# WF-CO-10KGF Coaxial Thrust Stand

3. 0

## Quick Use Guide (QSG)

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# I. Notice and Disclaimer

Please read following terms carefully before taking any operation:

1. Power Input should be within its range, DO NOT reverse polarity;

2. **DO NOT** test small-size motors with LY-10KGF test stand due to static friction between spindle and guide rail;

3. Ensure the test stand, power supply,batteries and all cables are well fixed;

4. Always **Disconnect** power source before entering the test area or touching the tool. Ensure no electric leakage when voltage exceeds the safety voltage of human body;

5. Check the test stand according to the regular checklist to avoid any safety issue caused by bolts loosening;

6. Operation **MUST** be strictly follow the user manual. Wing Flying has no liability for any issue caused by wrong operation(eg. Approach or touch the rotating motor and propeller);

7. Violent test or destructive experiment is **Prohibited**. Disconnect power source immediately when accidents occur like resonance, propeller exploding and propeller breaking.

# II. Installation

## 1. Install Motor

(1) Choose a suitable motor mount, as shown in Fig. 2.1.1 and Fig. 2.1.2


Fig. 2.1.1 Motor Mount


Fig. 2.1.2 Motor

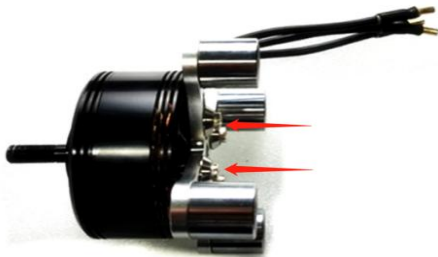(2)Mount the motor with 4 screws and fish-eye washers,as shown in Fig. 2.1.3 and Fig. 2.1.4
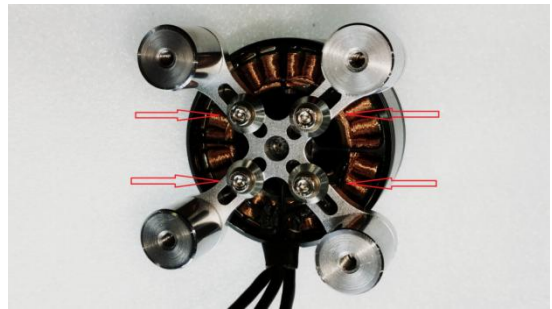

Fig.2.1.3


Fig.2.1.4

(3 )Install the motor on test stand with screws. Motor cables should be on the side of the ESC Mounting Plate, as shown in Fig. 2.1.5:
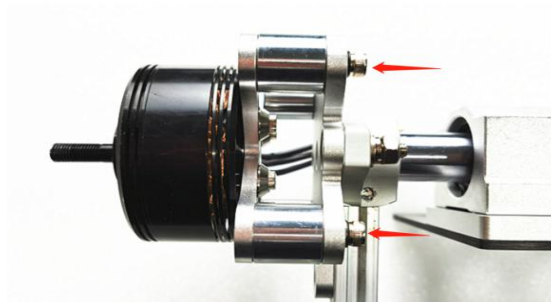

Fig. 2.1.5 Installation Completed

## 2. Install ESC

(1) Mount ESC on the mounting plate.  Connect ESC and motor with conversion cables. Connect
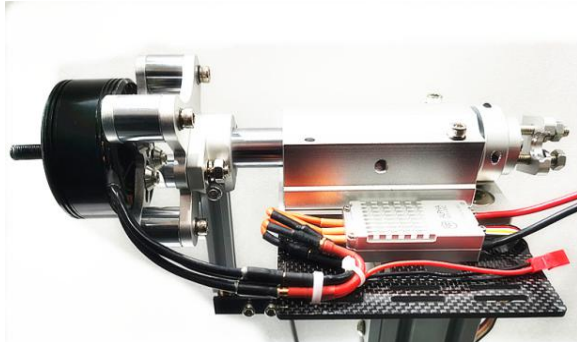ESC with the power module of WF-CO-10KGF, as shown in Fig. 2.2.1 and Fig. 2.2.2:
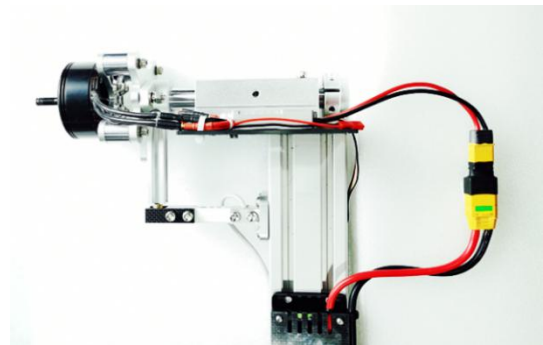


| Fig. 2.2.1 | Fig. 2.2.2 |

Note: Keep a  loose cable connection between motor and ESC, otherwise it will affect the accuracy of the test.

