

Rhein Tech Laboratories, Inc.  
360 Herndon Parkway  
Suite 1400  
Herndon, VA 20170  
<http://www.rheintech.com>

Client: EDH (South Africa) (Pty) Ltd  
Model: FlightScope X1  
Standards: FCC 15.245/IC RSS-210  
FCC/IC ID: QXP-SS661/4612A-SS661  
Report #: 2013032

**Appendix K: Manual**

Please refer to the following pages.

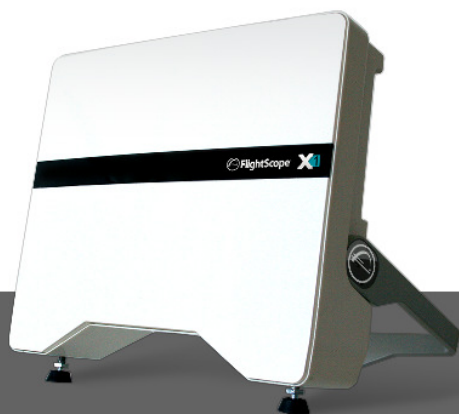


*Master your passion*

## 3D Golf Ball and Club Monitor

# User Manual

Doc No. E19-V9365- Issue 2



---

#### COPYRIGHT NOTICE:

The information presented in this document may not be copied or reproduced in any form whatsoever without the prior written consent of EDH. EDH reserves all rights to the information published this document. Title of the information and any copies thereof shall remain the property of EDH. No proprietary, copyright, confidential, or other proprietary rights, legend or markings may be removed from any part of this document.

---



## GENERAL AND SAFETY NOTICES

### Summary

The following notices and general safety precautions must be observed during the operation, service and repair of this equipment. Failure to comply with these precautions or with warnings elsewhere in the manual violates standards of the design, manufacture and intended use of the equipment. EDH accepts no liability for failure to comply with these notices.

**Operation of the device in any country may require approval in accordance with local telecommunications and safety regulations.**

### Sheltered and Clear Weather Use Only

The equipment has been designed for sheltered or in clear weather use and must not be used outdoors under rainy conditions.

### FCC Statement

**Changes or modifications not expressly approved by EDH (South Africa) (Pty) Ltd could void the user's authority to operate the equipment.**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in an office or residential installation. This equipment generate, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other electronic equipment, which can be determined by turning this equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Increase the separation between the equipment causing and experiencing the interference

Install a radio frequency shield between the equipment causing and experiencing the interference

Consult your dealer for help

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

## **IC Statement**

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

## **Déclaration IC**

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## Table of Contents

Introduction.....	1
Getting Started - Installation .....	3
System Components.....	3
Hooking up the cables .....	4
USB Cable Connection .....	4
Power Supply Connection .....	4
Placing the Sensor .....	5
Setting up the sensor.....	6
Position.....	6
Ground Surface.....	6
Handle.....	6
Leveling the sensor .....	6
Switching On and Off .....	7
Switching On .....	7
Switching Off.....	7
Setup Wizard .....	9
Step-by-step procedure .....	9
Spin Measurement.....	12
Spin measurement methods.....	12
Spin Measurement.....	13
Spin measurement methods.....	13
Marking and placing a ball for spin measurement.....	13
Spin measurement rule: .....	13
Sensor Status Indicators .....	15
Battery Level .....	<b>Error! Bookmark not defined.</b>
Sensor Status .....	15
Tooltips.....	15
Club Type and Roll/Tilt indicator.....	15
Sensor Firmware Updating .....	17

- Technical Capabilities .....21
  - Balls and Clubs .....21
  - Measurement zone .....21
  - Launch velocity .....21
  - Launch angles .....21
  - Carry and lateral distances .....21
  - Trajectory height .....21
  - Club head Speed .....21
  - Spin .....21
- Physical Characteristics .....22
  - Dimensions (approximate) .....22
  - Mass (sensor) .....22
- Environmental Specifications .....22
  - Ambient temperature: .....22
  - Ingress protection: .....22
- Electrical Characteristics .....22
- PC / Mobile Specifications .....23
  - PCs and Notebooks .....23
- Electrical Power Requirements .....23
  - Locations .....23
  - Supply Voltage .....23
  - Earthing .....23
- Requirements for Outdoor Installations .....23
- Maintenance and Troubleshooting .....25
  - Basic Care .....25
- Rear Panel LED Indicator .....27
- Frequently Asked Questions (FAQ) .....29
- Index .....33

## INTRODUCTION

**Congratulations** on purchasing **FlightScope®**, the world's first-ever 3D Doppler tracking system for golf.

**FlightScope** measures how a player hits golf balls, providing information about the player and the equipment (clubs and balls).

Here are a few examples of what FlightScope can do:

- Test clubs and balls to find the best equipment for a player
- Measure performance of a player
- Golf instruction
- Calibrate golf clubs in a player's bag
- Compare performance with other players including top golfers
- Evaluate personal progress
- Provide instructional and entertaining data about golf shots not known to most golfers
- Research on club and ball performance

As a professional club fitter or golf instructor you can measure the performance and progress of a player and his/her equipment accurately and scientifically, find the best equipment fit, and evaluate progress.

