# NPA/ChipCap Sensor Evaluation Kit: Pressure, Humidity & Temperature

## 1. Evaluation Kit Contents

The *NPA / ChipCap Evaluation Kit: Pressure, Humidity & Temperature* includes the following items:

- USB communication thumb drive connector
- Daughter board with *Digital NPA (15psia)* and *Digital ChipCap sensors* installed
- 1-meter extension cable (for testing samples remotely)
- CD-ROM with evaluation software, documentation and USB drivers

A complete evaluation kit is shown in *Figure 1* below:

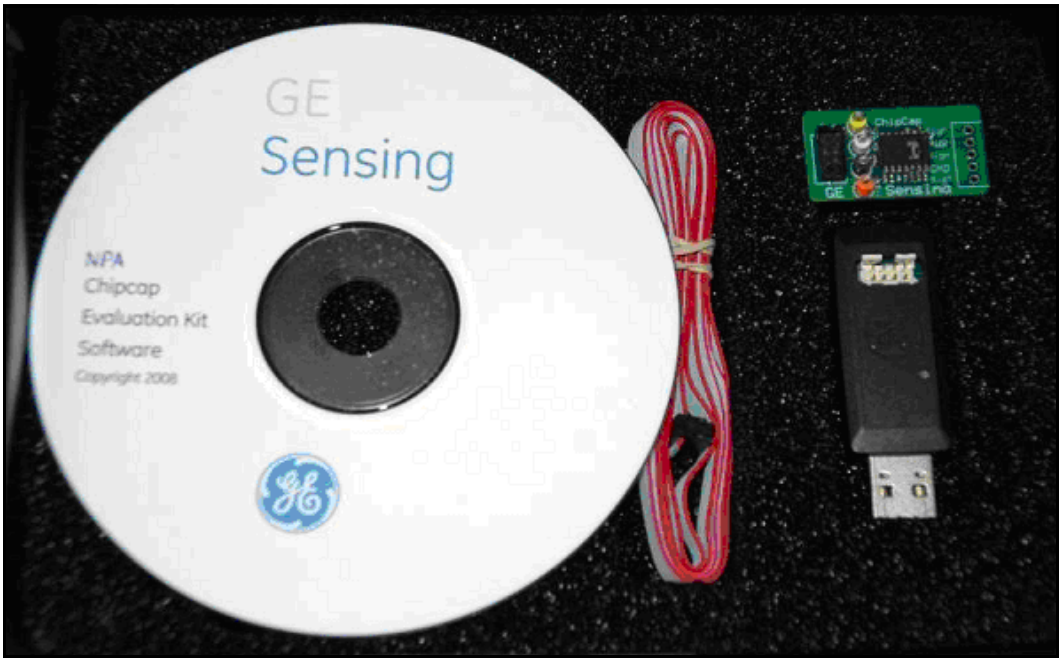


**Figure 1: NPA/ChipCap Evaluation Kit**

1100 Technology Park Drive, Billerica, MA 01821, U.S.A.
Telephone: 978-437-1000 or 800-833-9438

Sensing House, Shannon Free Zone East, Shannon, County Clare, Ireland
Telephone: +353 61 470200

Web: www.gesensing.com

## 2. USB Driver Installation

To install the required *USB drivers* on your computer, complete the following steps:

1. Remove the CD-ROM from the evaluation kit and insert it into the computer's CD-ROM drive.
2. Navigate to the **USB_Driver** folder on the disk and run the program called **CDM_Setup.exe**. The installation typically takes 20-40 seconds.
3. Check the USB port operation:
   a. Remove the USB communications thumb drive from the evaluation kit and plug it into any available USB port on your computer.
   b. To verify that the new hardware is operating properly, click on **Start>Settings>Control Panel**. Then, double-click the **System** icon to open the dialog box shown in *Figure 2* to the right.
   c. Click on the **Hardware** tab and then on **Device Manager** (see Figure 2 to the right) to open the dialog box shown in *Figure 3* below.
   d. Expand the **Ports (COM & LPT)** branch of the device listing and verify that there is a device called **USB Serial Port (COMx)** listed. Typically, x will be 4 or 5 (it is not important to remember this number; x=4 in the example shown in *Figure 3* below).
   e. If your USB port is operating properly, proceed to the next section to install your software. Otherwise, contact GE for assistance.

