




**TECHNICAL NOTE**

***Ambient Light sensor technical specifications***

***BeanDevice® SUN-XX products***

***[www.beanair.com](http://www.beanair.com)***

	<b>"Plug and Play" Wireless Sensor Networks</b>	<b>Document version : 1.0</b>
	<b>Document Type : Technical Note</b>	<i>Ambient Light Sensor technical specifications</i>

### DOCUMENT

<b>Document number</b>		<b>Version</b>	V1.0
<b>External Reference</b>	RF_NT_005 V1.0	<b>Publication date</b>	10/06/2011
<b>Author</b>	Christophe DONTEGREUIL		
<b>Internal Reference</b>		<b>Project Code</b>	N.A.
<b>Document Name</b>	<i>DataLogger User Guide</i>		

### VALIDATION


Function	Recipients	For Validation	For information
<b>Reader</b>			X
<b>Author</b>		X	

### MAILING LIST

Function	Recipients	For action	For Info
<b>Staffer 1</b>	Jules SACHOT	X	
<b>Staffer 2</b>	Christophe DONTEGREUIL		X


### Updates

Version	Date	Author	Evolution & Status
V1.0	20/05/2011	Christophe DONTEGREUIL	First version of the document

	<b>“Plug and Play” Wireless Sensor Networks</b>	<b>Document version : 1.0</b>
	<b>Document Type : Technical Note</b>	<i>Ambient Light Sensor technical specifications</i>



1.	TECHNICAL SUPPORT .....	4
2.	VISUAL SYMBOLS DEFINITION .....	5
3.	AIM OF THE DOCUMENT .....	6
4.	AMBIENT LIGHT SENSOR (ALS) MAIN FEATURES .....	7
5.	LIGHT SENSOR TYPICAL SPECIFICATIONS.....	8
5.1	Ambient light sensor functional block diagram.....	8
5.2	IR Blocking .....	8
5.3	Data conversion and Radio Transmission .....	8
5.4	50/60-Hz Lighting Flicker.....	9
5.5	Spectral responsivity .....	9
6.	LIGHT SENSOR ORIENTATION .....	11
6.1	ALS Integration duration.....	11

	<b>“Plug and Play” Wireless Sensor Networks</b>	<b>Document version : 1.0</b>
	<b>Document Type : Technical Note</b>	<b><i>Ambient Light Sensor technical specifications</i></b>

***Disclaimer***

The information contained in this document is the proprietary information of BeanAir.

The contents are confidential and any disclosure to persons other than the officers, employees, agents or subcontractors of the owner or licensee of this document, without the prior written consent of BeanAir Ltd, is strictly prohibited.

BeanAir makes every effort to ensure the quality of the information it makes available. Notwithstanding the foregoing, BeanAir does not make any warranty as to the information contained herein, and does not accept any liability for any injury, loss or damage of any kind incurred by use of or reliance upon the information.


BeanAir disclaims any and all responsibility for the application of the devices characterized in this document, and notes that the application of the device must comply with the safety standards of the applicable country, and where applicable, with the relevant wiring rules.

BeanAir reserves the right to make modifications, additions and deletions to this document due to typographical errors, inaccurate information, or improvements to programs and/or equipment at any time and without notice.

Such changes will, nevertheless be incorporated into new editions of this document.

Copyright: Transmittal, reproduction, dissemination and/or editing of this document as well as utilization of its contents and communication thereof to others without express authorization are prohibited. Offenders will be held liable for payment of damages. All rights are reserved.

Copyright © BeanAir Ltd. 2010.

	<b>“Plug and Play” Wireless Sensor Networks</b>	<b>Document version : 1.0</b>
	<b>Document Type : Technical Note</b>	<i>Ambient Light Sensor technical specifications</i>

## 1. TECHNICAL SUPPORT

---

For general contact, technical support, to report documentation errors and to order manuals, contact **BeanAir Technical Support Center** (BTSC) at:  
[tech-support@beanair.com](mailto:tech-support@beanair.com)

For detailed information about where you can buy the BeanAir equipment/software or for recommendations on accessories and components visit:




[www.beanair.com](http://www.beanair.com)


To register for product news and announcements or for product questions contact BeanAir’s Technical Support Center (BTSC).

Our aim is to make this user manual as helpful as possible. Please keep us informed of your comments and suggestions for improvements. BeanAir appreciates feedback from the users.

