





WifibOT Lab

-  **4 roues motrices**
(2 roues + 1 roue folle possible)
-  **Architecture modulaire et ouverte**
-  **Contrôlable en RS232 ou en Wifi**
-  **PC x86 embarqué avec une image XPe(ou Linux Xubuntu)**

Robot WIFIBOT Lab

Le Wifibot Lab est une plate forme robotique **modulaire**, qui permet de couvrir un large spectre lié à la **robotique mobile**, à l'**informatique industrielle** et aux **réseaux sans fil**. Utilisée par un nombre croissant d'école, d'université, et de laboratoire dans le monde, elle se distingue par sa simplicité et son efficacité.

Le système de base est composé d'un **châssis en aluminium** anodisé, d'une **camera USB motorisée**, de **2 capteurs infra rouge** et d'une nappe laser **Hokuyo URG-04LX-UG01 en option**. Le châssis du robot est contrôlable en utilisant un port RS232. L'unité de calcul qui envoie les commandes au robot est une carte industrielle Intel Atom N270 3.5 pouces avec une image du système d'exploitation XP embedded SP3 (Linux Xubuntu possible), utilisés dans le monde de l'embarqué. Une carte WIFI assure la liaison sans fils au système avec le point d'accès fourni. Les utilisateurs peuvent ainsi modifier ou concevoir des programmes directement sur le robot (VGA/DVI ou bureau distant via WIFI).

Diverses interfaces de contrôle et API sont proposées aux utilisateurs avec le code source en C/C++. Des logiciels avec leurs modules WIFIBOT comme **RTMAPS**, **URBI**, **Matlab** ou d'autres peuvent s'interfacer facilement du fait de la simplicité du protocole RS232 ou Ethernet.

La carte bas niveau moteur est aussi programmable en C avec le débogueur ICD2/3 et l'outil MPLAB de Microchip.

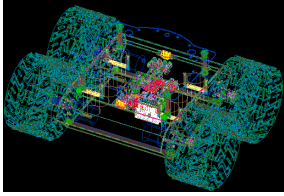
Divers options peuvent être ajoutés au cours du temps: Carte d'acquisition multi camera H264, carte firewire, Camera HD DSP Texas Davincy etc...



Option



www.wifibot.com



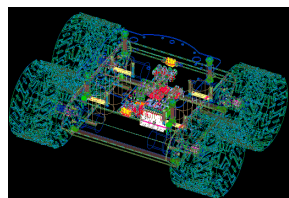
Wifibot Lab



Spécifications par défaut

<i>Capteurs moteur:</i>	2 codeurs en quadrature effet hall 2048 tics par tour de roue.
<i>Control vitesse :</i>	2 x PID sur 1 x DSPIC Microchip 33f programmés en C Débugueur ICD2/3 (option)
<i>Moteurs:</i>	4x moteurs 12V Réduction 52:1 planétaire 156 rpm
<i>Dimensions:</i>	L : 30 cm W : 35 cm H : 15 cm W : 3.5Kg
<i>Batteries:</i>	12V NiMh (LIFE 12V possible) 9000 mAH Chargeur 12V/220V
<i>Bus de contrôle interne:</i>	RS232. Le protocole est très simple et permet de contrôler le robot via l'API en C/C++ ou par n'importe quel logiciel du commerce comme MatLab, RTMAPS, Robotics Studio, URBI ...
<i>Protocole de contrôle distant :</i>	Socket TCP/UDP via WIFI ou RJ45
<i>Calculateur:</i>	Carte industrielle Intel Atom 1.6Ghz 1G Ram / 4G CF 4 x USB 2.0 4 x RS232/485 1 x Mini-Pci ...
<i>Capteurs:</i>	2 capteurs infra rouge 1 web cam Pan et Tilt 1 Lidar Hokuyo 4m en option
<i>Logiciels:</i>	API C++ de contrôle du robot 2 interfaces de contrôle distantes Serveur web embarqué

