General

This document describes the functions of the Multi-Gauge dashboard extension for the Yamaha FZS1000.

First start

At start up the multi gauge shows several welcome screens. After that the normal use screen is displayed permanently, showing the current values:

At standstill the electronics is not able to determine the engaged gear as no speedo signal is available. This state is indicated by a horizontal bar.

The readout of water temperatures is suppressed below 40 °C. A horizontal bar is displayed instead.

Normal use

As soon as the bike starts moving, the electronics is able to determine the current gear and displays it.

The following example shows: 2nd gear engaged, 11 liter of fuel remaining, water temperature at 74 °C and ambient temperature at 24 °C.

Operation

Operation and settings are performed by the existing cockpit buttons **SELECT** und **RESET**. The following actions will be recognized:

- **long** press on **SELECT** (or permanently pressed) (**S**)
- **short** press on **RESET** (**R**)

The naming of the buttons is not associated with their function inside the multi gauge, it's given by the cockpit. Interactions with the speedometer counters are minimized by utilizing the press duration.

The software of the multi gauge is under continuous development. Therefore it might happen that this documentation is in some aspects behind the present software and not completely fitting. Typically those deviations are of minor nature. In case of major and general changes this guide will be updated.

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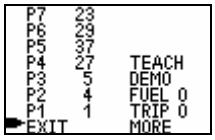
Viewmode fast-change

Toggling between favorite viewmodes is quickly done with **R**. Each press on **R** brings the next favorite to display in a consecutive, endless loop. At the end it jumps back to the first entry.

The multi gauge provides a list of more than 30 alternative display layouts (named VIEWMODES). Out of this list the user can select a group of **seven** as preferred **favorites**. At power-up the display is always set to the first favorite (P1). The mapping of viewmodes to favorites is not restricted, also multiple usage is possible. A very easy and comfortable way for switching is the installation of a „third button“ (**3**), e.g. by converting the flash light button.

Changing favorites

The mapping of the 7 favorites can be chosen freely. Press long **S** to enter the menu. You will find the 7 favorites named „**P1**“ to „**P7**“ with the assigned viewmode numbers behind:



Move the small indicator arrow by keeping **S** pressed. Release if the desired position is reached. Press **R** to alter the value. Any change is saved immediately. Other positions can be changed accordingly. The same viewmode can be assigned several times.

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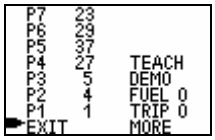
Configuration Menü

The configuration menu is started with **S**. The first screen is already known from changing favourites.



EXIT

Return to normal use.

TRIP 0

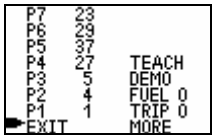
Reset the internal trip counter. Used for fuel economy.

FUEL 0

Reset the internal fuel counter. Used for fuel economy.

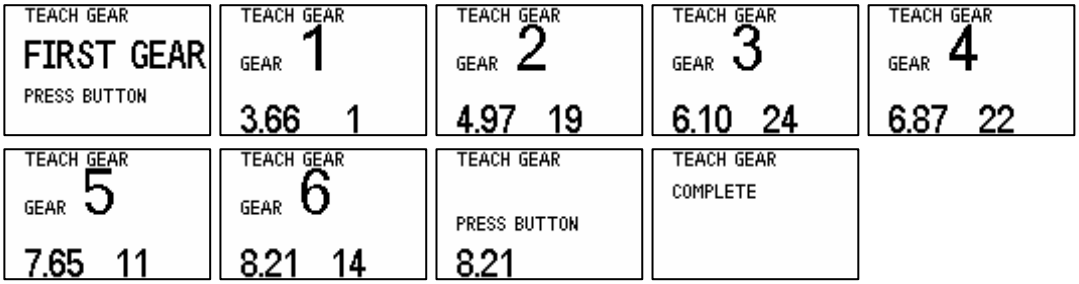
Demo

Cycles through all viewmodes. The overlayed number is used for setting the favorites.



TEACH

Teaches the gear recognition. Only needed for very special configurations.
Ride the bike in the displayed gear and press **S** . Wait until the countdown timer reaches zero. Proceed with the next gear. The following screens will be displayed:



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MORE

Additional configuration options. The configuration menu is divided into 2 sections.