(2) . Connect JST Plug. ESC signal cable connects to "OUT" port on the control module, as shown
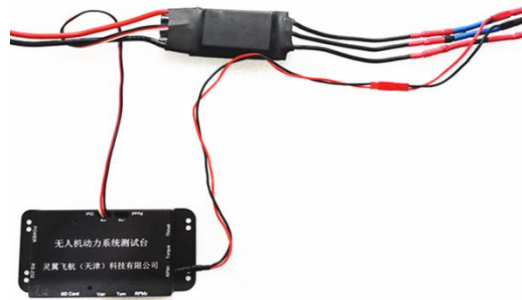in Fig. 2.2.3:



Fig. 2.2.3 Connection of signal cables

Note: Out and read+ come with 5V output  for the receiver or ESC of special requirements. Disconnected them if do not use the receiver or ESC.

## 3. Installation of Infrared Temperature Probe

WF-CO-10KGF measures temperature with infrared detection. Install the probe parallel to the test surface and keep the distance around 1-3cm (keep the lens clean without greasy covered).

The temperature probe detects temperature without touching the object. There will be a deviation due to the emissivity of the object. Therefore, the test area should be in dark (black tape or black marker can be used). Besides, the probe may also detect the ambient temperature,  install the sensor inside the bracket and keep good ventilation,as shown in Fig. 2.3.1 and Fig.2.3.2:
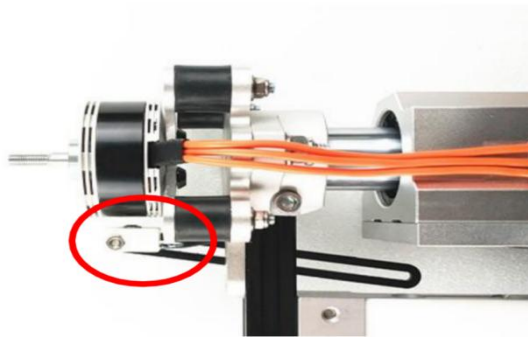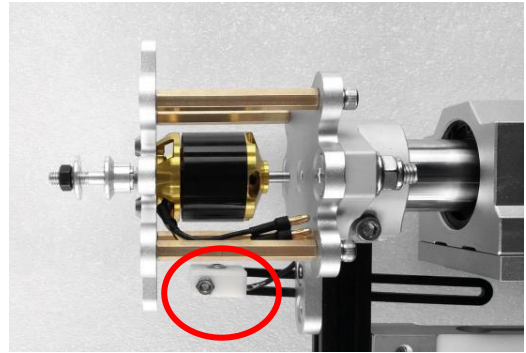
Fig.2.3.1 Location of Temperature Probe


Fig.2.3.2 Location of Temperature Probe

Note: The bracket should not touch the main body or torque sensor to avoid inaccuracy.

## 4. Install Propeller and First Test

(1) Install propellers according to your manual. Ensure your propeller is well fixed.

(2) First Test

User **Should** do the Safeguard settings to prevent any damage for first-time use, as shown in Fig. 2.4.1:

① Min voltage: recommended setting = number of lithium batteries * 2.8V (18650 is 2.5V);

② Max current:  the max current recommended by the manufacturer;

③ Max motor temperature: recommended setting =the temperature of motor case 75℃ /coil temperature 100℃. Temperature can be higher for large-size motors.