Architecture haut niveau

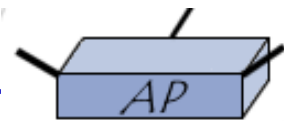


Wifibot Lab

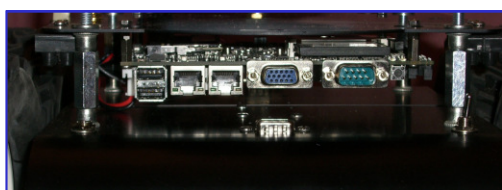
WIFI



Mini-PCI



Ethernet



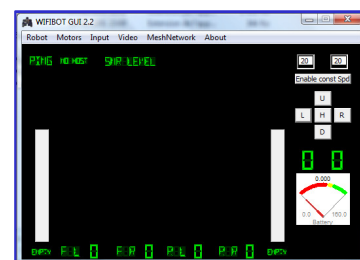
Calculateur

USB

USB

Serveur Web

RS232



Interface de contrôle
distante



Camera

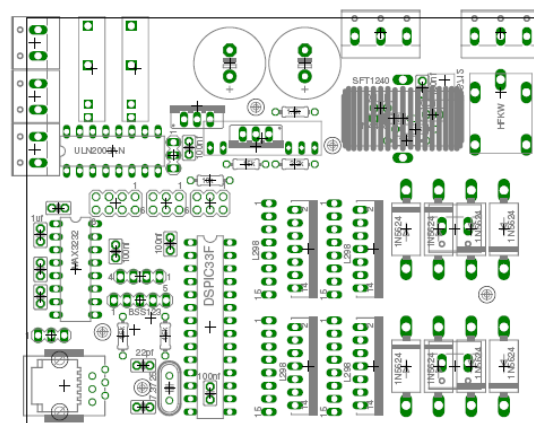


Lidar 4m

Option



ICD2-3 (option)



