VetPro® Sensor

Digital Sensor System

User and Installation Guide

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VETPRO® SENSOR
DIGITAL SENSOR SYSTEM

USER AND INSTALLATION GUIDE

MIDMARK CORPORATION

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General Information

Indications for Use

VetPro® Sensor is intended to be used by veterinarians and other qualified professionals for producing diagnostic x-ray radiographs of dentition, jaws and other oral structures in anesthetized patients.

Contraindications

None known.

Warnings/Precautions

Radiation Safety	• Only qualified and authorized personnel may operate this equipment observing all laws and regulations concerning radiation protection. • The operator at all times must remain at a safe distance from the focal spot and the X-ray beam for operator protection. • Full use must be made of all radiation safety features on the X-ray equipment. • Full use must be made of all radiation protection devices, accessories and procedures available to protect the patient and operator from X-ray radiation.
Electrical Safety	• The VetPro® Sensor cable should be handled with care. Do not sharply bend or crimp the sensor cable. Doing so could permanently damage the sensor. • This equipment must only be used in rooms or areas that comply with all applicable laws and recommendations concerning electrical safety in rooms used for medical purposes, e.g., IEC, US National Electrical code, or VDE standards. • Before cleaning or disinfecting, this equipment must always be disconnected from the electrical supply. • The computer and any other associated equipment (like USB hub) shall be placed outside the patient's environment (i.e.: more than 1.5 meters away from the table). The operator shall not access the patient and such devices at the same time. • The computer and any other associated equipment shall be compliant with IEC 60950 or IEC 60601.

Patient Safety

- Prior to use **always** cover the sensor with a disposable hygienic protective cover. A new cover must be used for each patient. It is recommended to disinfect the sensor between uses.
- The VetPro® Sensor, Computer, and provided cables comprise a Medical Electrical System. The Computer is not intended to be located in the patient environment (within a 1.5 m radius of the patient).
- Patients should be properly anesthetized prior to taking oral radiographs.
- System installation shall be in accordance with the requirements of IEC 60601-1, the Standard for Safety Requirements of Medical Electrical Systems

Product Description

VetPro® Sensor is a digital imaging system for dental radiographic application. The product is to be used for dental radiographic diagnostic examinations. Two different sized sensors (size 1 and size 2) are utilized to image different anatomy and for different patient sizes. The CMOS sensor connects directly to a USB connection in a PC without the need for an intermediate electrical interface. VetPro® Sensor works with a standard dental intraoral x-ray source without any connection to the x-ray source. VetPro® Sensor captures an image automatically upon sensing the production of x-ray and after the x-ray is complete, transfers the image to an imaging software program on the PC. Disposable sheaths are used with each use to prevent cross-contamination between patients. VetPro® Sensor is a state of the art intraoral x-ray detector intended for digital imaging of teeth and the oral cavity. The system provides:

- Immediate production of an image
- Digital image storage and management
- Efficient archiving and recall of images
- Elimination of film processing

The components of the VetPro® Sensor system are the Digital Sensor internal USB Cables and, the Sensor Calibration Files.

Digital Sensor

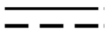
The digital sensor is designed to transform a two dimensional X-ray picture into an electrical signal. The structure of the sensor is assembled with a first layer of phosphor material (scintillator) which, when exposed by incident X-rays, emits a luminous radiation. This light is then transferred to the photo sensitive elements of the Sensor where it is transformed to electrical potential. The electrical signal is sent to the computer for processing.

Sensor Calibration Files

During installation of the VetPro® Sensor system, files specific to the sensor serial number are stored on each computer where the sensor will be used. For more details, refer to the VetPro® Sensor Installation section of this manual.

Progeny Imaging	Provides the user interface to acquire, store, retrieve, transmit, review and post process images acquired by the VetPro® Sensor system. For more details refer to the VetPro® Sensor Installation section of this manual or the Progeny Imaging User Manual.
NOTE	The VetPro® Sensor digital sensor is sensitive to intense UV light. Therefore, the sensor should be stored in the box provided and never exposed to direct sunlight for extensive periods of time.