- Section **1** contains settings to be altered individually by the user. Those are the welcome messages, units for distances, fuel, temperature and the like. You get into this section with MORE.
- Section **2** contains adjustment values and fixed settings e.g. type of bike and the like. Those settings are typically never modified, and should never, not even unintended. Therefore a simple security is implemented. Access is only possible from a special menu item at the end of section 1.

General remarks:

Changed parameters can be saved permanently by selecting **SAVE**. A few items differ, those are saved instantaneously.

NEXT takes you to the following menu screen.

You have to run through the complete menu to come back to the entry screen to **EXIT**. (Fast forward: keep **S** pressed).

Power-off during menu is without consequences.

Some menu entries are only for service and viewing and have no parameters to alter.

Some menu entries are only usefull if the corresponding hardware is present (e.g. GPS, fuel economy, ..)

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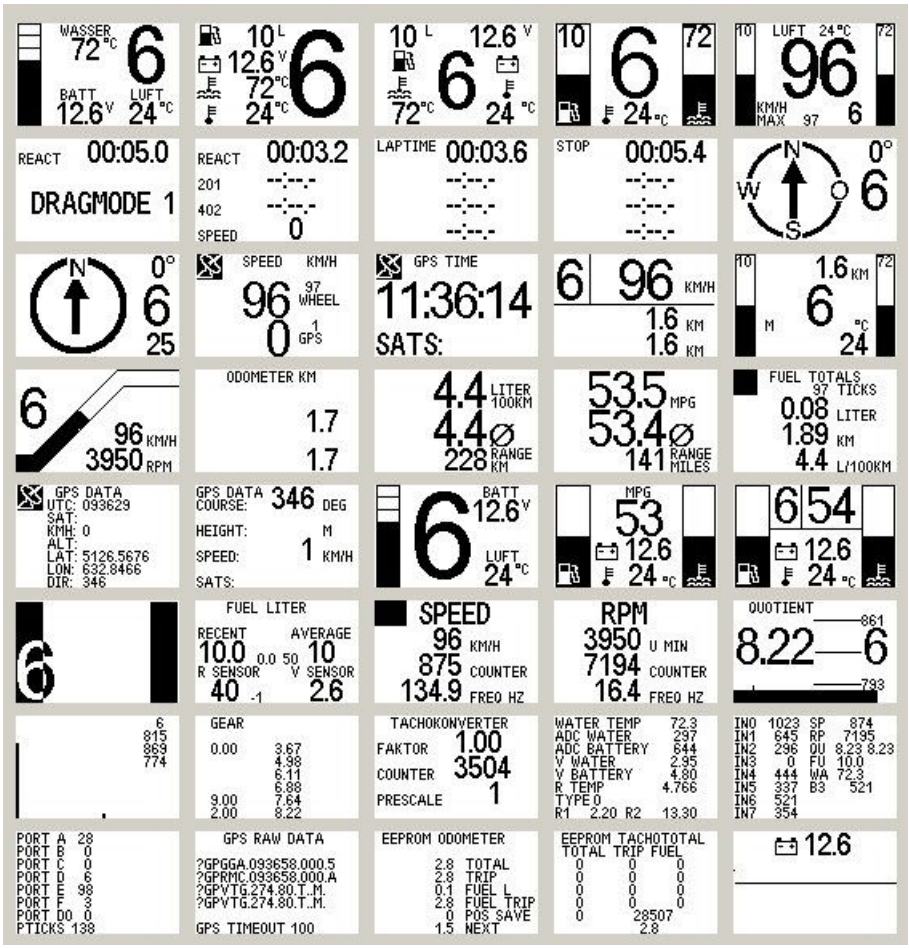
List of Viewmodes



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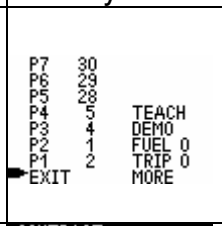
Menu 1

