Overview

The Sensr CX1 LabVIEW driver is a collection of nine LabVIEW 2010 virtual instruments (VIs) that enable detecting, connecting to, beginning collection of data from, getting acceleration data from, getting tilt data from, getting temperature data from, ending collection of data from, and disconnection from CX1 sensors. An overall demonstration VI that incorporates all the VIs is also provided as an example of use of the driver VIs.

Installation

1) Start by closing all open instances of LabVIEW to ensure that LabVIEW is not running.

2) Find the directory or folder named "SENSR - CX1" and copy it (including its contents) to the LabVIEW installation directory.

> For 32-bit systems, the LabVIEW installation directory is usually:
> C:\Program Files\National Instruments\LabVIEW 2010\instr.lib
>
> For 64-bit systems, the LabVIEW installation directory is usually:
> C:\Program Files (x86)\National Instruments\LabVIEW 2010\instr.lib

3) Open LabVIEW and look for the Sensr VIs in the Functions palette in:

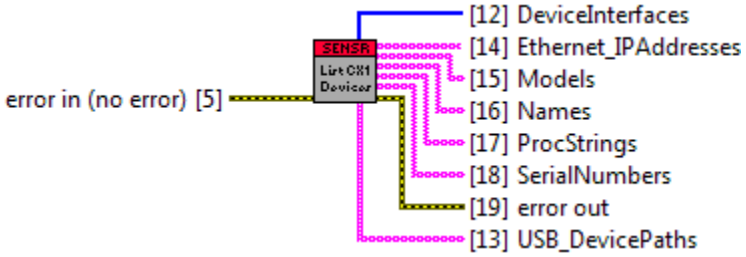
> Functions >> Instrument I/O >> Instrument Drivers >> SENSR - CX1

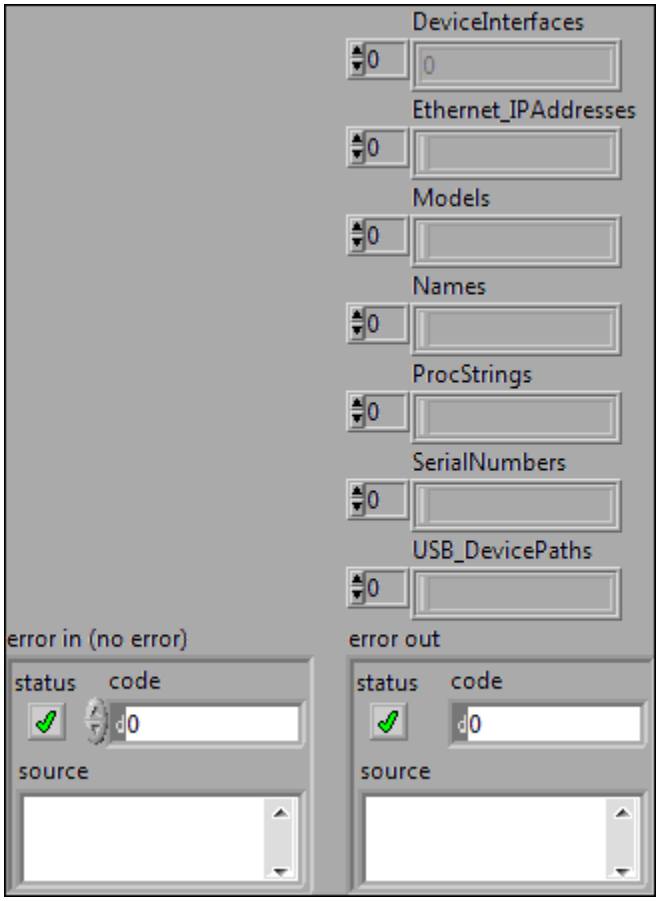
Description of Virtual Instruments (VIs)

Six to nine VIs are required in order to collect data from CX1 sensors. Collection of data typically begins with listing available devices and proceeds to establishing a connection to a specific device. After a device is connected, any or all of the three general types of data can be collected. When data collection is finished, a routine must be followed to disconnect from the device.

