# PS
## pico scan

# Quick Start Guide

Thank you for purchasing the Pico Scan from 4ddynamics.

We have developed this system to be as user friendly as possible without compromising on the quality of the scan data and the capabilities of the scanner. The flexibility and portability of this scanner allows it to scan objects of varying material, colour and property which on occasion can require a small amount of experimentation. This quick guide aims to get you up and running as quickly as possible, if you would like a more in depth idea of how the scanner works and more information about some of the more advanced feature please refer to the user manual which can be found on the install disk.

We look forward to hearing from you and seeing the results of the data you capture. If you have any queries regarding the use of the scanner please first use this guide and the user manual to check that everything is in order, second check our web site and forum and finally e-mail our support team who will endeavor to help you as soon as possible.

# Precautions

## Important Safety Instructions

1. Do not block any ventilation openings. To ensure reliable operation of the scanner and to protect from over heating, it is recommended to install the system in a location that does not block ventilation. (As an example, do not place the system on a crowded coffee table, sofa, bed, etc). Do not put the system in an enclosure that restricts air flow or cover with fabric.

2. Do not use the system near water or moisture. To reduce the risk of fire and/or electric shock, do not expose the system to rain or moisture.

3. Do not install near heat sources such as radiators, heaters, stoves or any other apparatus such as amplifiers that emits heat.

4. Clean only with dry a cloth.

5. Only use attachments/accessories specified by the manufacturer.

6. Do not use the unit if it has been physically damaged or abused.

Physical damage/abuse would be (but not limited to):

☒ Unit has been dropped.

☒ Power supply cord or plug has been damaged.

☒ Liquid has been spilled on to the system.

☒ System has been exposed to rain or moisture.

☒ Something has fallen in the system or something is loose inside.

Do not attempt to service the unit yourself. Opening or removing covers may expose you to dangerous voltages or other hazards. Please call 4DDynamics before you send the unit for repair.

7. Do not let objects or liquids enter the system. They may touch dangerous voltage points and short out parts that could result in fire or electric shock.

8. Do not look into the projector's lens when the lamp is on. The bright light may hurt your eyes.

**Please, carefully read Canon camera and Pico projector manuals and safe use instructions !**
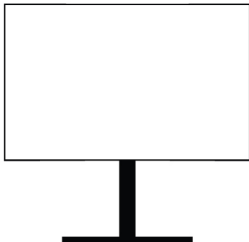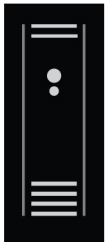
## Minimal recommended computer specifications

Operating System: Microsoft Windows Vista or Windows 7, 32bit or 64 bit

Intel Core Duo or better processor, 2.4 GHz or better processor

At least 2Gb of RAM, 4Gb recommended

nVidia or ATI OpenGL 2.0 /DirectX 10 graphics card with at least 512 Gb on board RAM with dual screen support (VGA connector for Pico Projector)

USB 2.0 port available

At least 20Gb available free hard disk space

DVD or CD player for installation

# Canon box contents

A. 18-55mm lens
B. Canon camera body
C. Canon software installation CD
D. Battery charger & mains chord
E. Rechargeable battery
F. AV cable
G. Mini USB cable
H. Strap

A                    B                    C

D          E          F          G

H

# Pico projector box contents

A. Power adapter
B. Remote control
C. Foldable mini tripod & clip
D. Pico Pro projector
E. 3.5mm to RCA cable
F. VGA to VGA cable
G. Mini USB cable
H. Travel Adapter
I. Battery charger
J. Rechargeable Battery
K. Pico Projector User Guide

A

B

C

D

E

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# Also included
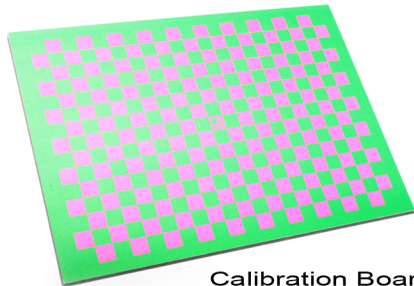
Calibration Board

Hot Shoe adaptor

# Preparing your Gorillapod

Remove the ball head and thread adaptor screw from your Gorilla pod

Screw the thread adaptor and hot shoe adaptor on the ball head.

