, to copy calibration settings from one instrument to another. We however recommend that you do go though the calibration procedure even if the two aircraft are identical in all respects. Tolerances do exist and the calibration cancels these out.
Accurate fuel level displays are a vital safety factor for an aircraft and a very useful feature for peace of mind during cross county flights.

Notes on Slope error

Sender value is a value determined by the Stratomaster Ultra. It is used to calculate e.g. fuel level, fuel bingo estimate and current range estimate. The fuel tank setup sender value can either increase in value as fuel is added on decrease in value if fuel is added. This is dependant on the type of fuel level sender used. However should the second reading be larger than the first reading all readings will have to be larger than the previous reading. Likewise should the second reading be smaller than the first reading all readings will have to be smaller than the previous reading. If this is not the case the wording "Slope error" will be displayed. This could happen when fuel was removed instead of added between steps, no fuel was added between steps or when the fuel level sender was moved in the wrong direction e.g. moving the fuel level sender manually when it is not inserted in to the fuel tank.

Should you get a slope error message determine the cause of the error. If you do not know the cause of your error it is best to start from scratch. It should be remembered that accuracy is the fuel tank calibration is Ultraly important to enable your Stratomaster Ultra to display the correct data.

Calibration Menu



Airspeed calibration

This function is used to calibrate the airspeed reading. It works in % relative to a nominal value. Your calibration certificate will give you the setting required for correct reading if no external airflow factors are present. In many aircraft installations it may be required to correct the reading to cater for errors created by the airflow around your aircraft.
You can use the + and – keys to change the calibration factor.

An easy method to determine the amount of position error on your aircraft would be to wait for a wind still day, set the Stratomaster Ultra to display TAS, equip your aircraft with a GPS and take a flight. The ground speed as reflected by the GPS and the TAS as reflected by the Stratomaster should agree if there is no position error. Any difference between these two readings would be the position error.

It should be remembered that if you enter an incorrect adjustment here all airspeed readings would reflect this error. It is thus important that the amount of error be determined accurately.

Examples:

Stratomaster Ultra under reading

TAS as indicated by Stratomaster Ultra = 53 mph
Ground speed as indicated by GPS = 55 mph
Difference = 2 mph

Express difference as a % of TAS.

(2*100)/53 = 3.77 % rounded to 4 %

Enter (100+4) = 104 under airspeed calibration.

Stratomaster Ultra over reading

TAS as indicated by Stratomaster Ultra = 60 mph
Ground speed as indicated by GPS = 55 mph
Difference = 5 mph

Express difference as a % of TAS.

(5*100)/60 = 8.3 % rounded to 8 %

Enter (100-8) = 92 under airspeed calibration.

Stratomaster Ultra reading correct

Enter 100 under airspeed calibration.

To enter airspeed calibration the following steps should be followed:

Step one: Press Next until the required field is highlighted

Step two: Press plus and minus to change

Step three: Press next to move to the next field

Altimeter calibration

This calibration is done at the factory using very accurate references. It is not normally required to change this setting. You may do so if you feel that you would rather use another reference, like your local airfield's elevation according to survey maps.

Be aware that generally survey maps and GPS readings may not give you the expected readings and are subject to small errors. For example, your GPS receiver may be using a different datum of reference to the survey maps.

The value entered here is a correction factor that is entered during calibration of your instrument. This factor is shown on your calibration certificate.

At sea-level, one unit corresponds to an air pressure difference as expected for a 7 ft (2,1 m) change in altitude. At 5 000 ft (1 524 m) MSL this corresponds to about 10 ft (3 m). A positive correction factor will decrease the altimeter reading and a negative factor will increase the reading.

Please do not confuse this setting with the QNH (local pressure) setting available from the main display (+ and – keys).

Reset ASI and VSI to zero

This function is used to calibrate the zero point readings of airspeed and vertical speed indicators (ASI and VSI). Use this function from time to time to zero the readings. This way your instrument will always perform at its best. Perform the zero calibration when your aircraft is on the ground and **not exposed to any airflow (for example when it is parked inside the hangar). (The engine should not be running)**.
Do take care to perform the calibration in conditions where no air pressure fluctuations are present. For example windy conditions can have an effect of air pressure inside your hanger that may lead to a false setting of the zero point for the VSI.