As a player, you will be able to go out onto the course knowing your yardage and shot making capabilities. This will improve your scores and enjoyment of the game.



Blank Page

## **GETTING STARTED - INSTALLATION**

Before FlightScope can be used, the sensor and other hardware and software must be installed.

### **System Components**

Your X1 system needs a PC/Notebook computer to install and use FlightScope.

The components included with your system are:

- Sensor Unit
- USB Cable
- AC Adapter
- Mains Power Cord
- Software on CD
- User Manual
- Carry Case

The system is intended for use with a PC or notebook computer. See section on Error! Reference source not found. for details of compatible devices.

# HOOKING UP THE CABLES


## CAUTION

**Ensure that connectors are inserted with the correct orientation.**

**The connectors are keyed to ensure that they are inserted correctly. Do not force the connectors when inserting.**



## USB Cable Connection

Insert the Communications Cable (USB) to your PC and connect the other end to the COMMS connector marked with the symbol -  .

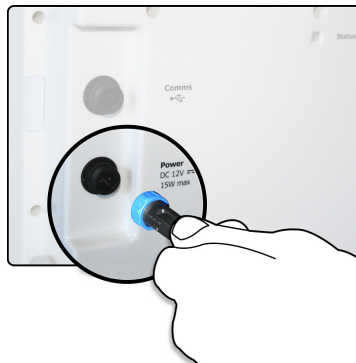
Insert the connector and fasten the nut lightly.

## Power Supply Connection

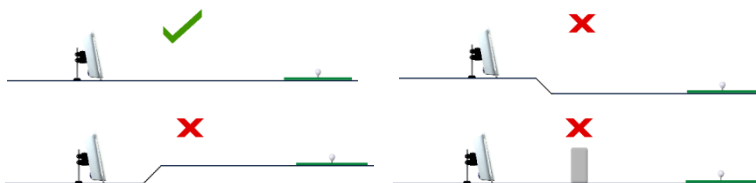
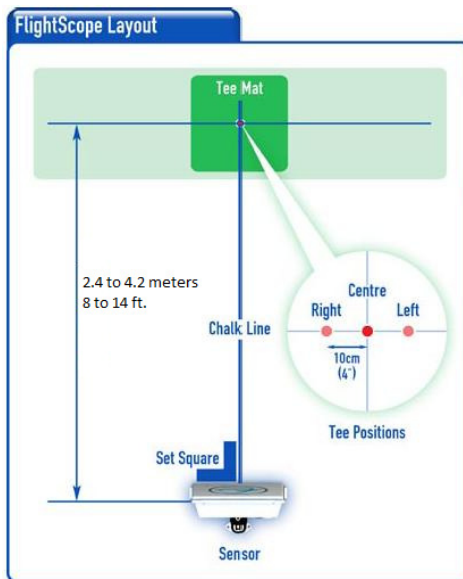
Insert the AC Adapter connector into the Power connector on the rear of the sensor.

The connector is keyed and can only be inserted one way.

Insert the connector and fasten the nut lightly.



# PLACING THE SENSOR



## NOTE

Use FlightScope on a level surface. There must be no obstructions in front of the sensor.

# SETTING UP THE SENSOR

## Position

The sensor must be placed between 2.4 to 4 meters (8 to 14 ft.) behind the tee.

## Ground Surface

The sensor should be used on a level surface, (grass, carpet, or hard floor).

## Handle

### CAUTION

**The handle is locked in position by spring loaded plungers. Release the plungers before moving the handle. Do not force the handle while locked.**

Release the handle by sliding the two lock catches inwards to release the spring loaded pins that lock the handle position. At the same time pull the handle backwards.

When free, move the handle to the "down" position. The spring loaded pins will again lock the handle in the down position.

In the down position, the handle acts as the rear support for the sensor.

## Leveling the sensor

The sensor should be set up with no roll (sideways angle) and tilted at the optimum angle of approximately 10 degrees (leaning backwards).

The sensor roll and tilt angles must be manually set by adjusting the feet of the sensor and/or by modifying the work surface to achieve the correct sensor angles.

## Switching On and Off

### Switching On

The FlightScope X1 has no On/Off switch.

It will start up when it is connected to a power supply.

The system is powered by the supplied AC adapter, which in turn must be connected to an AC supply (100-240 V AC single phase).

When on, the **Status** LED indicator lamp will light up and blink. See LED Indicator states below.

### Switching Off

The FlightScope X1 has no On/Off switch.

Simply switch off the power supply or disconnect the power cable from the sensor.

Blank Page

# Setup Wizard

## NOTE

Do set-up at least the first time the system is used.

The Setup Wizard is a step-by-step procedure to be followed before using the FlightScope. It can be skipped if the set-up remains unchanged between use, but should be repeated if the set-up changes (e.g. if the system is moved to a different location).

