

CY3271-EXP1 PSoC[®] Environmental Sensing Kit

Spec. # 001-49259 Rev. **

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1. Introduction



1.1 Welcome

Thank you for purchasing the CY3271-EXP1 Environmental Sensing Kit. The CY3271-EXP1 is designed to quickly evaluate the flexibility, integration, and mixed signal capabilities of Cypress' Programmable System-on-Chip (PSoC[®]) when interfacing with sensors.

Use the sample projects to explore:

- PSoC's programmable analog and digital blocks 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

If you have questions about or need help with the CY3271-EXP1 kit, visit our online support center at http://www.cypress.com/support for support options, or contact your local Cypress sales representative or authorized distributor.

1.2 CY3271-EXP1 System Overview

1.2.1 CY3271-EXP1 Hardware Overview

The CY3271-EXP1 kit hardware consists of a Weather Station Expansion Board and a Pigtail Thermistor Expansion Board.

1.2.1.1 Weather Station Expansion Board

The Weather Station Expansion Board features a PSoC device, and several sensors:

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





Figure 1-1. Weather Station Expansion Board

The Weather Station Expansion Board sends the sensor data over I^2C to the RF Expansion Card, which is contained in the CY3271 PSoC FirstTouch Start Kit.

1.2.1.2 Pigtail Thermistor Expansion Board

The Pigtail Thermistor Expansion Board features a thermistor on a 3 foot cable. The thermistor at the end of the cable is identical to the thermistor used on the RF Expansion Board allowing dual temperature readings.

The Pigtail Thermistor Expansion Board does not have a PSoC on board, rather it uses the PSoC from the RF Expansion Board to read the sensor.

Figure 1-2. Pigtail Thermistor Expansion Board



1.2.2 CY3271-EXP1 Software Overview

The software noted in this section is not included in the CY3271-EXP1 Kit, but instead, is located on the CY3271 PSoC FirstTouch Starter Kit CD.

1.2.2.1 PSoC Designer

PSoC Designer is the integrated development environment (IDE) where all PSoC projects are created, edited, built, and debugged. You are able to open all firmware examples included with the CY3271-EXP1 kit in PSoC Designer.







1.2.2.2 PSoC Programmer

After a PSoC project is built, the PSoC Programmer tool (along with the PC Bridge board) programs the target PSoC.

Figure 1-4. PSoC Programmer

SoC Programmer		
Programming Utilities View Help		
🗄 🚔 File Load 🛛 🥵 Program 🛛 🔋 Checksum 🛛 🔋 Read		
Port	Device Family	Device
FirstTouchRF 🗸 Connect	27x43 💌	CY8C27443 💌
Programming Mode Seet O Power Cycle Toggle Device Power		
Actions		Results
Successfully Connected to FirstTouc	hRF	FirstTouch Programmer Version 1.90
Opening Port at 1:35:56 PM		
Connected at 1:35:56 PM		FirstTouchRF
Disconnected at 1:35:51 PM		FirstTouchRF
		Select Port in the PortList, then try to connect
Active HEX file set at 1:12:38 PM		C:\My Projects\WeatherStation\output\WeatherStation.hex
Device set to CY8C27443 at 1:12:38	PM	16384 FLASH bytes
Device Family set to 27x43 at 1:12:	38 PM	
session started at 1:12:38 PM		PPCOM Version 1.U
L		
For Help, press F1		PASS Powered Connected



1.2.2.3 Cypress Sense and Control Dashboard (SCD)

SCD enables data logging and monitoring of wired and wireless sensors created using PSoC. The features include data logging, calibration, alarms, and data aggregation from hundreds of sensors.

The CY3271-EXP1 Kit uses the SCD application to wirelessly log data from the sensors connected to the PC Bridge using the CY3271 PSoC FirstTouch Starter Kit.