Carte Moteur DSPIC 33F

Analogue

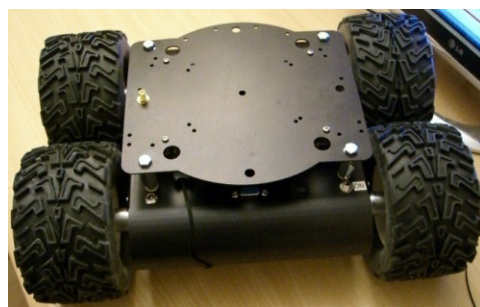
PWM

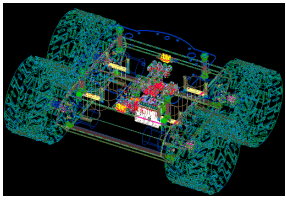


Capteurs IR x2



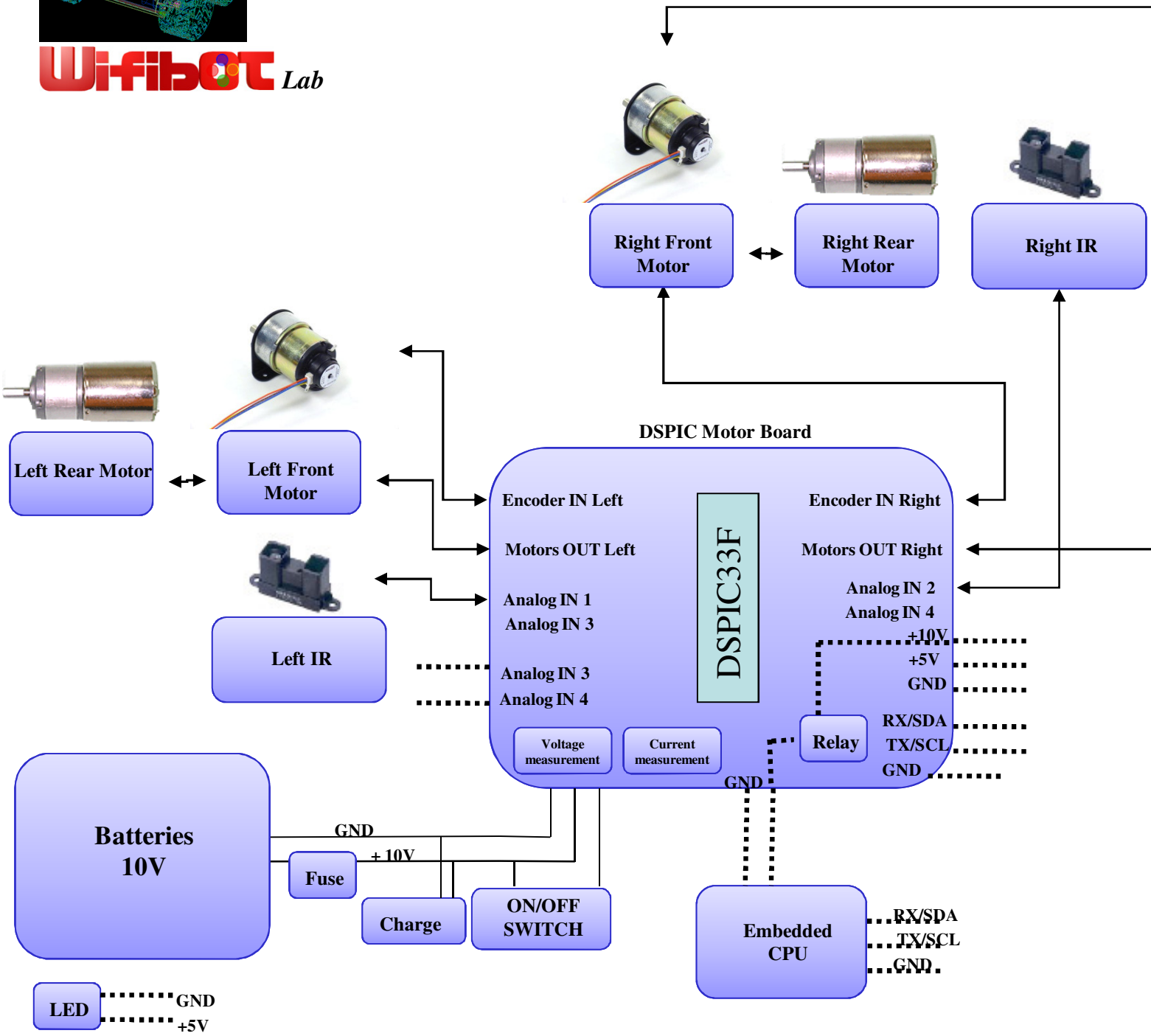
Moteur + Codeur Hall

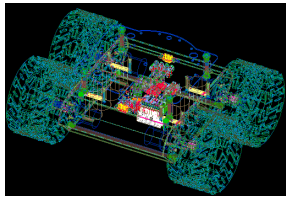




WifiBOT Lab

Architecture bas niveau





Annexe 1

Wi-Fi Bot Lab

Industrial Single Board Computer 3.5 inches Miniboard LE-374

Intel Atom processor
Onboard VGA, LVDS, DVI, Giga LAN,
Mini PCI, USB2.0, SATA
AC97 Audio and Compact Flash socket



Form Factor	3.5 inches Miniboard
CPU	Intel Atom N270 processor 1.6GHz Package type: FCBGA8, Front side bus: 533MHz
Memory	One 200-pin DDR2 SO-DIMM SDRAM up to 2GB Non-ECC, unbuffered memory supported only
Chipset	Intel 945GSE & ICH7M
Real Time Clock	Chipset integrated RTC with onboard lithium battery
Watchdog Timer	Generates a system reset with internal timer for 1min(sec) ~ 255min(sec)
Power Management	ACPI 1.0 compliant, supports power saving mode
VGA Interface	Intel integrated extreme GMA 950(Graphic Media Accelerator) Technology
Video Memory	Up to 224MB shared with system memory
LVDS interface	Onboard 18-bit dual channel LVDS connector
Serial ATA interface	2 x serial ATA interface with 150MB/s transfer rate
Solid State Disk	IDE supports 44-Pin Disk On Module with +5V power supply One Compact Flash Type II socket
DVI Interface	Onboard Chronitel CH7307C DVI Transmitter for DVI interface
Audio Interface	Intel ICH7-M integrated with Realtek ALC655 5.1CH AC97 Codec
LAN Interface	1 x Intel 82574L Gigabit Ethernet controllers
GPIO interface	Onboard programmable 8-bit Digital I/O interface
Extended Interface	1 x Mini-PCI socket
Internal I/O Port	1 x IrDA, 1 x GPIO, 1 x AUDIO, 1 x CDIN, 1 x LVDS, 2 x USB2.0 1 x RS232/RS422/485, 1 x DVI, 1 x LCD Inverter, 2 x SATA, 1 x HDTV
External I/O Port	1 x COM, 1 x VGA, 1 x RJ45, 2 x USB2.0, 1 x PS2
Power Requirement	9~24V full range DC Input
Dimension	146mm x 101mm
Temperature	Operating within 0~60 centigrade Storage within -20~85 centigrade

Annexe 3



TL-WN562AG

Spotlight:

- 54M 802.11a/b/g WLAN mini PCI Module with 2x to 3x eXtended Range™ technology
- 2.4G/5GHz, IEEE 802.11a/b/g, with two Ultra-Mini SMT-GSC Antenna connector
- WPA/WPA2 data security, IEEE 802.1x authentication, TKIP/AES encryption, 64/128/152-bit WEP encryption