Remove the mounting plate from the ball head and tightly screw it on your Pico projector

# Assembling

Slide assembled ball head into the hot shoe mount and tighten the locking screw

Plug in the projector power cable & VGA cable

Plug in the Mini USB cable
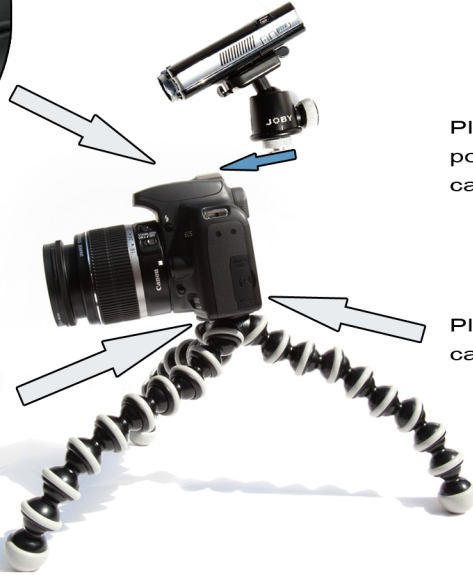
Fix the Gorilla pod to the camera with the mounting screw.

# Preparing your Canon

It is highly advisable to familiarize yourself first with your Canon using the Canon documentation and manuals. Charge the Canon battery as per instructions in the Canon user manual. Insert the battery in the Canon camera and power the camera on.
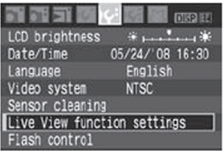
Enable the Live View option in the camera options menu by pressing the Menu button on the back of the camera and follow the steps below:

Use Mode Dial to switch to a fully manual mode on (M). Only this mode is applicable for 3D scanning
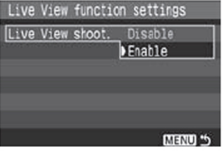
Switch to Manual Focusing mode and disable the Stabilizer using the switches on the lens.

**2 Select [Live View function settings].**
● Under the [Ⓜ] tab, select [**Live View function settings**], then press <⊕>.

**3 Select [Live View shoot.].**
● Select [**Live View shoot.**], then press <⊕>. Select [**Enable**], then press <⊕>.

**4 Exit the menu.**
● Press the <MENU> button to exit.

**5 Display the Live View image.**
● Press <⊕>.
▶ The Live View image will appear on the LCD monitor.
● The Live View image will reflect the brightness level of the actual image you capture.
● If the image is too bright, turn the <✲> dial to the right. If it is too dark, turn the <✲> dial to the left.

# Connecting and preparing computer

Install the Canon software and PicoScan software from the corresponding installation disks. Follow the step by step installation instructions to successfully complete the installation. After the installation is completed; plug in the projector VGA cable and the camera USB cable into the corresponding ports on your computer.

Power your Pico projector on and proceed to configure your desktop. Right click on your windows desktop and choose the "Screen resolution" from the pop-up menu. Make sure that the resolution for your second screen (projector display) is set to 800 x 600 and the multiple display option is set to "Extend these displays".

Plug the VGA cable in

Plug Canon USB cable into a free USB port on your computer
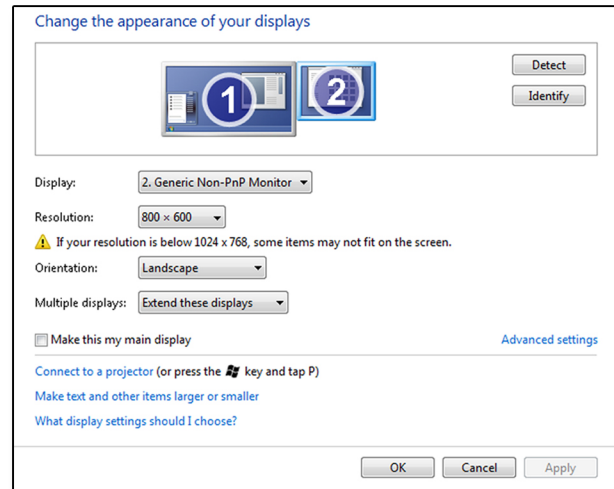
# PicoScanner wizard

Please, make sure that Canon camera and Pico projector are on and connected to your computer.
Start the Pico Scanner software and click 'File - New'.  You will be presented with a "Project Wizard" window.
In this window you can configure your project and scanner setup. You can find more information about all the features of this project wizard in the Pico Scanner User Manual.
For the first use, make sure that you select your Canon camera for 3D reconstruction - just click on the radio box in front of he Canon camera field and pick your Canon EOS 1000D from the drop down list.