Explanation of Symbols on Technical Labels

	Caution, consult accompanying documents
	Refer to operating instructions
	Class II equipment – provides double Isolation to protect against electric shock
	Type BF – provides additional protection against electric shock
IP67	Degree of protection – IP67 means that sensor casting is : totally protected against dust, protected against the effect of immersion between 15 cm and 1 m.
	Direct current
	Serial number
	Catalogue number
	Date of manufacture
	Place of manufacture (manufacturer)

Compliance with Applicable Standards

The following regulatory documents apply:

General Safety	IEC 60601-1:1995 Protection against electrical shock – Class II Degree of protection against electrical shock – Type BF Applied Part Degree of protection against ingress of water – IP67 Not suitable for use in the presence of flammable anesthetic mixture with air or with oxygen or nitrous oxide.
EMI/EMC	IEC 60601-1-2:2007
Degree of Protection	IEC 60529: 2001 Degree of protection against ingress of water – IP67
Imaging Performance	IEC 61223-3-4:2002 Line pair resolution – better than 8 lp/mm Low contrast resolution – all holes visible
EMC Statement	Information regarding potential EMC interference and advice for avoidance • The VetPro® Sensor is considered as non-life-supporting equipment. While using VetPro® Sensor adjacent to other equipment, configuration should be carefully adjusted to ensure that electromagnetic interference (EMI) does not degrade performance. Specifically, mobile RF communications equipment can effect medical electrical equipment. Please refer to the EMC table below. • Usage limitation: VetPro® Sensor shall be used with IEC 60950 or IEC 60601 compliant computer. Also, any device between VetPro® Sensor and the computer (USB Hub) shall be compliant with IEC 60950 or IEC 60601. If not, this may result in degraded electromagnetic compatibility.

Guidance and manufacturer's declaration - electromagnetic emissions		
The VetPro® Sensor is intended for use in the electromagnetic environment specified below. The customer or the user of the VetPro® Sensor should assure that it is used in such an environment.		
Emission test	Compliance	Electromagnetic environment – guidance
RF emission CISPR 11	Group 1	The VetPro® Sensor uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emission CISPR 11	Class B	The VetPro® Sensor is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emission IEC 61000-3-2	Not Applicable	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Not Applicable	

Guidance and manufacturer's declaration - electromagnetic immunity			
The VetPro® Sensor is intended for use in the electromagnetic environment specified below. The customer or the user of the VetPro® Sensor should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If the floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/ output lines	Mains power quality should be that of a transient/ burst supply lines typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Not Applicable.	
Voltage dips, interruptions, and voltage variations on power supply input lines IEC 61000-4-11	< 5% U_T (>95% dip in U_T) for 0.5 cycle < 40% U_T (60% dip in U_T) for 5 cycles < 70% U_T (30% dip in U_T) for 25 cycles < 5% U_T (>95% dip in U_T) for 5 s	Not Applicable.	
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration - electromagnetic immunity			
The VetPro® Sensor is intended for use in the electromagnetic environment specified below. The customer or the user of the VetPro® Sensor should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compli-ance level	Electromagnetic environment – guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the VetPro® Sensor equipment, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance:**
Conducted RF IEC 61000-4-6	3 V 150 kHz to 80 MHz	3 V	$d = 1.2 \times \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = 1.2 \times \sqrt{P}$ 80 MHz to 800 MHz $d = 2.3 \times \sqrt{P}$ 800 MHz to 2.5 GHz
			Where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacture and *d* is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, [a] should be less than the compliance level in each frequency range. [b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the VetPro® Sensor is used exceeds the applicable RF compliance level above, the VetPro® Sensor should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the VetPro® Sensor. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V_1] V/m.			