④ Max RPM: set the max rotational speed. Motor can stop rotating in time when propeller reaches its limitation.
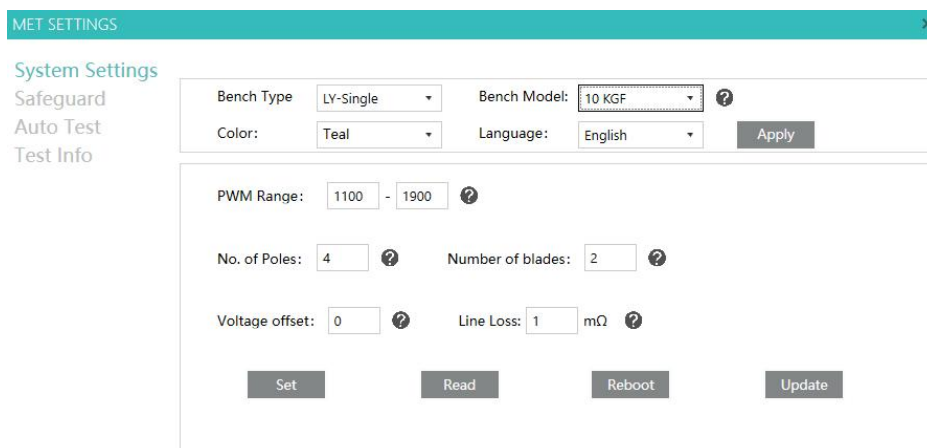

Fig. 2.4.1 Safeguard Settings

## 5. Slide rails and Safety Lock

It needs 8 safety locks and 8 safety loops to fix the coaxial thrust stand. (**Side A has been fixed**, only ONE side can be left free for axial movement). For safety, user should place 2 safety loops in the center of the slide rail or close to the Side B to avoid collision. The heights of motors are different, user should check these two safety loops every time.

After ESC installed and safety loops fixed, move the Side B to assigned position and fasten the 4 safety locks, as shown in Fig 2.5.1 and Fig.2.5.2:
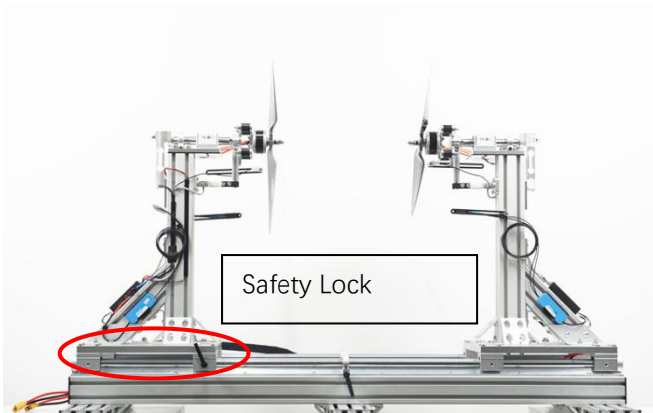


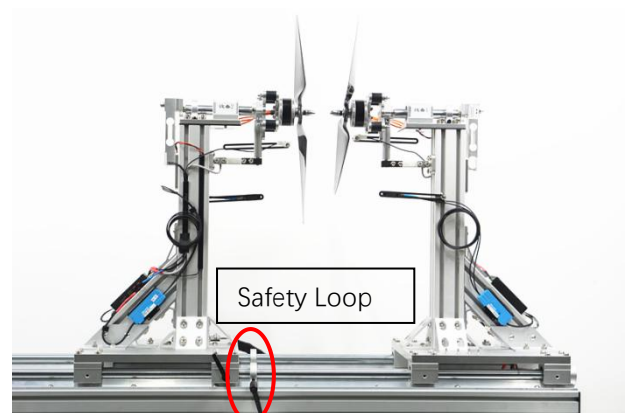| | |
|---|---|
| Fig. 2.5.1 | Fig.2.5.2 Fasten the loop to proper location |

# III. Software Debugging

## 1. Power On the Test Stand

Connect with 220V input, then Power adapter connects to DC input(12V) on the test stand.  You will hear "DiDiDi"after powered on, as shown in Fig. 3.1.1 and Fig. 3.1.2:



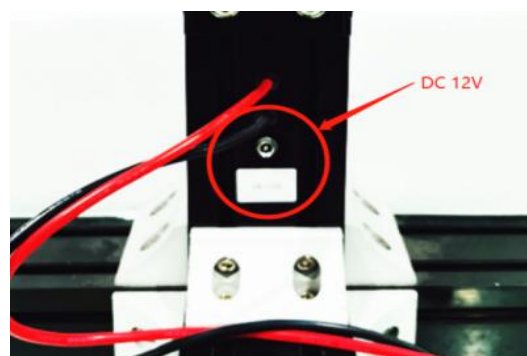| | |
|---|---|
| Fig. 3.1.1 Power Adapter | Fig. 3.1.2 DC Input |

## 2. Connect with PC

(1) Software installation: Win7 / Win8 / Win8.1 / Win10 system

(2) Connection: connect the data cables or wireless data transmission. USB cable connects to your computer.

