

Flight Computer 1.0

Users Guide



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Welcome!

Congratulations on the purchase of your Flight Computer. Xicoy are dedicated to the design and production of electronic controllers to the highest standards of quality and reliability to bring you the customer the very latest next generation designs.

Features

The Xicoy Flight Computer is a device designed to collect, display, record, transmit, merge and control all the typical data necessary on a modern jet aircraft.

Current features:

- 2.4" full color touchscreen display, high quality, sunlight readable.
- Connection to the Xicoy Fadec to collect the engine data and display in graphical form
- GPS module (option) to collect the coordinates, ground speed, date, time and altitude.
- Airspeed pressure sensor (PLUS option) to measure the airspeed using a pitot tube.
- 3 axis accelerometer to measure the G load in all 3 axis.
- Barometer/altimeter/thermometer. Measures barometric altitude and air density to calculate the engine performance.
- Telemetry output to send the entire data trough the telemetry link of the radio. Currently supported Jeti, HoTT, Futaba, JR, Spektrum and Multiplex.
- uSD memory card to store all measures from sensors, GPS data, battery voltage, engine data. Supplied with a card capable of 2.000 hours of recording, one set of data each 0,5 seconds. Data analyzable by the supplied computer software and exportable to Excel and Google Earth.
- Software updatable trough the uSD card.
- Output for 2 high power LED, to visually show the airspeed during landing.
- Compatibility with Jetcat turbines (JetCat version).

Planned future additions

- Twin engine connection, data of the 2 engines displayed in same screen and stored in uSD card.
- Twin engine control. Sequential starting, synchronization and automatic management of engine flame out.

***Please note:** The future additions are planned, but Xicoy Electronica cannot guarantee if or when these new features will be available, please contact us for details.*

Available models and accessories

The Xicoy Flight computer is currently offered in 3 models, PLUS, BASIC and JETCat. The difference is in that the basic model doesn't have the Pitot pressure input to measure the

airspeed; hence airspeed related functions are disabled. The JETCat version is compatible only with JETCat engines.

It is not possible to upgrade a BASIC unit to a PLUS unit after manufacture.

Currently the available accessories are:

- GPS module
- LED indicators.
- Pitot probe. (Only for PLUS version).

Electric connections



Picture 1

All the connections are placed on the left side of the box and functions labeled. (Picture 1)

From Left to Right:

Throttle Out1, Out2, In: Twin engine operation. Not used on current release.

Telemetry Out: Data output to receiver.

GPS: Connection to GPS Module

Eng1: Connection to ECU. Xicoy ecus with servo lead data terminal currently supported.

Eng2: Connection to second engine. Not supported in

current release.

LED: Output to 2 external LED lights.

Port1...6: Not used. Inputs/Outputs for future expansion (sequencer, etc)

If telemetry is used, the unit will be powered from the telemetry lead from the RX.

If telemetry is not used, then the unit can be powered directly from the ecu, if the ecu is of latest version (year 2012 or newer), but the ecu will power only the flight computer. If external modules like GPS are installed, it is necessary to provide external power. Connect the patch cable provided from the "throttle In" socket to any unused socket on the receiver or PowerBox-like system. Signal present on this output is not important, only power will be used 9 Volt maximum.

Warning: *All sockets, except the Engine 1 and 2, are connected in parallel. In an installation that uses different voltages, a cross connection can occur through the device. For example, if the RX is powered at 5.0V by an independent source but any other input is connected to a different higher voltage, then the RX will be powered to this higher voltage through the telemetry lead. In this case, it is necessary to cut the red wire on the telemetry lead to avoid feeding the RX through this lead.*

Air pressure input: (PLUS model only)

Connect the lines from the Pitot tube on the nipples on the bottom of the box. Top nipple is the static input (white) and bottom is the dynamic pressure input (red).



Picture 2

Memory card

The slot for the memory card is located in bottom/right side (**Picture 2**). Card should be of microSD type (**Picture 3**), maximum capacity 16Gb. Formatted in FAT or FAT32, other formats are not accepted. Typically the recording function uses 1MB/hour, so a 1 GB card can store 1.000 hours.



Picture 3

Operation

At power-up the main screen will be displayed (**Picture 4**). There are currently 3 buttons.