Recommended separation distances between portable and mobile RF communications equipment and VetPro® Sensor			
The VetPro® Sensor is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the sensor can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the sensor as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter, W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.2 \times \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \times \sqrt{P}$	80 MHz to 2.5 GHz $d = 2.3 \times \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.34
10	3.69	3.69	7.38
100	11.67	11.67	23.34
For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer. NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			

Obtaining Technical Support

Contact

Midmark Corporation
1001 Asbury Drive
Buffalo Grove, IL 60089

Phone: +1-800-MIDMARK (US only); +1-844-856-1232 (direct)

its@midmark.com

To facilitate your service call, the following information should be ready and available:

- Computer operating system
- Version of Progeny Imaging software
- Serial number of your sensor
- Type of Progeny Imaging installation (standalone, peer-to-peer network, client-server network)

NOTE: It is recommended that the installing technician review the complete instructions before attempting to install or upgrade any component

Authorized Representatives

Europe	CE Partner 4U Esdoornlaah 13 3951DB Maarn The Netherlands Phone: +31 (343) 442-524 Fax: +31 (343) 442-162

Installation

Overview

The VetPro® Sensor System is an intraoral digital sensor used with an intraoral X-Ray generator to capture digital images of dentition and the surrounding skeletal structures The Sensor is available in two configurations:

- Standalone – Sensor, connected directly to a PC
- Integrated – Integrated into and part of the VetPro Complete system.

NOTE: The integrated version of is available as a retrofit kit for certain existing Progeny products.

Before You Begin

Computer and Software

You must have a dedicated Computer with a 32-bit or 64-bit Windows operating system and have at least one **High-speed** USB port available. The computer requirements are listed in Table 1.

Image capture and management software must be installed on all computers that will host the VetPro® Sensor. The performance of that software is affected by the amount of RAM and storage memory available to the system for acquisition, displaying, storing, and printing digital X-Ray images. The recommended requirements are listed as a guideline only.

NOTE: Be aware that the patient volume, and the specific demands of your practice, may require adjusting these guidelines accordingly. The system requirements of other programs operating on the same computer or network may affect these guidelines as well.

Table 1: Recommended System Requirements

Component	Requirement
Computer Hardware	PC - compatible Pentium 4 / 1.4 GHz or greater computer
Memory System	2 GB RAM or higher recommended (minimum 1 GB)
Operating System	Microsoft Windows XP Professional with Service Pack 3; Microsoft Vista (Business or Ultimate editions); Microsoft Windows 7 (Professional or Ultimate editions)
Disk Space	450 MB minimum NOTE: Additional disk space is needed depending on the size of the practice, the number of images, and other information you plan to store. Each image is approximately 4 MB. For example, approximately 300 GB are needed to store 75 000 images.
Display Settings	1024 x 768 (16 - bit or higher) with 32 MB (or higher) of Video RAM NOTE: It is possible to increase these settings based on the actual video adapter installed. As a rule, the better your video adapter or capture card the better your images.

	Midmark requires the use of Progeny Imaging or Progeny Imaging Twain software. It must be installed on every computer that will interface with the VetPro® Sensor. If you are not intending to use Progeny Imaging, then compatible image capture and management software must be installed on all computers to be used. This software may support direct integration with VetPro® Sensor (direct integration) or may use TWAIN interface. For installation and use of Progeny Imaging software, refer to the Progeny Imaging Installation Manual, or contact Technical Support. For installation and use of third party software that supports direct integration, refer to that software installation and user manuals.
Check System Contents	Verify that all items listed on the Packing List are contained in your system order. If any item appears to be missing, contact Technical Support immediately. For guidance refer to Figure 1.
Tools Required	No tools are required to install VetPro® Sensor System.

