

**SMARTPRO**<sup>®</sup>

Generation Ahead Technology

*Screen I*

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**USER MANUAL BOOK**

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**SMARTPRO**<sup>®</sup>  
GENERATION AHEAD TECHNOLOGY

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## **SmartPro SCREEN I User Manual**

Congratulations on your new SmartPro Screen I (SPS I). The smartest & fastest diamond tester in the world that designed for smart testing of natural earth-mined colorless diamond (d-J) type Ia, Ib from lab created or synthetic type IIa, IIb / CVD / HPHT mounted and loose colorless diamond. Moreover, it lasted around 150 hours on heavy use for more enjoyable testing.

### **Included in your package :**

- a. SmartPro Screen I (SPS I)
- b. Micro USB Cable
- c. Protective Carry Case
- d. User Manual Book
- e. Warranty Card

## **1. DISCLAIMERS, EXCLUSIONS AND LIMITATIONS OF LIABILITY**

Please read and note SMARTPRO WARRANTY TERMS AND CONDITIONS as stated in the warranty card. SmartPro warranty for its subject to proper use by its user in accordance with all the terms and conditions as started in the relevant user manual and shall cover only manufacturing defects.

Due to continues product improvement, SmartPro reserves the right to revise all documents including the right to make changes to the user manual with without notice and without obligation to notify any person of such revisions or changes. Users are advised to check SmartPro's website <http://www.smartproinstrument.com>.

SmartPro shall not be responsible for any damage or loss resulting from the use of the Tester or user manual, and under no circumstances shall SmartPro, its manufacturer or any of its subsidiaries, licensors, distributors, resellers, servants and/or agents be liable for any direct or indirect damages resulting from the use of this Tester.

To maximum extent permitted by applicable law, under no circumstances shall SmartPro, its manufacturer or any of its subsidiaries, licensors, distributors, resellers, servants and/or agents be liable for any special, incidental, consequential or indirect damages howsoever caused.

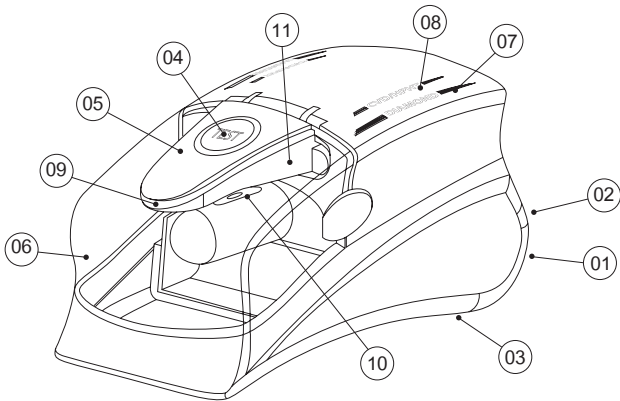
SPS I referred to in this user manual is provided and/or sold on “as is” basis. Except as required by applicable law, no warranties of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

## **2. SPECIAL FEATURES :**

- a. Can screen earth mine colorless diamond (Color D to J) Type Ia, Ib from Lab created diamond HPHT / CVD (Type IIa).
- b. Can test from 0.01 ct. up to 12 ct.
- c. Capable in checking the mounted stones (mounted jewellery with under hole only).
- d. New technology LED light source with high efficiency and mercury-free.
- e. Smart Touch Test Switch.
- f. Laser Target Pointer.
- g. Auto Testing Function.
- h. No warm up time before testing.
- i. Result Indicating by bright LED lights with sounds.
- j. Automatic Power OFF (after 5 minute inactive).
- k. Ready LED indicator.
- l. Low Battery Indicator.
- m. Super battery life saver.
- n. Powered by Micro USB or 4 x AAA batteries.

### 3. OVERVIEW

- 01. Power ON/OFF Button
- 02. Micro USB Port
- 03. Battery Slot
- 04. Smart Touch Test Switch
- 05. Lid Cover
- 06. Dust Cover
- 07. Diamond Indicator
- 08. CVD/HPHT Indicator
- 09. Laser Target Pointer
- 10. Test Platform
- 11. Light Source





## **4. TECHNICAL NOTES :**

### **4.1. For these cases SPS I Tester will not allow to Power-ON :**

- a. Lid cover is open - Its has to be completely closed. If not the device will make a warning beep sounds.
- b. Low battery - The device will make a warning beep sound with Red light blinking on the Smart Switch.
- c. Object blocking the hole on Test Platform - The device will make a warning beep sound.