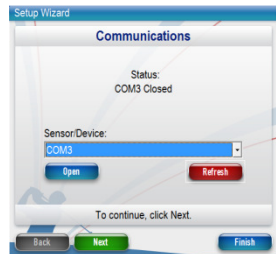
The Setup Wizard can be started from the Main screen menu or from the Advanced Settings (F10) menu.

## Step-by-step procedure

### Setup 1. Connection (by USB cable)

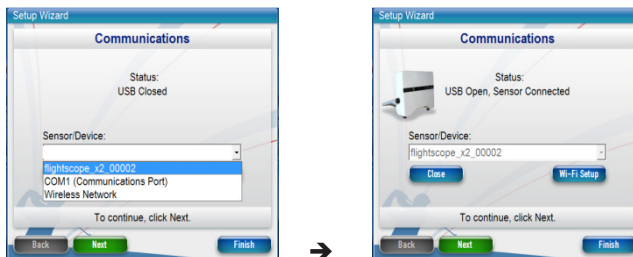
Connect the sensor to the PC and turn power on. Run the FlightScope software and choose Setup Wizard.

On the Communications screen (right) choose **Refresh** to list the available connections.



Open the list of Sensor Port Devices and select the indicated FlightScope in the list (see example below). Then click "**Open**".

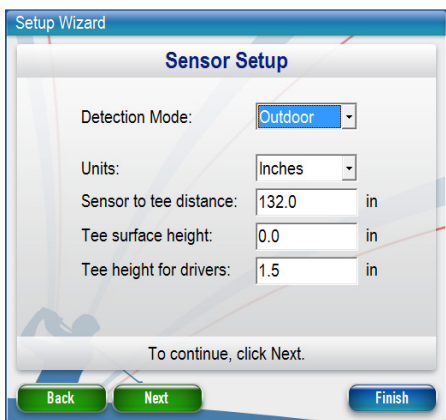
The sensor will now connect and showing the selected COM port as "Open".



Click "**Next**" to continue to sensor mode and geometry, or "**Finish**" to exit Setup Wizard.



## Setup 2. Set up the sensor mode and geometry.



Setup Wizard

### Sensor Setup

Detection Mode:

Units:

Sensor to tee distance:  in

Tee surface height:  in

Tee height for drivers:  in

To continue, click Next.

Set the Detection Mode:

- Select **Indoor** if the system is used indoors e.g. in a hitting cage with limited ball travel distance.
- Select **Outdoor** if hitting outdoors e.g. on a driving range or golf course.
- Select **Long Indoor** to use when the ball travel distance is more than 20 yards/meters but full ball flight is not possible (e.g. there is a distant net

- Choose the **Units** to use for entering for the hitting geometry (Inches or Centimeters).
- Enter the **Sensor to Tee distance**, which is from the tee/hitting spot to the sensor face.
- Enter the **Tee surface height** which is the height of the tee surface (*not the Ball Tee itself*) above the surface on which the FlightScope is placed.
- Enter the **Tee Height for Drivers**. This value is the height of a tee above the Tee surface when using a Driver. For other clubs, this height is assumed to be 0 (zero).

Click "**Next**" to continue.

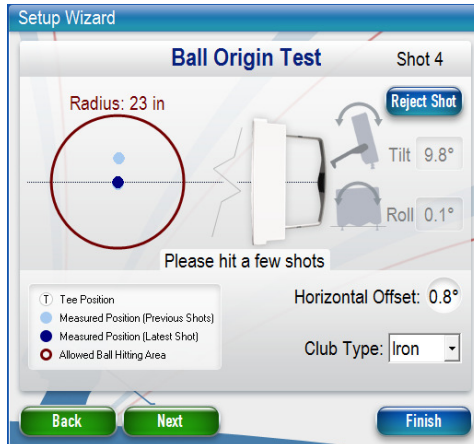
## Setup 3. Tilt, Roll and Pointing Direction

### **NOTE**

FlightScope X2C models have automatic tilt and roll adjustment. If you use this model, skip the Tilt and Roll adjustment below and proceed to the Ball Origin step

### Tilt and Roll

The wizard indicates the sensor's actual roll and tilt angles. Ideal Roll is between +0.3 and -0.3 degrees and Tilt between 9.5 and 13 degrees. If needed, adjust the sensor feet to correct the roll and tilt angles.



## Ball Origin

The purpose of this step is to point the sensor through the tee position along a desired target line. The target line could for example be to a distant flag or feature on a driving range, or to the center of an indoor hitting cage net.

To use the wizard, select a club type to use for the test (iron, driver or wedge) and proceed to hit one or more balls from the chosen tee position.

The ball origin for each shot is displayed as a blue dot. The latest shot will be dark and previous shots are a lighter shade. The ball origins will typically be spread around center of the red circle if the sensor pointing direction is more or less correct. The dots can be closely spaced and should overlap. Any outlier shot can be rejected ("Reject Shot").

The average "Horizontal Offset" for the played shots is displayed. This should be 0 (zero). If the error is not close to 0, correct the pointing direction by slight clockwise or counterclockwise rotation of the sensor, and repeat the Ball Origin test.

### **NOTE**

The horizontal error must as small as possible. A Horizontal Offset of  $1^\circ$  translates to a lateral error of 2.5 yards at a distance of 150 yards.