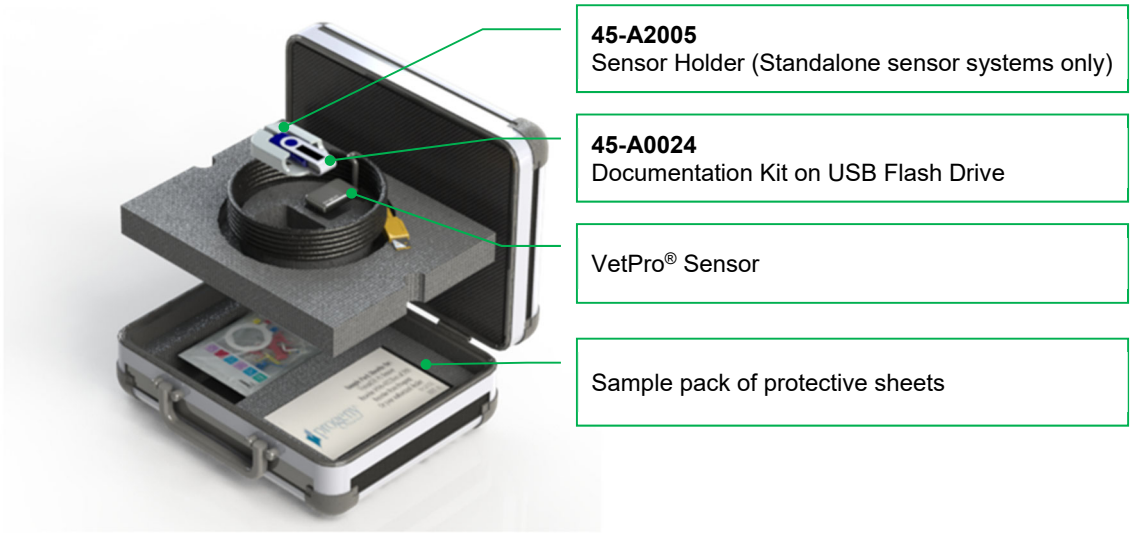


Figure 1: Contents of VetPro® Sensor System

Installation Procedure

Installing together with Progeny Imaging Software

When installing the VetPro® Sensor drivers and associated software, it is assumed that previous versions of the Progeny Device Suite and Progeny Imaging image management software are not present.

NOTE: Proper operation requires any previous version of Progeny Device Suite and Progeny Imaging to be removed (uninstalled) prior to the installation process to begin.

Execute the following steps:

- Insert the USB Flash Drive into an available USB port on your computer and allow the computer to recognize the flash drive.
- The main screen of the installation software is shown on Figure 2. If the software on the USB flash drive does not start automatically, navigate to Windows Explorer™ and select the “Progeny” drive letter. Browse to the content of the flash drive and start “Setup.exe”. This step begins the installation process.

NOTE: The installation software requires Microsoft .NET Framework revision 3.5. This software will be installed if it is not yet present to the operating system. Follow all on screen prompts.

NOTE: If the intended configuration is based on Windows XP, the Service Pack 3 update is required. This update is included on the USB flash drive and can be installed from folder named ‘Utilities’. Another option is to use the Windows update tool provided by Microsoft.

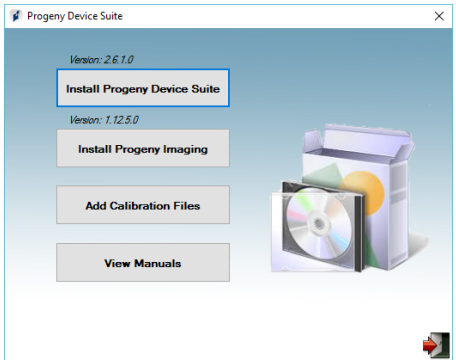


Figure 2: Main screen of the Installation software

- Start the installation process by clicking on 'Install Progeny Device Suite' button (Figure 3).

NOTE: The installed software requires multiple software components that may already be available in your system. These components will be installed if they are not yet present. Follow all on screen prompts.

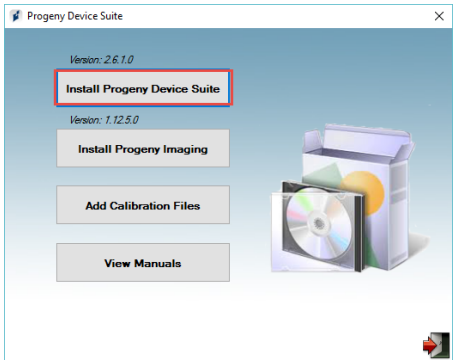


Figure 3: Starting the Progeny Device Suite installation

- The screen on Figure 4 will be displayed. Choose "VetPro Sensor" and all other device families that have to be supported by the Imaging Software.