“List Devices.vi”

The “List Devices.vi” VI discovers CX1 sensors attached either by USB or by network. All discovered devices are returned in a list.

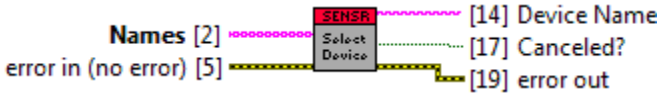


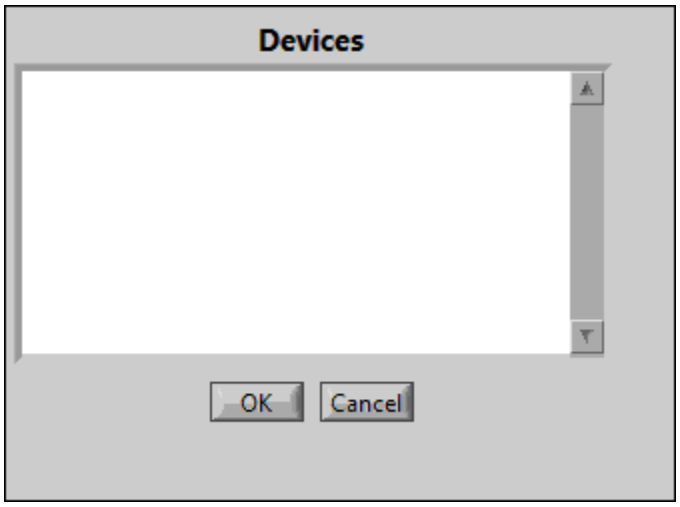


List of signals	
Signal (default)	Description
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
Names	Returned list of device names.
Name	Returned list of device names.
DeviceInterfaces	Returned list of device interfaces.
DeviceInterface	Returned list of device interfaces.
Ethernet_IPAddresses	Returned list of network IP addesses.
Ethernet_IPAddress	Returned list of network IP addesses.
Models	Returned list of device model type.
Model	Returned list of device model type.
ProcStrings	Returned list of ProcStrings.
ProcString	Returned list of ProcStrings.
SerialNumbers	Returned list of device serial numbers.
SerialNumber	Returned list of device serial numbers.
USB_DevicePaths	Returned list of paths specifying the USB location of found devices.
USB_DevicePath	Returned list of paths specifying the USB location of found devices.
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.

“Device Name Dialog.vi”

The “Device Name Dialog.vi” VI provides a dialog for a user to select a specific CX1 device. The list of names provided to this VI should be produced by the “List Devices.vi” VI.





List of signals	
Signal (default)	Description
Names	List of known CX1 devices.
Name	List of known CX1 devices.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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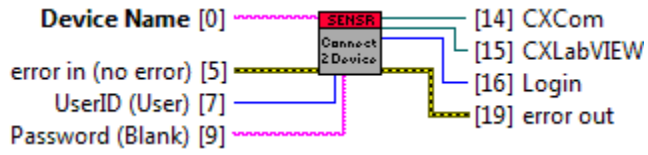
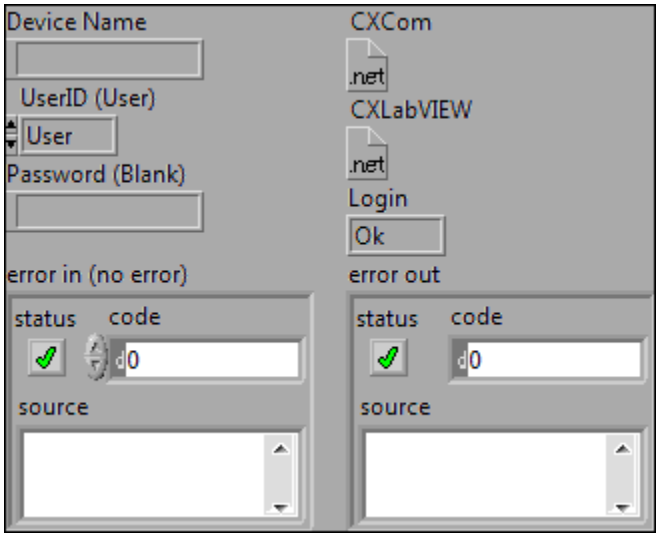
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
Device Name	Selected device name.
Canceled?	Boolean indicator of option selected. True for "Cancel" and False for "OK".