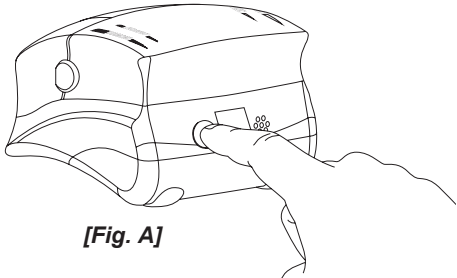
### **4.2. SPS I can be powered by either the use of USB port power adapter or batteries :**

- a. Through its micro USB port can connect to USB port on a computer or any standard USB adapter with 5V DC power output.
- b. 4 x AAA Batteries are required, take note of the positive (+) and negative (-) directions of batteries. We are recommending to use alkaline batteries and it should give approximately 150 hours continuous operation time (Calculated by under standard lab test).

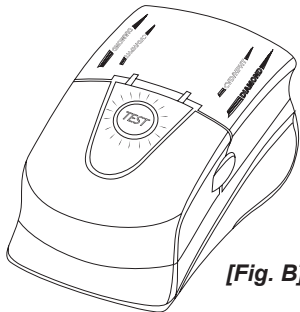
## 5. TURNING ON / OFF

### 5.1. Turning ON :

Press the power ON/OFF button (backside of the tester) **[Fig. A]** to power-up the device. Meanwhile Smart Switch will light up by Green color with two quick beep sound that indicate the SPS I is ready to use **[Fig. B]**.



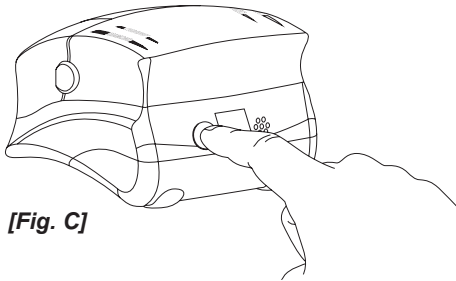
**[Fig. A]**



**[Fig. B]**

## 5.2. Turning OFF :

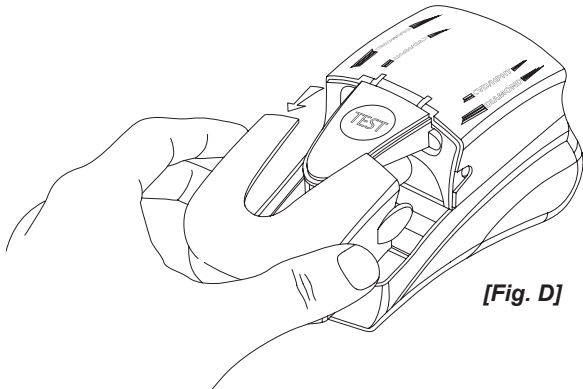
Keep press the power ON / OFF button for few seconds and the SPS I will make alert sound while turning OFF **[Fig. C]**.



**[Fig. C]**

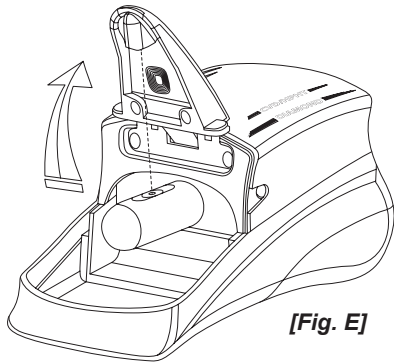
## 6. TESTING PROCEDURES

### 6.1. Remove the Dust Cover *[Fig. D]*.



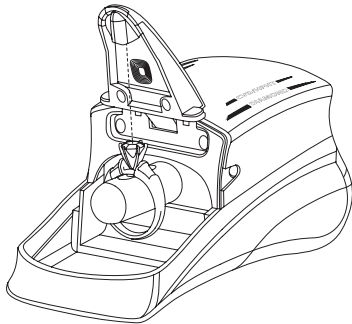
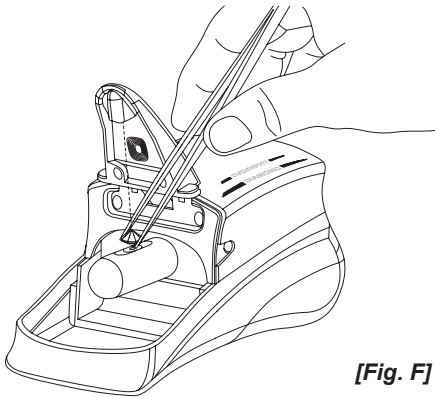
***[Fig. D]***