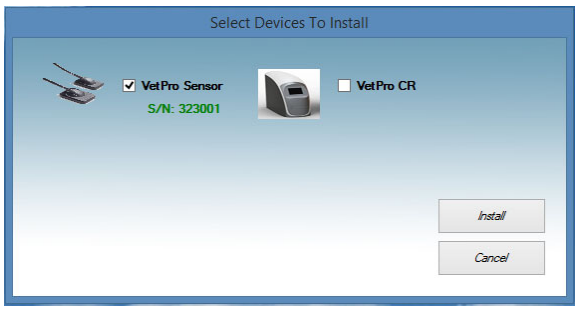


Figure 4: Selecting the device families to be installed

- The dialog box shown on Figure 5 may appear when Progeny Device Suite is installed in Windows Vista and Windows 7 environments. Select 'Always trust software from Midmark' check box and click on the Install button.

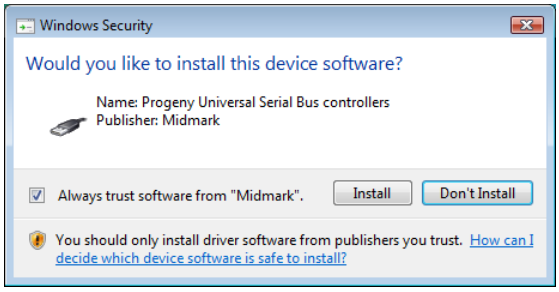


Figure 5: Enable Midmark software installation

- A green check mark next to the 'Install Progeny Device Suite' button will appear when Progeny Device Suite installation is completed. Continue by installing Progeny Imaging software by clicking on 'Install Progeny Imaging' button (Figure 6) and follow the prompts on the screen to perform the installation.

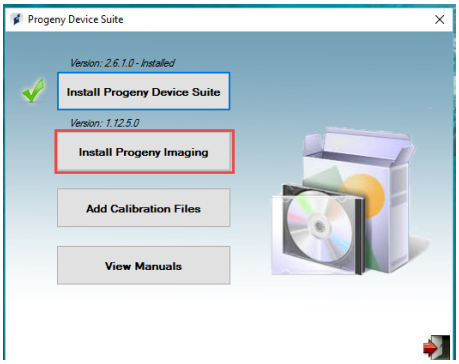


Figure 6: Starting the Progeny Imaging installation

- Green check marks next to each of the 'Install Progeny Device Suite' and 'Install Progeny Device Suite' buttons will appear when both the Progeny Device Suite and Progeny Imaging are installed (Figure 7).

Figure 7: Progeny Device Suite and Progeny Imaging are installed

Installing Sensor Calibration Files

The VetPro® Sensor requires a calibration file to be installed for each device to operate correctly. This calibration file is unique for each sensor and it is provided on the USB flash drive.

NOTE: The USB flash drive contains the unique sensor calibration file, the operation instructions and the sensor support software. Do not discard or reuse. Save and store the USB flash in a convenient location to allow future references to its content.

The calibration files for the VetPro® Sensor are installed during the Progeny Device Suite installation from the provided USB flash drive. No additional installation is needed if only one sensor will be used in the installed configuration and the sensor support software was installed from the provided USB flash drive.

Install the sensor calibration file by executing the following steps, if more than one sensor is needed, or if the current sensor is installed after the support software is installed, or if you are uncertain whether the sensor calibration file was installed.

- Insert the USB flash drive that came with the VetPro® Sensor into an available USB port on your computer and allow the computer to recognize the flash drive.

- The main screen of the calibration file installation is shown on Figure 8. If the software on the USB flash drive does not start automatically, navigate to Windows Explorer™ and select the drive letter labeled “Progeny”. Browse to the content of the flash drive and start “Setup.exe”. This step begins the installation process.