The "Ball Origin" can also be checked at any time during system operation from the Advanced Settings menu (F10 > Sensor > Ball Origin).

Click "**Next**" to continue.

#### **Setup 4. Set Altitude**

Set the altitude (meters or feet) as **Sea Level, Medium, High** or a **Custom** value.

The Altitude setting is important when Indoor or Long Indoor modes are used, as this affects the calculation of ball flight from the initial trajectory

Click **“Next”** to continue.



#### **Setup 5. Set Units of Measurement**

Set the units of measurement for data (Metric or Imperial).

To complete the setup, press **Finish**.

The system is now ready for use.



## **SPIN MEASUREMENT**

FlightScope measures the spin of a ball accurately both outdoors as well indoors where ball flight distance/time is limited.

### **CAUTION**

**Balls in poor condition or of poor quality (for example damaged balls) should not be used when measuring spin because the marks on the ball may cause incorrect spin to be reported.**

#### **Spin measurement methods**

FlightScope directly measures the spin rate of the ball both indoors and outdoors.

## SPIN MEASUREMENT

FlightScope measures the spin of a ball accurately both outdoors as well indoors where ball flight distance/time is limited.

### CAUTION

**Balls in poor condition or of poor quality (for example damaged balls) should not be used when measuring spin because the marks on the ball may cause incorrect spin to be reported.**

### Spin measurement methods

FlightScope directly measures the spin rate of the ball both indoors and outdoors.

### Marking and placing a ball for spin measurement

#### NOTE

This procedure is only required when measuring spin indoors.

**A ball flight distance of at least 14 ft. (4.2 meters) is necessary.**

A metal foil disk or patch is used to assist FlightScope to detect the spin of the ball reliably in a hitting cage where the flight time is limited:

- i. Stick a single metal foil disk or patch of approximately 5mm (1/4 inch) diameter/dimensions to the surface of the golf ball.
- ii. Tee the ball up with the metal disk facing forward, away from the sensor.



### Spin measurement rule:

Outdoors	Indoors
Use unmarked balls in good condition	Use with balls marked with metal sticker

*Metal sticker order info: Part# 77715A33 Foil from [www.mcmaster.com](http://www.mcmaster.com)*





Blank Page

## SENSOR STATUS INDICATORS

Various system status and controls are displayed in the upper right hand corner of the screen.

### Sensor Status

Sensor status is displayed as follows:

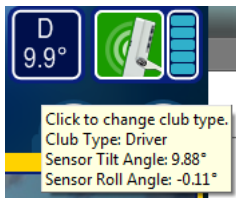
Disconnected	Sleeping	Standby	Active
			

The indicator will show Disconnected (red) when the sensor is not connected (by either USB cable or Wi-Fi or if the sensor is not switched on. If this occurs (a) check that the sensor has power and is switched on (b) check that the USB cable is connected to the PC OR that it is connected by Wi-Fi. Then run the Setup Wizard, Refresh connections list, and Open the correct USB or Wireless connection.

### Tooltips

Place/Hover the mouse over any of the sensor status indicators to see a short description of the indicator.

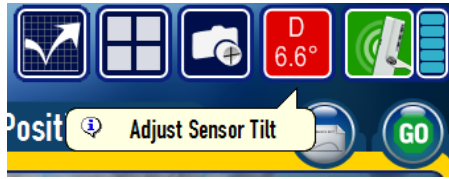
### Club Type and Roll/Tilt indicator



Click this indicator to set the club (D: Driver, I: Iron or W: Wedge) you are using.

The indicator also displays the sensor's tilt and roll angles. The user is warned when the sensor is not in ideal tilt range or roll range.

When the roll angle is within acceptable limits, only the tilt angle is displayed.



If the Roll Angle is outside the ideal range, the icon will indicate a Roll warning



# SENSOR FIRMWARE UPDATING

This section describes the procedures to update Sensor firmware.

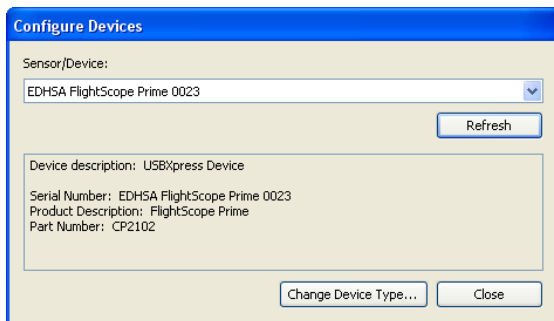
## CAUTION

**Sensor firmware programming is a critical task that requires the power supply and USB connections to be uninterrupted while in process.**

1. With the sensor connected and switched on, open the Firmware Writer program from the Start Menu.
2. After the application has opened click on **Configure Devices** on the welcome screen.