(3) Driver Debugging: Right click "My Computer" to "Computer management" , click "Device Manager". User can find "USB Serial Port (COM XX)" which indicates driver has been installed automatically , as shown in Fig. 3.2.1
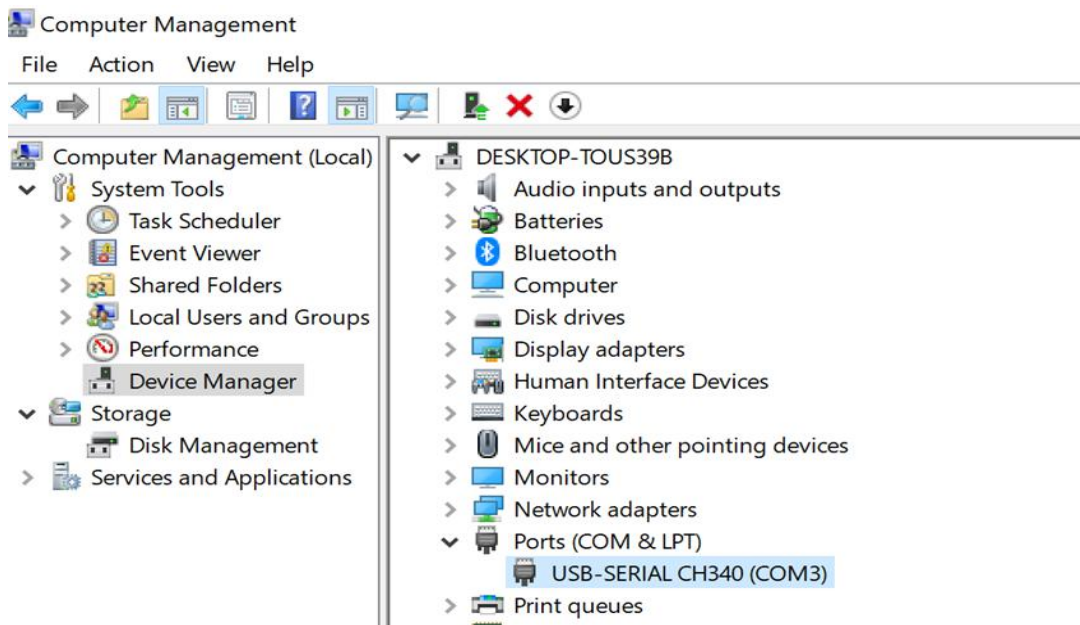


Fig. 3.2.1

NOTE: Failed to install the drive when it comes with ⚠ .Please check your computer and driver installation.(right-click to update).

(4)Software Connection: Open the software, user will see the COM XX , then click "Connect". Connection succeeded when hearing "Di", as shown in Fig. 3.2.2:
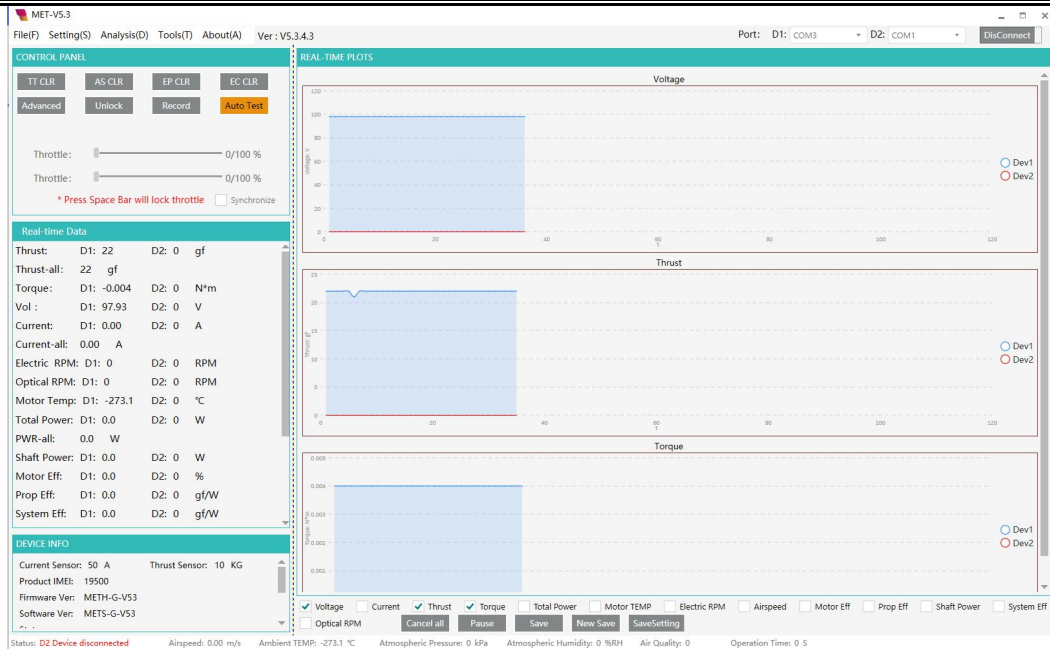
Fig. 3.2.2 Software Connection