Figure 1-5. SCD					
🚾 Cypress Sense and Control Dashboard					
Eile View Tools Help					
Network W Add Node Information Sensor Configure C	alibrate Chart Zoom Arrange E	xport Console Help			
Sensors			Alarm History		
Temperature on RF Expansion Board 1	Temperature Text		Time	Sensor	Туре
30.0	on RF Expansion Board 1		8:56:54 AM	Temperature	Н
29.0			8:56:52 AM	Temperature	н
5 27.0	Last reported value		8:56:50 AM	Temperature	н
	20.4 Deg C		8:56:47 AM	Temperature	н
			8:56:45 AM	Temperature	н
when chart chart chart . 5.9 . 5.0	Reported at 10/2/2008 8:57:27 AM		8:52:08 AM	Temperature	н
\$. \$. \$. \$. \$. a. a.	10/2/2000 0.37.27 AM		8:52:06 AM	Temperature	н
			8:52:03 AM	Temperature	н
Temperature on RFExpansion Board 2	Temperature Text		8:52:01 AM	Temperature	н
32.0			8:51:59 AM	Temperature	н
	Last reported value		8:51:57 AM	Temperature	Н
≗ _{26.0} ↓ □ [♀] [≖] = ₌ ↓	26.5		8:51:54 AM	Temperature	н
24.0	Deg C		8.51.52 AM	Temperature	H
Brann Brann Brann Brann Brann Brann	Reported at 10/2/2008 8:57:28 AM				
				Acknowledge	
UID Status W Connected UID Destagely av720 Wined Con	rever Composited County 0		3.6		
HUB Status: W Connected HUB Protocol: e212C Wired Sen	ors connected count: 0				_

1.3 Document Revision History

Table 1-1. Revision History

Revision	PDF Creation Date	Origin of Change	Description of Change
**	10/07/2008	YUR	New Guide



1.4 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 <i>sourcefile.hex</i> file in the <i>PSoC Designer User Guide.</i>
[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.

Introduction





The CY3271-EXP1 uses the same software as the PSoC FirstTouch[™] Starter kit. If you have installed the software for your FirstTouch kit, then no additional installation is necessary. If, however, you did not install the PSoC FirstTouch[™] Starter kit then follow these instructions.

2.1 CY3271 Installation Instructions

Installation Guide

2.

Insert the CY3271 kit CD into your CD drive. This automatically launches the installer. If the autorun fails, then manually choose "autorun.exe" on the root of the CD, as shown in Figure 2-1.

Figure 2-1. Selecting autorun.exe

Name	Size	Туре
Files Currently on the CD		
Cypress		File Folder
🛅 installers		File Folder
autorun.exe	236 KB	Application
📴 autorun.inf	1 KB	Setup Information
ZCY3271_Setup.exe	6,685 KB	Application
Noclogo.bmp	1,686 KB	Bitmap Image

The installer presents three options. The first option launches the kit installer, which installs the following:

- PSoC Designer 5.0
- PSoC Programmer 3.00
- Cypress Sense and Control Dashboard
- Kit Contents



Figure 2-2. Kit Installer



Click **Install CY3271 Kit and Tools** to start the kit installations. Click **Next** to start the installer and then choose **Install** to launch the PSoC Designer installer.

Click **Next** through the next several screens.

When the Device Driver screen appears, click **Next** and then **Finish**.

Figure 2-3. Device Driver Screen



Wait for the Setup Status screen to complete. Then select **Finish** to complete the installation of PSoC Designer 5.0.

Figure 2-4. Setup Status Screen

PSoC Designer 5.0 - InstallShield Wizard	×
Setup Status	CYPRESS
Please wait while PSoC Designer 5.0 is installed.	
Generating manifest data This may take a few minutes.	
Instaliohield	Cancel

The Hi-TECH compiler for PSoC Designer begins installation.

Figure 2-5. Hi-TECH Compiler

Installing HI-TECH C PRO for the PSoC Mixed-Signal Array					
	HI-TECH C [®] PRO for the DCG PSoC [®] Mixed-Signal Array				
This program will install HI-TECH C PRO for the PSoC Mix Press Next to continue.	ed-Signal Array version 9.61PL1.				
<u>On-line help</u> <u>Ordering Information</u>	K Back Next Cancel PSoC is a registered trademark of Cypress Semiconductor Corp.				



PSoC Programmer 3.0 begins to install. Click **Next** through the next several screens. Figure 2-6. PSoC Programmer Installer

PSoC Programmer Installer	
PSoc Programmer Installer	PSoC Programmer 3.0 Setup Wizard Welcome to the PSoC Programmer 3.0 Setup program. This program will install PSoC Programmer 3.0 on your computer
InstallShield	<back cancel<="" td=""></back>

Another Device Driver Installation Wizard appears. Click **Next** and **Finish** to complete the installation of PSoC Programmer.

