CY3271-EXP1

Environmental Sensing Kit

Spec. # 001-49259 Rev. *B

Cypress Semiconductor
198 Champion Court
San Jose, CA 95134-1709

Phone (USA): 800.858.1810
Phone (Intnl): 408.943.2600
http://www.cypress.com

Copyrights

Flash Code Protection

Cypress products meet the specifications contained in their particular Cypress PSoC Data Sheets. Cypress believes that its family of PSoC products is one of the most secure families of its kind on the market today, regardless of how they are used. There may be methods, unknown to Cypress, that can breach the code protection features. Any of these methods, to our knowledge, would be dishonest and possibly illegal. Neither Cypress nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Cypress is willing to work with the customer who is concerned about the integrity of their code. Code protection is constantly evolving. We at Cypress are committed to continuously improving the code protection features of our products.

Contents

1. Introduction

Thank you for your interest in the CY3271-EXP1 Environmental Sensing Kit. This is an expansion kit for the CY3271-PSoC FirstTouch Starter Kit with CyFi Low-Power RF (CY3271-FTRF). The CY3271-EXP1 kit includes two boards: the Weather Station Expansion Board (atmospheric pressure, humidity, temperature, and ambient light) and the Pigtail Thermistor Expansion Board. The Sense and Control Dashboard (SCD) enables users to quickly set up and monitor a wired or wireless sensor network through an intuitive visual dashboard. The CY3271-EXP1 demonstrates features such as data logging, data aggregation, alarms, and sensor calibration for different sensor types. The CY3271-FTRF kit can be purchased separately at http://www.cypress.com/go/ CY3271-FTRF.

The code examples enable using:

- The programmable analog and digital blocks of PSoC® to interface to common sensors such as thermistors and ambient light sensors.
- PSoC Designer™ integrated development environment (IDE) to create embedded designs in two methods: traditional chip level designs that involve writing code and code-free system level designs.
- PSoC's flexible analog to allow multiple sensors to connect the same internal resources.

1.1 Kit Contents

The CY3271-EXP1 kit hardware consists of the following components:

- Weather Station Expansion Board
- Pigtail Thermistor Expansion
- CY3271-EXP1 kit CD/DVD
  - PSoC Designer installation file
  - PSoC Programmer installation file
  - Bridge Control Panel installation file (packaged along with PSoC Programmer)
  - Sense and Control Dashboard (SCD)
  - Code examples
  - Hardware files
  - Kit guide
  - Quick start guide
  - Release notes

Inspect the contents of the kit. If any parts are missing, contact your nearest Cypress sales office for further assistance.

1.2 Prerequisites

The CY3271-FTRF Kit is required to operate this kit. This kit can be purchased separately at http://www.cypress.com/go/CY3271-FTRF.

1.3 Additional Learning Resources

Visit http://www.cypress.com for additional learning resources in the form of data sheets, technical reference manual, and application notes.

- For more information regarding PSoC Designer functionality and releases:
  http://www.cypress.com/go/psocdesigner
- For more information regarding PSoC Programmer, supported hardware and COM layer:
  http://www.cypress.com/go/psocprogrammer
- For a list of PSoC Designer-related trainings:
  http://www.cypress.com/?rID=40543

1.4 Document Revision History

Table 1-1. Revision History

Revision	PDF Creation Date	Origin of Change	Description of Change
**	10/07/2008	YUR	New Guide
*A	07/07/2011	OWEN	Removed reference to HiTech compiler installation. Installation instructions and screenshots modified to match the latest installer. Added schematic level block diagrams for hardware and firmware description. Added Appendix.
*B	09/27/2011	RKPM	Extensive content updates

1.5 Documentation Conventions

Table 1-2. Document Conventions for Guides

Convention	Usage
`Courier New`	Displays file locations, user entered text, and source code: `C:\ ...cd\icc\`
Italics	Displays file names and reference documentation: Read about the *sourcefile.hex* file in the *PSoC Designer User Guide*.
[**Bracketed, Bold**]	Displays keyboard commands in procedures: [**Enter**] or [**Ctrl**] [**C**]
File > Open	Represents menu paths: File > Open > New Project
Bold	Displays commands, menu paths, and icon names in procedures: Click the **File** icon and then click **Open**.
Times New Roman	Displays an equation: 2 + 2 = 4
Text in gray boxes	Describes Cautions or unique functionality of the product.

2. Getting Started

This chapter describes how to install and configure the CY3271-EXP1 kit.

2.1 Kit Installation

To install the kit software, follow these steps:

1. Insert the kit CD/DVD into the CD/DVD drive of your PC. The CD/DVD is designed to auto-run and the kit installer startup screen appears.

   Note You can also download the latest installer from http://www.cypress.com/go/CY3271-EXP1. Three different types of installers are available for download:

   a. CY3271-EXP1_ISO: This file (ISO image) is an archive file of the optical disc provided with the kit. You can use this to create an installer CD/DVD or extract information using WinRar or similar tools.

   b. CY3271-EXP1_Single Package: This executable file installs the CD/DVD contents, which includes PSoC Programmer, PSoC Designer, code examples, kit hardware files, and user documents.

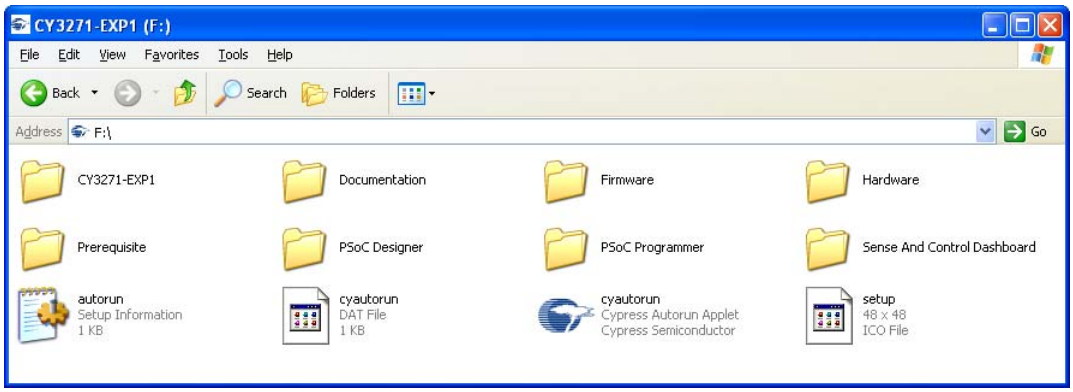
   c. CY3271-EXP1_Single Package (without prerequisites): This executable file installs only the kit contents, which includes kit code examples, hardware files, and user documents.

2. Click **Install CY3271-EXP1** to start the installation, as shown in Figure 2-1.

   Figure 2-1. Kit Installer Startup Screen

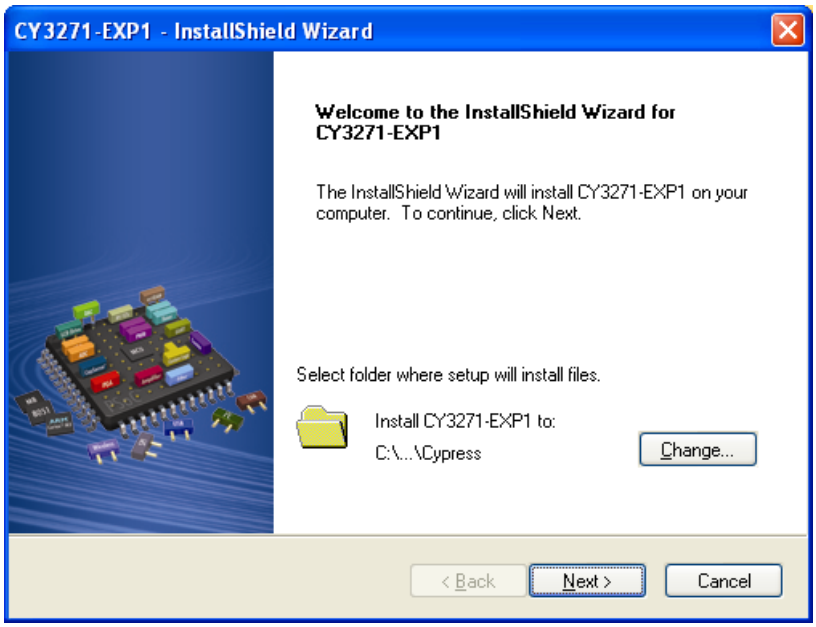
Note If auto-run does not execute, double-click *cyautorun.exe* file on the root directory of the CD/DVD, as shown in Figure 2-2.

Figure 2-2. Root Directory of CD/DVD



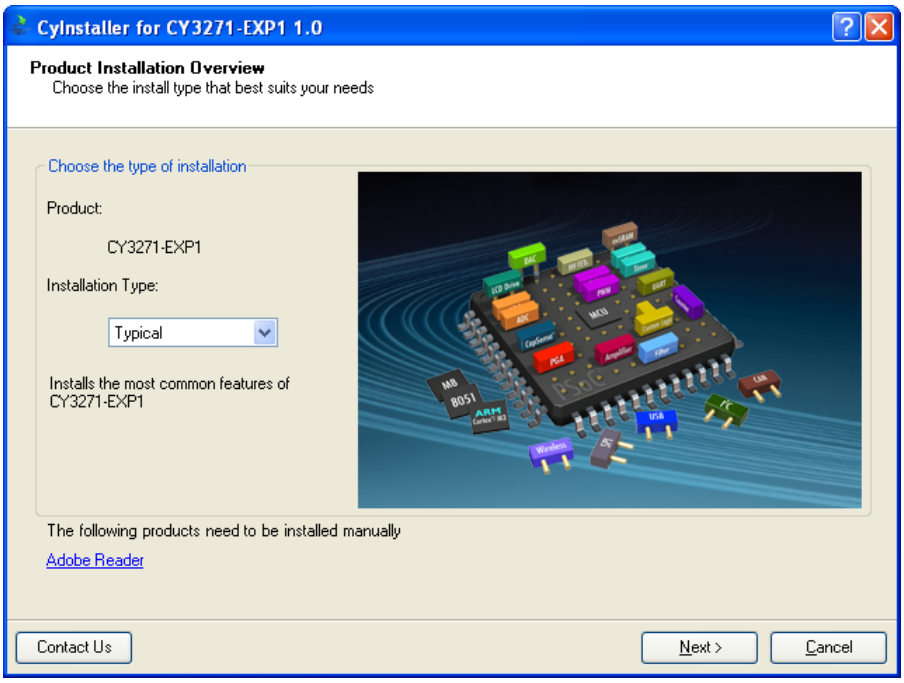
3. The **InstallShield Wizard** screen appears. On this screen, choose the folder location to install the setup files. You can change the location using **Change**, as shown in Figure 2-3.
4. Click **Next** to launch the kit installer.

Figure 2-3. InstallShield Wizard



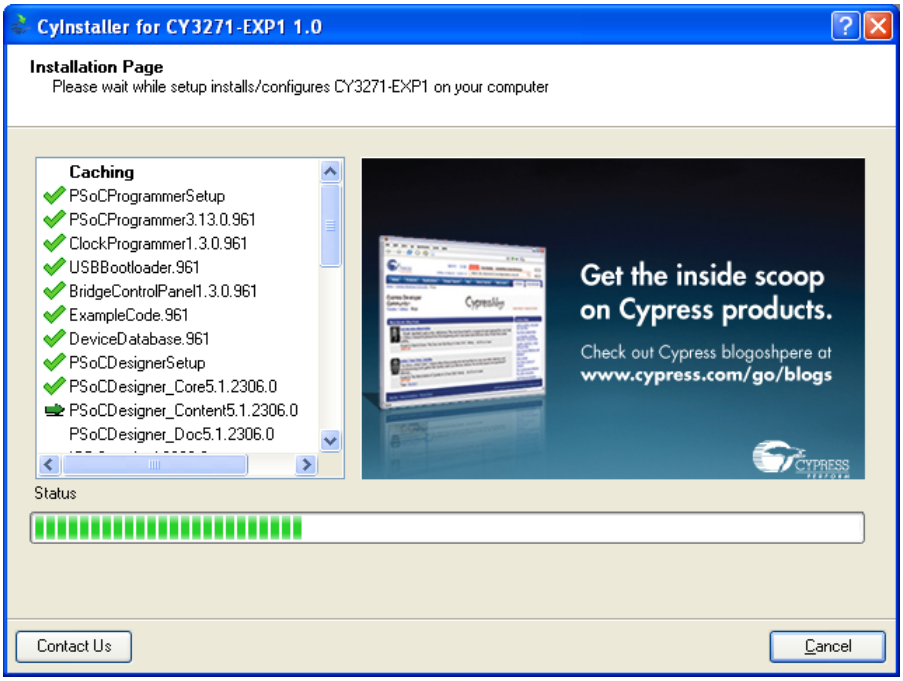
5. On the **Product Installation Overview** screen, select the installation type that best suits your requirement. The drop-down menu has three options - **Typical, Custom,** and **Complete**, as shown in Figure 2-4.
6. Click **Next** to start the installation.