# 3. Settings

Open the software to "System SETTINGS", as shown in Fig. 3.3.1:

①PWM range : MIN and MAX throttle input of the ESC. generally from 1100 to 1940.

② Motor Pairs(Polar Pairs): the number of Magnetic poles /2; Obtain the motor-pairs from

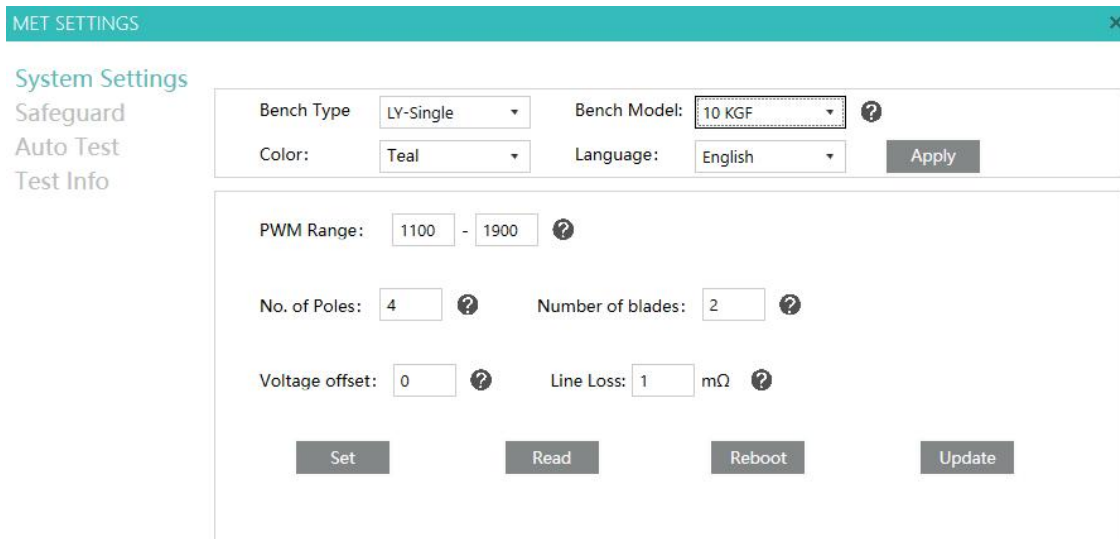the list. Must input the motor pairs, otherwise it will display an wrong RPM.


Fig. 3.3.1 System Settings

**Software debugging**: **DO NOT** install propeller for first-time use. Power on the test stand, click

"unlock throttle" after ESC starts working(user may need to calibrate throttle range. Learn how to Calibrate throttle from FAQ). Throttle unlocked when hearing "DiDi" from the test stand.

Move the "throttle" slider to check if motor works and displays correct RPM. Move "throttle" to full range to check the actual RPM and calculate the KV.

## 4. Advanced Throttle and Data Recording

The data in Excel is recorded in Manual Control mode. User can click "Recording" to start recording. Click "Lock" or "Stop" to stop data recording.