The Sense and Control Dashboard Software setup wizard appears. Click **Next** through the next several screens to install the default configuration. This installer also installs Microsoft SQL server.

Figure 2-7. Installing SCD Software





Installing		
Please wait while Setup i 🔂 Microson your computer.	oft SQL Server	Compact 3.5 SP1 English
Installing Microsoft SQL S		Welcome to the Microsoft SQL Server Compact Setup
	5	Setup helps you install, repair or remove Microsoft SQL Server Compact. To continue, click Next.
		WARNING: This program is protected by copyright law and international treaties.
wieler@ 2009 Cuercove Species		
унднист 2000 сургаас област		

Figure 2-8. Installing Microsoft SQL Server

Click Finish to complete installing the CY3271 kit.

A directory structure similar to that sown in Figure 2-9 is created during the installation process.

Figure 2-9. Device Templates Directory



The device templates directory contains templates for all of the FTRF Design examples as outlined in the Design Example Summary Table on page 21.

The firmware section contains the firmware projects for all of the projects used in this kit. Each project contains the source code as well as the compiled .HEX image enabling you to quickly pro-



gram each application into the hardware. It is advised to generate and build each project before making changes to the project source code.

The Hardware section contains the design files for the schematics and PCB layout. There are also in PDF format for ease of viewing.

3. Design Examples



3.1 Design Example Summary Table

Design Example	Overview
Weather Station Expansion Board	This example demonstrates the Weather Station Expansion Board talking to the RF Expansion Board. The RF Expansion Board transmits data from the sensors to the PC Bridge. The bridge receives this data and sends it to the host PC, which displays the data from all four sensors in text or graph form in the SCD program.
Pigtail Thermistor Expansion Board	This example demonstrates the RF Expansion Board reading two identical thermistors: one thermistor on the RF Expansion Board and the other on the Pigtail Thermistor Expansion board. The RF Expansion Board transmits data from both thermistors to the PC Bridge. The Bridge receives this data and sends it to the host PC, which displays the data from both sensors in text or graph form in the SCD program.

3.2 Out of Box Design Examples

These demonstrations operate at +10dBm of RF output power. They are limited to +10dBm because of the RF power restrictions imposed in Europe and Japan. The power can be increased to +20dBm in the United States and Canada only. The process is explained in detail on pages 47 and 64 of the CY3271 PSoC FirstTouch Starter Kit Guide.

3.2.1 Weather Station Expansion Board

Operate the Weather Station demonstration by downloading the corresponding .hex file onto the RF Expansion Board.

- 1. Connect the RF Expansion Board 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 from the Hex Files folder located on the CY3271-EXP1 Kit CD.
- 4. Set **Programming Mode** to Reset, **Device Family** to 27x43, **Device** to CY8C27443 and click **Program**.



Figure 3-1. PSoC Programmer Settings

Report Programmer						
Programming Utilities View Help						
🔁 File Load 🛛 🥵 Program 🛛 👰 Checksum 🛛 😰 Read						
Port	Device Family	Device				
FirstTouchRF 🛛 Connect	27x43 💌	CY8C27443 🛛 🗸				
Programming Mode Reset O Power Cycle Toggle Device Power						
Actions		Results				
Successfully Connected to FirstTouc	hRF	FirstTouch Pro	grammer Version 1	.90		
Opening Port at 1:35:56 PM						
Connected at 1:35:56 PM		FirstTouchRF				
Disconnected at 1:35:51 PM		FirstTouchRF				
		Select Port in	the PortList, th	en try	to connect	
Active HEX file set at 1:12:38 PM		C:\My Projects	\WeatherStation\o	utput\[JeatherStat	ion.hex
Device set to CY8C27443 at 1:12:38	PM	16384 FLASH by	tes			
Device Family set to 27x43 at 1:12:	38 PM					
Session Started at 1:12:38 PM		PPCOM Version	1.0			
For Help, press F1				PASS	Powered	Connected

- 5. Disconnect the RF Expansion Board from the PC Bridge, leaving the Bridge connected to your computer.
- 6. Attach the Weather Station Expansion Board and the battery pack to the RF Expansion board as shown in Figure 3-2.

