

## X3 WIPER BLADE SENSOR

AUTOMOTIVE TESTING

## X3 Wiper Blade System

XSENSOR's X3 Wiper Blade System is a design and quality assurance tool that measures a wiper blade's linear force as it is applied on a windshield. The wiper blade sensor is a consistent, reliable, and repeatable measurement tool used to assess wiper blade interface pressure distribution.

The X3 Wiper Blade Sensor's distinct properties make it an ideal tool for wiper blade designers and engineers:

- Provides repeatable results (users have more confidence in the data)
- Offers excellent calibration stability (users save time and cost)
- Uses plug-and-play electronics (makes it simple to set up and use)
- Ultra-flexible design conforms to windshield or wiper fixture
- High-resolution pressure images showing the wiper blade profile

The X3 Wiper Blade Sensor can be used to evaluate new wiper designs and construction with confidence. Users can verify wiper selections based on a particular windshield curvature. In addition, they can also compare design data against production line data to ensure that manufactured end-products continually meet design specifications. Furthermore, this flexible sensor can replicate results regardless of test or production location.

### INNOVATORS IN PRESSURE IMAGING

XSENSOR Technology Corporation is the leading innovator of advanced pressure imaging in sleep, patient safety, and automotive testing solutions. Offering sensor superiority, custom solutions, and X3 technology, XSENSOR is an internationally recognized leader with products in use in over 40 countries worldwide.

### LEARN MORE

Visit [www.xsensor.com](http://www.xsensor.com) for additional information. Please contact us directly to request additional information or to arrange for a complimentary consultation and product demonstration.

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### Repeatable Linear Force Measurement - Consistency Produces Confidence

The X3 Wiper Blade System is comprised of a flexible and conformable, high-resolution capacitive sensor, **X3 PRO** electronics, and **X3 PRO v6.0** software. This complete package provides consistent and repeatable measurements of wiper profiles. With this system, designers and engineers can apply the wiper blade to the sensor repeatedly, knowing that they will get consistent results after numerous trials.

### Calibration Stability – Saves Time and Cost

XSENSOR systems are designed to measure pressure over thousands of cycles. With the X3 Wiper Blade System, users can focus on gathering critical data instead of calibrating the sensor after each test.

### Plug-and-Play Electronics – Simple to Set Up and Use

The X3 Wiper Blade System takes advantage of the XSENSOR **X3 PRO** electronics, **X3 PRO v6.0** software, and XSENSOR's plug-and-play technology.



Close up of X3 Wiper Blade Sensor



## X3 Wiper Blade Sensor Properties

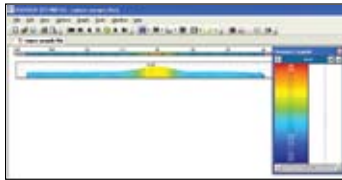
The X3 Wiper Blade Sensor pad is a capacitive, low-pressure sensor designed specifically to measure the linear force of wiper blade applications. Approximately one millimetre thick, the sensor is thin and pliable, allowing it to conform well to uneven surfaces.

Two X3 Wiper Blade Sensors are available:

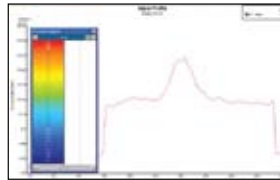
- The PX100:1.64.02 has 64 sensing points and a pressure range of 0.06 to 0.5N/cm
- The PX100:1.160.05 has 160 sensing points and a pressure range of 0.06 to 0.5N/cm

## X3 PRO v6.0 Software and the X3 Wiper Blade Sensor

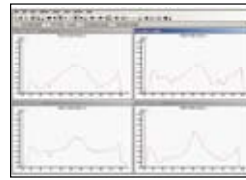
The **X3** PRO v6.0 software has specific tools for wiper analysis and comparison. It provides users with the following features:



2D cross-section profiles, viewable in a dynamic or static manner



Compares graphs and analyzes data for multiple wiper blades using wiper blade profile graphs (up to 4 separate analyses)



Compares graphs and analyzes data for multiple wiper blades using a wiper blade comparison graph (up to 4 plotted on the same graph)



Export data into .csv format for analysis

## X3 Wiper Blade System Packages

X3 Wiper Blade packages include 16-bit resolution electronics as well as XSENSOR's **X3** PRO v6.0 software.