6.2. Open the lid cover and will see the test platform with Laser pointer on center of the test platform **[Fig. E]**.

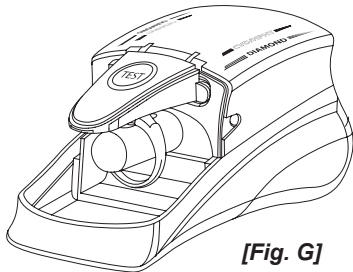


**[Fig. E]**

6.3. Place the mounted or loose colorless stone and align to the center of the Test Platform **[Fig. F]**.



6.4. Close the Lid Cover gently and completely, then testing will start automatically (one time auto-test after closing the lid cover). Then can just touch on the Smart Switch to perform the test again **[Fig. G]**.



**[Fig. G]**

**Notice:** SPS I operates with SWUV light which is hazardous if exposed to human eyes and skin. Do not attempt to look at the light source directly or expose your skin to it.

## **7. TEST RESULTS**

### **Natural Diamond :**

BLUE light will light up with melody sound (The Diamond is can be considered as natural).

### **CVD/HPHT diamond :**

RED light will light up with long buzzer sound (The Diamond may be synthetic or may be colored enhanced).

### **Notice:**

1. If tested stone result shown as CVD/HPHT, we recommend to bring to testing laboratory for further examination.
2. If mounted or loose stone is not placed properly in the center position on the Test Platform, If Smart Switch and Test Platform RED light (blinking) RED or it will show incorrect result.



## **8. CAUTION**

These are may affect to the result

- a. Mounted or loose stone not place center of test platform.
- b. Try to screening other than Diamond, i.e., Simulant, Moissanite, Cubic zirconia & etc.

## **9. CALIBRATION**

No calibration needed. The user is advise not to attempt self-calibration, all testers have been calibrated already during the manufacturing process. To minimize any risk related, user is advised to contact [customercare@smartproinstrument.com](mailto:customercare@smartproinstrument.com) for further assistance. If the users require the manufacturer to re-calibrate the unit, the user is responsible to bear all expenses for the freight charges of any shipping company he decided to use.

## 10. SAFE HANDLING INFORMATION

- a. Avoid exposing to the dust and moist. This tester contains precise electrical circuits, never attempt to open any sealed parts except the lid of the battery compartment.
- b. If the Tester is not going to be used for an extended amount of time, should to keep on its cool and dry place. Always keep the tester in its protective carry case when not in use.
- c. Operating temperature The Tester is designed to work in ambient temperatures between 32 °F and 95 °F (0 °C and 35 °C) and stored in temperatures between -4 °F and 113 °F (-20 °C and 45 °C). The Tester can be damaged and life shortened if stored or operated outside of these temperature ranges. Avoid exposing SPS I to dramatic changes in temperature or humidity.
- d. This Tester operates with SWUV light which is hazardous if exposed to human eyes and skin. Do not attempt to dismantle the unit at all time.

If the tester is not working properly, kindly contact out customer service at [customercare@smartproinstrument.com](mailto:customercare@smartproinstrument.com)

## 11. TYPE OF DIAMOND

To help the user to gain more knowledge about diamond, we had make a summary of type of diamond with short descriptions and characteristic. We hope that this information will help to all SmartPro Screen I users to further understand the different types of diamonds and what CVD and HPHT means.

### **Type I**

- a. Common Class.
- b. Contains Nitrogen atoms as their main impurity.
- c. Absorb in both infrared and ultraviolet region.

### **Type Ia**

- 98% of all natural diamonds.
- Nitrogen impurities, up to 0.3% (3000 ppm).
- Nitrogen clusters can cause the diamond to absorb blue light.
- Mixture of IaA and IaB material; these diamonds belong to the Cape series.
- Show blue fluorescence to long-wave ultraviolet radiation.

### **Type IaA**

- Does not affect the diamond's colour.

### **Type IaB**

- Impart a yellow to brown tint.

### **Type Ib**

- make up about 0.1% of all natural diamonds.
- contain up to 0.05% (500 ppm) of nitrogen, but the impurities are more diffuse.
- absorb green light in addition to blue.
- Almost all HPHT synthetic diamonds are of Type Ib.

## **Type II**

- a. Have no measurable nitrogen impurities.
- b. Absorb in a different region of the infrared, and transmit in the ultraviolet .
- c. Formed under extremely high pressure for longer time periods.