Description

Features

Specifications

Software Specification

Standards	IEEE 802.11g, IEEE 802.11b, IEEE 802.11a
Wireless Signal Rates With Automatic Fallback	11g: Up to 54Mbps (Dynamic) 11b: Up to 11Mbps (Dynamic) 11a: Up to 54Mbps (Dynamic)
Frequency Range	2.4-2.4835GHz 5.150~5.350GHz 5.725~5.825GHz
Wireless Transmit Power	20dBm(MAX)
Modulation Type	1M DBPSK, 2M DQPSK, 5.5M/11M CCK, 6M/9M/12M/18M/24M/36M/48M/54M OFDM
Receiver Sensitivity	54M: -68dBm@10% PER 11M: -85dBm@8% PER 6M: -88dBm@10% PER 1M: -90dBm@8% PER 256K: -105dBm@8% PER
Work Mode	Ad-Hoc Infrastructure
Wireless Range	Indoors up to 200m, Outdoors up to 830m.
Wireless Security	64/128/152 bit WEP WPA/WPA2, WPA-PSK/WPA2-PSK (TKIP/AES)
Support Operating System	Windows 2000/XP/Vista

Hardware Specification

Interface	32-bit Mini PCI connector
Certifications	CE, FCC
Operating Temperature	0°C~40°C (32°F~104°F)
Storage Temperature	-40°C~70°C (-40°F~158°F)
Relative Humidity	10% ~ 90%, non condensation
Storage Humidity	5%~90% non-condensing
Dimensions	2.4 × 1.8 × 13 in.(60 × 45 × 3.3 mm)

Annexe 3

108M Wireless Access Point TL-WA601G



Specifications:

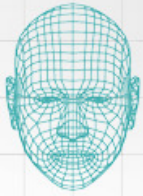
Standards	IEEE 802.11g, IEEE 802.11b
Interface	1 10/100M auto-sensing LAN Port
Wireless Signal Rates With Automatic Fallback	Super G™ : 108M 11g: 54/48/36/24/18/12/9/6M(dynamic) 11b: 11/5.5/2/1M(dynamic)
Frequency Range	2.4-2.4835GHz
Wireless Transmit Power	20dBm(Max)
Antenna	3dBi detachable Omni directional antenna
Modulation Technology	IEEE 802.11b: DQPSK, DBPSK, DSSS, and CCK IEEE 802.11g: BPSK, QPSK, 16QAM, 64QAM, OFDM
Receiver Sensitivity	108M: -68dBm@10% PER 54M: -68dBm@10% PER 11M: -85dBm@8% PER 6M: -88dBm@10% PER 1M: -90dBm@8% PER 256K: -105dBm@8% PER
Power Supply Unit	Input: localized to country of sale Output: 9VAC / 0.8A linear PSU
Operating temperature	0°C~40°C (32°F~104°F)
Storage temperature	-40°C~70°C (-40°F~158°F)
Relative humidity	10% ~ 90%, non condensation
Storage Humidity	5%~95% non-condensing
Dimensions	6.2×4.3×1.3 in. 158×110×32 mm

Annexe 4



Technical Specifications

- Motorized tracking (189° horizontal and 102° vertical)
- Carl Zeiss® optics
- Autofocus lens system
- Ultra-high resolution 2-megapixel sensor with RightLight™ 2 Technology
- Color depth: 24-bit true color
- Video capture: Up to 1600 by 1200 pixels (HD quality)
- Still-image capture: 8 megapixels (with software enhancement)
- Built-in microphone with RightSound™ Technology
- Frame rate: Up to 30 frames per second
- High-Speed USB 2.0
- Logitech QuickCam® software (with Video Effects™, filters, avatars, and face accessories)
- Works with Skype™, Windows Live™ Messenger, Yahoo®, AOL® and other compatible instant messaging applications



Motorized tracking

It keeps you right in the middle of the picture, offering 189-degree field of view and 102-degree tilt.



Carl Zeiss® optics

You'll enjoy razor-sharp images from a lens designed with the help of one of the pioneers in the industry. Find out more about why our collaboration with Carl Zeiss benefits you.

[Learn more.](#)



Advanced autofocus

Your images stay razor sharp, even in close-ups (up to 10 cm from the camera lens) with built-in autofocus. Learn all about Logitech autofocus.