Figure 2-4. Installation Type Options



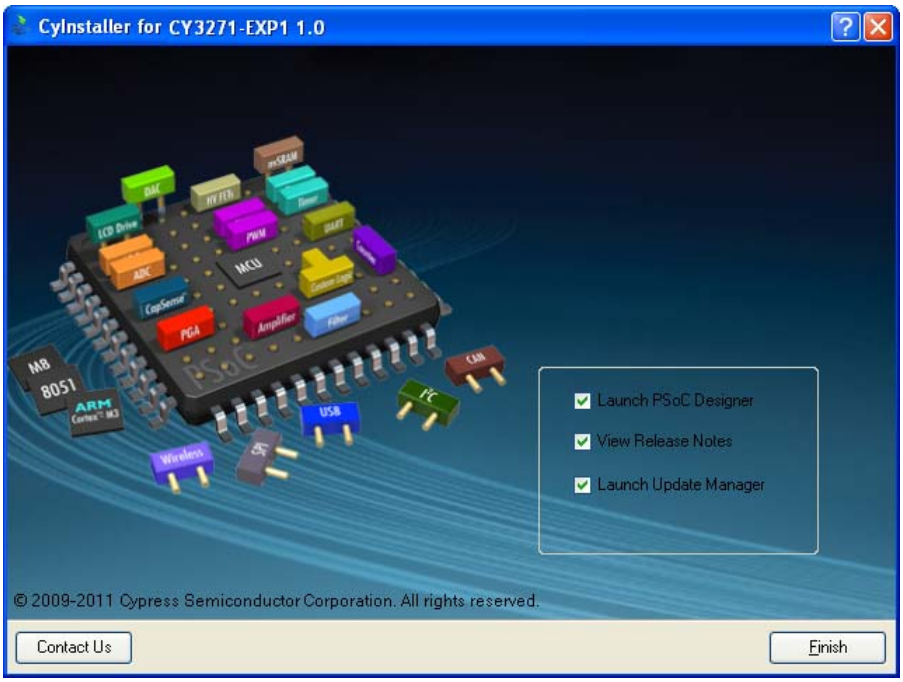
7. When the installation begins, a list of packages appears on the **Installation Page**. A green check mark appears adjacent to every package that is downloaded and installed; see Figure 2-5.
8. Wait until all the packages are downloaded and installed successfully.

Figure 2-5. Installation Page



9. Click **Finish** to complete the installation, as shown in Figure 2-6.

Figure 2-6. Installation Complete

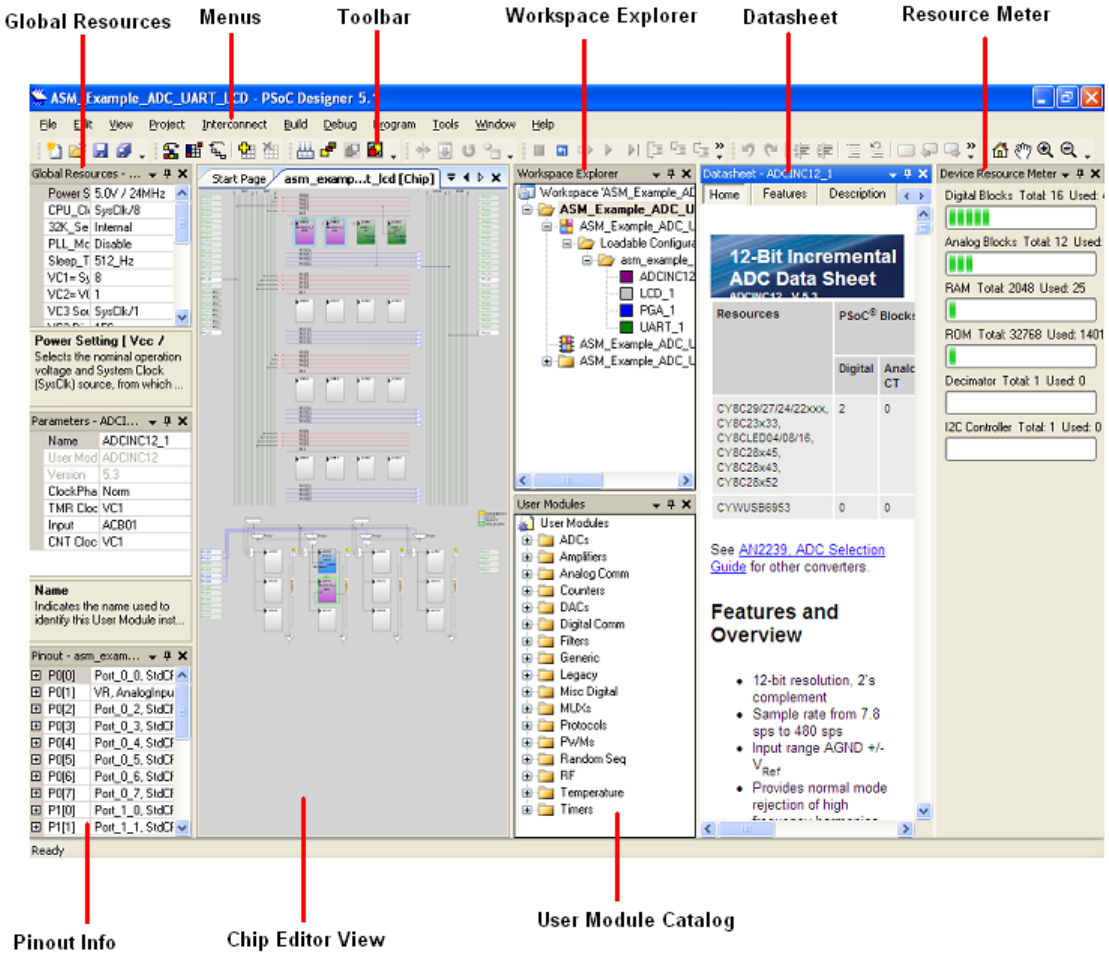


Advanced users can go to Code Examples chapter on page 23.

2.2 PSoC Designer

1. Click **Start > All Programs > Cypress > PSoC Designer <version> > PSoC Designer <version>**.
2. Click **File > New Project**, to create a new project; click **File > Open Project** to work with an existing project.

   Figure 2-7. PSoC Designer Interconnect View



3. To experiment with the code examples, go to Code Examples chapter on page 23.

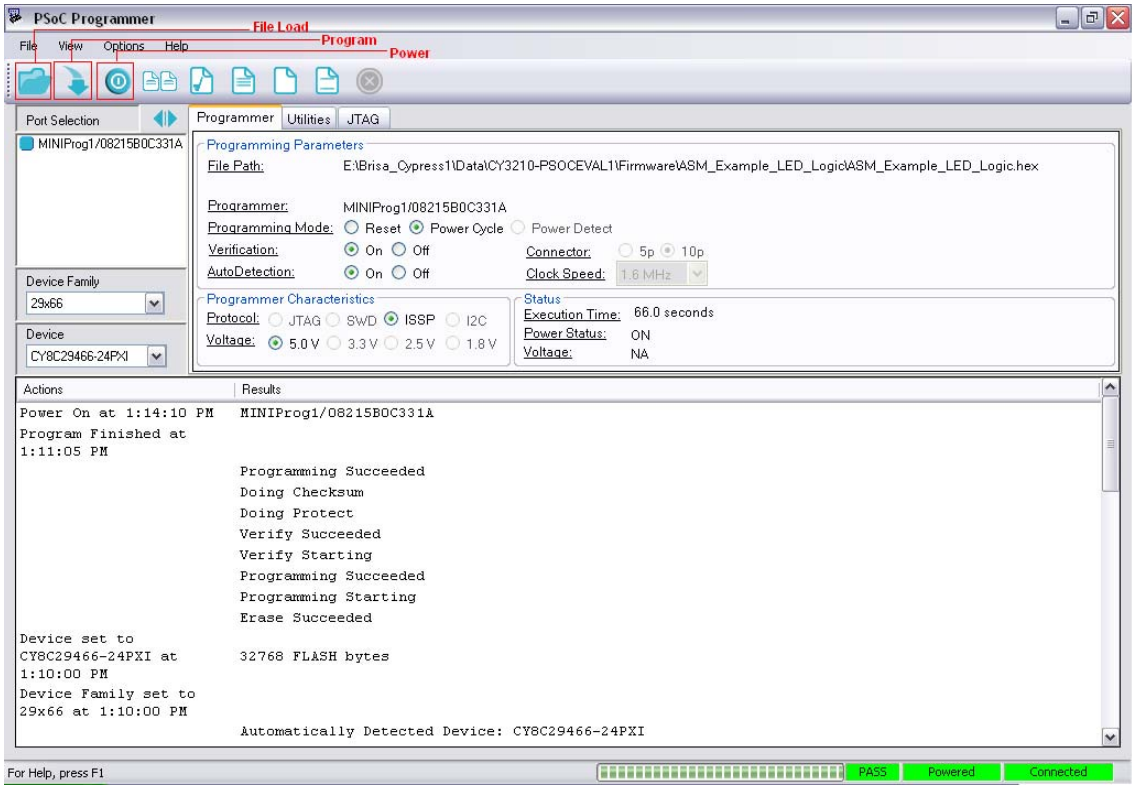
Note For more details on PSoC Designer, see the PSoC Designer IDE Guide located at: `<Install_Directory>:\Cypress\PSoC Designer\<version>\Documentation.`

See Additional Learning Resources on page 6 for links to PSoC Designer training. The PSoC Designer quick start guide is available at: http://www.cypress.com/?rID=47954.

2.3 PSoC Programmer

1. Click **Start > All Programs > Cypress > PSoC Programmer <version> > PSoC Programmer <version>**.
2. Select the MiniProg from Port Selection, as shown in Figure 2-8.

Figure 2-8. PSoC Programmer Window



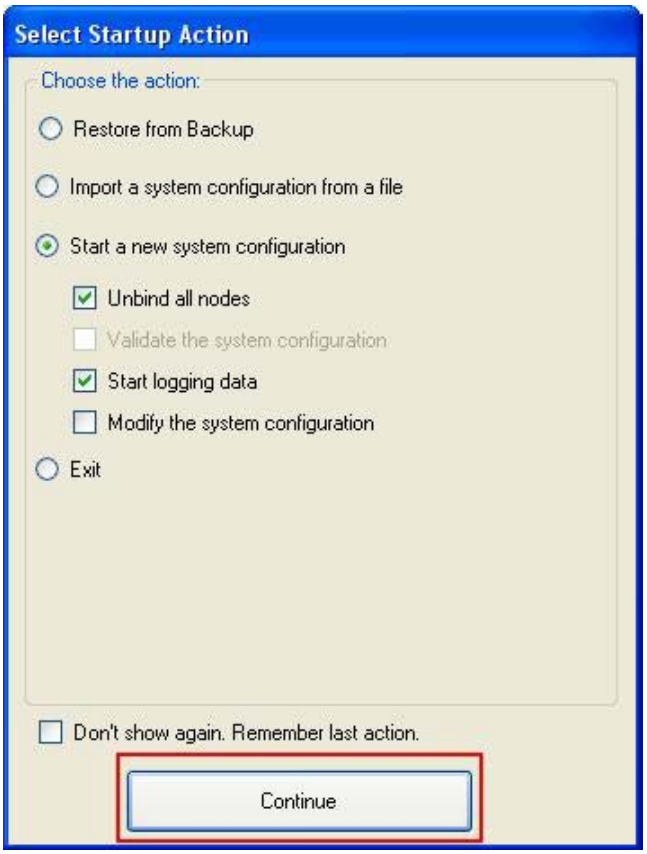
3. Click **File Load** to load the hex file.
4. Use the **Program** button to program the hex file on to the chip.
5. When programming is successful, **Programming Succeeded** appears in the Actions pane.
6. Close PSoC Programmer.

Note For more details on PSoC Programmer, see the user guide at the following location: `<Install_Directory>:\Program Files\Cypress\Programmer\<version>\Documents`.

2.4 Configuring Sense and Control Dashboard

1. Click **Start > All Programs > Cypress > Sense and Control Dashboard <version> > Sense and Control Dashboard <version>** to open the SCD software.
2. Select **Startup Action** window; select the options **Start new system configuration**, **Unbind all nodes**, and **Start logging data**; click **Continue**.