Use "select" to perform the calibration. The display will not change but may flicker for a moment. The calibration takes only a few fractions of a second. You may find that it is perfectly sufficient to perform this calibration once a year.

This function is the equivalent of the zero setting screw on traditional analog instruments.

Rev counter: Pulses per 10 revs

Use this function to calibrate your rev counter. A value of 60 is used for most two-stroke Rotax engines based on the Ducati DCDI system (6 pulses per rev). Rotax 912/914 engines produce 1 pulse per rev so the correct setting would be 10.

Select the value according to your engine's tach generator output for all other engines.

Should you have an engine without a tach generator such as a VW, we suggest that you try a pickup using a wire looped tightly about 20 times around one of the spark plug leads. (See installation manual for further details on this method). A spark is generated every second revolution per cylinder on a four stroke engine so you should enter a value of 5 in this case. You can also try pickups directly from the switched end of the ignition coil (points). This may give you a better signal. In this case the factor to be entered will depend on the number of cylinders. You should find two cylinders firing for every revolution in a typical four-cylinder four stroke engine so this would give you a factor of 20 to enter.

Fuel flow K-Factor

This setting is used to calibrate the fuel flow sender if you fit such a device. Increase the setting to lower the fuel flow reading and vice versa.

The value of 7000 corresponds to the recommended setting for the RS 256-225 liquid flow sender. Using this setting and a correctly installed sender you should expect an accuracy of about +/- 3% maximum error.

This factor will affect the instrument's range and fuel bingo time estimates so be careful should you choose to change this setting. Should you have difficulty in obtaining the correct fuel flow indication your problems are most likely due to vapor bubbles trapped in the fuel sender housing. Make sure you install the sender in such a way that it is not possible for bubbles to remain trapped in the sender housing.

The K-factor is the number of pulses the flow sender will generate for one liter of fuel flow. Most flow senders will be in the range of about 2000 to 15000 pulses per liter.

CARING FOR THE STRATOMASTER ULTRA

Pitot tube

Dust etc. can cause a blockage in the pitot tube. Such blockage will effect the operation of the pitot tube which will in turn affect the accuracy of the ASI/TAS readings. We recommend that the pitot tube be covered when the aircraft is not in operation.

Cleaning

The Stratomaster Ultra can be cleaned by wiping it with a damp cloth. A mild soap may be used if necessary.

Take care not to wet the instrument excessively.

Do not use chemicals e.g. petrol, spirits, turpentine when cleaning the instrument.

Calibration

The Stratomaster Ultra instrument does not require re-calibration if it is used in normal operation.

Stratomaster Instruments used as references to calibrate other instruments may be sent in for periodic calibration to MGL Avionics. For this application we recommend a two year calibration interval. Please contact MGL Avionics for details.

Altimetry

This section is intended to clarify how an altimeter works and what determines its accuracy in simple terms.

As you know an altimeter is a simple absolute pressure gauge. This means it measures the pressure of the surrounding air relative to absolute vacuum as you would find in outer space.

Ordinary, well made altimeters are intricate mechanical devices that can achieve very good performance. However, these are subject to a whole host of influences that introduce errors in the readings. Vibrations tend to wear out the tiny gears, temperature has an effect on the elasticity of the materials used and therefore has a direct influence on the reading. The quality of the vacuum has a direct bearing on errors and the maximum altitude the instrument can indicate with a reasonable error.

The Stratomaster Ultra is based on a silicon pressure sensor. In principle, these sensors are subject to many of the problems that affect ordinary mechanical instruments and many digital altimeters have poor accuracy and resolution.

What is different in the Stratomaster Ultra?

The Stratomaster Ultra employs the most accurate absolute pressure sensor available. This sensor is not cheap or simple. It starts with a tiny cavity in a silicon chip. This cavity is about ¼ mm^3 in size and contains a near perfect vacuum. It is sealed with a very thin membrane that is only a few thousand atoms thick. The air pressure on the one side of this membrane bends the membrane towards the vacuum cavity. This introduces tiny changes in the electrical properties of the membrane. These changes are measured. Temperature effects on the membrane are taken into account by measuring the temperature on the membrane