”Connect to Device.vi”

The ”Connect to Device.vi” VI establishes a connection to a specific CX1 sensor identified by the device name. The output of this VI is a connection to the instances of the CXCom and CXLabVIEW structures.





List of signals	
Signal (default)	Description
Password (Blank)	Password associated with UserID selection. Default settings for administator is - UserID = Admin and Password = admin.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
Device Name	Name of the device to connect and login.
UserID (User)	Login access level. Default is "User".
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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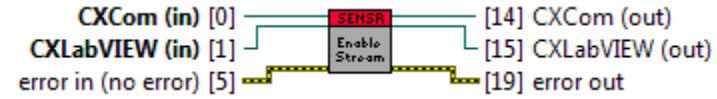
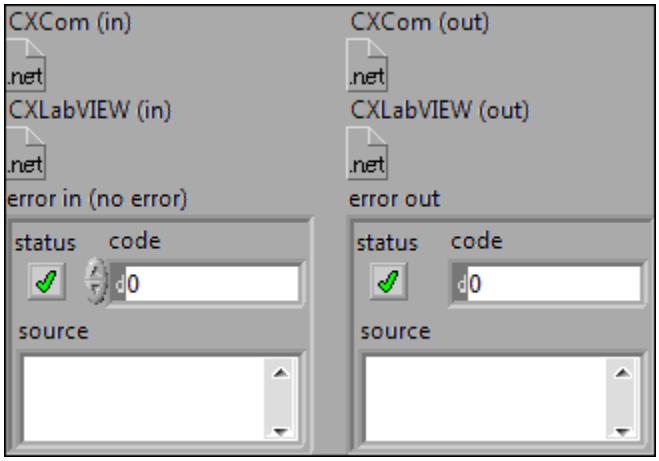
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXCom	Reference to the CXCom dotNET structure.
Login	Results of login function.
CXLabVIEW	Reference to the CXLabVIEW dotNET structure.

“Enable Data Stream.vi”

The “Enable Data Stream.vi” VI is used to enable a CX1 sensor to stream data. A pair of CXCom and CXLabVIEW structures must be provided.





List of signals	
Signal (default)	Description
CXCom (in)	Reference to the CXCom dotNET structure.
CXLabVIEW (in)	Reference to the CXLabVIEW dotNET structure.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXCom (out)	Duplicate reference to the CXCom dotNET structure.
CXLabVIEW (out)	Duplicate reference to the CXLabVIEW dotNET structure.
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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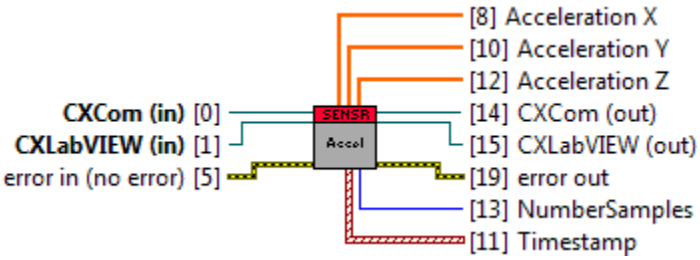
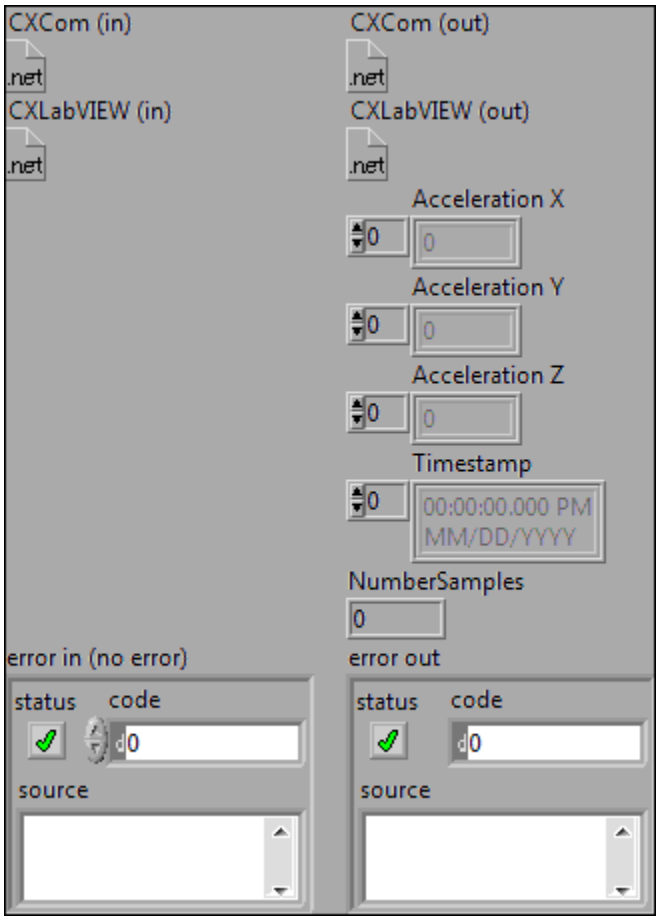
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.