   Figure 2-9. Startup Action Window



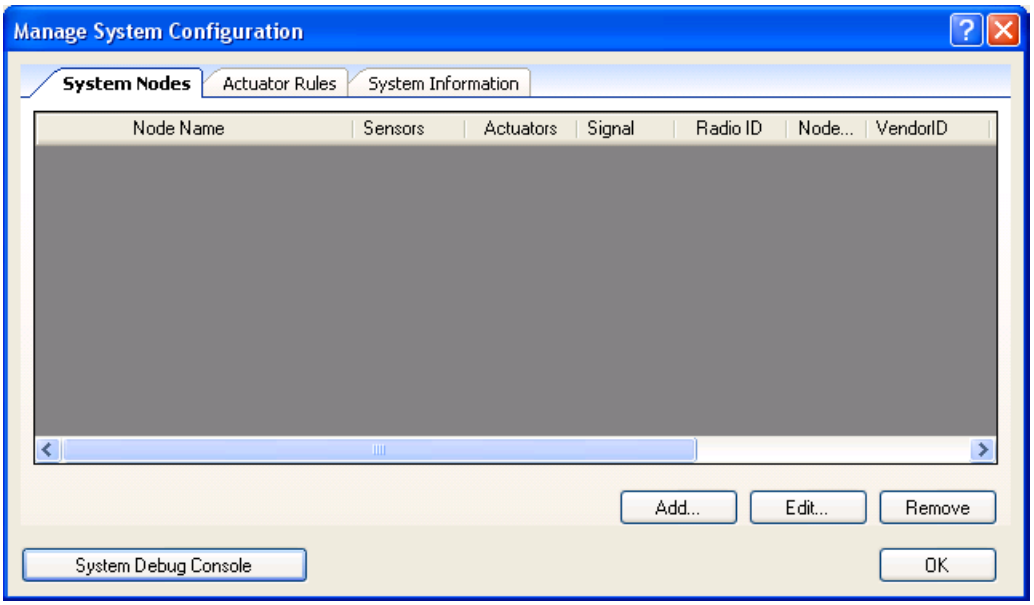
3. Select a location to save the configuration file (SDF).
4. Connect the PC Bridge (FTPC) USB dongle to a free USB port in the PC.
5. Connect the Multifunction board to the RF Bridge board. Power up this assembly using the AAA power pack board provided with the kit.
6. Attach a node to the wireless hub and configure the SCD to view the node data; to do this, follow these instructions.

7. Click the **Manage** button to add a new node, as shown in Figure 2-10.

   Figure 2-10. Manage Button in SCD Dashboard

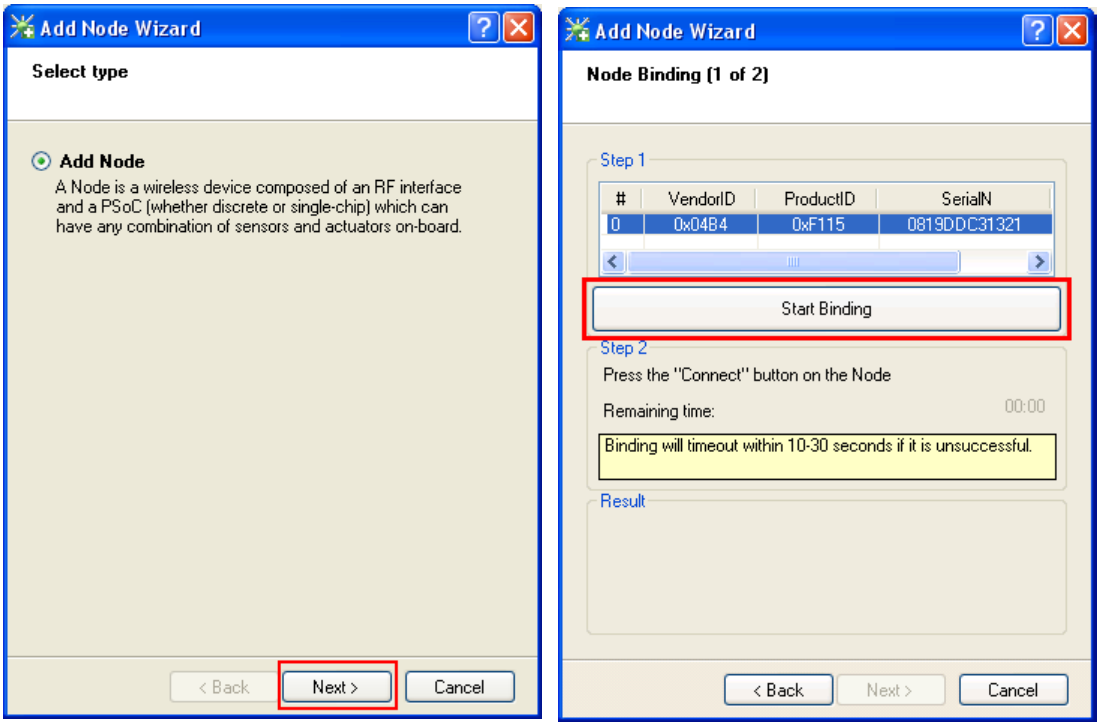
8. In the Manage System Configuration screen, click **Add**.

   Figure 2-11. Manage System Configuration - Add



9. The Add Node Wizard opens up; Select the **Add Node** option and click **Next** in the Add Node Wizard; then, click on **Start Binding** in the subsequent window.

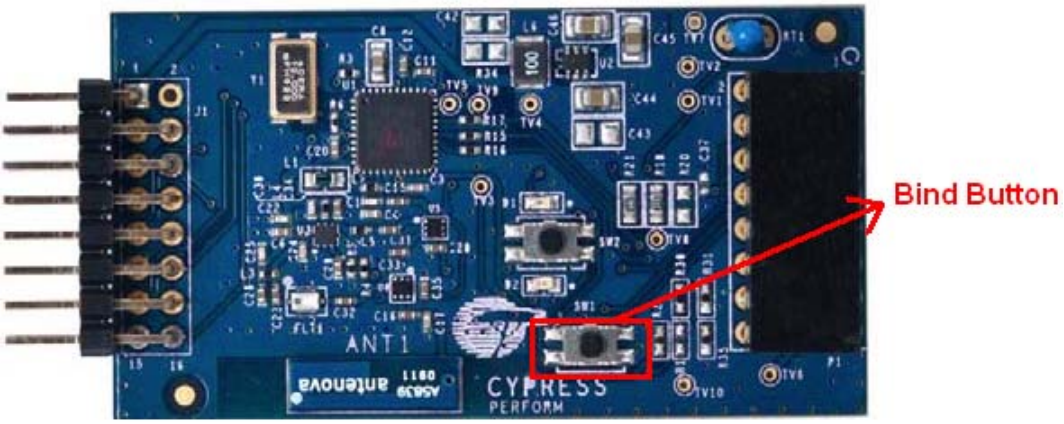
Figure 2-12. Add Node and Start Binding



10. Press the **Bind** button on the RF Bridge board; this ensures that the node is in Bind mode and allows the hub to discover the node.

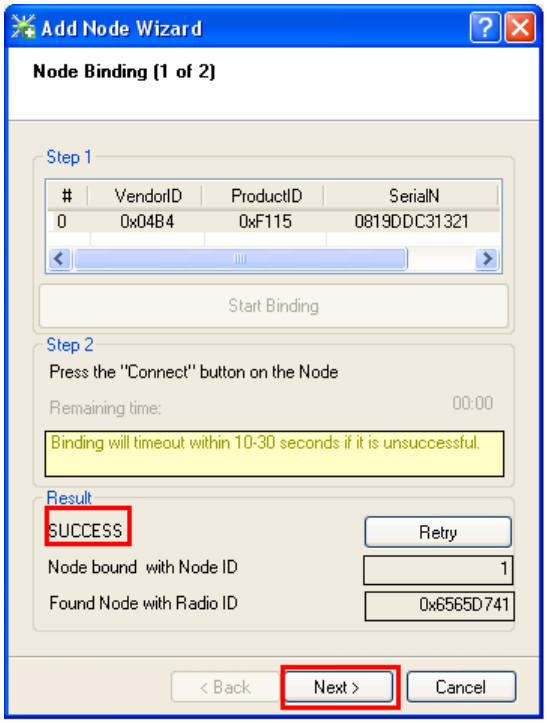
    Note Press the Bind button within 30 secs of pressing the button on the GUI; otherwise, binding does not occur and the result is shown as 'Time out'.

    Figure 2-13. Bind Button



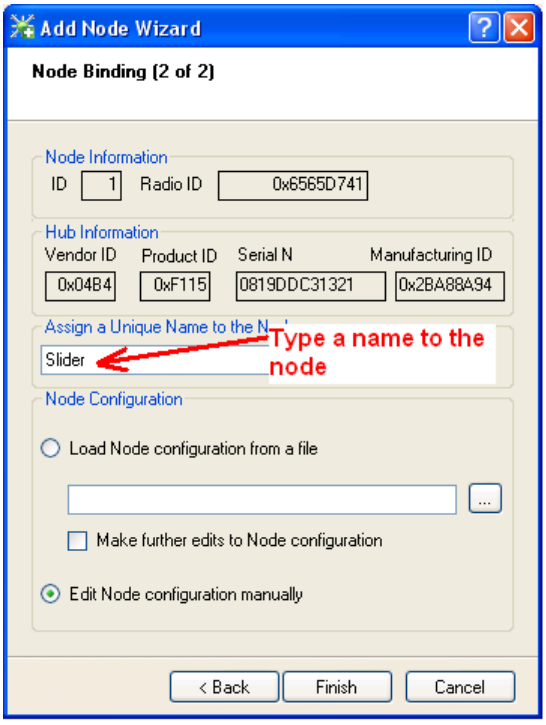
11. Verify the success of the bind and click **Next.**

Figure 2-14. Successful Bind



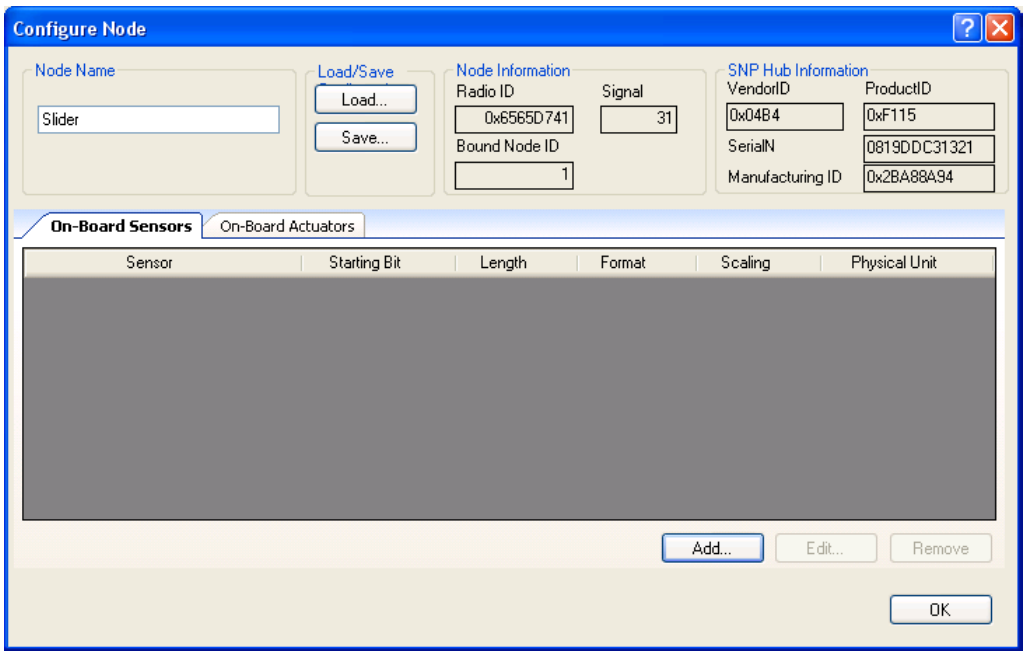
12. On the next screen, assign a name to the node.

Figure 2-15. Enter Node Name



13. In the Node Configuration section, the option **Edit Node Configuration manually** is selected by default. For this kit, the node configuration is completed and stored as xml files. On successful binding of the node, choose **Load Node Configuration** from a file option and select the appropriate xml file from `<Install_Directory>:\Cypress\CY3271-EXP1\<version>\Firmware\DeviceTemplates.` Click **Finish**.
14. To edit the node manually, select **Edit Node Configuration manually** and click **Finish**.
15. Click **Add** on the **Configure Node** screen to configure the sensor parameters.