[Learn more.](#)



HD video recording

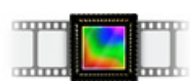
Your friends and family can see you in widescreen video at HD quality (720p).

2.0 megapixel sensor

Higher-megapixel performance

With its true 2-megapixel sensor, with up to 8-megapixel photos (software enhanced), every video call and photo will look sharp. Megapixels? Sensor? Why is image quality so important?

[Learn more.](#)



RightLight™ 2 technology

Even if you make a video call in dim or poorly backlit settings, the camera will intelligently adjust to produce the best possible image. Find out what's right about RightLight 2 technology.

[Learn more.](#)

Annexe 5

AC/DC Multi-Functional Balance Silent Charger/Discharger

*Chargeur AC/DC Multi-Fonctions
charge/décharge équilibreur silencieux
Avec monitoring USB par PC*



GP2Y0A02YK

Long Distance Measuring Sensor

■ Features

1. Less influence on the colors of reflected objects and their reflectivity, due to optical triangle measuring method
2. Distance output type
(Detection range: 20 to 150cm)
3. An external control circuit is not necessary
Output can be connected directly to a microcomputer

■ Applications

1. For detection of human body and various types of objects in home appliances, OA equipment, etc

■ Absolute Maximum Ratings ($T_A=25^{\circ}\text{C}$)

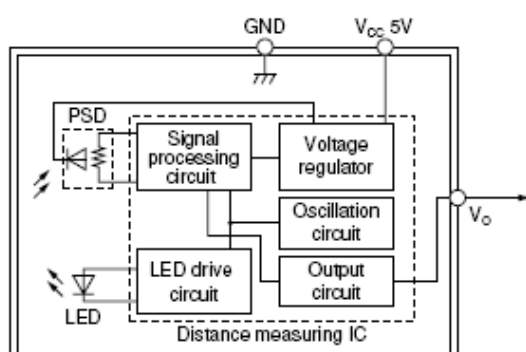
Parameter	Symbol	Rating	Unit
Supply voltage	V_{CC}	-0.3 to +7	V
*1) Output terminal voltage	V_O	-0.3 to $V_{CC}+0.3$	V
Operating temperature	T_{opr}	-10 to +60	$^{\circ}\text{C}$
Storage temperature	T_{stg}	-40 to +70	$^{\circ}\text{C}$