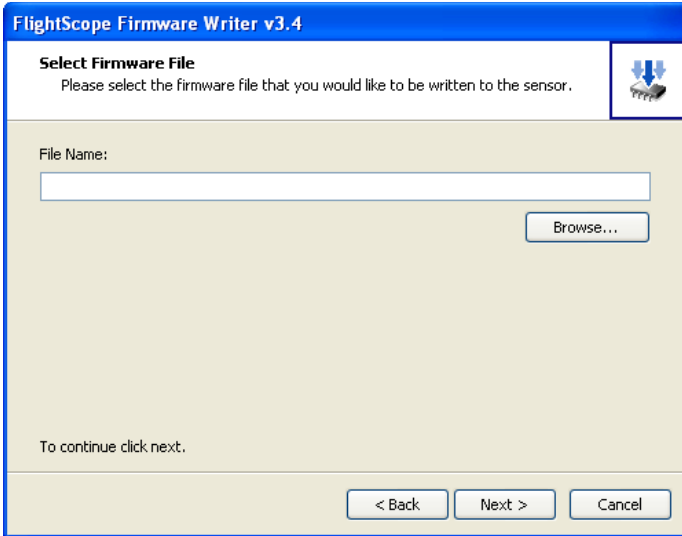


3. Select a sensor from the list (in case more than one sensor is found). Only one sensor should be connected when programming firmware, so that a wrong selection is not made.

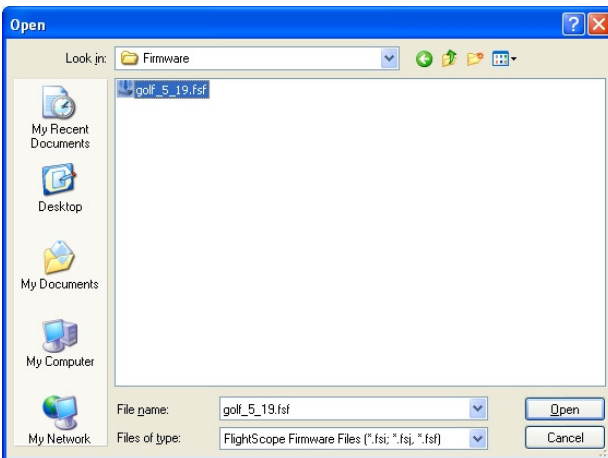




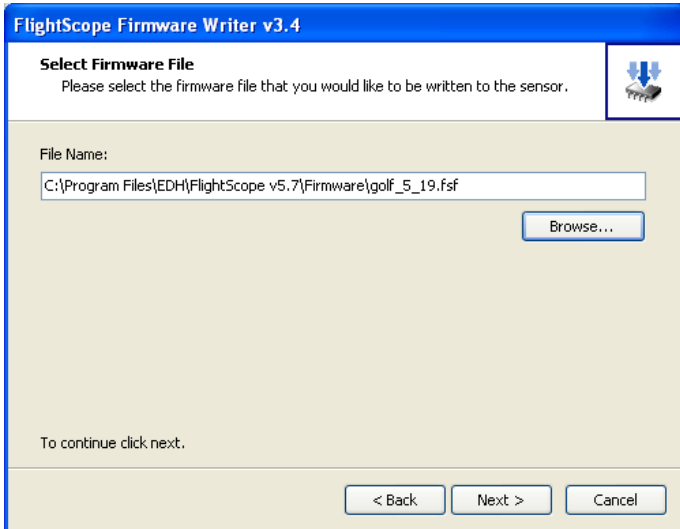
- Use the **Refresh** button to update the list if a sensor is removed and re-connected to the PC. If no sensors are listed after pressing the refresh button when a sensor is connected then the PC may still be installing software drivers.
- On the next screen, click **Browse** to locate the firmware file.



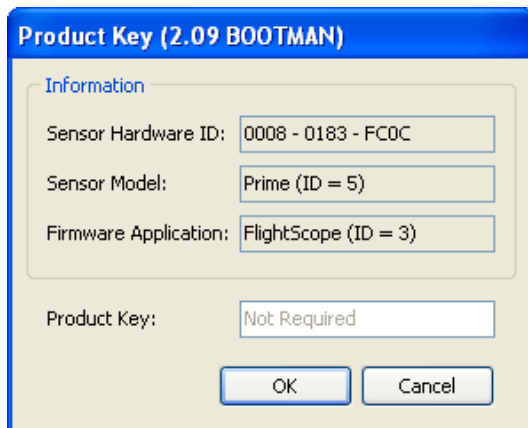
- From the open dialog box find and select the **golf\_6\_xx.fsj** file and click on "Open". The file will normally be located in the Firmware directory on the CD, or within the program files PC directory:



7. Press Next to proceed with the selected firmware file.

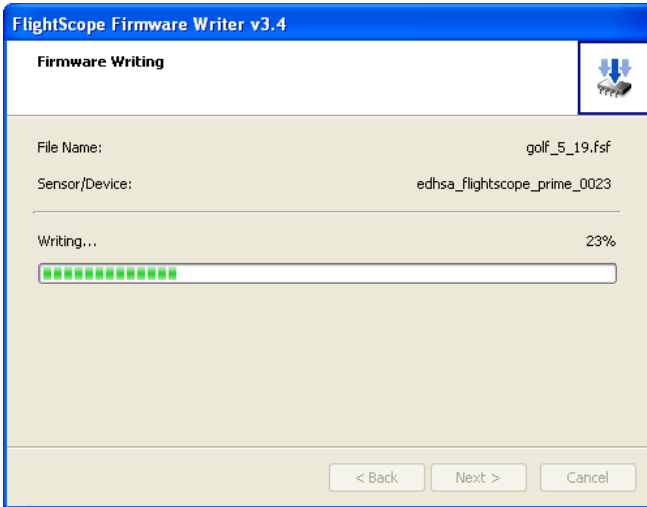


8. The Product Key dialog box will pop up and indicate if a product key is required or not.



9. If the message "Please contact EDH for a product key to run this firmware", you will be asked to supply the information provided in the product key window. Click "OK" and make a note of the information. This information must be supplied to an EDH support engineer by email on [support@flightscope.com](mailto:support@flightscope.com). The product key to enter will be provided on return. Enter the product key obtained in the Product Key field and click "Next".

10. The firmware will now be written to the sensor:



11. On completion of writing, cycle the power on the Sensor to reboot, and then click on **Finish**.



# TECHNICAL CAPABILITIES

Specifications below represent typical performance.

## **Balls and Clubs**

All regulation tournament balls and good quality practice range balls. All woods, drivers, irons, wedges and hybrids can be measured.

## **Measurement zone**

The sensor measures ball flight in a spatial volume of approximately 20 degrees by 20 degrees around its pointing direction.

## **Launch velocity**

From 2 to 400 km/h (1.2 to 250 mph)

## **Launch angles**

Vertical and horizontal (direction) angles, within the measurement zone.

## **Carry and lateral distances**

Carry and lateral distances refers to the landing position of the ball.

## **Trajectory height**

The height the ball reaches along its flight path.

## **Club head Speed**

The club head strike speed.

## **Spin**

Spin of ball at launch. This spin rate is directly measured and requires the use of good quality balls. Poor ball quality may affect accurate measurement of spin rate. The ball must be marked when testing indoors (see section on "**Spin Measurement**").

## **PHYSICAL CHARACTERISTICS**

### **Dimensions (approximate)**

300 x 325 x 100 mm ( $11\frac{7}{8}$  x  $12\frac{3}{4}$  x 4 in) (H x W x D)

### **Mass (sensor)**

3.3 kg ( $7\frac{3}{4}$ lbs)

## **ENVIRONMENTAL SPECIFICATIONS**

### **Ambient temperature:**

Recommended operating range: 0°C to 45°C (32°F to 104°F)

### **Ingress protection:**

IP54 / NEMA-4

## **ELECTRICAL CHARACTERISTICS**

Electrical supply: 100-240 V AC @ 0.2 Amp 50/60Hz single phase

Communications interface: USB 2.0 Hi Speed

Electromagnetic compatibility: Meets FCC Class 15, Industry Canada, and CE requirements

# PC / MOBILE SPECIFICATIONS

## PCs and Notebooks

Most new PCs or Notebook computers with the following minimum requirements can be used with FlightScope:

Processor/speed:	Any
Memory (RAM):	1 GByte or more recommended
Hard disk storage:	80 GByte or more
CD/DVD ROM drive	
Display:	1024 x 768 pixels or more <sup>1</sup>
Interface ports:	USB 2.0 Hi Speed, DC supply current to 500 mA <sup>2</sup>
Operating system:	Microsoft Windows XP, Vista, or Windows 7.

- 1 A sunlight-readable screen is strongly recommended if used outdoors
- 2 Consult your PC vendor to determine if your computer's technical specifications meet the USB port requirements.

# ELECTRICAL POWER REQUIREMENTS

## Locations

Mains electrical power supply need to be provided at the following points:

- Sensor mounting position
- Computer position

## Supply Voltage

The sensor supply shall be 100-240VAC, 0.2A. 50/60Hz. Single phase

## Earthing

An earth connection must be provided in addition to the live and neutral circuits.

# REQUIREMENTS FOR OUTDOOR INSTALLATIONS

The following are typical requirements for an outdoors installation:

- (Safe) mains power supply point (100V to 240 V AC, 0.2A, 50/60 Hz, single phase).
- Tee on grass or hitting mat.
- Level surface

Blank Page

# MAINTENANCE AND TROUBLESHOOTING

FlightScope is designed to operate reliably with a minimum of maintenance for many years. This section tells you how to care for your FlightScope to ensure that you achieve this.