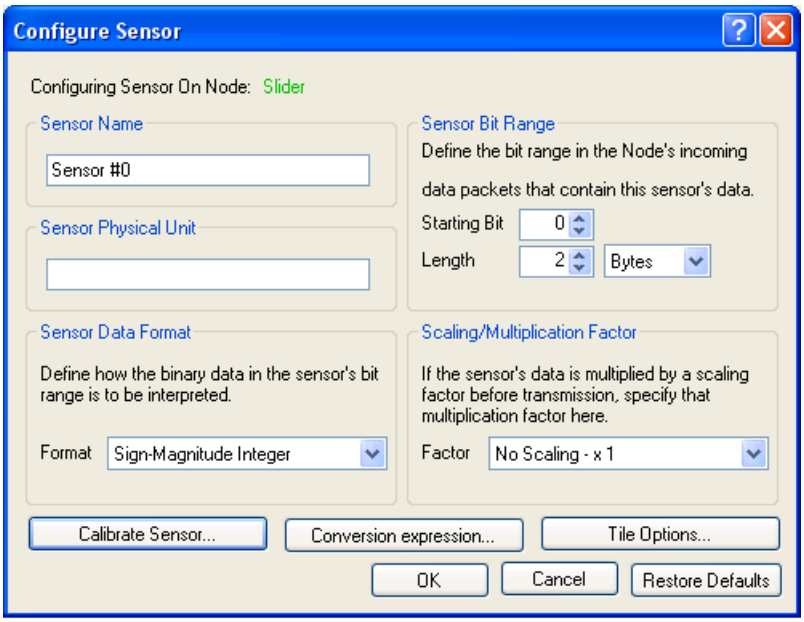
Figure 2-16. Configure Sensor Parameters



16. The Configure Sensor window opens up. The following parameters can be configured for the sensor:
    a. Sensor Data Format - Unsigner Integer, Two's Complement Integer, and so on
    b. Senor Bit Range
    c. Data Length - Bits or Bytes
    d. Scaling/Multiplication Factor (if any)
    e. Sensor Physical Unit - KPa, Lux, and so on. This is used in the graphical display of node data.

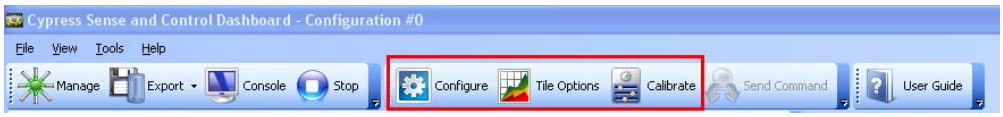
    Note Figure 2-17 shows the default values.

Figure 2-17. Configure Sensor Parameters



17. The SCD GUI provides the options to calibrate the sensor, specify the conversion expression, and display options (Tile options). Click on the respective buttons to enter the context specific menus and options.
18. After configuring the node, click **OK** on all subsequent screens to return to the main screen where the data logging has started.
19. Configuring the sensor can even be done at a later time by clicking on the appropriate button in the main menu

Figure 2-18. Main Menu Buttons



2.5 Kit Operation

The CY3271-FTRF Kit is required to operate this kit. The kit operation for the CY3271-EXP1 kit is explained with the help of two code examples using the weather station board and the pigtail thermistor board. See Code Examples chapter on page 23 for details.

The code examples operate at +10 dBm of RF output power. They are limited to +10 dBm because of the RF power restrictions imposed in Europe and Japan. The power can be increased to +20 dBm in the United States and Canada only. The process to increase power is explained in detail in the CY3271-PSoC FirstTouch Starter Kit Guide, available at http://www.cypress.com/go/ CY3271-FTRF.

3. Hardware

The CY3271-EXP1 kit hardware consists of a weather station expansion board and a pigtail thermistor expansion board.

3.1 Weather Station Expansion Board

The weather station expansion board features a PSoC device and several sensors such as:

- Thermistor
- Ambient light sensor
- Humidity sensor
- Atmospheric pressure sensor

Figure 3-1. Hardware Block Diagram for Weather Station Board

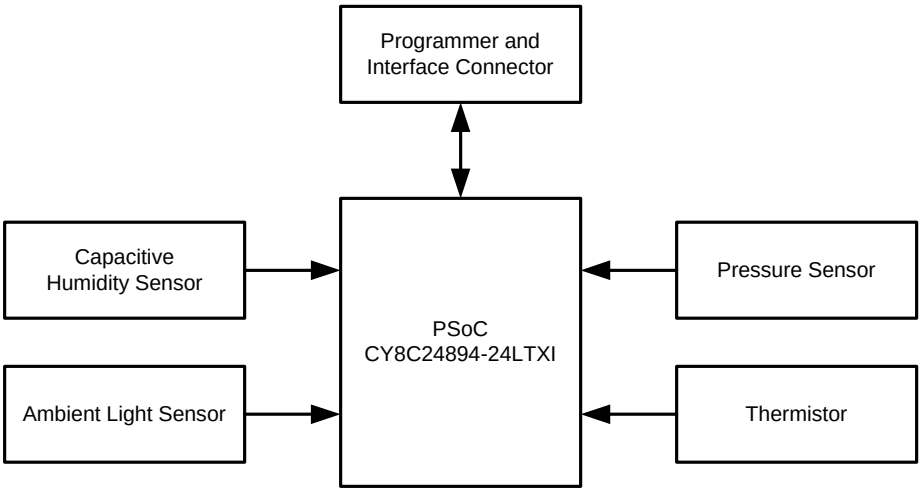
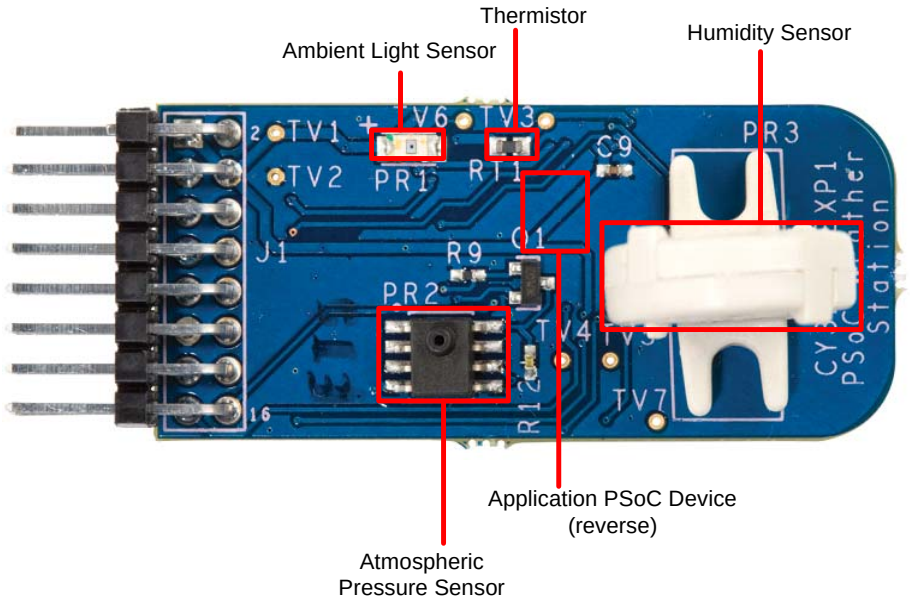


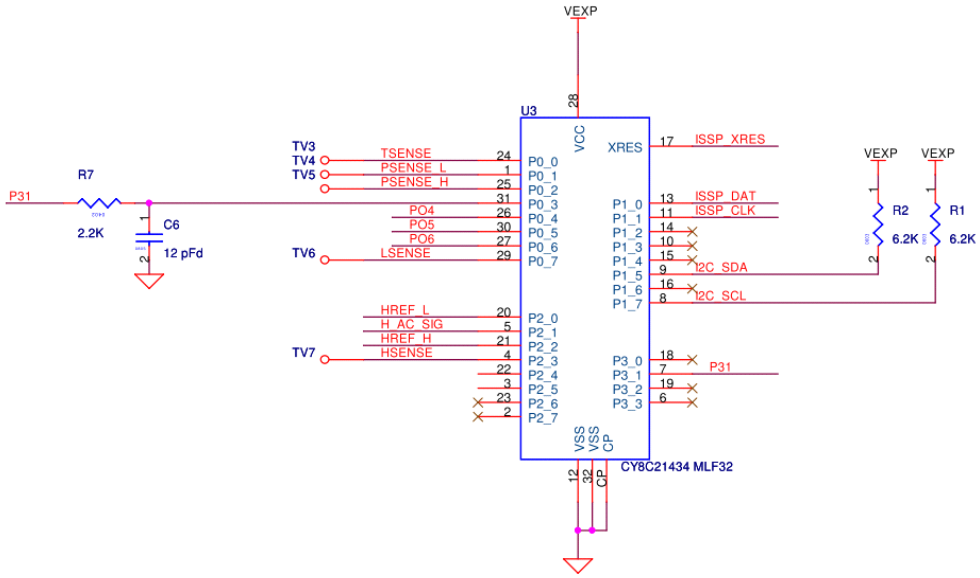
Figure 3-2. Weather Station Expansion Board



The weather station expansion board sends sensor data over I2C to the RF expansion card, which is included in the CY3271-FTRF kit.

- PSoC CY8C24894 silicon

The CY8C24894-24LTXI PSoC device on the weather station expansion board converts the analog data from the sensors to I2C data. This sensor data is sent over I2C to the CY3271-RF expansion card.



Sensor data is located in the kit CD/DVD under `\Documentation` folder or in the default install location: `<Install_Directory>:\Cypress\CY3271-FTRF\<version>\Documentation`

3.2 Pigtail Thermistor Expansion Board

The pigtail thermistor expansion board features a thermistor on a three-foot cable. The thermistor at the end of the cable is identical to the thermistor used on the RF expansion card allowing dual temperature readings. The pigtail thermistor expansion board does not have a PSoC on board; instead, it uses the PSoC from the RF expansion board to read the sensor. Resistors are chosen to remove offset errors from the thermistor measurement; see AN2017 - PSoC 1 Thermistor-Based Thermometer.

Figure 3-3. Hardware Block Diagram for Pigtail Sensor Board

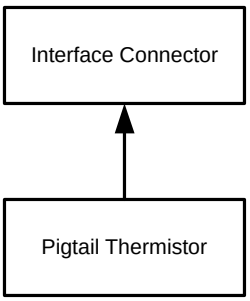
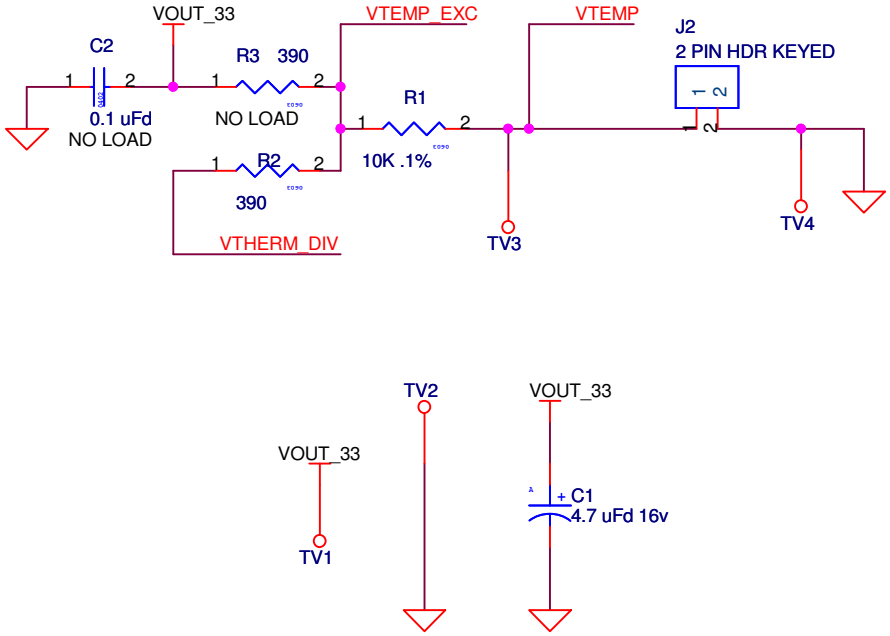


Figure 3-4. Pigtail Thermistor Expansion Board

Figure 3-5. Temperature Sensor Schematic



4. Code Examples

4.1 My First Example Project

See the CY3271-FTRF kit user guide at http://www.cypress.com/go/CY3271-FTRF for a detailed explanation of how to create a PSoC Designer project. All code examples are available on the CY3271-FTRF kit CD/DVD or at: `<Install_Directory>:\Cypress\CY3271-FTRF\<version>\Firmware`.