Make sure that the projector screen is set to "Screen 2 with 800 x 600 resolution.
The calibration Checker Patterns should have values exactly like in the screenshot below.

Click Finish and you will be taken to the next stage.

# Aligning camera & projector

Before you proceed with the scanner calibration and scanning, the camera and projector field of view and focus should be aligned. It is  easiest to achieve by switching on the "Focus" pattern in the idle pattern selection list in the settings tab*.



Mount the calibration board on the mini tripod included in the projector box. Now position the mounted calibration board in front of your PicoScan.

First zoom and focus your Canon camera so the calibration board fits inside the field of view. Then focus the projector on the centre of the calibration board until you see the focus grid clearly. Then align the projection view by adjusting the ball head and Canon lens zoom until the projected focus pattern fills the Canon field of view and it is centered.
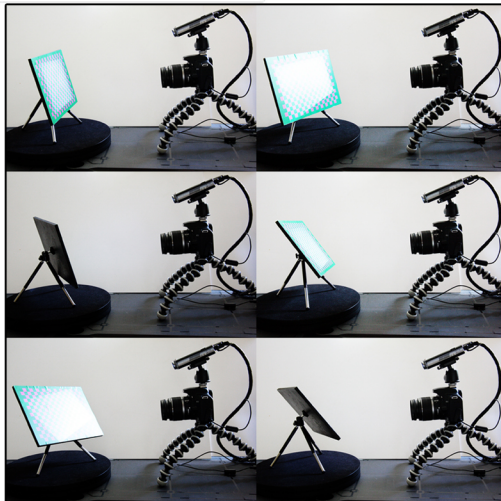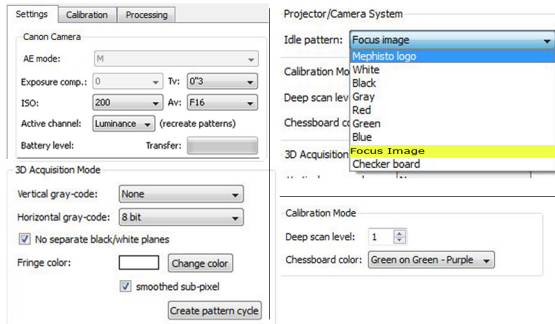


Set Chessboard color  to Green on Green - Purple
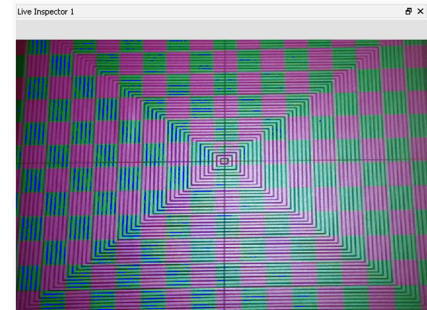


*Note:  If the 'Focus' Image is already selected but no pattern is being projected, select a different image and then re-select  the'Focus' image.

# Calibration

Now your system is ready for it's calibration. The settings in the settings tab should match the following screen shots. For more information see the user manual

Switch to the Calibration tab and proceed with the geometric calibration. Geometric calibration is achieved by capturing the calibration board in different angled positions like in the illustration to the left.
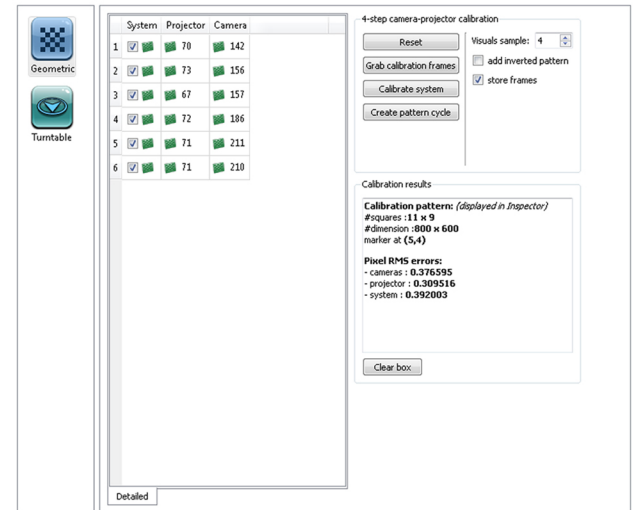