#	Layout	Remark
1.1		7 favorites (P1 .. P7) to be assigned with individual viewmodes. Changes are saved instantaniously. MORE to enter menu TRIP 0 to reset trip distance counter FUEL 0 to reset fuel consumption counter DEMO to show all available views TEACH to learn new gear recognition values
1.2		Contrast setting for the LCD. Min 6, Max 24
1.3		Correction factor for the build-in speedo converter. Select ratio (e.g 15:44) or arbitrary factor with PLUS and MINUS. Select SAVE to save. This factor scales the speedo signal going to the analog cockpit's speedometer and odometer.
1.4		Select MORE from 1.3 to reach this. Special commands for testing the speedo converter. Set to DISABLE if function is not needed. Enable SLIP to correct for additional wheel-spin.
1.5		Correction factor for **viewmodes with speedo readout (e.g. #5)**, independent from speedo converter settings. This value scales ONLY the digital speedo readout inside the multi gauge. The analog speedo and speedometer are not affected.
1.6		The **digital speedo readout** is corrected by this internal SLIP-factor. It follows are square function. The default is 4% at 200Km/h. Example: measured: 208Km/h -> corrected by –4% -> Readout 200Km/h
1.7		Limit for shift light. The fuel-LED **flashes** if the RPM is above a certain limit. Those limits can be set individually for each gear.
1.8		Limit for shift light. The fuel-LED **is on permanently** if the RPM is above a certain limit. Those limits can be set individually for each gear.
1.9		Minimal number of identical consecutive measurements until a new gear is accepted as valid. Higher values slow down recognition.
1.10		Fuel level, number of most recent measurements taken for averaging. Preset values for NORMAL, FAST and SLOW behaviour.
1.11		Lower limit for fuel warning light to come up.

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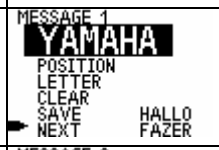
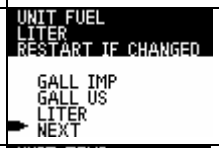
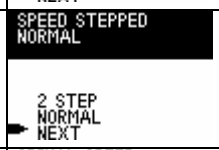
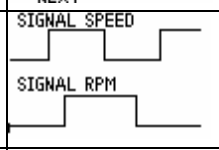
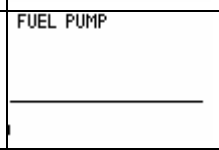
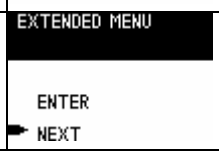
1.12		Suppress start-up messages.
1.13		Self definable start-up message, line 1. Change POSITION to the desired position in the word, change the character with LETTER. The font is limited: N? 1234567890+-.:seEABCDEFGHIJKLMOPQRSTUVWXYZ,*/°
1.14		Same as before for line 2.
1.15		Units speed
1.16		Units fuel
1.17		Units temperature
1.18		Type of logo during start-up
1.19		Language for viewmodes, menu always remains in english.
1.20		Automatically jump back to favorite P1 after a certain time. Change wait time with PLUS/MINUS.
1.21		Displays the speedo-readout as normal or in steps of 2 km/h.
1.22		External Signals over time.
1.23		External Signals over time.
1.24		Select ENTER to get access to section 2 of the menu.

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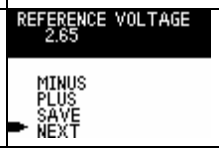
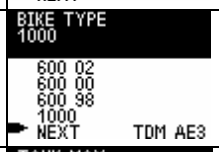
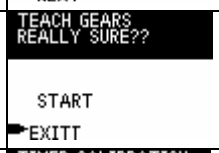
Menu 2

#	Layout	Remark
2.1		Calibration value, do not modify! Can only be measured on the pcb.
2.2		Calibration value, do not modify! Can only be measured on the pcb
2.3		Bike type. Alters related settings accordingly (e.g fuel capacity, gear recognition)
2.4		Maximum fuel capacity. FZ1 has 20 liter in reality.
2.5		Fuel sensor tolerance and offset compensation.
2.6		Fuel sensor tolerance and offset compensation.
2.7		Timeout for missing speed signal recognition.
2.8		Gear recognition parameters (quotients). Modify in case default values do not fit. Individual setting for each gear. Select gear with NEXT GEAR. Don't forget to SAVE each value!
2.9		Start gear teaching. Sees also first menu screen.
2.10		Calibrate internal clock. Improves accuracy of stopp watch and speedo readout. Press START, wait for exactly(!) 1 minute, press STOP, SAVE.
2.11		Fine tuning for ambient temperature sensor. Modify until readout matches to a reference.
2.12		Select alternative oil temperature sensor. Needed for older FZS600 models w/o water sensor. Consult installation guide for further details as additional wiring is required.