4.2 Weather Station Code Example

4.2.1 Project Objective

This example demonstrates how the weather station expansion board talks to the RF expansion card. The weather station board has sensors for light, temperature, humidity, and pressure. The data from the weather station board is read by the RF_I2C_Bridge board (from CY3271-FTRF kit) through an I2C protocol and transmitted to the PC hub (PC dongle from CY3271-FTRF kit) wirelessly using the CyFi SNP protocol.

The hardware has a capacitive humidity sensor to detect humidity. Because the CY8C24894 PSoC device has only two rows of analog blocks, the dynamic reconfiguration feature of PSoC Designer is used to read the data of all four sensors. See the PSoC Designer User Guide for more information on dynamic reconfiguration.

This example uses the following user modules:

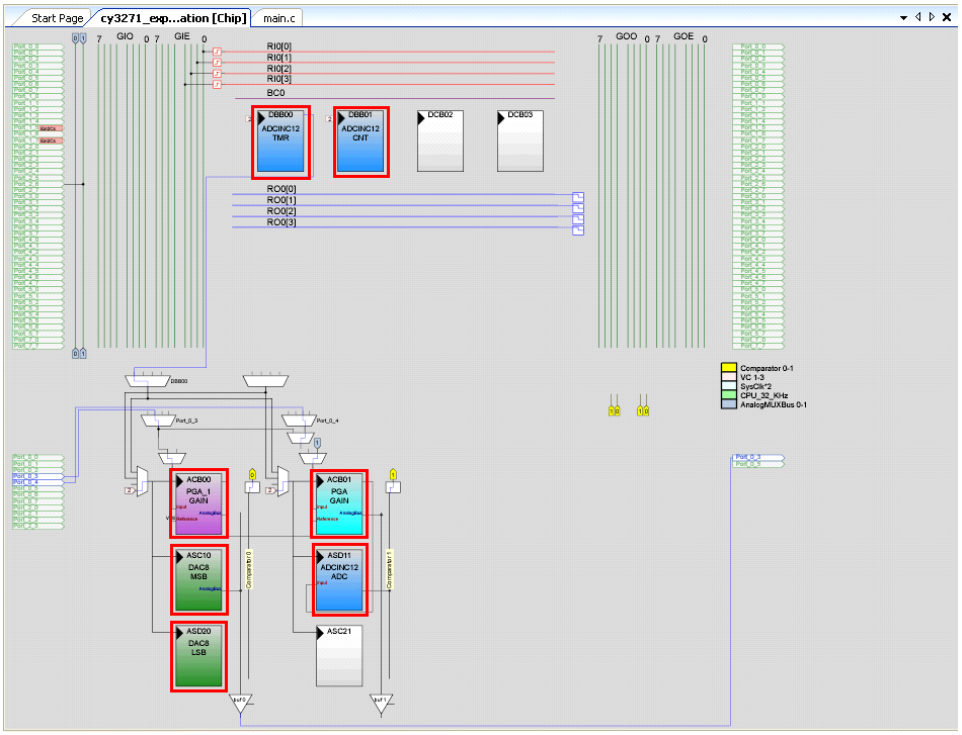
CY3271_EXP1_Weather_Station Configuration

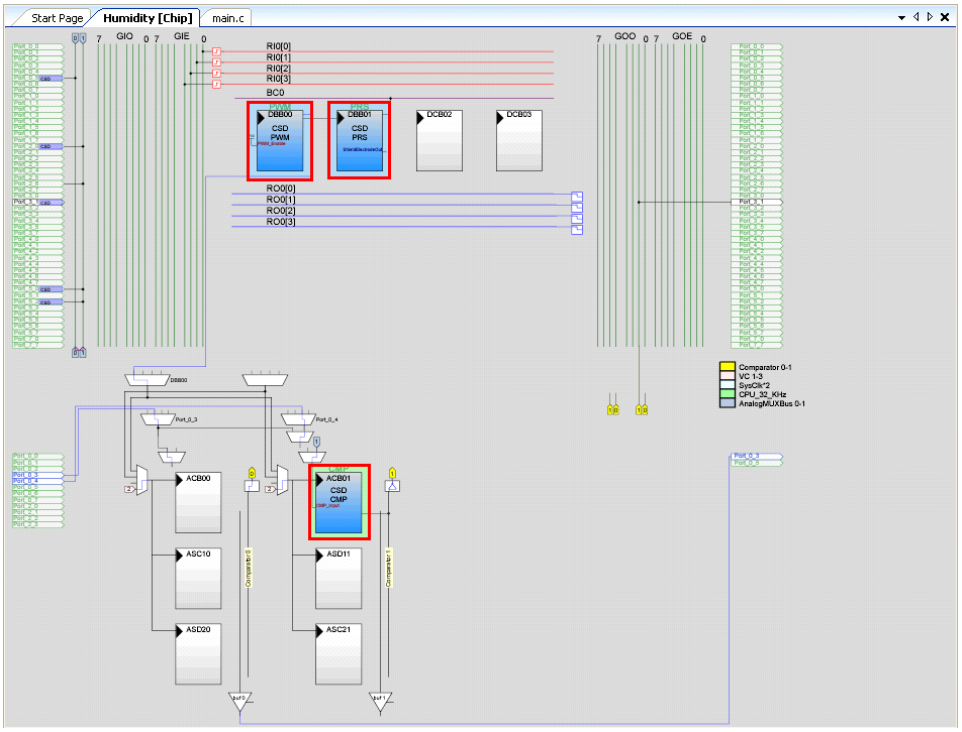
- **ADCINC12**: This user module converts the analog values from the sensors to digital value. The input to the user module is set to read the pressure sensor, light sensor, and temperature sensor one after the other in the firmware.
- **DAC**: This user module stalls the microprocessor until the input voltage is stabilized before the ADC conversion can take place.
- **E2PROM**: This user module stores the sensor data.
- **EzI2Cs**: This user module configures PSoC on weather station board as I2C slave. The slave data is available for acquisition using a bridge board that is configured as I2C master.
- **PGA**: Two instances of this user module is used to obtain a dual amplification of the analog input.

Humidity Configuration

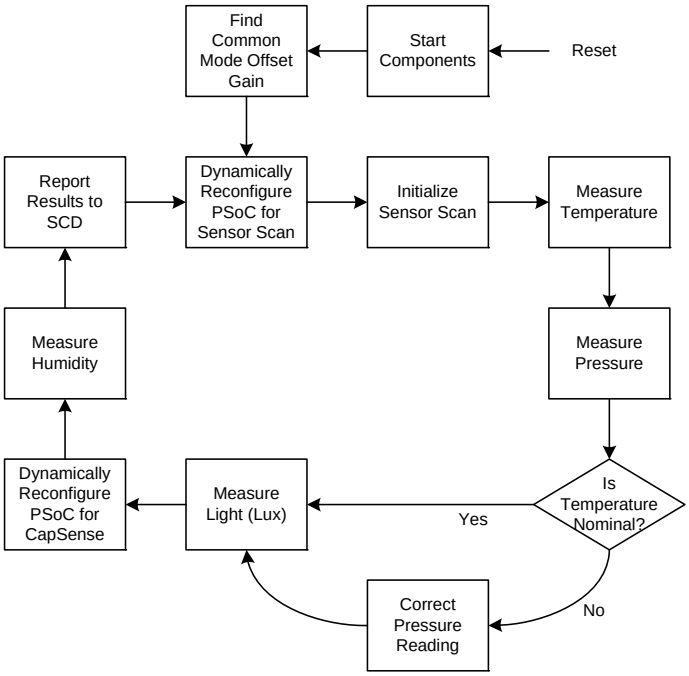
- **CSD**: This user module detects the capacitive changes due to changes in humidity.

4.2.2 Device Configuration





4.2.3 Flowchart



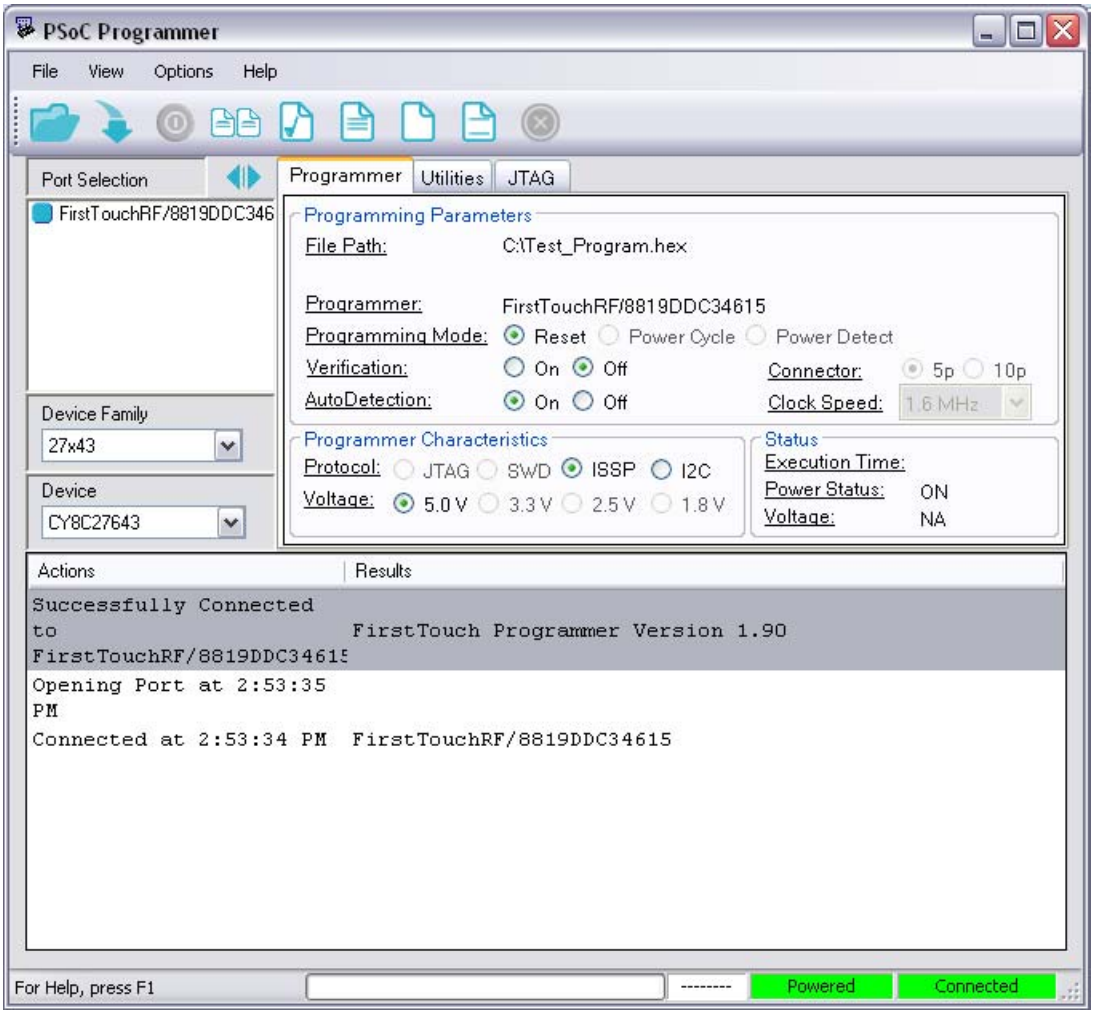
4.2.4 Verify Output

Operate the weather station demonstration by downloading the corresponding hex file to the RF expansion card. Note that the weather station board is pre-programmed and does not need to be programmed.

1. Connect the RF expansion card to the PC bridge.
2. Insert the PC Bridge into any free USB port of your PC/laptop.
3. Open PSoC Programmer and load *RF_I2C_BRIDGE.hex* provided with CY3271-FTRF kit.

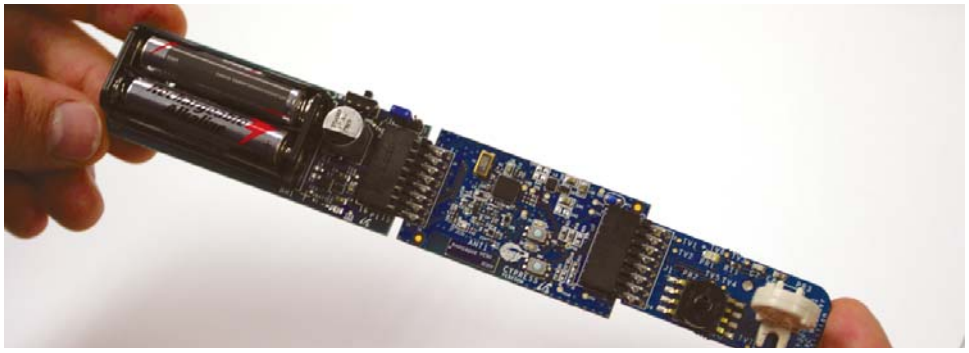
   Note After installation, this file is available at `<Install_Directory>:\Cypress\CY3271-FTRF\<version>\Firmware`
4. Set **Device Family** to 27x43 and **Device** to CY8C27443. Click **Program**.