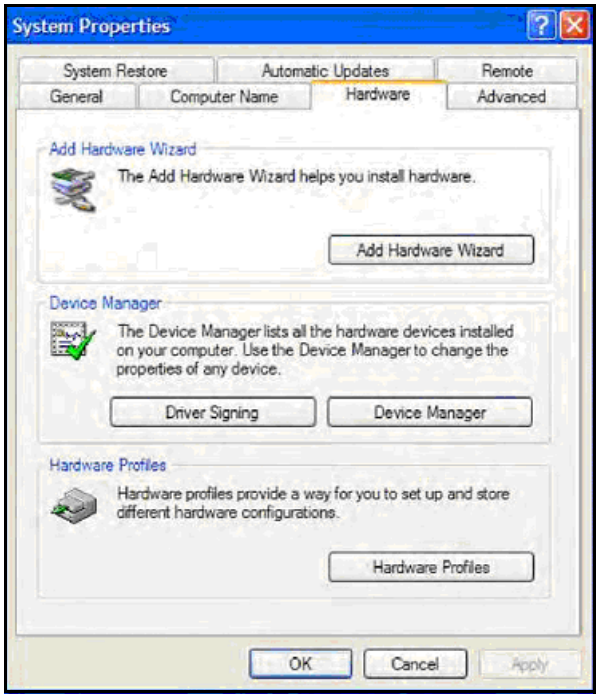


**Figure 2: System Properties Screen**

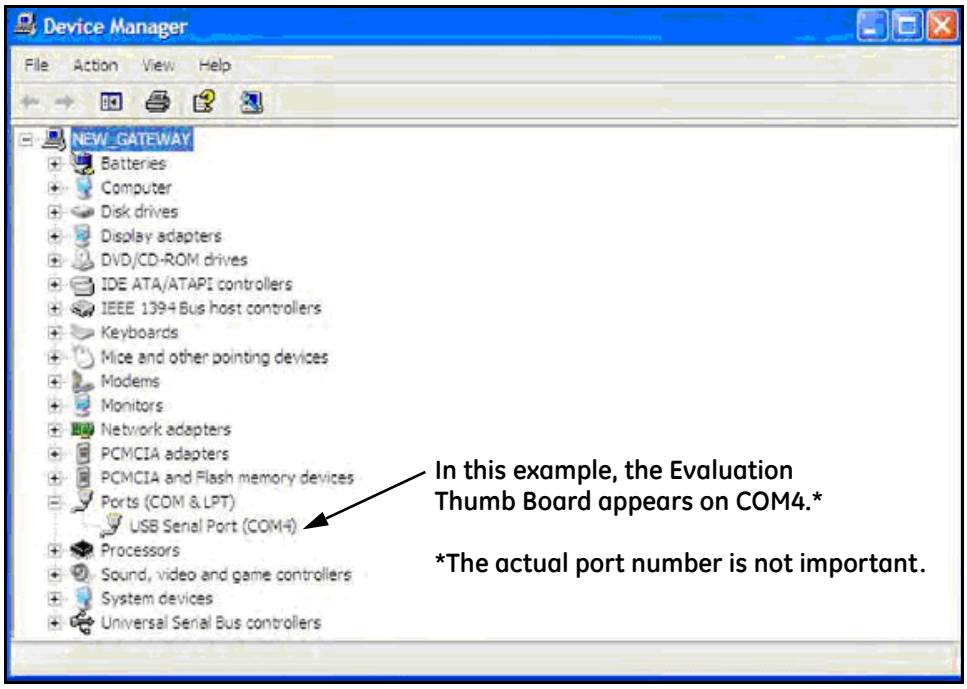


**Figure 3: USB Port Device Listing**

## 3. NPA/ChipCap Demonstration Software Installation

To install the *NPA/ChipCap Evaluation Kit* software on your computer, complete the following steps:

1. Remove the CD-ROM from the evaluation kit and insert it into the CD-ROM drive on the computer.
2. Navigate to the **Software Install** folder on the disk and run the program called **ChipCap NPA Setup.exe**.
3. Follow the on-screen instructions to complete the installation.

Upon Installation, a **ChipCap NPA GE** icon will be placed on the desktop to start the program.

Note that these instructions along with Datasheets and Application notes for both ChipCap and NPA are available in the **Documentation** folder located on the DVD for your reference. They are also available within the program if you select the "Help" button. Seethe section "Using the NPA / ChipCap Evaluation Kit Software" below.

## 4. Hardware Hookup

The NPA/ChipCap communications hardware is provided as a compact USB thumb drive. Also included in the evaluation kit is a daughter board. It contains the NPA and ChipCap sensors as listed on page 1. *Figure 4* below shows how the daughter board can be plugged directly into the USB communication Thumb Drive.

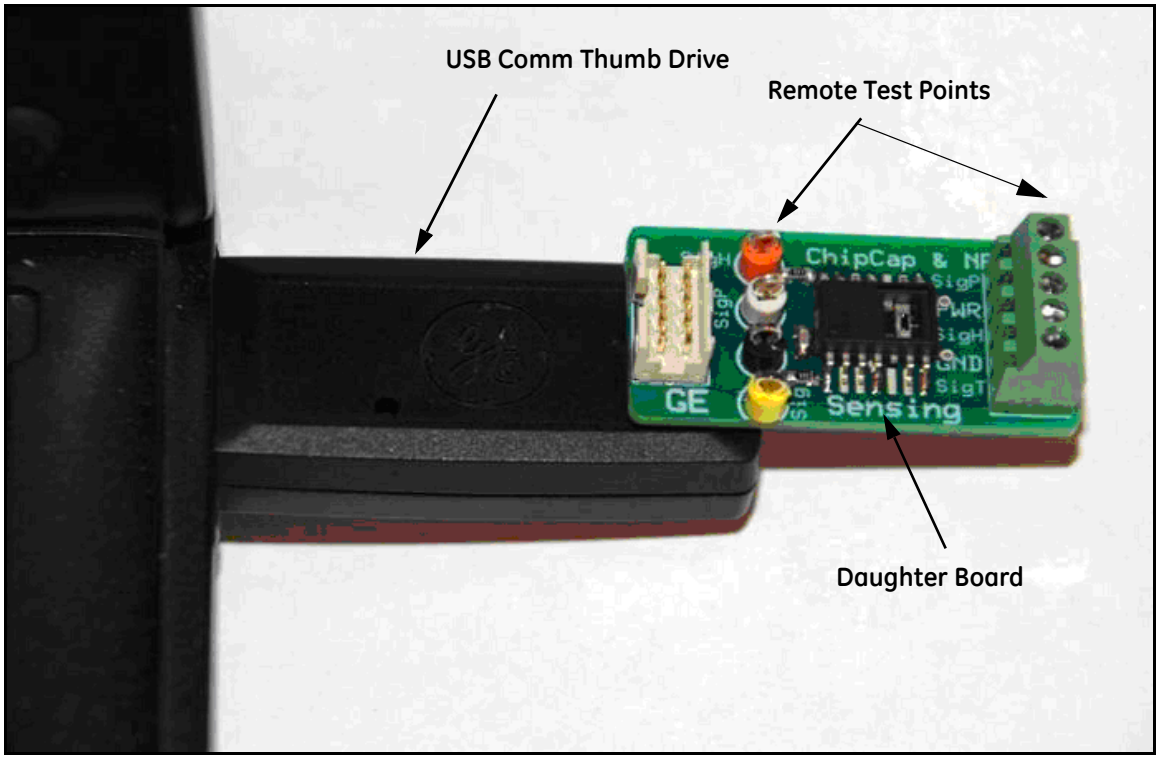


**Figure 4: Thumb Drive and Daughter Board Direct Connection**

With the configuration shown in *Figure 4* above, the following features are available:

- **Convenient Connector -** Attach the daughter board directly or utilize the extension ribbon cable for remote sensing.

## 4. Hardware Hookup (cont.)

- **Surface-Mount LED** - indicates when the transmission of pressure/humidity/temperature data is in progress.
- **Test Points** - allows for the convenient hookup of a multi-meter to monitor the **SigP**, **SigH** and **SigT** lines.

For remote testing of pressure, temperature, and humidity, simply unplug the daughter board from the USB communication Thumb drive and use the provided extension cable to make the connection. Plug the cable extension into both the USB communication Thumb drive and the ChipCap side of the daughter board, with the cable extending away from the boards. Now the ChipCap daughter board can be placed remotely with the extension cable running out to the monitoring PC. Figure 5 below shows the cable use configuration. If the daughter board is installed backwards to the cable, the status line will report "Could not find Sensor".

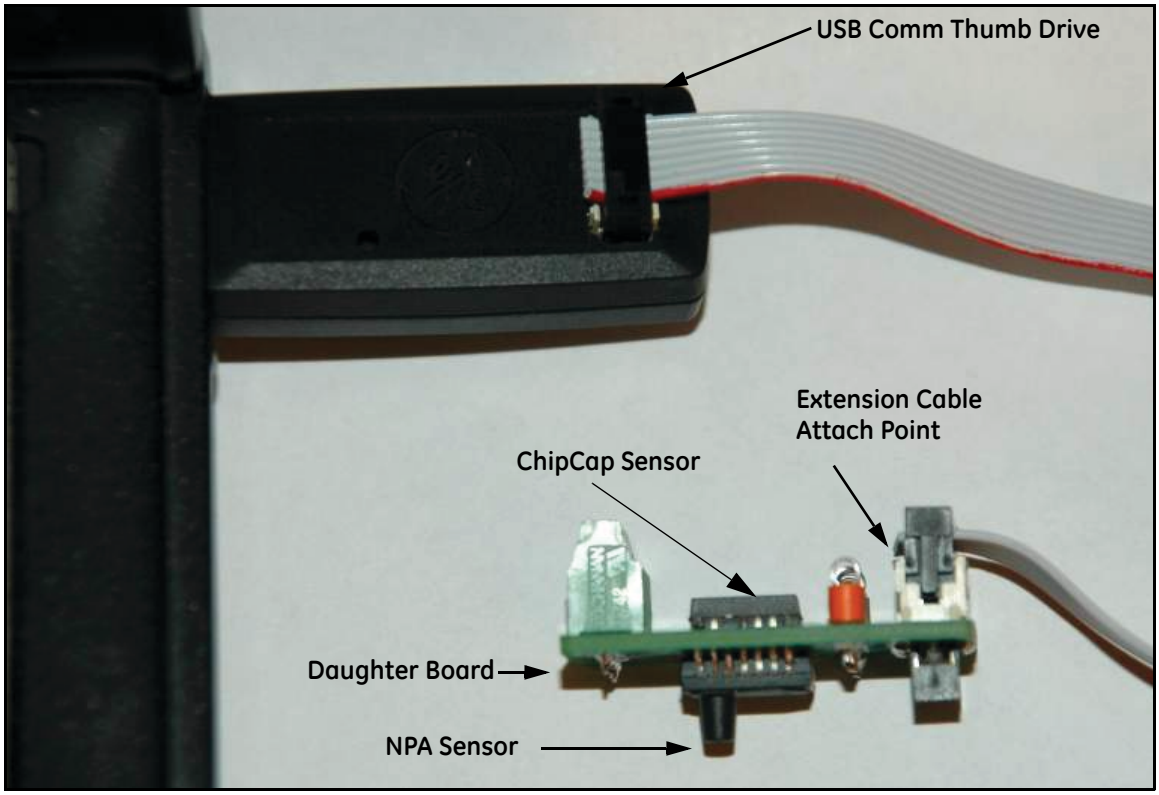


**Figure 5: Remote Daughter Board Connection**

When testing the NPA and ChipCap sensors with the evaluation kit, please note the following important points:

- The USB communication Thumb drive automatically detects the NPA/ChipCap daughter board. The detection process requires digital communication with the NPA and ChipCap sensors, and the resulting information is used to properly interpret and display the output. Although one might be tempted to add additional capacitance on the **SigP**, **SigT** and **SigH** lines to suppress the signal noise when using the extension cable, doing so could interfere with the automatic detection process.
- The software will automatically detect the USB communication Thumb drive if it is inserted before the software is started. If the software is started before the USB communication Thumb drive is inserted, you will have to select the "Find Sensor" button on the front-end software to connect the signal.

Proceed to the next section for instructions on using the *ChipCap Thumb Monitor* software.

## 5. Using the NPA/ChipCap Evaluation Kit Software

The evaluation software supplied with the kit permits easy monitoring of the output signals on the computer screen and the logging of the output data. To launch the *NPA/ChipCap Evaluation Kit* software, double click the **GE** icon on your desktop to open the screen shown in *Figure 6* below.