It will automate data recording in Automatic Mode. The data will be saved when stop recording. Open the File →File Storage, to check the original data.
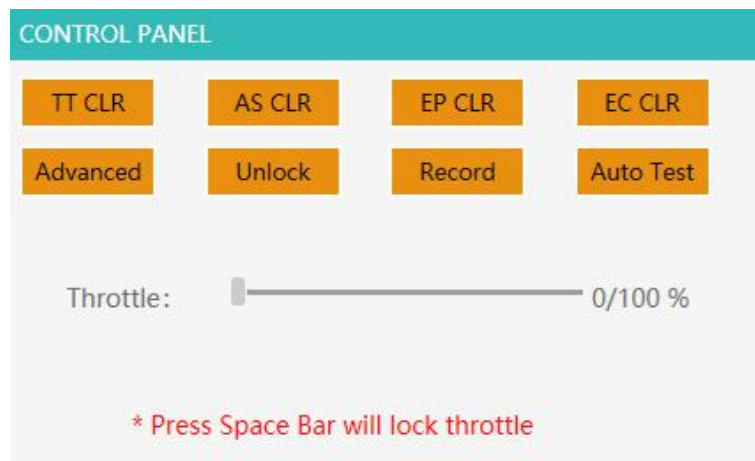


Figure 3.4.1 Throttle Unlock Interface

Disconnected the motor, then install propeller. User can do next step in "Advanced throttle". Unlock throttle to Advanced Throttle mode.
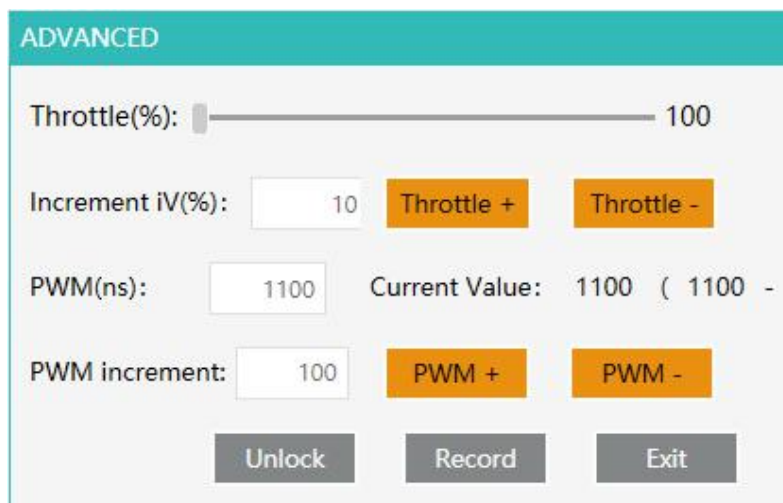


Figure 3.4.2 Advanced Throttle

# IV. Regular Checklist

| Item | Each test | Each detachment | 30 times test/month | 100 times test/3 months | Remarks |
|---|---|---|---|---|---|
| Screws on holding Structure | x | x | x | √ | This data is obtained from JXF-22 inch propeller with 2000-5000RPM. Please make proper adjustment if the vibration of your motor and propeller is far different from it. . |
| Screws on Motor mount | √ | √ | √ | √ | |
| Screws to fix Temperature probe | √ | √ | √ | √ | |
| Linear bearing  lubrication | x | x | √ | √ | |
| Screws on thrust/torque sensor | x | x | √ | √ | |
| Airspeed components | x | x | √ | √ | |
| Screws on Control Module | x | √ | √ | √ | |
| Thrust/Torque sensor | x | x | x | √ | |
| Voltage/current sensor calibration | x | x | x | √ | |

(1) Check the screws:  Use an Allen key to tighten screws and apply some glue when necessary.

(2) Linear bearing lubrication：  Spray the low viscosity lubricant (WD-40 high performance white lithium grease is recommended) into the oil inlet (**DO NOT** use mechanical lubricating oil with high viscosity).

(3)Thrust/torque sensor inspection: use a tension meter on the end plate. Compare the data with the test bench. It's qualified if the error is less than 500g ( Thrust<10KGF). Generally,  the sensor will not be damaged or flailed to work as long as the data are almost the same.

(4) Calibrate voltage/current sensor: Compare with a high-precision multi meter to check if it exceeds maximum error.

Note: Please read  the Software Manual for details.
        Please read FAQ if there is any question of using the test stand.