Figure 4-1. PSoC Programmer Settings



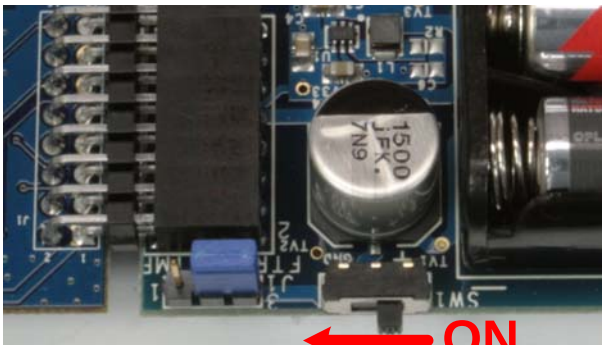
5. Disconnect the RF expansion card from the PC bridge, leaving the bridge connected to your computer.
6. Attach the weather station expansion board and battery pack to the RF expansion card, as shown in Figure 4-2.

Figure 4-2. RF Expansion Card Connected to the Battery Pack and Weather Station Boards



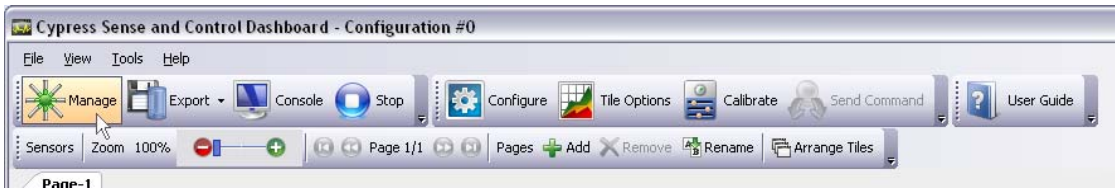
7. Power the RF expansion card by sliding the ON/OFF switch on the battery pack towards the card.

Figure 4-3. Turning ON the Switch



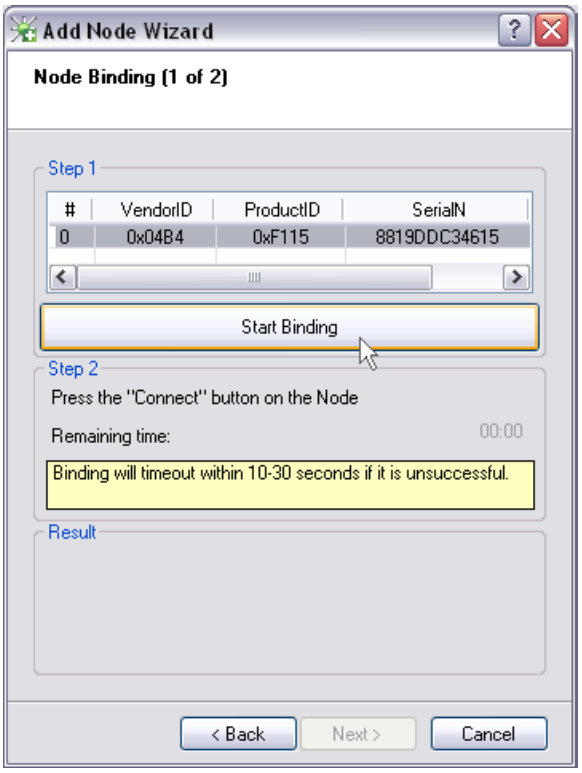
8. Open the SCD software.
9. Place the PC bridge in Bind mode using SCD.
10. Click **Manage** to set up the sensor network.

Figure 4-4. Manage Network within SCD



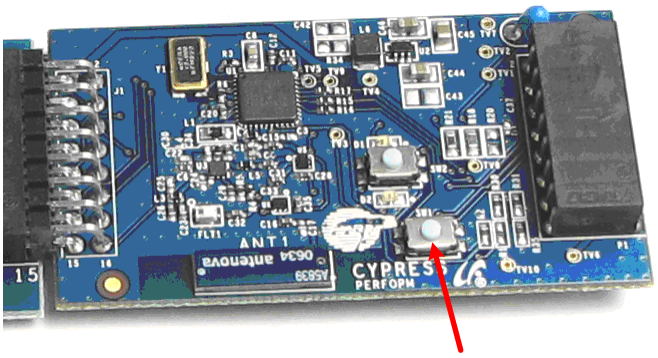
11. In the Manage System Configuration screen, click **Add** to add a new node.
12. On the Node Binding screen, click **Start Binding**.

Figure 4-5. Node Binding Window



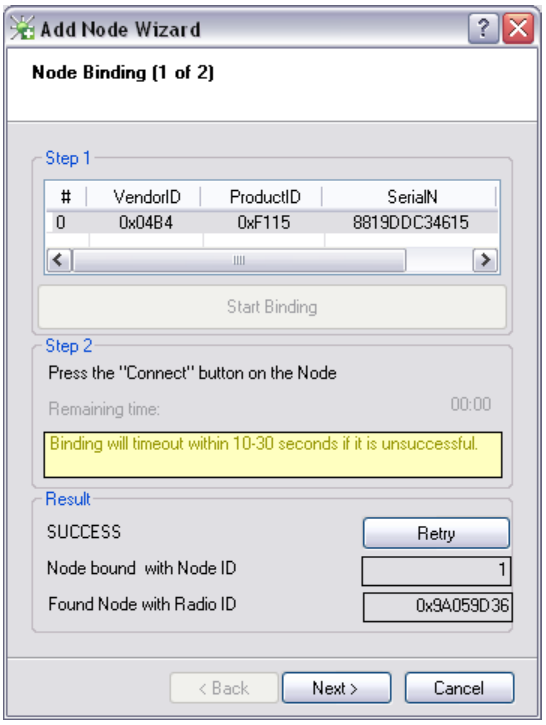
13. After activating this function, you have approximately 10 to 30 seconds to press the bind button on the RF expansion card.

Figure 4-6. Press Bind Button



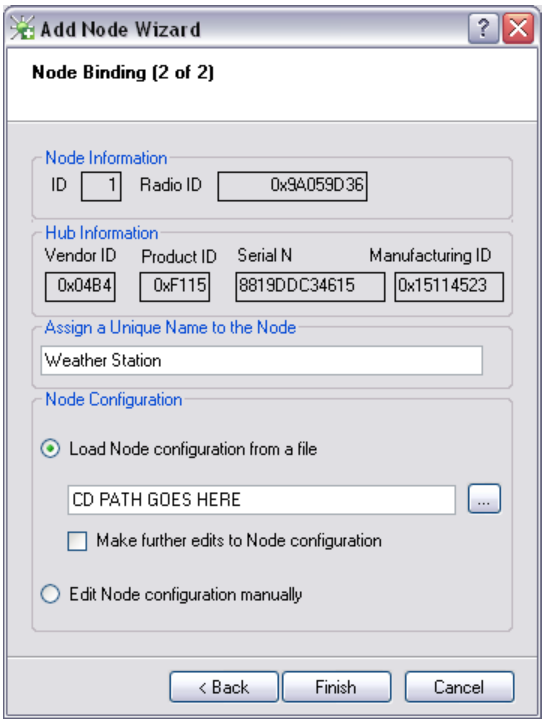
14. Verify the success of the bind. A successful bind window looks similar to Figure 4-7.

Figure 4-7. Successful Bind Window



15. Click **Next** to go to the Node Binding (2 of 2) window. In this window, assign a name to the newly bound node. On the Node Configuration pane, click **Load Node configuration from a file** and load *Weather Station Dashboard Configuration.node.xml* from the Device Template folder located on the CY3271-EXP1 kit CD/DVD.

Figure 4-8. Node Configuration



16. Select graphical or textual mode of data display. The data is displayed in graphical or text format on the SCD screen.
17. Click **Apply** on all successive dialog boxes until the main SCD window reappears.

Note that the weather station expansion board is not calibrated. If more accurate measurements are required, then the board must be calibrated. The calibration process is described in Sensor Calibration chapter on page 35.

4.3 Pigtail Sensor Code Example

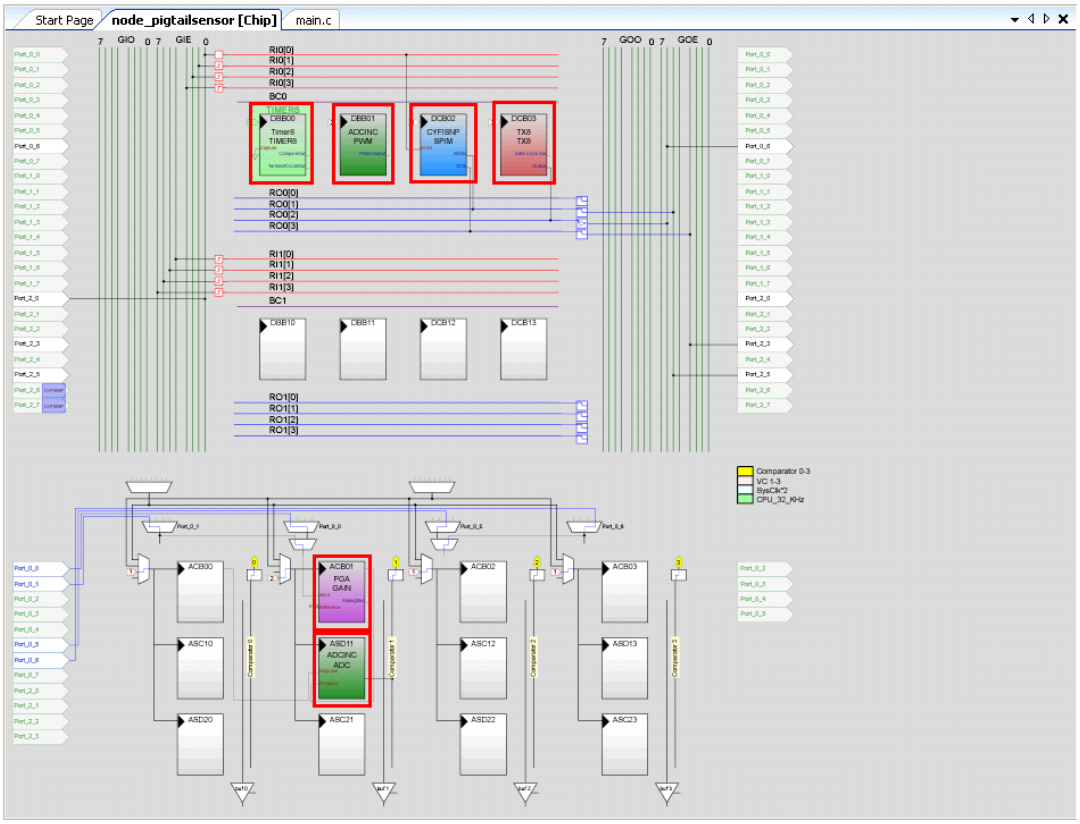
4.3.1 Project Objective

This project outputs the temperature values from two different sensors: the pigtail thermistor on the pigtail sensor board and the thermistor on the RF_I2C_Bridge board. The pigtail sensor board does not have a PSoC on board but the signal lines from the sensor are routed to the male header on the board. The CY8C27443 device on the RF_I2C_Bridge reads both the sensor values and outputs to the PC hub (PC dongle from CY3271-FTRF kit) wirelessly using the CyFi SNP protocol.