”Get Accelerations.vi”

The ”Get Accelerations.vi” VI outputs arrays of acceleration data from an already connected and enabled device. A pair of CXCom and CXLabVIEW structures must be provided.





List of signals	
Signal (default)	Description
CXCom (in)	Reference to the CXCom dotNET structure.
CXLabVIEW (in)	Reference to the CXLabVIEW dotNET structure.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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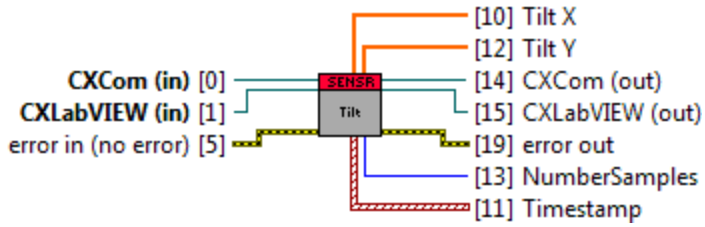
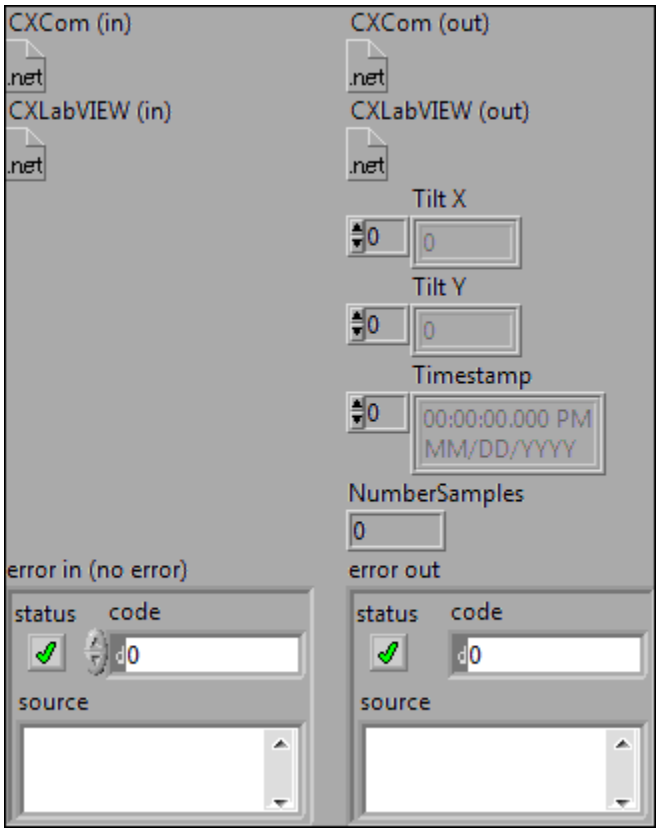
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXCom (out)	Duplicate reference to the CXCom dotNET structure.
NumberSamples	Number of acceleration samples returned.
Acceleration X	Array of acceleration values in the X direction.
	Acceleration in the X direction sample.
Acceleration Y	Array of acceleration values in the Y direction.
	Acceleration in the Y direction sample.
Acceleration Z	Array of acceleration values in the Z direction.
	Acceleration in the Z direction sample.
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXLabVIEW (out)	Reference to the CXLabVIEW dotNET structure.
Timestamp	Array of sample time stamps.
	Time stamp sample.