The software is compatible with Microsoft XP and Microsoft Vista. The table below shows what each package includes:

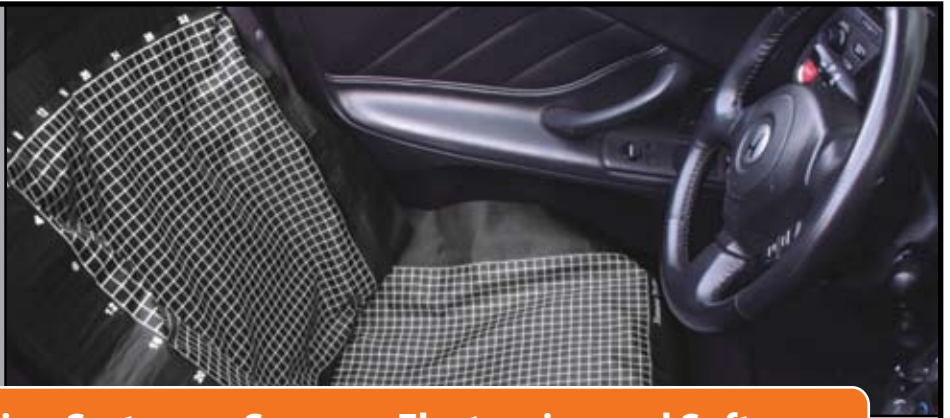
	<b>PACKAGE 1</b>	<b>PACKAGE 2</b>
	<b>X3 Sensor Pad:</b> Model: PX100:1.64.02 wiper sensor Size of sensor array: 12.7 x 812.8mm Number of sensing points: 64 Resolution: 12.7mm Calibration range: 0.06 to 0.5N/cm	<b>X3 Sensor Pad:</b> Model: PX100:1.160.05 wiper sensor Size of sensor array: 12.7mm x 812.8mm Number of sensing points: 160 Resolution: 5.08mm Calibration range: 0.06 to 0.5N/cm
	<b>X3 Software:</b> X3 PRO v6.0 software (5-user licence)	
<b>X3 Electronics:</b> 1 X3 PRO Platform 1 X3 PRO SENSOR PACK (for PX100:1.64.02) OR 3 X3 PRO SENSOR PACKS (for PX100:1.160.05) 1 X3 USB Cable 1 Electronics Carry Case 1 X3 STANDARD POWER SUPPLY + "Country Specific" Power Cord		
1 Wiper Sensor Carry Case		

### Minimum Computer Requirements (to Operate any XSENSOR System):

- A Pentium or Intel Core 2-based CPU with USB 2.0 host port or higher
- Windows XP or Vista



Seat sensors are used to evaluate comfort and performance



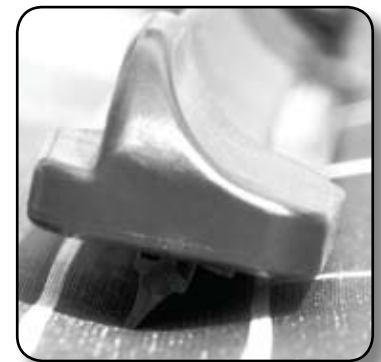
## XSENSOR's Automotive Testing Systems – Sensors, Electronics, and Software

XSENSOR uses sensors, software, and electronics to provide pressure imaging solutions for automotive testing and to graphically display the pressure distribution between two interface surfaces in real time.