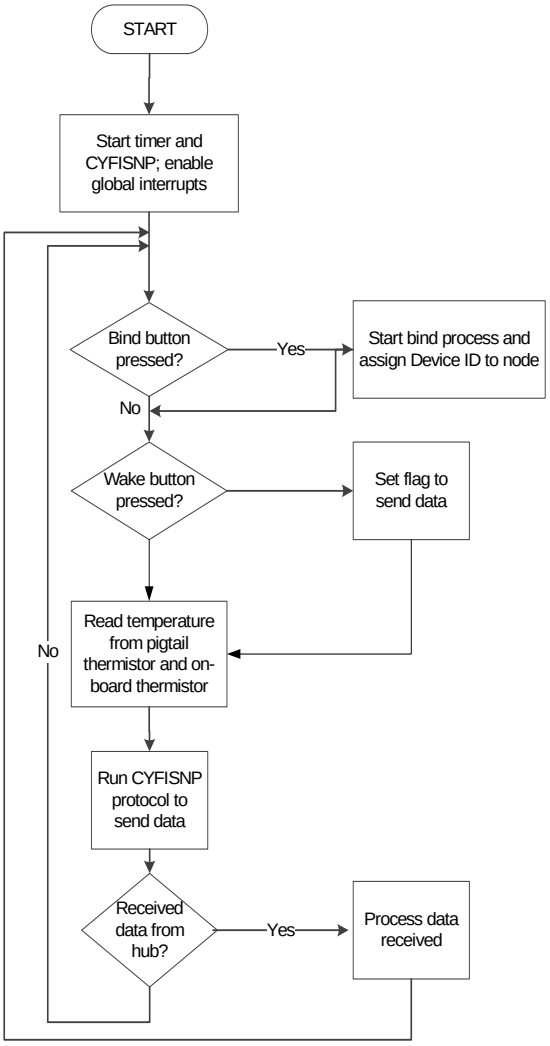
This project uses the following user modules:

- **CYFISNP**: This module implements the entire star network wireless protocol and all protocol modes, in addition to low level radio communication and radio control by the MCU.
- **ADCINC**: The incremental ADC is used to read the analog values from pigtail thermistor and on board thermistor one after the other in firmware.
- **PGA**: This module facilitates the route ability of the analog inputs to the ADC analog block.
- **TX8**: This module is used for serial communication with host and for debugging.
- **Timer8**: This module implements an 8-bit timer that is clocked by a divider of SysClk. It is used to calibrate the sleep timer that is clocked by the 32 kHz system oscillator.

4.3.2 Device Configuration



4.3.3 Flowchart



4.3.4 Verify Output

The pigtail thermistor demonstration can be operated by downloading the corresponding hex file to the RF expansion card.

1. Connect the RF expansion card to the PC bridge.
2. Insert the PC bridge into any free USB port of your computer.
3. Open PSoC Programmer and load *RF_I2C_BRIDGE.hex* provided with the CY3271-FTRF kit.

   Note After installation, this file is available at `<Install_Directory>:\Cypress\CY3271-FTRF\<version>\Firmware`.
4. Set **Device Family** to 27x43 and **Device** to CY8C27443. Click **Program**.
5. Disconnect the RF expansion card from the PC bridge, leaving the bridge connected to your computer.
6. Attach the pigtail thermistor expansion board and battery pack to the RF expansion card.
7. Power the RF expansion card by sliding the ON/OFF switch on the battery pack towards the card.
8. Open the SCD software.

9. Place the PC bridge in Bind mode using SCD as follows:
   a. Click the **Manage** button to set up the sensor network.
   b. In the Manage Network screen, click **Add** to add a new node.
   c. On the Node Binding screen, click on **Begin Binding**.
   d. After this function is activated, the user has about 10 to 30 seconds to press the bind button on the RF expansion card.
   e. Verify the success of the bind.
9. Click **Next** to go to the Node Binding (2 of 2) window. In this window, assign a name to the newly bound node. On the Node Configuration pane, click the **Load Node configuration from a file** option and load *Pigtail_Thermistor_Dashboard_Configuration.xml* from the Device Template folder located on the CY3271-EXP1 kit CD/DVD.

   Note After installation, this file is available at `<Install_Directory>:\Cypress\CY3271-EXP1\<version>\Firmware`
10. Select graphical or textual mode of data display. The data is displayed in graphical or text format on the SCD screen.
11. Click **Apply** on all successive dialog boxes until the main SCD window reappears.

Note that the pigtail thermistor expansion card is not calibrated. If more accurate measurements are required, then the board must be calibrated. The calibration process is described in Sensor Calibration chapter on page 35.

5. Sensor Calibration

5.1 Overview

The SCD allows you to calibrate a sensor in the system using linear calibration. Calibration can improve measurement accuracy of sensors, such as the humidity sensor, whose accuracy is specified at ±15% relative humidity. SCD sensor calibration is based on data pairs (raw value versus adjusted value). Calibration of the humidity sensor is also possible in firmware. Calibration in firmware is useful when the hardware is sent without access to the local calibration settings in SCD, or when the SCD is not the target software.

To register a calibration pair, select a graph and click the **Calibrate** button. Click the **Add Point** button and enter the appropriate values. Raw Value is the value reported by the SCD and Adjusted Value is the data point value. There is no limit on the number of data pairs. More data pairs mean more accurate calibration and more accurate measurements from the SCD.

For one data pair, SCD computes the offset calibration equation in the form of y = x + b using the provided data.

Calibrated Value = Raw Value + Offset

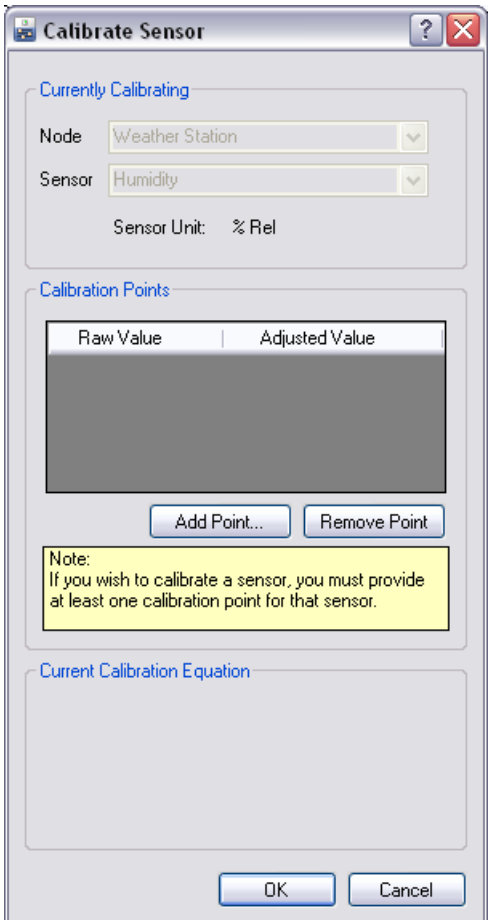
For two or more data pairs, SCD computes the offset and gain calibration equation in the form of y = mx + b using a least squares best fit of the provided data:

Calibrated Value = (Slope) × (Raw Value) + Offset

This calibration equation is used to calibrate all incoming raw data from the sensor before displaying it in the SCD. The SCD also records both raw and calibrated data for each sensor in its data log.

To access the **Calibrate Sensor** window, highlight the sensor that you want to calibrate. Then, either click on the **Calibrate** button on the toolbar, or go to **Tools > Selected Sensor > Calibrate**.

Figure 5-1. Calibrate Sensor Window



5.1.1 Calibrating Humidity Sensor in Firmware

Calibration of the humidity sensor is also possible in firmware. The process is similar to the calibration process in the SCD. Two types of calibration are possible in firmware: offset calibration and gain calibration. Offset calibration is easier and corrects most errors in the sensor reading; gain calibration can be used for high accuracy applications.

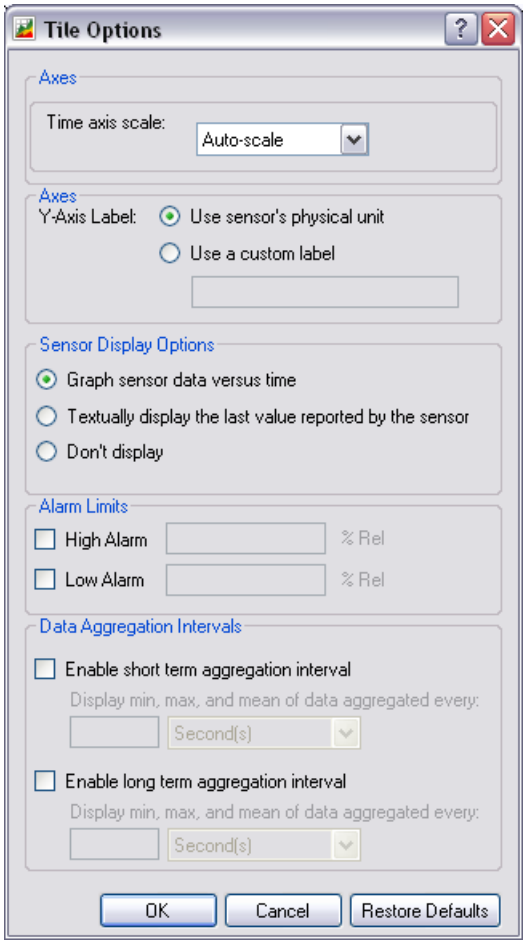
To calibrate the offset in firmware, you must know the relative humidity to a good degree of accuracy. Turn on and connect the kit; compare the readings it supplies with the actual relative humidity. Now, in the firmware package CY3271_EXP1_Weather_Station provided with the kit, open the *main.c* file. The conversion equation for the humidity measurement is in the ConvertHumidity function on line 185. Use the difference between the known value and reported value to correct the offset value in this equation. Next, compile and program the weather station board to complete the offset calibration.

Gain calibration is more involved, requiring data taken at a minimum of two points and some math. Gain calibration is usually not required for this sensor unless you want high accuracy. During at least two known accurate relative humidities, record the real relative humidity and the value reported by the Weather Station. Plot these values versus the known humidity values and determine the linear relationship between the two, with measured relative humidity as a function of real humidity. Use this equation, in the form y = m (x + b), and substitute the equation in *main.c*, line 185 for x. Simplify the resulting equation and replace the equation in the firmware. Compile and program your board. This completes gain calibration.

5.2 Alarms and Data Aggregation Intervals

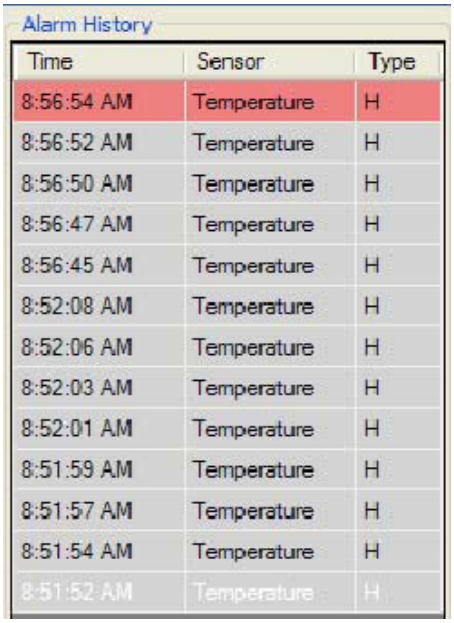
The **Chart Options** dialog enables to set low and high alarms for a selected sensor. To view this window, highlight the sensor for which you want to set an alarm. Then, either click on the **Chart** button on the toolbar or go to **Tools > Selected Sensor > Chart Options**.

Figure 5-2. Chart Options for Setting Alarms



If the application detects a triggered low or high alarm, it reports this event on the **Alarms** panel. The alarm values are also reflected on the sensor display tile if graph option is selected.

Figure 5-3. Alarm History



Data aggregation intervals are also specified using the **Chart Options** dialog. To enable long or short term aggregation, select the corresponding check box and specify the data sampling period. The long term aggregation interval must be longer than the short term aggregation interval.

5.3 Data Export

Selected sensor data, data reported by all sensors, and alarm history are exported to a file using comma separated values format. To do this, click **File > Export Data**..