- Info. Access to information / measures menus.
- Setup. Access to setup screens
- Tools: Special menus for advanced functions, like software upgrade and settings backup.



Picture 4

Info screens

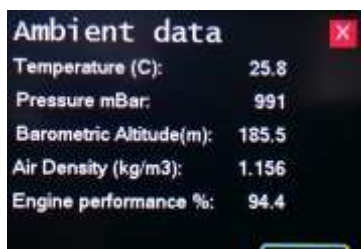
After touching the Info button (**Picture 5**), a list of the different measures will be offered.

The list displayed on your particular unit can be different depending on the options installed and software version.



Picture 5

Air Data



Picture 6

This screen (**Picture 6**) displays the current ambient conditions. Temperature and pressure are measured by the internal sensors. Altitude, air density and engine performance are calculated from this data. Jet engines provide the nominal thrust at 15°C and sea level conditions. The expected engine power at the current ambient conditions is automatically calculated and displayed.

GPS

If the GPS module (**Picture 7**) is connected, this screen displays the data in real time.

GPS module should be installed in the model with the antenna on top (as per picture) and without any metallic or carbon fiber cover.



Picture 7



Picture 8

The GPS module (**Picture 8**) has two LED lights. Green blinks while it is looking for satellite data, and the blue blinks when the module has acquired the position and is fully functional.

G-Meter

On the left side (**Picture 9**) the current measure of all 3 axis are displayed, and the gauge will record the maximum achieved since power-up, so the maximum airframe stress can be check after landing.



Picture 9

Airspeed *(Plus model only)*

Airspeed measured by Pitot tube is displayed, as well as maximum airspeed achieved since power up in km/h, mph and knots. The maximum is set automatically to zero at power-up, and can be set to zero manually by touching the Reset button (**Picture 10**).



Picture 10

Engine data terminal

The half bottom of the screen (**Picture 11**) displays same data similar to the normal data terminal, including the buttons. The upper half of the screen displays the data in real time in graphical form. RPM, EGT, Pump power and fuel gauges.



Picture 11

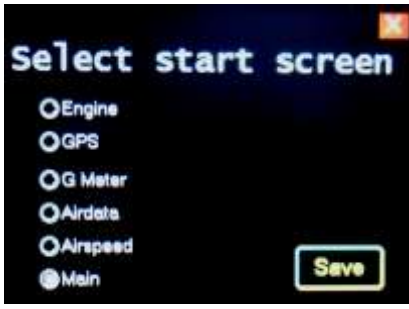
SETUP screens

Touching the SETUP button (**Picture 12**) on main screen, the different adjustment options will be displayed.



Picture 12

Default /start screen



Picture 13

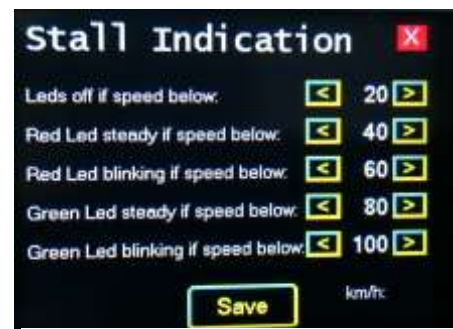
This screen (**Picture 13**) allows selection of the main screen at power-up. There is a delay of few seconds after power-up before changing to selected screen.

Stall Alarm *(Only available if Pitot or GPS installed)*

The Airspeed information when is transmitted by telemetry, some radios allow to set voice alarms to indicate the airspeed, especially during landing. For those radios without telemetry, or in slow telemetry systems, an optical aid can be controlled by the Flight Computer. Through the LED connector the system can power two high power LEDs (250mA maximum) to be installed in the airframe. The leds will light accordingly to airspeed per the settings entered in this screen. Pilot can get the information of the speed quickly and without taking the focus away from the plane.

Speed information is taken from Pitot tube in "Plus" models.

In "Basic" models, the GPS module should be installed to enable this function.