*1) Open collector output

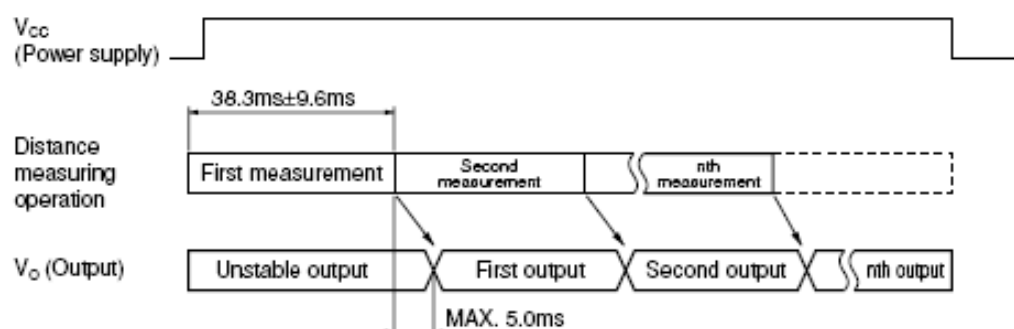
■ Recommended Operating Conditions

Parameter	Symbol	Rating	Unit
Operating Supply voltage	V_{CC}	4.5 to 5.5	V

Internal Block Diagram

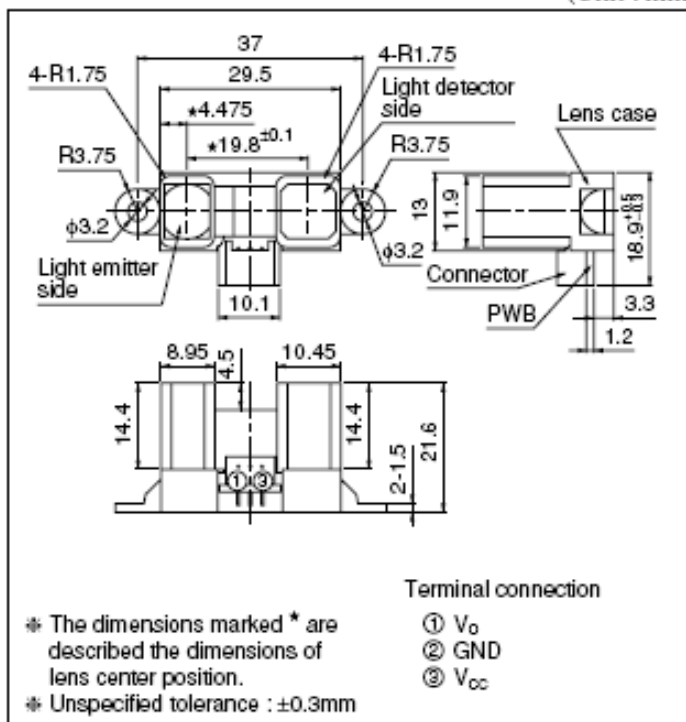


Timing Chart

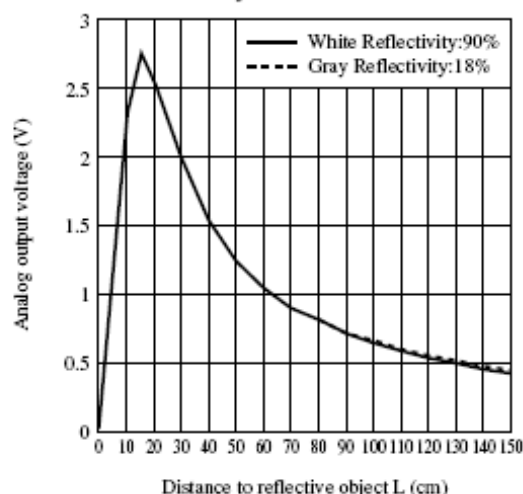


■ Outline Dimensions

(Unit : mm)



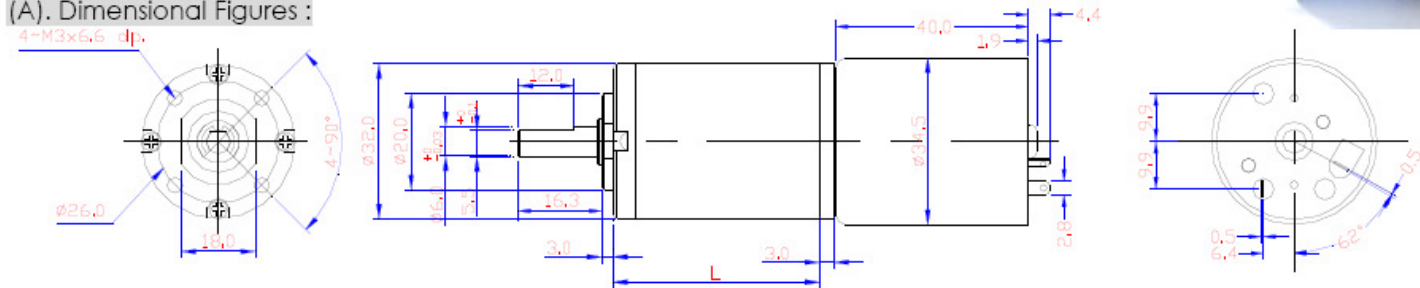
Analog Output Voltage vs. Distance to Reflective Object



Annexe 7 (Motor 12V 1/51)

Model : PK32F Series of DC Planetary Gear Motor

(A). Dimensional Figures :



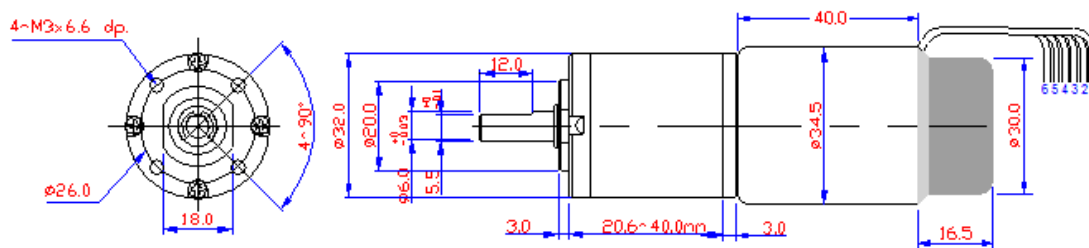
(B). Standard DC Motor Specifications :

