



# MET-Engine Software User Manual

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### I. Disclaimer

This disclaimer applies to Wing Flying's users and authorized distributors who have purchased the product. Read the disclaimer carefully before using this product. By using this product, you hereby agree to this disclaimer and signify that you have read it fully. Please use this product in strict accordance with the manual and Wing Flying's guidance. Wing Flying assumes no liability for damage or injuries incurred directly or indirectly from using, installing or refitting this product improperly.

1. User should set the parameters in accordance with the manual.
2. User can update the software.
3. Manufacturer parameters are used for initial calibration . User CAN NOT change the settings.
4. Any alteration or destruction of the internal components is prohibited. Wing Flying assumes no liability.
5. MUST use the correct software in case of any unnecessary damage caused by compatibility difference.

### II. Notice

1. Ensure your engine has been well fixed on the test bench.
2. Ensure the emergency switch of the engine is effective and good working
3. Ensure all screws on the test bench are well fixed.(Need to check whether the bolt mark line is misaligned).
4. Check the propeller installation and ensure engine rotation is correct before test.
5. Ensure the fuel tank and inlet have been well fixed and NO leakage.

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6. Specify the test area. Well fixed the test bench on concrete flooring before test. Ensure no floaters(like plastic bags) around the test area
7. Without operator's permission, other people are NOT allowed to approach in case of any personal injury.
8. Ensure the engine is always off before entering the test area or touching the test stand. Ensure ECU/EFI system is NOT in working condition.
9. Ensure your test is within the specified range. DO NOT exceed the max range of the test bench.
10. Make sure operator is NOT under the influence of anesthesia, alcohol, drugs or suffering from dizziness, fatigue, nausea or any other conditions, whether physical or mental, that could impair your ability to operate the test stand safely.
11. Stop the operation immediately when the software issues an alarm

### III. Introduction

1. MET-Engine software works with Wing Flying engine test bench to acquire and analyze the test data.
2. The software can acquire the data of shaft power, instant fuel consumption, total consumption, propeller efficiency and engine vibration.
3. Real-time data display and data storage(storage frequency up to 10Hz)
4. History data can be read in Chart. User can see the relevant curves and process the data.
5. Compatible with **Windows system**. Contact Wing Flying to download the correct software.

### IV. Installation

#### 1. Operating System

- ◎CPU: 2Ghz and above
- ◎Memory: 2G and above

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- ◎Video card: No requirement
- ◎Screen: 1366\*768 resolution or above
- ◎Operation system: Windows7,Windows8,Windows10
- ◎Software dependencies: Excel , .NetFrameWork4, .NetFrameWork4.6.2

### 2. Installation and Initialization

名称	修改日期	类型	大小
 19056.LIC	2019/8/13 19:36	LIC 文件	1 KB
 MET_Setup.msi	2019/8/9 16:20	Windows Install...	1,909 KB
 setup.exe	2019/8/9 16:20	应用程序	809 KB

Double Click “setup.exe” to run the installer. Follow the instructions to complete installation.

User will see “MET-Engine”and “DataAnalyze”shortcuts on the desktop

Open“MET-Engine”,user needs to install the license for initial installation. Find “File -> Install License” to install the license.

## V. Test Data

- ◎Voltage(V): engine output voltage.
- ◎Current(A): engine output current.
- ◎Power consumption(W): engine output power.
- ◎Temperature(°C): Infrared temperature measurement.
- ◎Thrust(g): thrust collected by the thrust sensor
- ◎Torque(N\*M): torque collected by the torque sensor
- ◎Speed(rpm): Revolutions per minute。
- ◎Shaft Power (W) : torque\*RMP
- ◎Propeller efficiency(g/w): the thrust generated by propeller/motor output power. Thrust/Shaft Power
- ◎Max Vibration(mm/s): vibration at the current moment.
- ◎Throttle Input(ms): Monitor the PWM at the current moment.

## VI. Function

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## 1. Main Interface



**Device Control** -- TT CLR(Clear thrust and torque), AS CLR(Clear Airspeed), EP Clear(Clear fuel consumption), STOP(stop recording).

“**Data Monitor**” displays the data acquired and calculated by the test bench,data update frequency is 3Hz

“**Device Information**” shows the information of the test bench and warning information

“**Chart Monitor**” shows the data in the chart, data refresh frequency is 1Hz

Note 1: Some information may not be displayed, such as optical speed, air speed, barometric pressure, etc. These can be displayed only if they are included in hardware configuration.



## 2. System Settings

"System Settings" includes software setting and test bench parameters.

"Other Settings" used to set the test bench parameters. This mode is designed for developers only. User **CAN NOT** do this setting.

## VII. Operation



### (1) Clear Thrust and Torque

In some cases, the thrust and torque are not 0. User need to clear thrust and torque before test, otherwise the test data may not accurate.

### (2) Clear Airspeed

Clear airspeed before test.

### (3) Clear Fuel Consumption

Clear fuel consumption before test if user needs to recalculate power consumption.

## VIII. Data Analysis

The log(CSV file) will be saved in "My computer/Document/MET Chart/Log" after test finished and the tool locked.

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Open the log, the software will load it automatically. User can select the parameter from the left, then it will be displayed in the chart. Press left mouse button to zoom in and right mouse button to zoom out the curves.

The main Y-axis on the left and secondary Y-axis on the right. User will easily find the data with big differences.

“Data Sampling” is used to process the data. User can set the “period”, then the software will process the data within this period. (include the average and extremum) The “Period” is 0.1s. X-axis represents the time

Test data may not able to display in one chart after a long-time test. User can move the slider to select the data needs to be loaded.