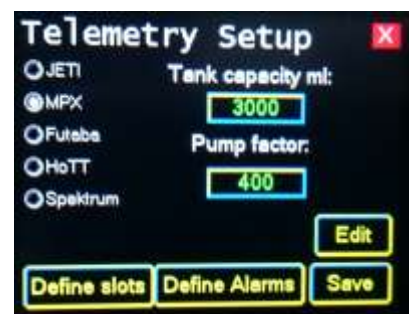
Picture 14

Warning: *The speed measured by the GPS module is related to ground, it does not account for the wind. Alarms could be unreliable in windy conditions using GPS data.*

Telemetry output

All the information from the engine and different sensors is sent to the receiver through the "Tele Out" port when used together in Jeti, Multiplex, HoTT and Futaba radios. Spektrum radios will be supported using the central white connector.

Main telemetry setup allows selection of the radio brand (**Picture 15**) and to enter the tank capacity and pump factor (please check the manual of the Xicoy telemetry adapter for detailed description).



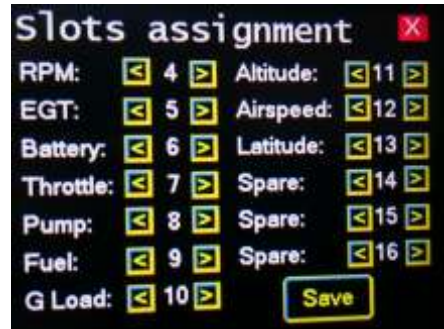
Picture 15

To change any setting, first touch the "Edit" button to enable the fields to be modified. Once information is entered, click the "Save" button to store the settings in permanent memory.

Transmitted data to the TX may vary depending of the radio brand. Jeti allow all data (engine data, G load, Airspeed, altitude, GPS coordinates, GPS speed, height), but other radios don't support some of the measures or are displayed using wrong units (amperes in place of G load, for example).

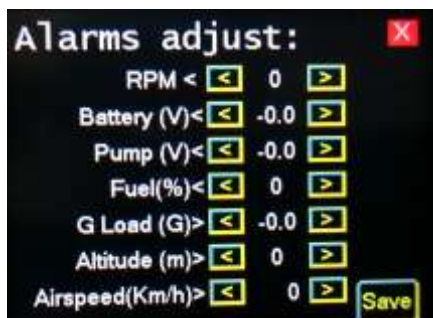
Slots assignment *(MPX and Futaba radios only)*.

This screen (**Picture 16**) allows assignment of the telemetry slot on MPX and Futaba radios so the measures can be transmitted.



Picture 16

Alarms adjust (**Picture 17**)*(On radios that allow alarms through telemetry)*



Picture 17

Remote alarms can be set on this screen for the radio systems which need that alarms be programmed in receiver side.

Data recording

If there is a memory card inserted, the Flight computer will record all the measured data once each 0,5s on the card.

Data recorded in text form can be read using any text editor like Notepad, imported to Excel, or viewed in 3D on Google Earth using the free FlightViewer software supplied by Xicoy.

A new file is created at each power-up. Files are numbered and if the system has the GPS module installed and it is receiving data, the date and time of the file will be the current one.

An example of a file is:

Xicoy Flight Computer Ver. 0.3

Date, Time, Cycle, RPM, EGT, Pump, Throttle, EcuBat, RxBat, Fuel, BaroAlt, G, Airspeed, Longitude, Latitude, GPS Speed, GPS Height