DESCRIPTION	Rated Voltage VDC	Speed RPM	Current mA	Torque g-cm	Output W	Eff %
NO LOAD	12V	6000 ± 600	approx. 136			
	24V	6000 ± 600	approx. 50			
AT MAX. EFF	12V	5000	approx. 710	approx. 105	approx. 5.4	63
	24V	5100	approx. 320	approx. 105	approx. 5.4	71
AT STALL	12V		approx. 3755	approx. 656		
	24V		approx. 2122	approx. 780		

(C). Gearbox Specifications :

Reduction Ratio	Rated Torque	Max. Momentary Tolerance Torque	Efficiency	Radial Play of Shaft	Thrust Play of Shaft	L
1/5	2kgf-cm Max	6 kgf-cm	80%	≤ 0.05 mm	≤ 0.03 mm	17.6
1/27	6kgf-cm Max	18 kgf-cm	70%	↑	↑	24.0
1/51, 1/71	12kgf-cm Max	36 kgf-cm	60%	↑	↑	30.4
1/100	12kgf-cm Max	36 kgf-cm	60%	↑	↑	30.4
1/264	12kgf-cm Max	36 kgf-cm	50%	↑	↑	36.8
1/516	12kgf-cm Max	36 kgf-cm	50%	↑	↑	36.8
1/721	12kgf-cm Max	36 kgf-cm	50%	↑	↑	36.8

Model: EM3516 One / Two Channel Hall Effect Encoder



■ Resolution : 12 Resolution P/R

■ Electrical Specifications

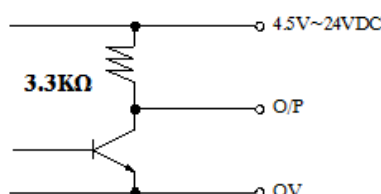
Power Source	4.5 ~ 24VDC
Current Consumption	30mA or below
Response Frequency	20KHz
Output Mode	With pull up resistor
Output Signal	A, A&B

◎ Please indicate which is the resolution P/R and rotational direction when placing an order.

■ Feature

- Hall Effect Sensor
- Speed Position Detection
- Low cost

■ Output Circuit :



■ One Channel Encoder Connections :

1. Black : HALL SENSOR GND
2. Red : HALL SENSOR Vcc
3. White: HALL SENSOR Aout
4. Green: EMPTY
5. Brown: + MOTOR
6. Blue : - MOTOR

■ Two Channel Encoder Connections :

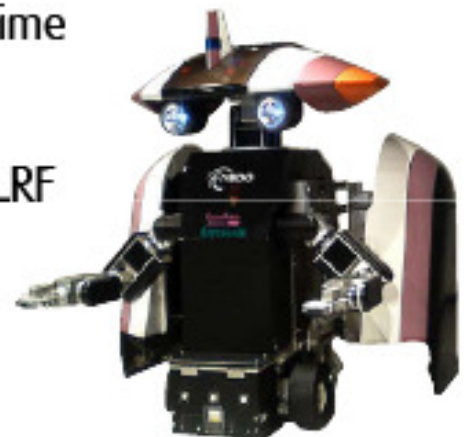
1. Black : HALL SENSOR GND
2. Red : HALL SENSOR Vcc
3. White: HALL SENSOR A Vout
4. Green: HALL SENSOR B Vout
5. Brown: + MOTOR
6. Blue : - MOTOR

URG-04LX-UG01

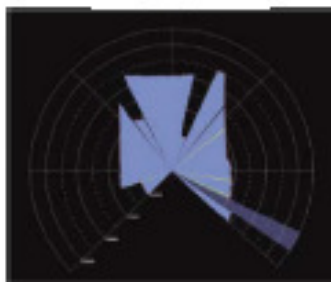
Low Cost Compact LRF from **HOKUYO**

Laser Range Finders (LRF) provide continuous time stamped mapping information.

The URG-04LX-UG01 is the smallest & lightest LRF available. With a single USB connection it is ideally suited to mobile robotic applications



Imaginix Co., Ltd. - HEBiO
Outdoor Learning Robot - Muroto



Detection performance
in the indoor environ-
ment with the existence
of two poles

- 5.6 metres range
- 240° scan 0.35° resolution
- 10 scans per second
- Compact: 50 x 50 x 70mm
- Lightweight 160g
- Low Power 5V DC, 2.5W