NOTE: Do not run the Progeny Device Suite installation as that software is now installed.

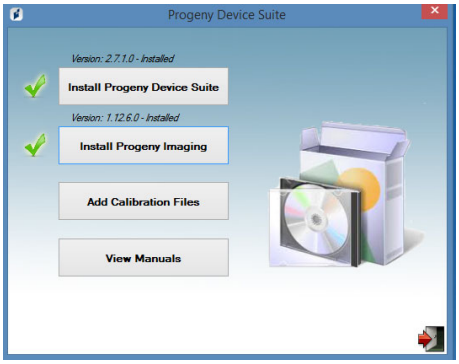


Figure 8: Main screen of the calibration file installation

- To add the calibration file onto your computer click on the “Add Calibration Files” button (Figure 9).

Figure 9: Calibration file installation

- The dialog box shown on Figure 10 will appear to allow selection of the calibration file(s) source folder. The initial selection will point to the source folder on the current USB flash drive. Navigate to the calibration file source folder if needed and click on the 'OK' button to continue.

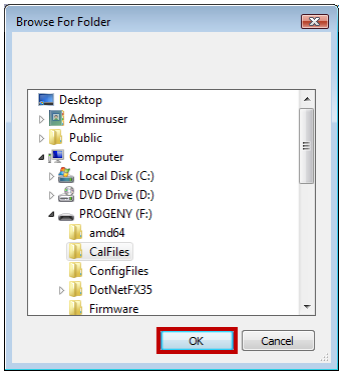


Figure 10: Select the source folder for the calibration file

- A green check mark next to the 'Add Calibration Files' button will appear when the calibration files are installed (Figure 11). Exit from the installation by clicking on the 'Exit door' icon as highlighted on Figure 11.

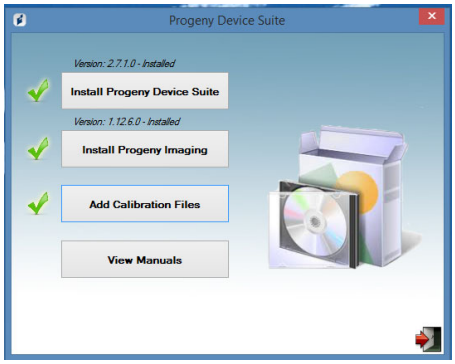


Figure 11: Calibration files are installed

Sensor Installation

If a Standalone version is installed, plug the sensor into an available High-speed USB port on the computer with installed sensor support software. Attach the Sensor Holder to a secure location near the computer and use it as a sensor storage location.

If an Integrated version is installed, plug the sensor in the USB port available at the end of the Articulated Arm, near to the tube-head. Verify also that the USB hub embedded in the integrated system is connected with the provided cable to a High-speed USB port of the computer that contains the sensor support software. That connection has to be present for the Sensor to be operational. Attach the Sensor Holder to Articulated Arm near to the tube-head if it is provided separately. Use the Sensor Holder as a sensor storage location.

A Windows device driver installation message will be displayed when the sensor is connected to an USB port for the first time.

NOTE: A Windows device driver installation message will be displayed every time when the sensor is connected to a new USB port for the first time.

No additional interaction is needed when the VetPro® Sensor is used in a Windows Vista and Windows 7 environment. If the VetPro® Sensor is used in a Windows XP environment, an installation device wizard may appear (Figure 12). Follow the steps bellow to complete the installation.

- Select ‘Yes, this time only’ from the dialog box and press the ‘Next’ button (Figure 12).

Figure 12: Found New Hardware Wizard in Windows XP (first screen)

- Select ‘Install the software automatically’ and continue by pressing the ‘Next’ button (Figure 13). Follow the wizard instructions and prompts to complete the drive installation.