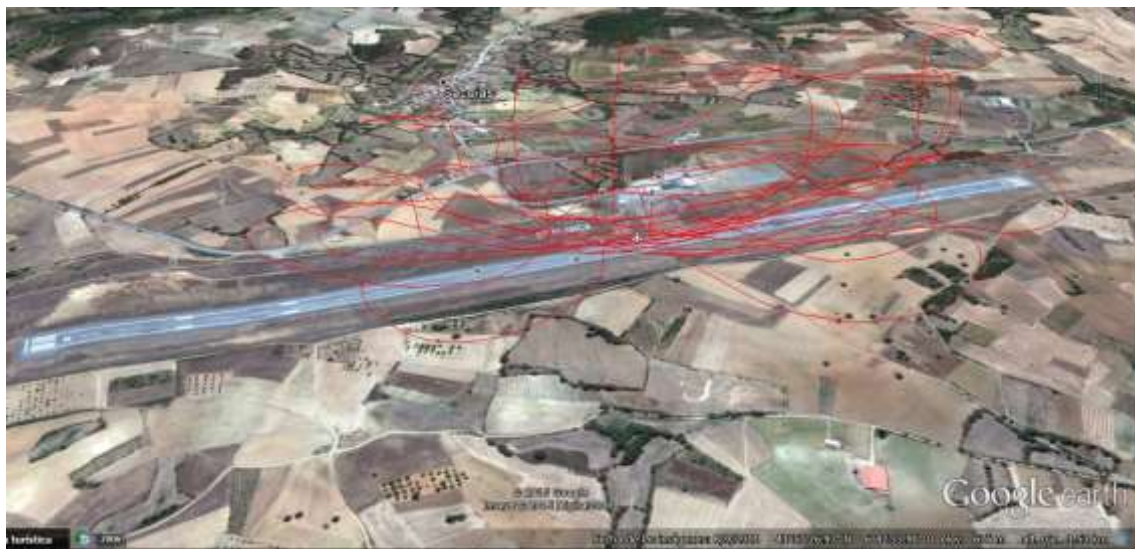
```
06/06/15, 15:50:17, 2, 31900, 576, 21, 50, 8.1, 5.9, 100%, 64.36, 0.9, 113, 004°55.2480E, 44°10.8052N, 4, 97.7
06/06/15, 15:50:18, 2, 31900, 576, 21, 50, 8.1, 5.9, 100%, 64.27, 0.7, 113, 004°55.2475E, 44°10.8051N, 3, 97.8
06/06/15, 15:50:18, 2, 32000, 580, 21, 50, 8.1, 5.9, 100%, 64.20, 0.4, 113, 004°55.2470E, 44°10.8050N, 3, 97.8
06/06/15, 15:50:19, 2, 32000, 580, 21, 50, 8.1, 5.9, 100%, 64.21, 0.5, 113, 004°55.2466E, 44°10.8049N, 4, 97.9
06/06/15, 15:50:19, 2, 32000, 580, 21, 50, 8.1, 5.9, 100%, 64.18, 0.9, 113, 004°55.2460E, 44°10.8048N, 4, 97.8
06/06/15, 15:50:20, 2, 32000, 584, 21, 50, 8.1, 5.9, 100%, 64.24, 0.9, 113, 004°55.2456E, 44°10.8046N, 5, 97.7
```

If the GPS module is not used, then the fields of date, time, longitude, latitude, GPS speed and GPS height will be empty.

This data files can be imported directly in to the "Flight Computer viewer", that is a Windows application that allow to display and analyze the data in graphical form, and to export the data to Google Earth, so that the flight profile with all the data can be analyzed point to point (Picture 18 - 19). Check the manual of the "FC viewer" for detailed information.



Picture 18



Picture 19

Advanced Options

Besides the normal operation of the system, the button "Tools", placed on the upper left side of main screen, provides access to the advanced functions:

SAVE SETTINGS TO CARD: Writes the contents of the settings (alarms, tank capacity, etc) to the memory card.

READ SETTINGS FROM CARD: Read a previously recorded file on the card and write to the memory of the unit. (Picture 20)

CAUTION: All settings on the memory will be replaced by the contents of the file.



Picture 20

SOFTWARE UPDATE

Procedure:

- 1) Use the supplied memory card, or a microSD memory card formatted in FAT16 or FAT32. At time of writing unit was tested with cards from 1 to 8Gb. ExtFAT (32 GB and over) not supported.
- 2) Unzip the provided file. Copy the FC1.bin file on the uSD card. Do not rename the file.
- 3) Insert the card on the unit.
- 4) Assure you have a healthy battery connected.
- 5) Touch on TOOLS button, Software Update, Update button.
- 6) **WAIT!** The procedure takes about 1 minute. Do not shutdown the unit while updating, the software can become corrupted and the unit damaged.
- 7) Once you again see the normal screen with Xicoy logo, check that it display the new version number.

Disposal

Electrical equipment marked with the cancelled waste bin symbol must not be discarded in the standard household waste; instead it must be taken to a suitable specialist disposal system.

In the countries of the EU (European Union) electrical equipment must not be discarded via the normal domestic refuse system (WEEE - Waste of Electrical and Electronic Equipment, directive 2002/96/EG). You can take unwanted equipment to your nearest local authority waste collection point or recycling centre. There the equipment will be disposed of correctly and at no cost to you.

By returning your unwanted equipment you can make an important contribution to the protection of the environment.