## 2. VISUAL SYMBOLS DEFINITION

---

<i>Visual</i>	<i>Definition</i>
	<p><u>Caution or Warning</u> – Alerts the user with important information about BeanAir wireless sensor networks (WSN), if this information is not followed, the equipment /software may fail or malfunction.</p>
	<p><u>Danger</u> – This information <b>MUST</b> be followed if not you may damage the equipment permanently or bodily injury may occur.</p>
	<p><u>Tip or Information</u> – Provides advice and suggestions that may be useful when installing BeanAir Wireless Sensor Networks.</p>


	<b>“Plug and Play” Wireless Sensor Networks</b>	<b>Document version : 1.0</b>
	<b>Document Type : Technical Note</b>	<b><i>Ambient Light Sensor technical specifications</i></b>

### 3. AIM OF THE DOCUMENT

---

This document is intended to provide a technical description of the ALS (Ambient Light Sensor) available on all BeanDevice® SUN-XX products:

- ***BeanDevice SUN***
- ***BeanDevice SUN-T***
- ***BeanDevice SUN-TIR***
- ***BeanDevice SUN-BN***

	<b>“Plug and Play” Wireless Sensor Networks</b>	<b>Document version : 1.0</b>
	<b>Document Type : Technical Note</b>	<b>Ambient Light Sensor technical specifications</b>


## 4. AMBIENT LIGHT SENSOR (ALS) MAIN FEATURES

The ALS is integrated inside the BeanDevice® SUN-XX product from Ecosensor product line. Based on a silicon photodiode technology, the ALS offers a great accuracy & low power consumption.



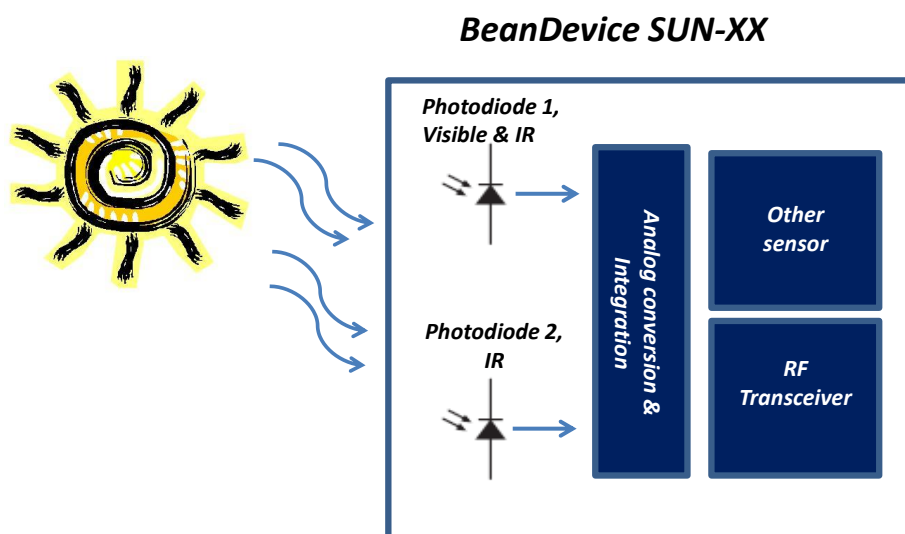
**Light sensor**

	Ambient Light Sensor Specifications
<b>Measurement range</b>	0,1 to 40000 Lux Automatically Rejects 50/60-Hz Lighting
<b>Photosensor technology</b>	Silicon photodiodes
<b>Accuracy</b>	3% @25°C
<b>Temperature Characteristics</b>	0.1% °C

	“Plug and Play” Wireless Sensor Networks	Document version : 1.0
	Document Type : Technical Note	Ambient Light Sensor technical specifications

## 5. LIGHT SENSOR TYPICAL SPECIFICATIONS

### 5.1 AMBIENT LIGHT SENSOR FUNCTIONAL BLOCK DIAGRAM



### 5.2 IR BLOCKING

One of the problems with the silicon photodiodes is that they are sensitive to light energy across a broad range of the spectrum. While this includes the visible light portion of the spectrum, a major portion of the response curve is in the invisible infrared (IR) range, which the human eye does not see.

As a result, the light sensor using a silicon photodiode would need to filter out this unwanted light energy. Without taking into account the IR energy, the silicon-based reading would show the ambient light is much higher than the person would actually perceive it to be.

The light sensor integrates a dual-diode solution that addresses this problem. By adding a second diode that is responsive primarily to IR light, its light energy can be subtracted from that of the primary diode (which is responsive to both visible and IR light energy). This dual-diode approach also provides the flexibility of having a simple subtraction as opposed to a more complex series of equations.

### 5.3 DATA CONVERSION AND RADIO TRANSMISSION

Two integrated ADC (Analog Digital Converter) convert the photodiode currents to a digital output that represents the irradiance measured on each channel.

This digital output is transmitted by radio where illuminance (ambient light level) in lux is derived using an empirical formula to approximate the human eye response.