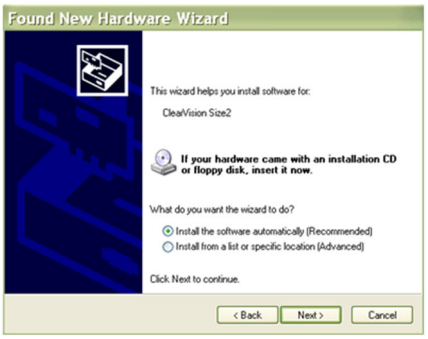


Figure 13: Found New Hardware Wizard in Windows XP (second screen)

Sensor Selection in Progeny Imaging

The VetPro® Sensor could be used once Progeny Imaging software is started as it is described in Progeny Imaging Installation Manual. To select the VetPro® Sensor use the 'Device Control Toolbar' by following the steps bellow.

- Select VetPro Sensor as shown on Figure 14.

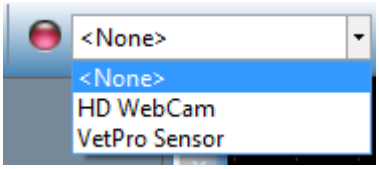


Figure 14: Selecting VetPro Sensor in Progeny Imaging

- Once VetPro Sensor is selected you will see a green LED (Figure 15). This verifies the sensor is now connected to the computer.

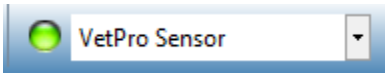


Figure 15: Successful VetPro® Sensor selection

Operating the VetPro® Sensor

Acquiring Images

Prerequisites

- Install the imaging software following the installation steps provided with the product.
- Connect the VetPro® Sensor as described in this guide.

Connect the Sensor

1. Connect the VetPro® Sensor X-Ray Sensor to the computer (standalone configuration) or to the USB Interface connector on the Progeny Articulated Arm (in the case of the integrated system configuration).

NOTE: Always attach the sensor and the integrated system to an USB port that complies with the USB specification and supports **High-speed** transfer. Use only USB certified components that support **High-speed** transfer if an additional USB hub or USB cable is needed. Attaching the sensor to a different port or using different components and cables will degrade sensor performance. (Contact Progeny technical support or refer to the Service and Installation manual for further information).

Taking images

1. Refer to the specific imaging software manual for X-ray image acquisition.

NOTE: We recommend the use of Progeny Imaging image management software. Incompatible software will not allow sensor operation.

2. Verify that the X-ray system exposure parameters are adequate for the desired examination.
3. Insert the X-ray sensor into a sensor sheath and then position the sensor inside the patient's mouth in the desired position.
4. Position the tube head of the X-ray system to the patient, using standard positioning procedures.
5. Activate the VetPro® Sensor via the imaging software (refer to the software guide).
6. Repeat steps 1-5 for additional images.

Using the Sensor Sheaths

A sample pack of sanitary sheaths is included with your sensor. Sheaths are necessary to avoid patient cross contamination. Care must be exercised when placing sheaths on sensors or in positioning device. If you suspect the sheath integrity has been compromised, discard and do not use. The sheaths are not sterile and are intended as a single use item. Dispose of used sheaths appropriately.

To order more sheaths, contact Midmark or your Midmark dealer.

1. Follow the procedure below prior to every use of the sensor. Hold sheath and insert sensor into opening between the white tab and the paper.
2. Gently slide the sensor into the sheath until it reaches the tip of the sheath. Do not force it.
3. Peel back the protective cover.
4. Peel away the paper backing. The sensor is now protected and ready for normal use.

Figure 16: Using protective sensor sheath

5. After use, slide the sensor out of the sheath delicately using the thumb. DO NOT pull the cable while removing the protective sheath.

Recommended Maintenance

VetPro® Sensor do not require maintenance. Disinfection is recommended between every use.

Cleaning and Disinfecting

NOTE: Disinfection of the VetPro® Sensor is the sole responsibility of the user according to their practice protocol and the instructions, requirements, and limitations of the disinfecting agent being used, as per the manufacturer of the agent.