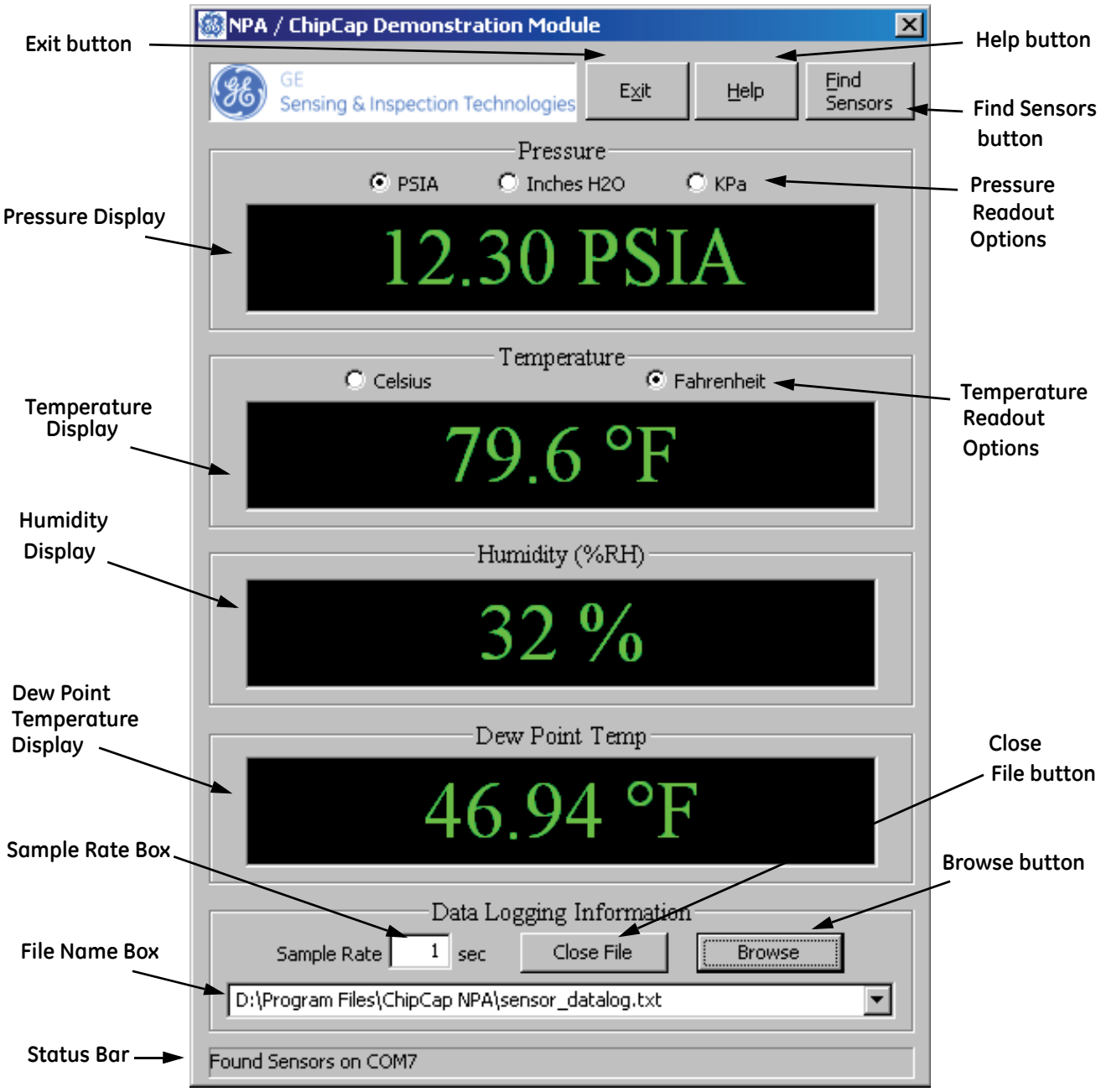


**Figure 6: ChipCap Monitor Screen**

Proceed to the next page for a detailed description of all the monitor screen components shown in *Figure 6* above.

## 5. Using the NPA/ChipCap Evaluation Kit Software (cont.)

The *NPA/ChipCap Evaluation Kit* software screen, as shown in *Figure 6* on the previous page, includes the following components:

- **Exit** button: Click this button to close the software.
- **Help** button: Click this button to view the software version, the software help files, and miscellaneous sensor information.
- **Find Sensors** button: If the USB communication board was plugged into the USB port on the computer after launching the NPA/ChipCap Evaluation software, click this button to force the software to scan for the board.
- **Pressure display:** The current pressure output reading is shown on this large, easy-to-read display.
- **Pressure Readout Option**: Allows the user to choose between three units of measurement: PSIA, Inches of $H_2O$, or KPa units, by clicking the unit of choice.
- **Temperature** display: The current temperature output reading is shown on this large, easy-to-read display.
- **Temperature Readout Option**: Allows the user to choose between two units of measurement: degrees F or degrees C, by clicking the unit of choice.
- **Humidity** display: The current humidity output reading is shown on this large, easy-to-read display.
- **Dew Point Temperature** display: The current dew point temperature output reading is shown on this large, easy-to-read display (units equivalent to the temperature above).
- **Status bar**: All actions attempted by the software and the results of those actions are listed in this bar.

The following components are used for the data logging function of the software:

- **Sample Rate** box: When logging data to a file, enter the desired logging sample rate (in whole seconds) in this box.
- **Browse** button: Click this button to search for an existing log file or to specify the folder and file name for a new log file. Setting this file name will automatically start the log file.
- **Close File** button: Click this button to terminate the current log and close the log file.
- **File Name** box:
  Enter the folder and file name for the desired log file in this box. This may be done by finding the file with the **Browse** button, by selecting it from the *drop-down list* or by entering it *manually*.

**Note:** *A log file created with the NPA/ChipCap software is formatted as a space-delimited text file, which may be imported into a Microsoft® Excel spreadsheet for graphing and analysis.*