Figure 3-2. RF Expansion Board Connected to the Battery Pack and Weather Station Boards



7. Switch on power to the RF Expansion Board by sliding the ON/OFF switch on the battery pack towards the RF Expansion Board.



Figure 3-3. Turning ON the Switch



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

Figure 3-4. Manage Network within the SCD

	🛛 Сур	ress So	ense a	and Cor	ntrol Dashb	pard										
	File	View	Tools	Help												
N	etworl	k 🗐 Mana)) ge A	ad Node	(Market Strength Stre	Sensor	Configure	Calibrate	<mark>、</mark> へ、 Chart	Zoom	Tools	Arrange	Export	- Console	? Help	
ſ	Sensor	s											Alarm	History	Sensor	Туре

- In the Manage Network screen, click Add to add a new node.
- On the Node Binding screen, click **Begin Binding**.

Figure 3-5. Node Binding Window

Node Binding (1 of 2)	? 🛛
Wireless hub Wired sensor	
Step 1	
Click button to begin Binding	Begin Binding
Step 2	
Press the "Connect" button on the	Node 00:20
Result	
	•
Back	Cancel

 After activating this function, you have aproximately 20 seconds to press the bind button on the RF Expansion Board.



Figure 3-6. Press the Bind Button



• Verify the success of the bind. A successful bind window looks similar to Figure 3-7.

Figure 3-7. Successful Bind Window

Node Binding (1 of 2)	? 🔀
Wireless hub Wired sensor	
CStep 1	
Click button to begin Binding	Begin Binding
Step 2	
Press the "Connect" button on th	ne Node 00:18
Result	
SUCCESS	Retry
Node bound with Node ID	1
Found Node with Radio ID	0x9A0596BC
Back Next	: Cancel

 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.xml from the Configuration Files folder.



Figure 3-8. Node Configuration

Node Binding (2 of 2)
Node ID 1 Node Radio ID 0x3A05968C
Assign a Unique Name to the Node
Weather Station
Node Configuration
 Load Node configuration from a file
CD PATH GOES HERE Browse
Make further edits to Node configuration
Edit Node configuration manually
Back Finish Cancel

- 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.



3.2.2 Pigtail Thermistor Expansion Board

The Pigtail Thermistor demonstration can be operated by downloading the corresponding .hex file onto the RF Expansion Board.

- 1. Connect the RF Expansion Board 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_Therm_Bridge.hex from the Hex Files folder.
- 4. Set **Programming Mode** to Reset, **Device** Family to 27x43, **Device** to CY8C27443 and click **Program**.
- 5. Disconnect the PC Bridge and the RF Expansion Board and connect the battery pack and Pigtail Thermistor boards to the latter.
- 6. Switch on power to the RF Expansion Board by sliding the ON/OFF switch on the battery pack towards the RF Expansion Board.
- 7. Open the SCD software.
- 8. Place the PC Bridge in Bind mode using the SCD software. This is described below:
- Click Manage button to set up the sensor network.
- In the Manage Network screen, click Add to add a new node.
- On the Node Binding screen, click on **Begin Binding**.
- After this function is activated, the user has about 20 seconds to press the bind button on the RF Expansion Board.
- 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 radio button and load Pigtail_Thermistor_Dashboard_Configureation.xml from the Configuration Files folder located on the CY3271-EXP1 Kit CD
- 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.





4.1 Weather Station

4.1.1 Weather Station Interface Definition

The board interfaces to the FirstTouch RF unit using the standard hardware interface defined for FirstTouch RF Expansion Boards. This interface is an augmented I^2C interface that transmits data in 8 byte packets. The Weather Station board is an I^2C slave device that presents the eight bytes of data on a virtual register interface. The eight bytes are interpreted as four 16-bit, 2's compliment data values, each corresponding to one of the four sensors monitored by the onboard PSoC. The 16 bit values are presented in this order:

- Humidity
- Temperature
- Ambient light
- Pressure

The following sections specify the exact definition of the engineering units provided for each sensor.

