



## CX1 Network Accelerometer & Inclinometer User Guide



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# CX1 User Guide

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## 1 Preamble

### 1.1 FCC Statement

This product has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this product in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

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.

This device must only be used with the supplied interface cables. A Class A digital device is intended for use in commercial, business and industrial environments.

### 1.2 Software License Agreement

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## 1.3 Acceptable Use

The SENSr CX1 is a monitoring instrument only. It is not recommended for any use that requires the instrument to act as a triggering mechanism for critical functions. The CX1 is not to be used for:

### **Monitoring life support or patient diagnoses**

### **Any type of input or controller for any process or system including but not limited to:**

- Automated production or manufacturing
- Life support or patient diagnosis
- Vehicle or machine control
- Emergency, redundant, or back up systems

It is the responsibility of the user to confirm that any use of the product conforms with all country, federal, state, county and municipal laws, ordinances and regulations.

## 2 CX1 Network Accelerometer and Inclinometer

### 2.1 General

The CX1 Network Accelerometer and Inclinometer is a 5-channel instrument that measures and streams 3-axis accelerations and 2-axis inclinations readings to a connected PC via Ethernet or USB interfaces.

### 2.2 Specifications

Size:	4.718" x 4.323" x 2.295"
Weight:	20 oz
Connectivity:	1 - M12 Ethernet & 1 - M12 USB Communication
Power source:	Ethernet (PoE) or USB
Ethernet Power consumption:	20mA @ 48V
USB Power consumption:	200mA @ 5V
Housing material:	Billet Aluminum
Status indicator:	Green LED
Accelerometer type:	3-axis MEMS
Accelerometer resolution:	.00001g
Accelerometer range:	±1.5g
Frequency response:	DC - 200 Hz (.1dB)
Accelerometer sample rate:	2000 samples / sec
Inclinometer type:	2-axis MEMS
Inclinometer range:	±15 degrees
Inclinometer resolution:	.00001 degrees
Inclinometer sample rate:	10 samples / sec
Device temperature range:	-40°C to +80°C (-40°F to 176°F)

### 2.3 LED Status Indicator

The CX1 has an indicator LED that is used to quickly determine the connection status. A green light indicates the CX1 is connected to a PC via USB or connected to a network.

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## 3 Getting started

The CX1 may be connected to a PC via USB or an Ethernet network and may be used with several different applications. It is useful to install the USB device driver even if the CX1 will be connected to a network because the USB connection may be used to set the IP address and other network parameters of the CX1. No device drivers are required for communication with the CX1 when it is connected to a network. You may install any or all of the software applications.

### 3.1 System Requirements

Please verify that your PC meets the following minimum system requirements:

Supported Operating System for the CX1 USB driver: Windows XP SP2 32 bit, Vista 32 bit, Windows 7 32&64 Bit.

Note: CX1 Ethernet supports all operating systems.

CPU:	Pentium 4, 1.4 GHz
System Memory (RAM):	1GB
Hard Disk:	2 GB free space (for data files)
Display:	1024 x 768, 32-bit "True Color"
Microsoft .NET Frameworks:	2.0 Service Pack 2 or newer and 3.5 SP1 or newer

Note: Microsoft .NET Framework software may be part of the operating system or may be installed as optional updates from Windows Update.

### 3.2 Installing the USB Device Driver

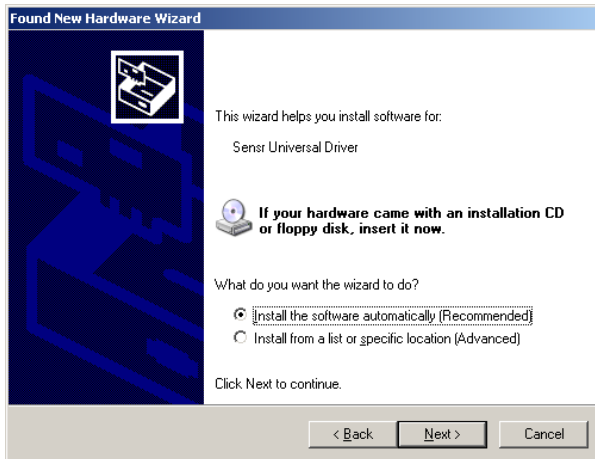
Start the driver installation by ensuring that the SENSR CD is in your PC and then connect the CX1 USB cable to the CX1. The USB cable may be identified by the USB trident logo on the USB connector. The connector on the USB cable is keyed to the CX1 USB connector so that it may only be inserted in the correct orientation. Push the cable connector into the CX1 connector and then screw the cable connector into the CX1 to lock the connectors together. The USB connector may be connected to any available USB connector on the PC.

You should see an indication near the system tray that the computer has detected new hardware.