“Get Tilts.vi”

The “Get Tilts.vi” VI outputs arrays of tilt data from an already connected and enabled device. A pair of CXCom and CXLabVIEW structures must be provided.





List of signals	
Signal (default)	Description
CXCom (in)	Reference to the CXCom dotNET structure.
CXLabVIEW (in)	Reference to the CXLabVIEW dotNET structure.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXCom (out)	Duplicate reference to the CXCom dotNET structure.
NumberSamples	Number of tilt samples returned.
Tilt Y	Array of tilt values in the Y direction.
	Tilt in the Y direction sample.
Tilt X	Array of tilt values in the X direction.
	Tilt in the X direction sample.
CXLabVIEW (out)	Duplicate reference to the CXLabVIEW dotNET structure.
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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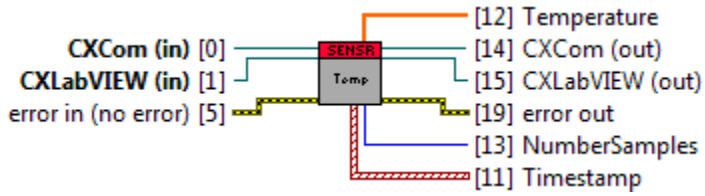
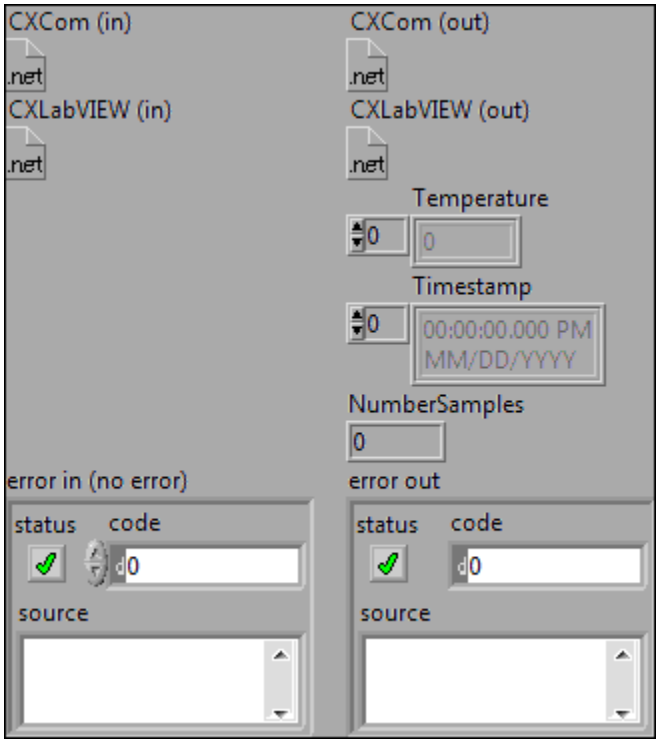
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
Timestamp	Array of sample time stamps.
	Time stamp sample.

”Get Temperatures.vi”

The ”Get Temperatures.vi” VI outputs arrays of temperature data from an already connected and enabled device. A pair of CXCom and CXLabVIEW structures must be provided.