In addition to the I²C interface, the board uses two hardware signals to control interaction with the FirstTouch PC Bridge: Board Select and Board Ready. The Board Select line is controlled by the Bridge and signals the PSoC on the weather station board to obtain readings. When readings are received, the PSoC sets the Board Ready line high to indicate to the PC Bridge that the values presented are stable.

Field	Size	Format	Units	Byte Offset
Humidity	16-bit	2's compliment	Percent relative	0
Temperature	16-bit	2's compliment	Degrees Celsius * 100	2
Ambient Light	16-bit	2's compliment	Lux	4
Pressure	16-bit	2's compliment	Inches of mercury * 100	6

Table 4-1. Weather Station Interface Definition



4.2 Pigtail Thermistor Expansion Board

4.2.1 Pigtail Thermistor Interface Definition

The Pigtail Thermistor board does not have an onboard PSoC. Instead, the analog signal is routed directly to the PSoC on the RF Expansion Board. This PSoC handles the signal measurement and processing, and communicates the results to the PC Bridge.

Table 4-2.	Pigtail	Thermistor	Interface	Definition

Field	Size	Format	Units	Byte Offset
Temperature (RF EXP)	16-bit	2's compliment	Degrees Celsius *10	0
Temperature (Pigtail)	16-bit	2's compliment	Degrees Celsius *10	2



5.1 Calibrating Sensors

5.

Selecting the manual configuration route in the second step of Node Binding Wizard activates the Configure Node dialog.

1. Click Add to add a new sensor and Edit to edit a selected sensor.

Figure 5-1. Configure Node

Calibrating Sensors

Node Name	Load/Save Configuration	Node Information	
node1	Load Save	Radio ID	0x6565D2BE
		Network Address	02
Charting Options			
Time axis scale:	Auto	-	
Note: Chart Root and a state and a	and the all and an also. Made		
Note: Chart time axis scale will a	pply to all sensors on this Node.		
In-Board Sensors			
In-Board Sensors			
Sensor	Starting Bit Length	Format Scaling P	hysical Unit
In-Board Sensor	Starting Bit Length	Format Scaling Pi	hysical Unit
In-Board Sensor	Starting Bit Length	Format Scaling Pi	hysical Unit
In-Board Sensor	Starting Bit Length	Format Scaling P	hysical Unit
In-Board Sensor	Starting Bit Length	Format Scaling P	hysical Unit
In-Board Sensor	Starting Bit Length	Format Scaling Pi	hysical Unit
In-Board Sensor	Starting Bit Length	Format Scaling P	hysical Unit
Sensor	Starting Bit Length	Format Scaling P	hysical Unit
Sensor	Starting Bit Length	Format Scaling P	hysical Unit
In-Board Sensor	Starting Bit Length	Format Scaling P	hysical Unit
Sensor	Starting Bit Length	Format Scaling Pi	hysical Unit
Sensor	Starting Bit Length	Format Scaling Pi	hysical Unit

- 2. In the Configure Sensor dialog, specify:
- Sensor name
- Sensor physical unit
- Sensor data format
- Sensor bit range
- Scaling factor
- Sensor display option



Click Apply.

Figure 5-2. Adding a Sensor

Sensor	Name	Sensor B	it Range		
Temp	1	Define th data pac	e bit range kets that c	in t	the Node's incoming ain this sensor's data.
Sensor	Physical Unit	Starting I	Bit O	*	
Deg C		Length	2	A. V	Byte(s) 🔻
Define I range is	Data Format now the binary data in the sensor's bit to be interpreted.	If the ser factor be multiplica	viuitiplications sor's data fore transmition factor	is m tissi her	actor nultiplied by a scaling on, specify that e.
Format	Sign-Magnitude Integer 🔹	Factor	x 10		
Sensor	Display Options		Don't	lisn	lav

The sensor entry appears in the **Configure Node** dialog:

Figure 5-3. Sensor Added Successfully

node1	Lo	ad/Save Configura	ation Save	Node Information Radio ID	0x6565D2B
Charting Options Time axis scale:	Auto	O Manual			
Note: Chart time axis scale v Dn-Board Sensors	vill apply to all sensors o	on this Node.			
Sensor	Starting	g Bit Length	Format	Scaling	Physical Unit
_					
			Add	Edit	Remove

Click Edit to start sensor editing.