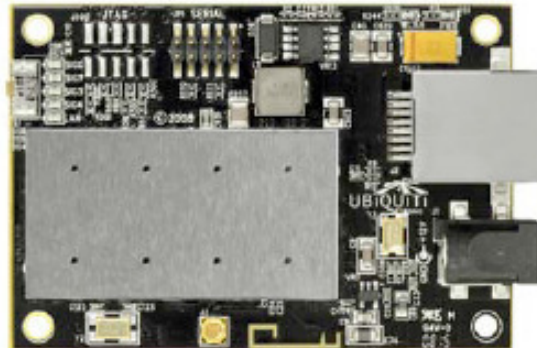
Annexe 8 (Option)



MiniStation

World's Smallest WiFi Platform

FREE LINUX SDK



SYSTEM INFORMATION							
Processor Specs		Atheros MIPS 4KC, 180MHz					
Memory Information		16MB SDRAM, 4MB Flash					
Networking Interface		1 X 10/100 BASE-TX (Cat. 5, RJ-45) Ethernet Interface					
REGULATORY / COMPLIANCE INFORMATION							
Wireless Approvals		FCC Part 15.247, IC RS210					
RoHS Compliance		YES					
RADIO OPERATING FREQUENCY 2412-2462 MHz							
TX SPECIFICATIONS				RX SPECIFICATIONS			
802.11b	DataRate	TX Power	Tolerance	802.11b	DataRate	Sensitivity	Tolerance
	1Mbps	26 dBm	+/-2dB		1Mbps	-97 dBm	+/-1dB
	2Mbps	26 dBm	+/-2dB		2Mbps	-96 dBm	+/-1dB
	5.5Mbps	26 dBm	+/-2dB		5.5Mbps	-95 dBm	+/-1dB
	11Mbps	26 dBm	+/-2dB		11Mbps	-92 dBm	+/-1dB
802.11g OFDM	6Mbps	26 dBm	+/-2dB	802.11g OFDM	6Mbps	-94 dBm	+/-1dB
	9Mbps	26 dBm	+/-2dB		9Mbps	-93 dBm	+/-1dB
	12Mbps	26 dBm	+/-2dB		12Mbps	-91 dBm	+/-1dB
	18Mbps	26 dBm	+/-2dB		18Mbps	-90 dBm	+/-1dB
	24Mbps	26 dBm	+/-2dB		24Mbps	-86 dBm	+/-1dB
	36Mbps	24 dBm	+/-2dB		36Mbps	-83 dBm	+/-1dB
	48Mbps	22 dBm	+/-2dB		48Mbps	-77 dBm	+/-1dB
	54Mbps	21 dBm	+/-2dB		54Mbps	-74 dBm	+/-1dB
ADJUSTABLE CHANNEL SIZE SUPPORT							
5MHz		10MHz		20MHz		40MHz	
RANGE PERFORMANCE							
Outdoor (Antenna Dependent):				Over 50km			
PHYSICAL / ELECTRICAL / ENVIRONMENTAL							
RF Connector		1xMMCX, 1x integrated PCB printed antenna					
Enclosure Size		5.0.0x2.0x1.2 (cm)					
Max Power Consumption		5 Watts					
Power Rating		Up to 24V					
Power Method		Passive Power over Ethernet (pairs 4,5+; 7,8 return)					
Operating Temperature		-20C to +70C					
Operating Humidity		5 to 95% Condensing					
Shock and Vibration		ETSI300-019-1.4					
SOFTWARE							
<div><div>AirOS™</div><div>by Ubiquiti Networks</div></div>							

Annexe 9 (Option)

Mini-PCI

MP-323 - Mini-PCI IEEE 1394a Module

Form Factor: Mini-PCI type III B with 124-pin interface.

Controller: Agere FW323.

Output Function: 3 x 8-pin IEEE1394a Connector.

Dimensions: 45mm x 60mm (W x L).

Accessories: 1x 8-pin IEEE 1394a Cable.

Power Requirements: small 4-pin AT power connector for 12V.



MP-840

H.264 Hardware Compression Card with 4 Ports of Video & Audio Inputs



Features

- Mini-PCI interface
- H.264 Hardware Compression
- 4-ch Video & Audio inputs
- Support D1
- Windows XP, Vista (32-bit) SDK & Driver

MP-878D2

2-ch Mini-PCI capture card with Software Develop Kit



Features

- Mini-PCI interface
- 2-ch Video input
- Support D1 , CIF resolution
- Windows Driver & SDK provide
- Linux Driver provide

MP-6100

H.264 Hardware Compression Card with 4 Ports of Video & Audio Inputs



Features

- Mini-PCI interface
- H.264 Hardware Compression
- 4-ch Video & Audio inputs
- Support D1 , CIF
- Windows / Linux SDK & Driver