The VetPro® Sensor should be cleaned according to the following procedure:

1. The VetPro® Sensor and associated cables may be disinfected by wiping with a high level EPA registered hospital disinfectant as per manufacturer's directions.
2. Use personal protection equipment during the disinfecting process.
3. Disinfect the sensor and the first 10 centimeters of the sensor cable only, before first use, and before any new patient.

4. Use a new sanitary sheath for each patient. The sheath must be biocompatible following the standard ISO 10993-1. Sheaths provided by Progeny meet this standard.
5. Wipe the sensor surface (not the cable) with a gauze sponge moistened with a disinfecting solution.
6. Disinfection by immersion with a disinfecting solution is preferred. Follow the disinfectant manufacturers recommended immersion time, and other instructions.
7. The sensor cable can be soaked in a disinfecting solution as long as there is no mechanical damage to the sensor or the cable. If mechanical damage is recognized, consult with Progeny technical support before attempting to immerse the sensor or cable.
8. Dry the sensor before placement in the next sanitary barrier.
9. Important:
    - Do not immerse the USB connector in a disinfecting solution.
    - Do not clean the sensor or cable with abrasive tools.
    - Do not use disinfectants that contain bleach or alcohol.

Do not heat sterilize or autoclave the sensor as this will damage the electronics and enclosure, thus voiding the warranty.

Preferred disinfecting liquids:

- CIDEX OPA (trademark of Johnson and Johnson)
- DENTASEPT (trademark of Anios Laboratories)
- RELYON (trademark of Phagogene Dec. Laborotories)

Never use:

- Alcohols (Isopropyl Alcohol, Methanol)
- SEKUSID-N (trademark of Ecolab Paragerm Laboratories
- SEKUSEPT Easy (trademark of Ecolab Paragerm Laboratories
- FD333 (trademark of Durr Dental Laboratories)
- FD322 (trademark of Durr Dental Laboratories)

Specifications

X-Ray Sensor

Film Size equivalent	Size 1 (37 mm x 24 mm) Size 2 (43 mm x 30 mm)
Active Area	(Size 1) 600 mm^2 (Size 2) 900 mm^2
Number of Pixels	1.65 million Pixels (Size 1) 2.59 million Pixels (Size 2)
Pixel Size	19 µm x 19 µm
Theoretical Resolution	27 lp/mm
Dynamic Range	72 dB
Sensor Cable	3 m or 0.9 m
Connection type	High Speed USB
Power Supply	+5 V, per USB 2.0 specification
Level of Protection	IP67 (sensor only, per IEC 60529)

Environmental

Operating Temperature	between +5 ºC and +35 ºC (between +41 ºF and +95 ºF)
Storage Temperature	between -40 ºC and +70 ºC (between -40 ºF and +158 ºF)
Operating humidity	5% to 85 % operating humidity
Storage humidity	10% to 90% non-condensing, storage humidity

Terms

Film Size Equivalent	The size of the X-ray sensor active area in relation to traditional film based X-ray systems available to the veterinary profession.
Active Area	The equivalent sensor area used to produce an image, measured in square millimeters (mm2). The larger the number, the larger the active area.
Number of Pixels	The total number of pixels in the sensor active area. It has no unit value; however, a larger number results in a finer image.
Pixel Size	The size of the smallest discrete picture element used in the process of image acquisition, measured in micrometers (µm). The smaller the pixel size, the finer the image.
Theoretical Resolution	Measures the maximum level of detail that the sensor system is capable of acquiring, measured in line-pairs per millimeter (lp/mm). The larger the number, the finer the image.
Dynamic Range	Represents the largest output of the device as a ratio to the smallest output, measured in decibels (dB). A larger number shows a greater X-ray exposure range in which the X-ray sensor system can produce an image without degradation.
Sensor Cable	Identifies the type and length of the sensor cable.
Connection Type	Specifies the connection type used to attach the sensor system to the computer.

Warranty

A separate Warranty Registration form has been included with your system. Please complete and return it immediately to validate your warranty and receive technical support. **Midmark cannot offer technical support or assistance unless your product has been registered.**

Extended Warranty Options are available. For more details, contact Midmark or your dealer.