List of signals	
Signal (default)	Description
CXCom (in)	Reference to the CXCom dotNET structure.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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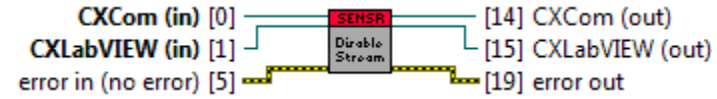
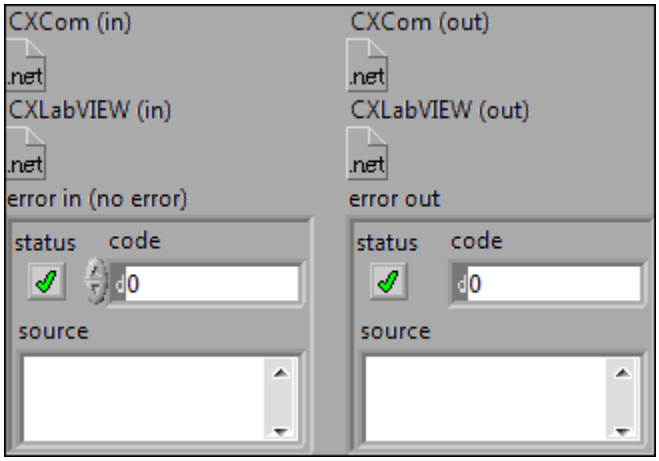
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXLabVIEW (in)	Reference to the CXLabVIEW dotNET structure.
CXCom (out)	Duplicate reference to the CXCom dotNET structure.
NumberSamples	Number of temperature samples returned.
Temperature	Array of temperature values.
	Temperature sample.
CXLabVIEW (out)	Duplicate reference to the CXLabVIEW dotNET structure.
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
Timestamp	Array of sample time stamps.
	Time stamp sample.

”Disable Data Stream.vi”

The ”Disable Data Stream.vi” VI is used to disable data streaming from a device. A pair of CXCom and CXLabVIEW structures must be provided.





List of signals	
Signal (default)	Description
CXCom (in)	Reference to the CXCom dotNET structure.
CXLabVIEW (in)	Reference to the CXLabVIEW dotNET structure.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXCom (out)	Duplicate reference to the CXCom dotNET structure.
CXLabVIEW (out)	Duplicate reference to the CXLabVIEW dotNET structure.
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
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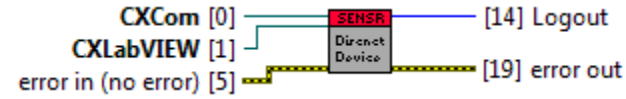
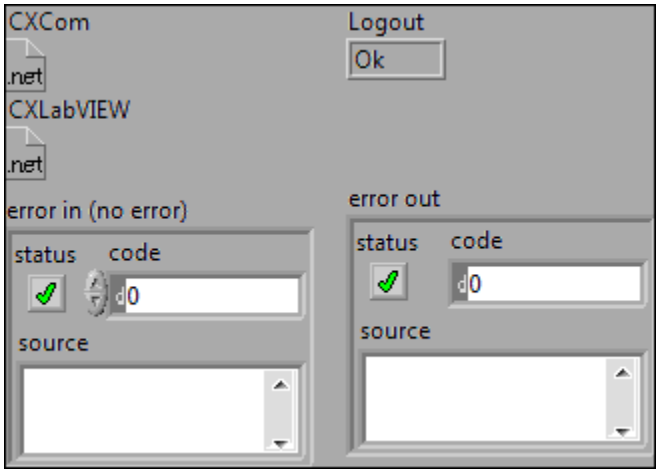
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.