## 5.4 50/60-HZ LIGHTING FLICKER

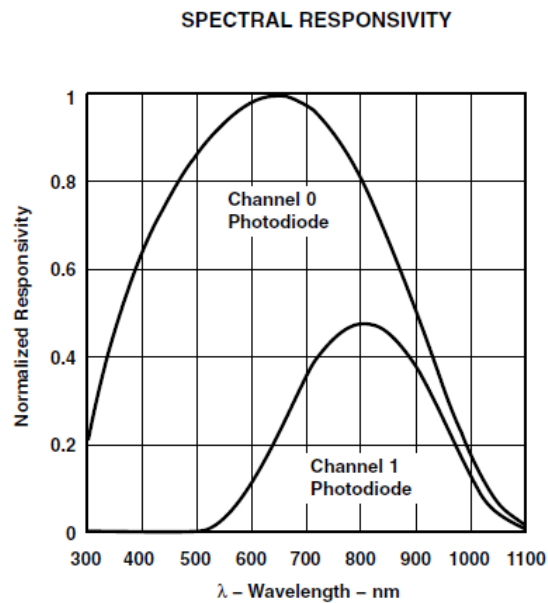
---

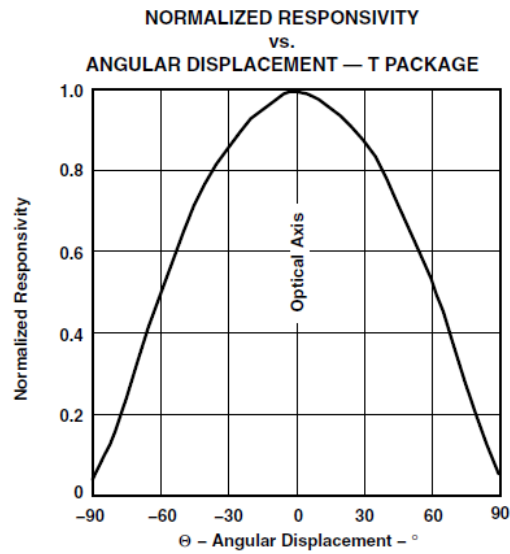
Alternating current (AC) powered light sources such as incandescent or fluorescent lighting have variations in light output. This variation or flicker can cause the light sensor to trigger when it's not supposed to, resulting in unwanted variations in light measurements.

The integrated analog to digital converter (ADC) in the light sensor serves to filter out optical noise, such as 50/60-Hz lighting flicker, through high-resolution sampling.

## 5.5 SPECTRAL RESPONSIVITY

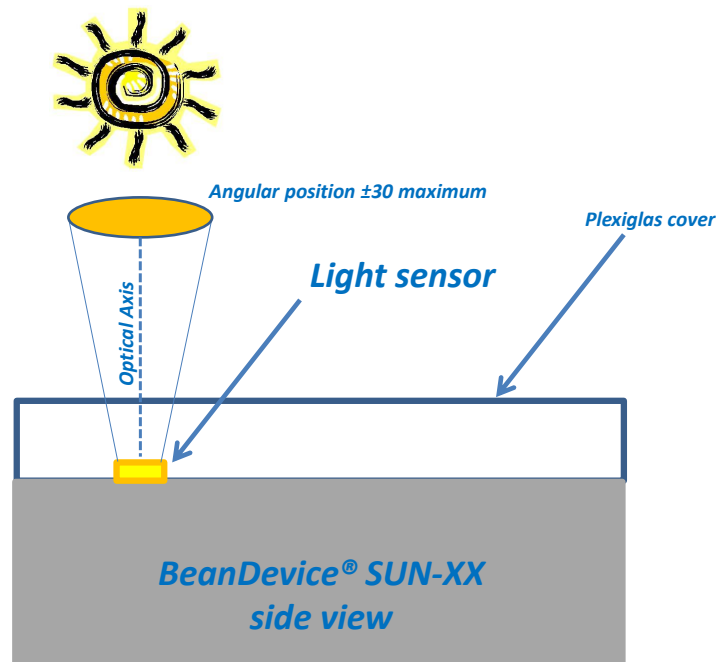
---





## 6. LIGHT SENSOR ORIENTATION

---



### 6.1 ALS INTEGRATION DURATION

---

With the integration time parameter, the light sensor can capture more or less light. A higher value of the integration time offers a better signal stability of the ALS.

Three pre-configured values are available: **13.7ms, 101 ms, 402ms**



**Choose properly your integration time of your light sensor. A long integration time will increase the power consumption of your BeanDevice® SUN-XX.**



The user can find this parameter on the “Configuration Tab” of the BeanDevice® SUN-XX profile available on the BeanScape®.

Custom display | Notes | Configuration | Measurement conditioning calibration | Log config.

Alarm threshold configuration

H1

H1  
H2  
L1  
L2

on du temps d'ouverture

13,70   ms