### **Type IIa**

- Make up 1–2% of all natural diamonds (1.8% of gem diamonds).
- Usually colorless and have the highest thermal conductivity.
- They are very transparent in ultraviolet.
- Being extruded towards the surface of the Earth.
- Can have their structural deformations “repaired” via a high-pressure high-temperature ( HPHT ) process
- Synthetic diamonds grown using the CVD process typically also belong to this type.

## **Type IIb**

- Make up about 0.1% of all natural diamonds.
- Rarest natural diamonds and very valuable.
- Very low levels of nitrogen impurities.
- Contain significant boron impurities.
- Boron causes these gems to absorb red, orange, and yellow light, lending Type IIb diamonds a light blue or grey color.

## Characteristics of natural diamonds according to diamond type.

Type	Impurity	Most common colours	Inclusions	Gemmological clue	Testing result
Ia	Nitrogen (aggregated)	Colorless, Brown, Yellow Pink, Orange, Green, Violet	Common; all sorts	Opaque to SWUV.	Diamond
Ib	Nitrogen (isolated)	Yellow, Orange, Brown	Common; cloud, needles	Strong general absorption to SWUV.	
IIa	None	Colorless, Brown, Pink, Green	Rare; crystals	Transparent to SWUV.	CVD/HPHT
IIb	Boron	Blue, Gray	Rare; crystals	Transparent to SWUV; Electrically conductive.	

Synthetic diamond (also known as cultured diamond or cultivated diamond) is diamond produced in an artificial process, as opposed to natural diamonds, which are created by geological processes. Synthetic diamond is also widely known as HPHT diamond or CVD diamond after the two common production methods (referring to the high-pressure high-temperature and chemical vapor deposition crystal formation methods, respectively). While the term synthetic is associated by consumers with imitation products, artificial diamonds are made of the same material (pure carbon, crystallized in isotropic 3D form). In the U.S., the Federal Trade Commission has indicated that the alternative terms laboratory-grown, laboratory-created, and [manufacturer-name]-created “would more clearly communicate the nature of the stone”.

Numerous claims of diamond synthesis were documented between 1879 and 1928; most of those attempts were carefully analyzed but none were confirmed. In the 1940s, systematic research began in the United States, Sweden and the Soviet Union to grow diamonds using CVD and HPHT processes. The first reproducible synthesis was reported around 1953. Those two processes still dominate the production of synthetic diamond.



A third method, known as detonation synthesis, entered the diamond market in the late 1990s. In this process, nanometer-sized diamond grains are created in a detonation of carbon-containing explosives. A fourth method, treating graphite with high-power ultrasound, has been demonstrated in the laboratory, but currently has no commercial application.

The properties of synthetic diamond depend on the details of the manufacturing processes; however, some synthetic diamonds (whether formed by HPHT or CVD) have properties such as hardness, thermal conductivity and electron mobility that are superior to those of most naturally formed diamonds. Synthetic diamond is widely used in abrasives, in cutting and polishing tools and in heat sinks. Electronic applications of synthetic diamond are being developed, including high-power switches at power stations, high-frequency field-effect transistors and light-emitting diodes. Synthetic diamond detectors of ultraviolet (UV) light or high-energy particles are used at high-energy research facilities and are available commercially.

Because of its unique combination of thermal and chemical stability, low thermal expansion and high optical transparency in a wide spectral range, synthetic diamond is becoming the most popular material for optical windows in high-power CO<sub>2</sub> lasers and gyrotrons. It is estimated that 98% of industrial grade diamond demand is supplied with synthetic diamonds.

Both CVD and HPHT diamonds can be cut into gems and various colors can be produced: clear white, yellow, brown, blue, green and orange. The appearance of synthetic gems on the market created major concerns in the diamond trading business, as a result of which special spectroscopic devices and techniques have been developed to distinguish synthetic and natural diamonds.

References : [www.wikipedia.org](http://www.wikipedia.org) & [www.gia.edu](http://www.gia.edu)

We thank you for purchasing SmartPro SCREEN I, Enjoy using The Tester  
SmartPro also recommends that you register your warranty by sending the warranty registration card to us or registering online at <http://www.smartproinstrument.com>

SmartPro Instrument Co., Ltd.  
249/40, MOO 9, J.S.P. BUILDING, BANGBON 1 ROAD,  
BANGBON, BANGBON, BANGKOK 10150, THAILAND.  
+66 (0) 2 899 2956  
Attn: Customer Service Executive

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