### X3 Sensors

X3 Sensors are ideal for design, testing, and quality control in the following automotive applications:

- Seating - Assess comfort, ingress-egress testing, and functionality, statistically relate design to comfort and support
- Tires – Compare tire tread designs, analyze tread pattern performance, and determine contact ratios
- Wiper blades – Conduct analysis on material composition, mechanical force properties, and verify production quality
- Door-seals – Test compression seals and production/design flaws



The wiper resting on the sensor for a measurement

X3 Sensors provide the following advantages:

#### Sensor Data Quality

Superior data quality comes from the sensor and X3 system's ability to provide repeatable and accurate data. Data quality increases an engineer's and designer's confidence in the imaging data collected.

#### Sensor Quality

XSENSOR sensor pads perform under the most rigorous testing environments and deliver a lower total cost of ownership. Sensors can be moved easily from one position to the next, or from one facility to another, without risking the loss of calibration or data. The sensor is extremely conformable which minimizes any distortion of the true interface pressure caused by the sensor's presence. These durability and conformability characteristics, when combined, are keys to providing high-quality data.

#### Calibration Stability

X3 sensors can be subjected to repeated tests without needing to be calibrated. As a result, users will save valuable research and testing time.



Tire sensor being used on a test bench



Wiper sensors are used to verify production quality

## X3 PRO Electronics

### X3 PRO platform

This platform is designed specifically for use in high-end applications where speed and accuracy are critical. Ideally suited for researchers, data-intensive users, and industrial users, the **X3 PRO** platform has four ports allowing for multiple options, optical power isolation, external sync functionality. The system operates with and comes with USB 2.0.

### X3 PRO SENSOR PACK(s)

The sensor pack contains the sensing electronics of the system and includes four sampling channels that provide a data acquisition rate of 325,000 measurements per second.

### Electronics Carry Case

X3 STANDARD POWER SUPPLY + “country specific” power cord.



Electronics are plug-and-play

## X3 PRO Software

**X3 PRO** software is an essential part of **X3 PRO** product series and is used to support automotive and industrial research, design, and process control. **X3 PRO** software users have access to the following tools:

### File Comparison Tools

- Simultaneous playback of up to 4 files
- Multiple frame and file comparisons
- Windshield wiper sensor users can graph multiple files for product and data comparisons

### Measurement Tools

- Line measurement allows users to measure pressure image dimensions
- Area measurement allows users to calculate areas within a pressure image

### Imaging Tools

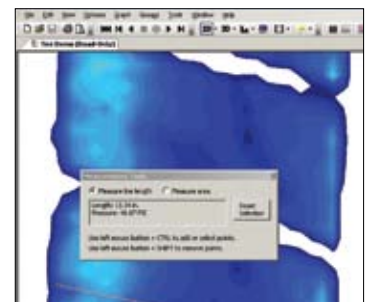
- Thumbnail preview strip displays each frame in filmstrip format
- Thumbnail view includes preview of attached videos, photos, and notes
- User-friendly frame navigation
- 2D zoom functionality

### Multiple Views

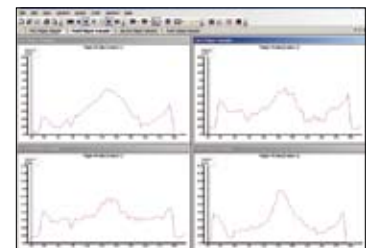
- View 2D and 3D dynamic and static pressure images
- Graph pressure readings over time; pressure reading can be either peak or average for the sensor
- 2D mode shows numerical pressure readings in each sensing cell and dynamic full-color display
- View dynamic, averaged cross-sections of pressure images in 2D View Mode

### Export/Analysis Tools

- Copy, paste, and select pressure values from 2D image directly into spreadsheets
- Copy and paste cross-section values into spreadsheets (cross-hair or average)
- Export a sensor group in its original shape in .csv format
- Export files into html viewable format



Line measurement of tire width



Profile comparison of 4 windshield wiper blades



Preview strip with pressure image and video