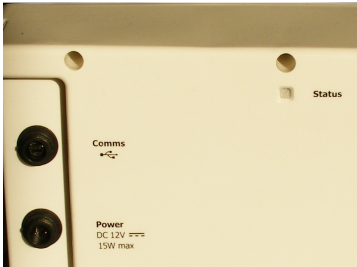
## Basic Care

1. **DIRT AND GREASE:** Keep the sensor clean. Clean occasionally with a damp cloth using a light detergent if necessary. **WARNING:** As a safety precaution, always switch electrical supplies off when working or maintaining electronic equipment.
2. **TRANSPORTATION:** Place your FlightScope in its original shipping carton or case, to prevent it from damage when transported in a vehicle or aircraft. Contact your FlightScope distributor for advice on transport packaging options in case your original packaging is not available.
3. **ALIGNMENT:** The alignment of the sensor is important to ensure good results.
4. **AREA:** The performance of the system may be affected if used where the ground or floor is not reasonably level. There must also be no obstructions between the sensor and the tee.
5. **PARAMETERS:** Do not change the sensor **Parameters** that are accessible under the **Advanced Settings** menu, unless instructed by a FlightScope Support engineer. If parameters are changed, the function and performance of the system may be compromised.
6. **RAIN:** Although the sensor is sealed and will not allow rain and dust to enter, the mains power supply connection may be unsafe if wet. When it rains, switch the system off and take it undercover or cover the sensor and especially power cables and AC adapter with a waterproof covers as a precaution.
7. **MECHANICAL SHOCK:** The sensor contains sensitive microelectronic circuits that may be damaged or altered by hard impacts. Therefore, take care not to drop the sensor, hit it with a club or ball, or cause any other impact to it if possible.
8. **CABLE DAMAGE:** Check your power supply and communications cables occasionally for damage or wear. Repair or if necessary replace damaged or worn cables.
9. **CABLE HANDLING:** Take care not to pull, twist or kink cables when handling, to prevent possible damage and ensure long life. When disconnecting cables, coil the cables loosely before packing. Replacement cables are available from your FlightScope distributor.



10. **SENSOR DAMAGE:** Regularly check the sensor for signs of damage. If enclosure is damaged it can be repaired at a FlightScope service location.
11. **REPAIRS:** The sensor contains no user serviceable parts. If necessary the sensor must be returned to your supplier for repairs. Unauthorized opening and repair actions may invalidate warranty.

## REAR PANEL LED INDICATOR



A multi-color LED status indicator is located on the rear panel of the sensor.

Colour	State	Description
None	OFF	Power is OFF <u>or</u> Sensor defective. Check power connection/send for servicing.
Blue Blinking	System switching on	After switch on
Green flashing (fast)	Processor Initialization	System is powered ON and the signal processor is running normally.
Green flashing (slow)	Idle	System is powered ON and signal processor is running normally. System is not armed.
Red/Green flashing	Armed	System is running and ready to measure a shot.

Blank Page

## **FREQUENTLY ASKED QUESTIONS (FAQ)**

### **Q: What is FlightScope?**

A: FlightScope is a low-power 3D Doppler tracking sensor for Golf and other sports. It accurately measures the launch and flight of balls and clubs and provides quantitative data about player and equipment performance.

### **Q: How does FlightScope work?**

A: FlightScope creates a low level electromagnetic field through which the golf ball and the golf club move. The movement creates a disturbance that is detected and processed to extract position and speed. The measured launch and flight data is displayed on a PC program in various views, and also stored. Measurements include: ball and clubhead speeds, launch angles, spin, carry distance, smash factor, and more.

### **Q. How is FlightScope different from other golf measurement systems?**

A: FlightScope is fundamentally different from most other launch monitors because it measures ball speed, position and direction continuously along the ball's flight path using microwave Doppler technology.

FlightScope is not only a launch monitor, but also measures what the club and ball are actually moving. It is therefore a more accurate and comprehensive measuring instrument for golf than a camera or light beam based system that take only single or at most a few launch data points and estimate what the ball will do after launch.

FlightScope is not dependent on ambient lighting conditions (it can work in complete darkness), it does not create blinding flashes of light.

### **Q: How accurate is it?**

A: FlightScope represents the state of the art in measuring technology for projectiles in flight. It is in a different class to launch-only monitors, and is able to track speeds extremely accurately and determine ball positions to within single yards.

### **Q: Where must I stand to use the system? Which direction must I hit?**

A: The sensor is typically placed approx 2.4-4.2 meters (8-14 feet) behind the tee. The ball is hit away from the sensor along its pointing direction.

### **Q: Can FlightScope help me make the right club or ball selection to play a particular shot?**

A: FlightScope measures the performance (launch conditions and launch results) of golf shots and provides data to a player or fitter to make scientifically justified decisions about the right clubs and balls.

### **Q: Is the sensor portable? How must it be mounted?**

A: The sensor has been calibrated to be placed or mounted on the floor or ground. To measure accurately, the sensor must be carefully aligned with the tee and the ground. Follow the prescribed setup procedures.

**Q: Can FlightScope only be used outside on a golf course or driving range?**

A: No. FlightScope is a versatile instrument that can be used both indoors and outdoors (e.g. at a driving range or golf course).

**Q: How much ball flight distance is required by the FlightScope in order to display a result?**

A: Typically at least 14 feet of ball flight is required.

**Q: How far back must FlightScope be set up behind the tee?**

A: A good practical distance is between 2.4m and 4.2m (8 to 14ft). There is no perfect distance, although a good rule of thumb is 3m/10ft.