5.2 Calibrating the Sensor

- SCD allows you to calibrate any sensor in the system using linear calibration
- SCD sensor calibration is based on data pairs (raw value, adjusted value)
- To register a calibration data pair, the last reported raw value from a sensor is displayed. You are prompted to adjust the value.
- When you begin to calibrate a sensor, specify at least one calibration data pair. You can choose not to calibrate the sensor or you can calibrate the sensor using at least one calibration data pair. There is no upper limit on the number of data pairs; more data pairs mean more accurate calibration.
- If you provide one data pair, SCD computes the calibration equation of the form y = x + b using the provided data pair.

Calibrated Value = Raw Value + Offset

If you provide two or more data pairs, SCD computes the calibration equation of the form
 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 that sensor before displaying it in SCD.
- SCD records both raw and calibrated data for each sensor in its data log.

The Calibrate Sensor window is where you calibrate the sensor.

Figure 5-4. Calibrate Sensor Window

Currently	Calibrating					
Node	node1					
Sensor	Temp1					
	Sensor Unit:	Deg C				
Calibratio	on Points					
Ra Note: If you w	w Value Add	Adjusted Value Point Remove Point a sensor, you must provide				
Note: If you w at least Current (Calibrate	w Value Add ish to calibrate one calibration Calibration Equ calibration Equ calibration equ d Value = (Slo	Adjusted Value Point Remove Point a sensor, you must provide point for that sensor. ation pe)*(Raw Value) + (Offset)				
Note: If you w at least Current (Calibrate Slope	w Value Add rish to calibrate one calibration Calibration Equ calibration Equ	Adjusted Value Point Point Remove Point a sensor, you must provide point for that sensor. ation pe)*(Raw Value) + (Offset) 1				



Open this dialog using the **Tools > Selected Sensor > Calibrate** menu item and **Calibrate Sensor** toolbar button. Use the buttons **Add Point** and **Remove Point** to add or remove calibration data pairs.

5.3 Wired Sensor Support

I²C and USB are the two tyes of wired sensors supported in SCD. To bind a sensor to the network, go to **Tools > Manage Network** and click **Add** button in Network Nodes tab. The Node Binding window opens. Select the **Wired sensor** tab and click **Find Wired Sensor**.. All connected sensors are displayed in a box.

For I^2C sensors the status message appears like "Sensor @ I2C Address = N", were N is the wired sensor I^2C address. If you select I^2C sensor and **Next**, on the second window, sensor nodeID is automatically equal to I2C Address + 0x80. Enter a unique name and press Finish.

USB sensors are displayed by the name from the unique USB product string of less then 25 characters. You cannot change this name in SCD because this name is used to compare with the original for auto detect purpose. Node ID is automatically equal to sensor USB index + 0x40.

USB sensors count connected to network, are shown in the status tray.



5.4 Alarms and Data Aggregation Intervals

The **Chart Options** dialog provides a way to set low and high alarms for a selected sensor. This dialog is activated using **Tools > Selected Sensor > Chart Options** or by selecting **Chart Options** in the toolbar.

Figure 5-5. Chart Options for Setting Alarms

Time axis sca	le: () Auto () Manual
Note: This va on the same	lue will apply to all sensors Node as this one.
Y-Axis Label:	Use sensor's physical unit
	Use a custom label
Alarm Limits	
💷 11:-k Al	22.00 Dog C
Mign Alarm	JZ.00 Deg C
🔽 Low Alarm	28.00 Deg C
Data Aggregatio	on Intervals
Enable short	term aggregation interval
Display min.	max, and mean of data aggregated ever
	· · · · · · · · · · · · · · · · · · ·
Enable long	term aggregation interval
	max, and mean of data aggregated ever
Display min,	
Display min.	· · · · · · · · · · · · · · · · · · ·



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

Figure 5-6. Alarm History

Time	Sensor	Туре
10:05:35 PM	Temp1	Н
10:05:34 PM	Temp1	н

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.

5.5 Data Export

Selected sensor data, data reported by all sensors, and alarm history is exported to a file using comma separated values format. The corresponding menu items is in the main menu at **File > Export Data**.

5.6 Saving a Configuration

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