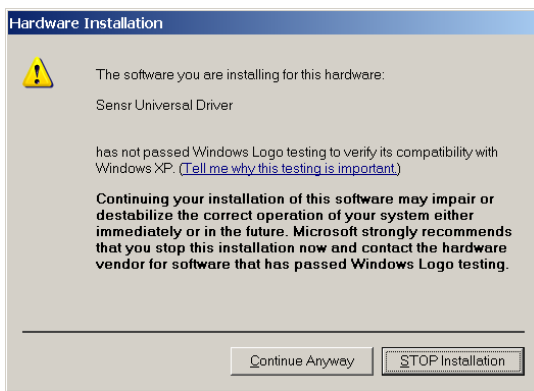


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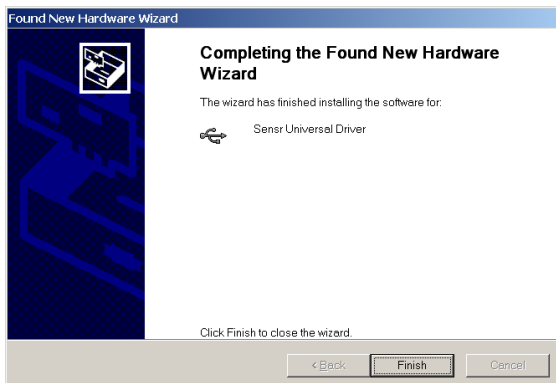
A moment later, a dialog will appear for the Found New Hardware Wizard. Do not allow the wizard to connect to Windows Update to search for software. Click the Next button.



Allow the wizard to install the software automatically. Windows should search the SENSR CD for the appropriate drivers. If the wizard cannot find the correct software, you can install from a specific location. The drivers are located on the SENSR CD in the Drivers\CX Series USB Device Drivers Vx.x.x folder.



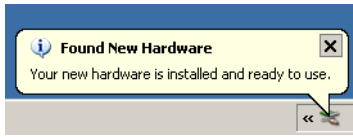
A warning will appear to advise you that the software has not passed Windows Logo testing. This is not a problem. Click the Continue Anyway button.



When the wizard is finished, this dialog appears. Click the Finish button.

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You should see an indication near the system tray that the computer has finished installing the device driver for the hardware.

### 3.3 Connecting the CX1 to an Ethernet network

Start by connecting the Ethernet cable to the CX1. The Ethernet cable may be identified by the 8P8C / RJ-45 connector. The connector on the Ethernet cable is keyed to the CX1 Ethernet connector so that it may only be inserted in the correct orientation. Push the cable connector into the CX1 connector and then screw the cable connector into the CX1 to lock the connectors together. Finally, the 8P8C connector may be connected to an Ethernet computer network by inserting the connector into a network jack.

### 3.4 Connecting the CX1 to a PC via USB

If the device drivers are not already installed, please start with the driver installation procedure. After the drivers are installed, simply connect the USB connector to any available USB connector on the PC.

### 3.5 Available Software Applications

The CX1 comes with four software components that when coupled with the CX1 perform different operations.

- CX Recorder - Designed to configure and collect data for both short durations and extended-lengths of time from up to 10 CX1 units via Ethernet or USB. The output can be saved as compressed SNSR files or uncompressed CSV files.
- CX Series Application Programming Interface – A required element for computer programmers developing software that communicates with CX1 units. This component facilitates the incorporation of CX1 units into new or existing monitoring environments.
- SensView – A graphics-based data viewer and analyzing program that lets users review real-time and collected data. The program can be used for short-duration monitoring and recording of data from one CX1.
- CXCapture – A command line program for controlling and collecting data from one or more CX1s.

### 3.6 Installing CX Recorder

CX Recorder is contained in a compressed folder located in the Applications folder on the SENSr CD. Double-click the icon for the compressed folder, a window should open to show the contents of the compressed folder. Drag the folder inside the window to a location on your desktop. CX Recorder is now located inside this folder on your desktop and is ready to be launched.

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To execute the program, double-click the CXRecorder.exe file.

## 3.7 Installing the CX1 API

The CX Series API is contained in a compressed folder located in the Developer folder on the SENSr CD.

## 3.8 Installing SensView

SensView is contained in a compressed folder located in the Applications folder on the SENSr CD. Double-click the icon for the compressed folder, a window should open to show the contents of the compressed folder. Drag the folder inside the window to a location on your desktop. SensView is now located inside this folder on your desktop and is ready to be launched.

To execute the program, double-click the SensView.exe file.

## 3.9 Installing CXCapture

CXCapture is a command line program that is contained in a compressed folder located in the Applications folder on the SENSr CD. Double-click the icon for the compressed folder, a window should open to show the contents of the compressed folder. Drag the folder inside the window to a location on your desktop. CX Capture is now located inside this folder on your desktop and is ready to be launched using the command prompt.

## 4 Miscellaneous

### 4.1 CX1 Cleaning

The CX1 can be cleaned by dampening a cloth with Windex™ and wiping down the exterior surfaces.

### 4.2 CX1 Storage

Store the unit in a dry, indoor environment.

### 4.3 CX1 Calibration

The CX1 uses a DC response accelerometer and is calibrated using the earth's gravity. The unit is factory-calibrated using precision surface plates and temperature chambers; users who want to verify the calibration of their unit can connect the unit to a PC and see check outputs of the accelerometer against a level surface. By placing the flat sides of the CX1 against the level surface and flipping the CX1 users can compare and verify each axis response. Inclinator response can be verified in a similar manner by rotating the CX1 and checking reported angles. If it is suspected the unit requires calibration the user can contact the factory to arrange a review.

### 4.4 Technical Support

If you have any questions about the product or require technical support please email us at support@sensr.com or call 563.245.3750. Standard hours of operation are 8 am - 5 pm CST, M–F.

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## 4.5 Product Warranty

SENSR LLC. (“SENSR”) warrants to the original Customer (“Customer”) that SENSR brand instruments (“Product”) are free from defects in material and workmanship under normal use and service for a period of 1 year commencing upon the date of purchase.

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