**Q: How is alignment of FlightScope done?**

A: In order to get accurate club and ball measurements, always align the sensor mechanically using a measuring tape and a set square so that the distance and pointing direction are accurate. Also level the sensor. Use the software Setup Wizard to assist or check the alignment.

**Q: How long does it take to align the unit?**

A: A trained user can set up and align the FlightScope in a few minutes, within the time it takes to start up his computer.

**Q: Must I use special balls?**

A: FlightScope measures any ball that is used. Even non-standard balls are measured accurately. To measure the actual flight of every specific ball, making no assumptions about the type or quality of the ball.

However, for accurate measurement of ball spin during a short distance indoor shot, it is recommended that a ball be marked with a small metal foil disk/patch. A marked ball enhances the ability of the system to measure spin accurately.

**Q: How does shot classification work?**

A: The actual path of the ball is determined by various factors like spin, lift, drag, aerodynamic coefficient, air pressure, humidity, etc. By measuring the actual ball flight, FlightScope can determine the type of shot (fade, draw, slice, etc.)

**Q: Will I receive future enhancements of FlightScope?**

A: You have a standard 12-month warranty on hardware and software. In addition though, you can subscribe to an annual support agreement enabling you to receive upgrades for your system when they become available.

**Q: Can FlightScope be used in the rain?**

A: Although the FlightScope sensor is sealed and will not suffer ingress of water it is not intended to be used in rain as it is powered from a mains electrical supply. For safety reasons power down and cover the system, or move it indoors when it rains.

**Q: Can slow swing speeds be detected?**

A: FlightScope discriminates against too low swing speeds, to reject false measurements from other movements in the area. For weak golfers and children who are not able to swing a club powerfully, the system can however be set to "wedge" mode, enabling the detection of shots.

**Q: What type of lighting can be used with FlightScope?**

A: The best lights to use are solid state or incandescent lighting, or certain halogen types. Fluorescent lights for example can influence Doppler measurements. This can however be effectively screened if it occurs. Consult your FlightScope representative for assistance with lighting problems.

**Q: Can FlightScope only be used for golf?**

A: FlightScope is a brand name for a range of sports tracking technology products and services, but it is currently well known in the golf market. FlightScope technology is also used in cricket, tennis and other sports. The various sports however use different software, and a system for Golf cannot be used directly for example for Tennis.

Blank Page

# INDEX

## A

- AC supply..... 22
- Advanced settings ..... 9
- Advanced Settings ..... 25
- Alignment .....25, 30

## B

- Ball marking..... 13
- Ball origin .....10, 11
- Ball speed ..... 29
- Basic care ..... 25

## C

- Camera ..... 29
- Carry distance..... 29
- Classification ..... 31
- Club & tilt indicator ..... 16
- Club type .....11, 16
- Clubhead speed .....21, 29
- Communications interface ..... 22

## D

- Detection mode ..... 10
- Dimensions.....13, 22
- Direction.....21, 29, 30
- Drag..... 31

## E

- Electrical supply .....22, 31
- EMC ..... 22
- Environmental specifications.. 22

## F

- FAQ..... 29
- FCC .....i, 22
- Firmware .....17, 18, 19

- Frequently asked questions ..... 29

## G

- Getting started..... 3
- Grouping ..... 29

## H

- Handle..... 6
- Height ..... 21
- Hooking up cables..... 4

## I

- Indoor ..... 10, 12, 13, 30, 31
- Ingress protection..... 22
- Installation ..... 3, 23
- Interference ..... i

## L

- Launch angle ..... 21, 29
- LED indicators ..... 27
- Level ..... 23, 25, 30
- Lift ..... 31
- Lights..... 31

## M

- Maintenance..... 25
- Mass..... 22
- Metal foil..... 13, 30

## O

- Obstructions ..... 5
- Other sports..... 31
- Outdoor ..... i, 10, 12, 13, 23, 30

## P

- Parameters ..... 25
- PC Specifications ..... 23



Pointing direction ..... 10

Power supply ..... 4

Product Key ..... 19

R

Rain..... 25

Repairs..... 26

Roll..... 10, 16

S

Safety.....i, 25, 31

Sea level ..... 12

Sensor leveling ..... 6

Sensor position..... 5, 6

Sensor status ..... 15

Sensor to Tee distance ..... 10

Setup Wizard ..... 9

Slow swing speed ..... 31

Smash factor..... 29

Software .....3, 18, 30, 31

Specifications .....21, 22, 23

Spin..... 21

Spin measurement ..... 21

Spin Measurement.....12, 13, 21

Sticker..... 13

Sunlight .....23

Surface.....6

Switching On .....7

System components.....3

T

Tee height .....10

Tee surface height .....10

Temperature range .....22

Tilt .....10, 16

Tooltips ..... 15

Troubleshooting.....25

U

Units of measurement .....12

USB..... 4, 22

USB connection.....4

V

Voltage..... 22, 23

W

Windows .....23



**- FlightScope® Customer Support -**

If you need additional help with your product,  
contact FlightScope at

+1 407 - 412 - 9400      USA

+44 203 - 239 - 4186      EUROPE

or email us at

[support@flightscope.com](mailto:support@flightscope.com)