5.4 Save Configuration

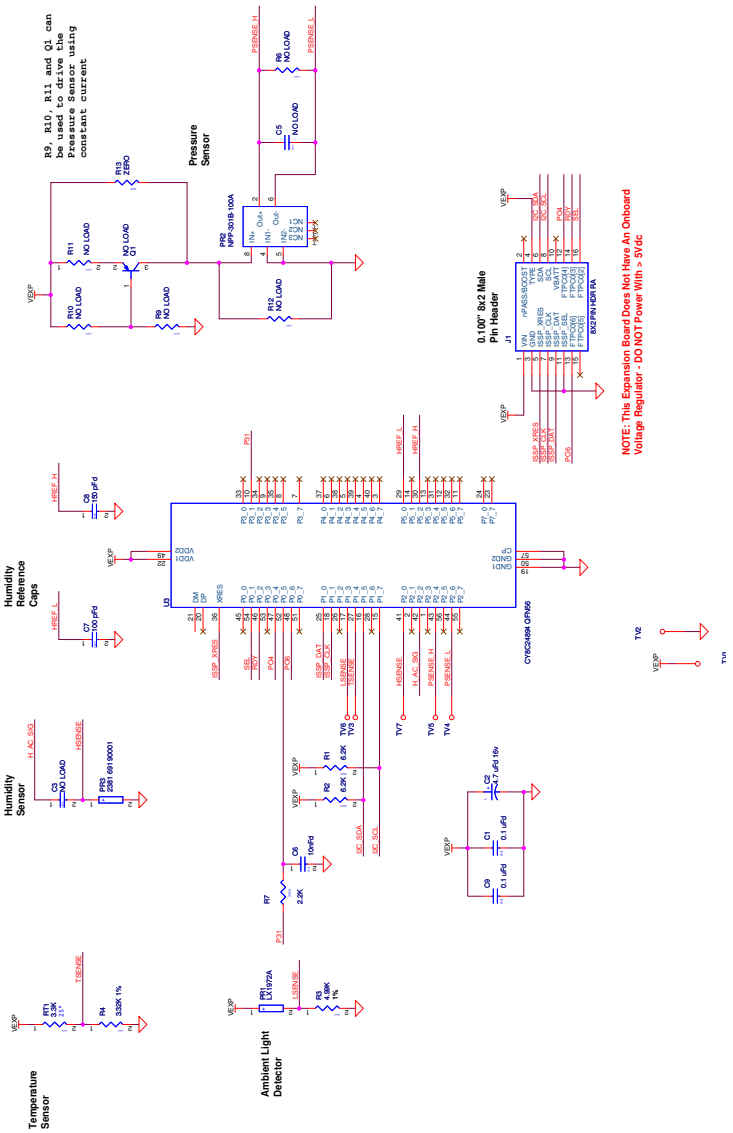
To save a network configuration, use **File > Save Configuration** or **File > Save Configuration As**. The network configuration is saved as an XML file.

A. Appendix

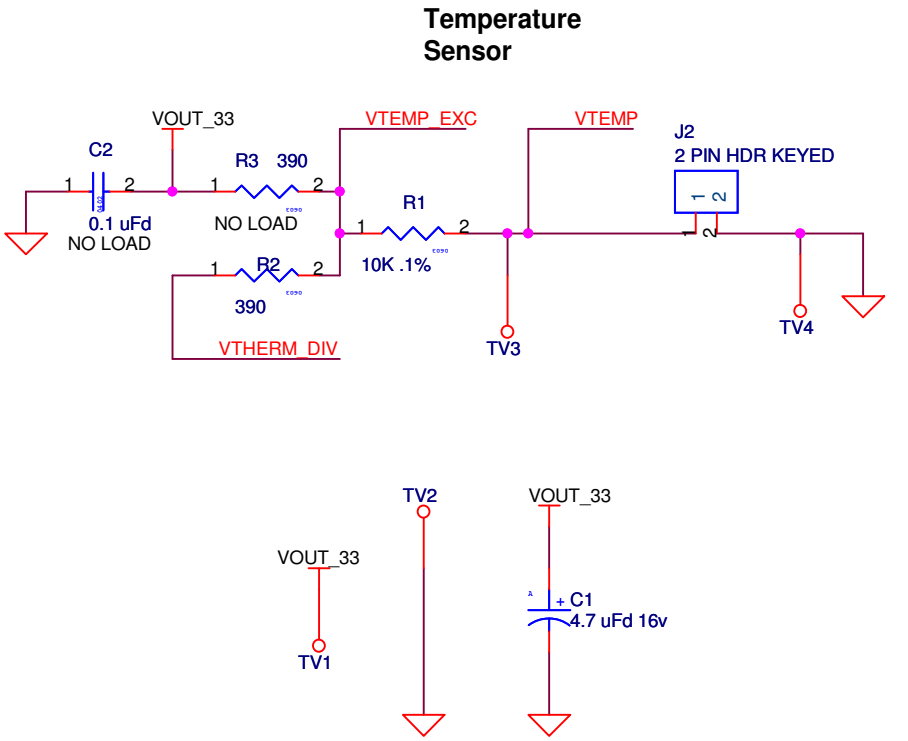
The schematic and board layouts are available on the CY3271-EXP1 kit CD/DVD. After installation, they are available at: `<Install_Directory>:\Cypress\CY3271-EXP1\<version>\Hardware`.

A.1 Schematics

A.1.1 Weather Station Board



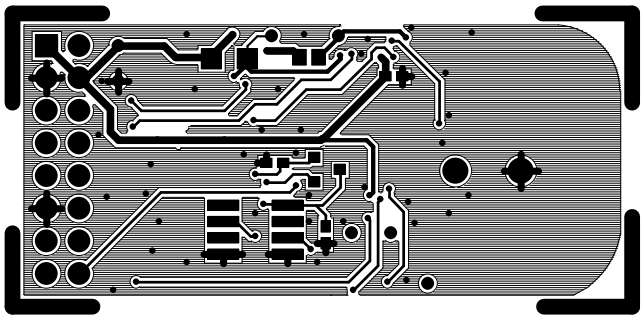
A.1.2 Thermistor Board



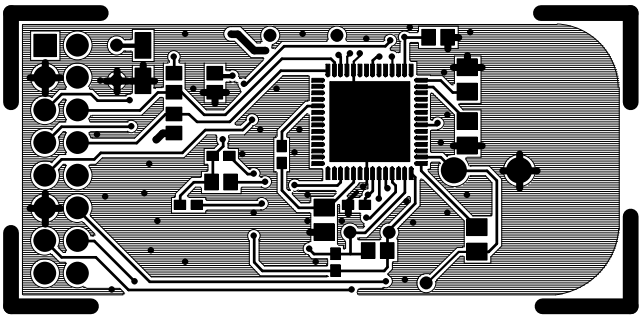
NOTE: This Expansion Board Does Not Have An Onboard Voltage Regulator - DO NOT Power With > 5Vdc

A.2 Weather Station Board Layout

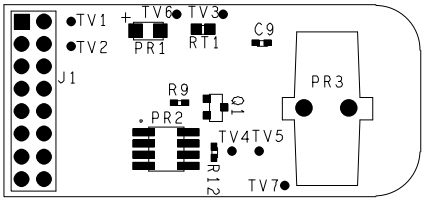
A.2.1 Top Layer



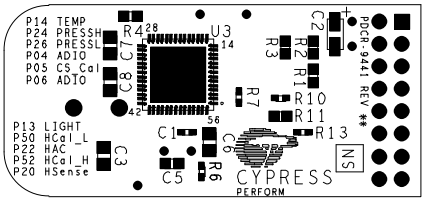
A.2.2 Bottom Layer



A.2.3 Primary Silkscreen

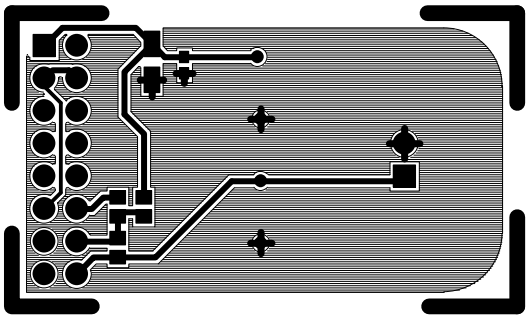


A.2.4 Secondary Silkscreen

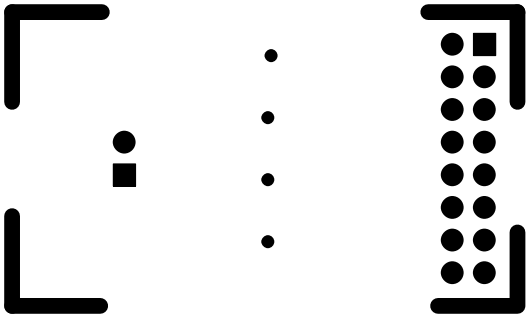


A.3 Thermistor Board Layout

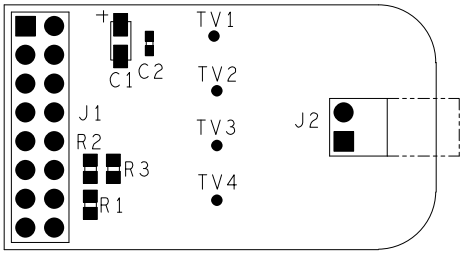
A.3.1 Top Layer



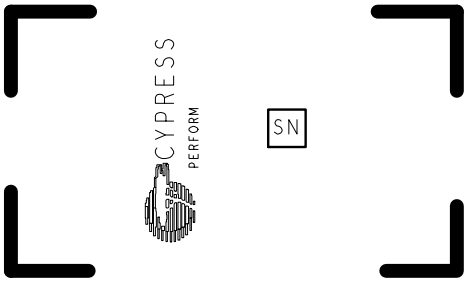
A.3.2 Bottom Layer



A.3.3 Primary Silkscreen



A.3.4 Secondary Silkscreen



A.4 Bill of Materials

A.4.1 CY3271-EXP1 Weather Station BOM

Item	Qty.	Reference	Description	Manufacturer	Mfg. Part Number
1	2	C1,C9	CAP .1UF 16V CERAMIC Y5V 0402	Panasonic - ECG	ECJ-0EF1C104Z
1	1	C2	CAP 4.7UF 16V Tantalum 3216	Nichicon	F931C475MAA
2	1	C5	CAP CERAMIC 47PF 50V 0603 SMD	Panasonic - ECG	ECJ-1VC1H470J
3	1	C6	CAP CER 10000PF 25V C0G 0805	Kemet	C0805C103F3GACTU
4	1	C7	CAP CERAMIC 100PF 100V NP0 0805	Panasonic - ECG	ECJ-2VC2A101J
5	1	C8	CAP CERAMIC 150PF 100V NP0 0805	Panasonic - ECG	ECJ-2VC2A151J
6	1	J1	CONN HEADER 16POS .100" R/A TIN	Molex/Waldom Electronics Corp	90122-0128
7	1	PR1	IC AMBIENT LIGHT DETECTOR 1206	Microsemi-IPG	LX1972IBC-TR
8	1	PR3	IC SENSOR CAPACITIVE HUMIDITY	Vishay/BC Components	2381 691 90001
9	1	RT1	THERMISTOR NTC 3.3K OHM 5% 0603	Panasonic - ECG	ERT-J1VT332J
10	2	R1,R2	RES 6.2K OHM 1/10W 5% 0603 SMD	Panasonic - ECG	ERJ-3GEYJ622V
11	1	R3	RES 4.99K OHM 1/16W 1% 0603 SMD	Panasonic - ECG	ERJ-3EKF4991V
12	1	R4	RES CHIP 3.32K OHM 1/16W 1% 0603 SMD	Panasonic-ECG	ERJ-3EKF3321V
13	1	R7	RES 2.2K OHM 1/16W 5% 0402 SMD	Panasonic - ECG	ERJ-2GEJ222X
14	1	R13	RES ZERO OHM 1/16W 0402 SMD	Panasonic - ECG	ERJ-2GE0R00X
15	1	U3	PSoC Mixed-Signal Array	Cypress Semiconductor	CY8C24894-24LFXI
NO LOAD Components					
17	1	C3	CAP NO LOAD 0805	NA	NA
18	1	Q1	TRANSISTOR PNP Low VCEsat SOT-23 NO LOAD	NXP Semiconductors	PBSS5350T
19	4	R6,R9,R10,R12	RES NO LOAD 0402 SMD	NA	NA
20	1	R11	RES NO LOAD 0603 SMD	NA	NA
21	7	TV1,TV2,TV3,TV4,TV5,TV6,TV7	TEST VIA 40 HOLE 20 PLATED	None	
Special Installation Components					
16	1	PR2	IC SENS PRES 15PSIA SO8 SMD	GE Sensing	NPP-301B-100A

A.4.2 CY3271-EXP1 Thermistor BOM

Item	Qty.	Reference	Part	Manufacturer	Mfg. Part Number
1	1		PCB Rev 01	Cypress	PDCR-9438
2	1	C1	CAP 4.7UF 16V Tantalum 3216	Nichicon	F931C475MAA
3	1	J1	CONN HEADER 16POS .100" R/A TIN	Molex/Waldom Electronics Corp	90122-0128
4	1	J2	CONN HEADER 2POS .100 R/A TIN	Molex/Waldom Electronics Corp	22-05-3021
5	1	R1	RES CHIP 10.0K OHM 1/16W .1% 0603 SMD	Panasonic - ECG	ERA-3AEB103V
6	1	R2	RES 390 OHM 1/16W 1% 0603 SMD	Panasonic - ECG	ERJ-3EKF3900V
7	4	TV1,TV2,TV3,TV4	TEST VIA 40 HOLE 20 PLATED	None	None
No Load Components					
8	1	C2	CAP 0402 NO LOAD		
9	1	R3	RES 0603 NO LOAD		