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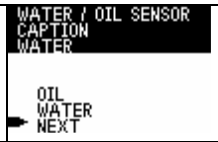
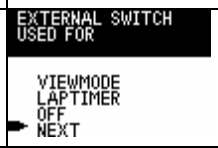
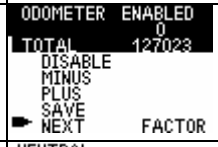
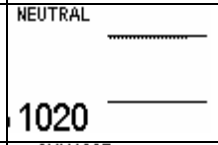
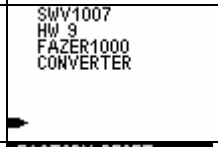
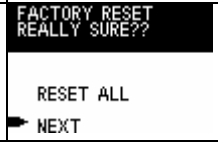
2.13		Caption for viewmodes.
2.14		Temperature limit for fuel (warning) LED to start flashing.
2.15		Configuration for an optional „third“ button.
2.16		Configuration for external GPS receiver. Set baudrate until message header (e.g. RMC) indicates successful decoding. Fine tuning with UP/DOWN
2.17		GPS time offset. To compensate for time zone differences. Systematically the GPS time has a constant remaining offset of about 15s compared to UTC.
2.18		Fuel Consumption. Number of fuel pump ticks to deliver 1 liter of fuel. Requires hardware extension and wiring.
2.19		Odometer settings Disable/enable storing of values to the internal EEPROM. Preset odometer by using plus/minus and factor
2.20		Important signals over time. Next signal with SELECT.
2.24		Overview about hardware and software versions.
2.22		Reset to factory defaults. Important values will be preserved.

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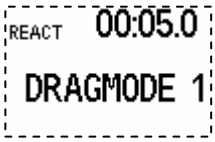
Particularities

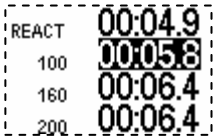
Dragmode:
In „DRAGMODE“ (acceleration measurement, viewmode 6 and 7) the display layout changes with state. At standstill and engaged gear the start-view is displayed. The measurement starts automatically as soon as a moving wheel is detected.

Standstill



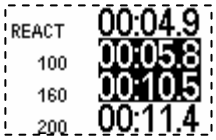
The “reaction” counter in the top line is counting down from –5s. Try to start at zero. The counter shows the response time zero until the first wheel movement is detected. The result does not affect the following measurements.

Split time 1:



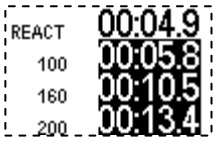
The first counter stops when passing 100Km/h, in the shown example at a time of 5.8s. This value is frozen and the displayed line inversed.
Current total elapsed time is 6.4s.

Split time 2:



The second counter stops when passing 160Km/h. This happened at an example time of 10.5s.

Finished:



A speed of 200Km/h is reached after 13.4s. All results are displayed inverted, except response time if below zero (jump start).

The display is erased and reset to „standstill“ state as soon as the wheels stop and a gear is engaged, ready for the next round. To preserve the results temporarily switch to neutral **before** the bike comes to a complete halt.

Gear Shift Indicator View:
The white bar shrinks with increasing RPM until the programmed shift-limit is reached.

1000 RPM

5000 RPM

8000 RPM

11500 RPM

GPS:

GPS-data will only be displayed if a GPS receiver is connected to the multi gauge. See related document “Multi Gauge Extensions” for details.

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Fuel Economy:

Data will only be displayed if the fuele pump is connected to the multi-gauge.

FAQ

- The water temperature readout only shows '-':

No defect. This is intended and happens as long as the temperature is below 40°C. The sensor's accuracy is not sufficient for lower temperatures.

- The value for ambient temperature is too high/inaccurate:

The sensor might be placed near the main lights and be influenced by their thermal radiation. Also the sensor has to be kept dry as he is quite sensitive to moisture. Mold into epoxy resin or similar.

- The gear readout is not constant/jumping:

There might be driving situations where the RPM/speedo signals are not interpreted correctly, maybe in combination with bad signal qualities. This can be compensated by modifying GEAR DELAYTIME on the cost of response time.

- GPS is activated but no data will be shown:

A few functions demand additional, external hardware. So the GPS does. Keep the respective menu entry disabled if not used. Consult the "Multigauge Extensions" document for more details.

- The fuel consumption readout does not work:

This function requires an additional connection to the fuel pump. Consult the "Multigauge Extensions" document for more details.

- Odometer and trip values are not stored; Odometer not matching the dashboard readout:

The function has to be enabled in menu 2.19. The odometer's base value has to be programmed manually.

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