Six different angled image pairs are acquired by pressing the "Grab Calibration Frames" button. After that press the "Calibrate System" button. Your result should look similar to this screen shot. Press the "Create pattern cycle" button then your calibration is finalized.  Save the project at this point:  'File - Save'
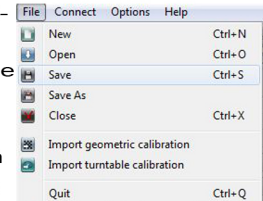
# First Scan

Your scanner is now ready to scan. Just switch to the "Processing" tab and press the "SCAN" button. Your scanner will project and capture patterns, process the captured images and will reconstruct the shape in the 3D viewer. It is recommended to scan your calibration board as the first scan, this to ensure that everything went alright during the calibration procedure and the scanner is reconstructing a smooth none warped surface.  Rotate around the scanned board to confirm it is flat and that the surface is smooth.  Be aware that the pattern of the boards squares may produce a pronounced surface that matches the image, this is normal with contrasting colours.
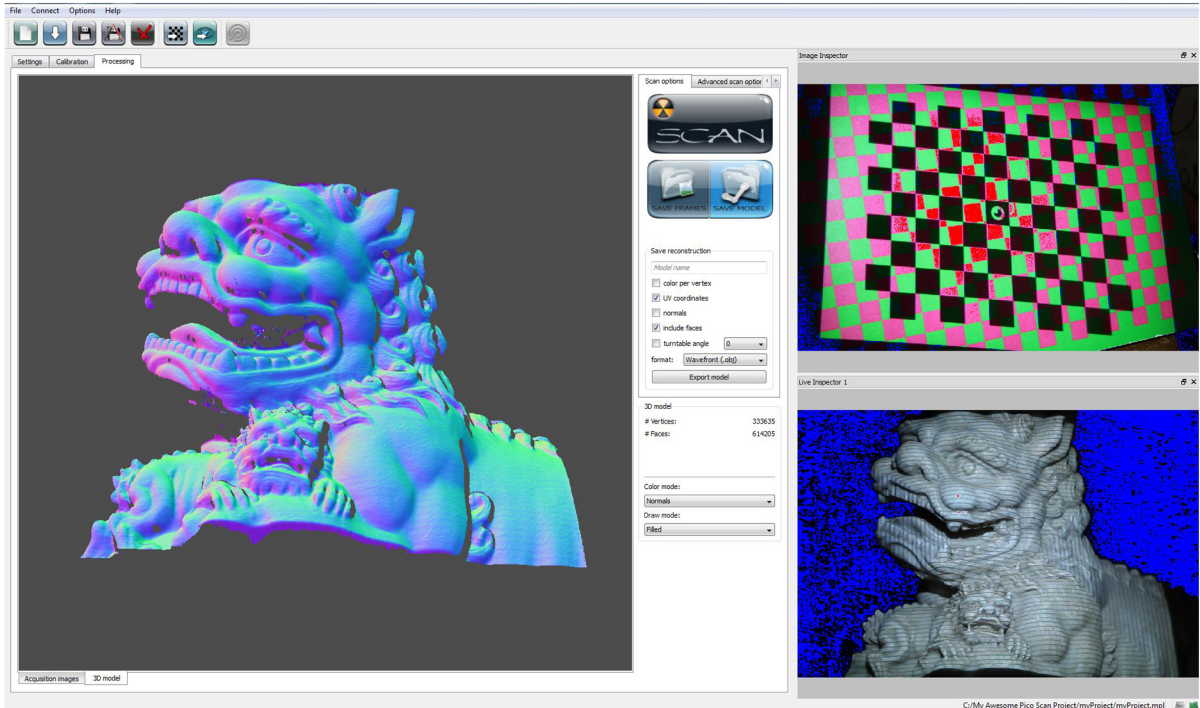
Congratulation on setting up and using the Pico Scanner

For more information about the features of the system, some tips on how to perform certain tasks and to problem solve any issues check the user manual which can be found on the install disk.

We look forward to see the results of your scanning.

The Pico Scan Team

# 4D Dynamics
## real 3D scanning solutions

To receive your 6 months warranty please register
online at www.4ddynamics.com/warranty