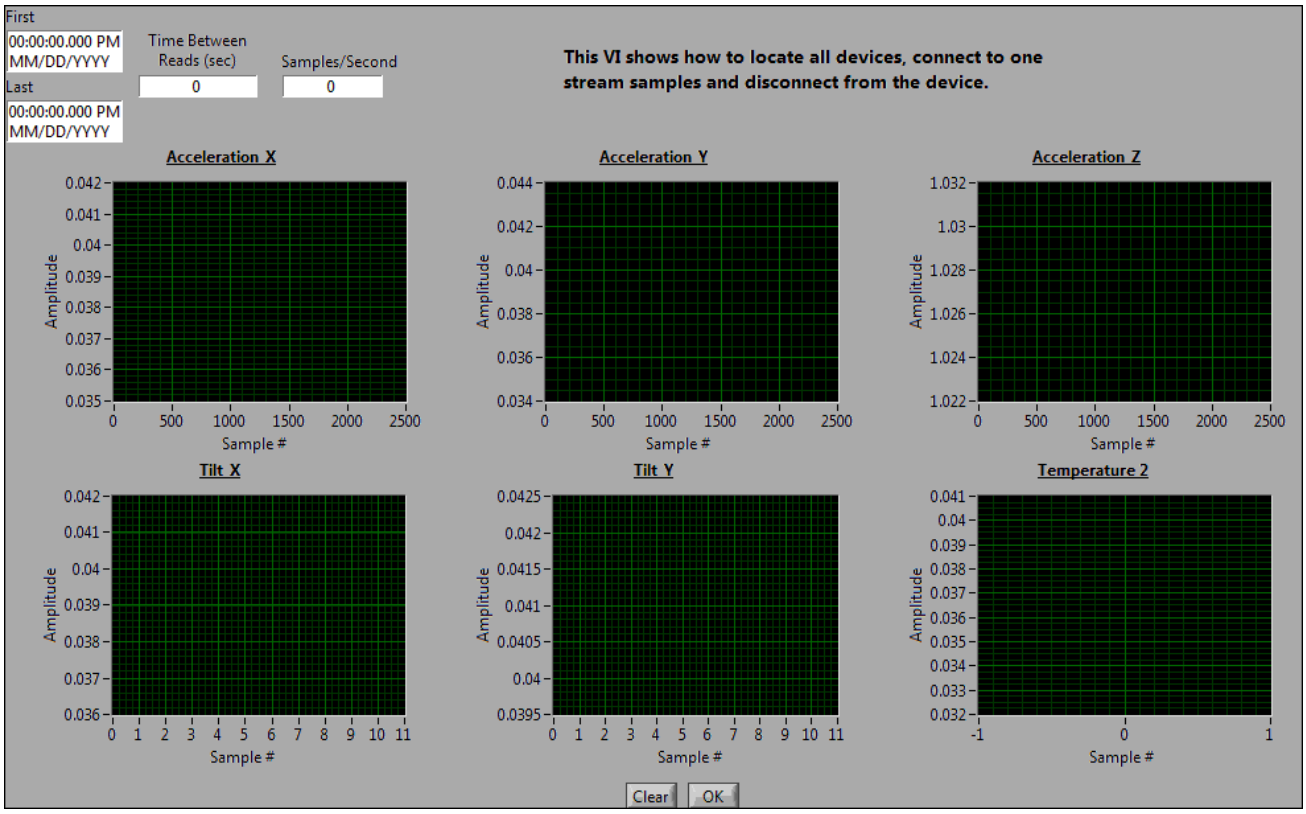
“Disconnect from Device.vi”

The “Disconnect from Device.vi” VI disconnects from a specific CX1 sensor. A pair of CXCom and CXLabVIEW structures must be provided.





List of signals	
Signal (default)	Description
CXCom	Reference to the CXCom dotNET structure.
error in (no error)	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
CXLabVIEW	Reference to the CXLabVIEW dotNET structure.
Logout	Results of logout function.
error out	error in can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
status	status is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
code	code is the error or warning code. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.
source	source describes the origin of the error or warning. Right-click the error in control on the front panel and select Explain Error or Explain Warning from the shortcut menu for more information about the error.

SENSR Data Collect Example

The VI named “SENSR Sample Data Collect.vi” is provided as an example to illustrate the use of the driver VIs. This VI simply connects to a CX1 sensor and then displays the acceleration, tilt, and temperature data.