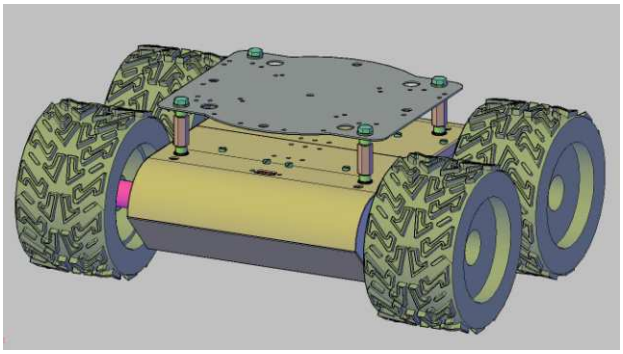


- *High mobility 4x4 platform using brushless motors*
- *Modular and open architecture*
- *Fully controllable over RS232 or Wifi*
- *Embedded PC with Windows 7 or Linux Ubuntu Embedded*

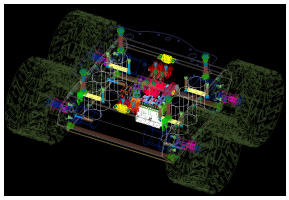
Wifibot *Lab V4*

Robot WIFIBOT Lab V4

Wifibot Lab is suited for those who want an affordable mobile platform for developing and learning robotics. The base system is composed by a four wheel drive chassis controllable using RS232, 4 infrared sensors, a pan&tilt camera, a mini-pci WIFI card, an Intel Atom duo core SBC (upgradable for a Core I5) running Windows 7 embedded or Linux Ubuntu, installed on a 8G SSD Hard Drive, and a free WIFI access point. **Hokuyo URG-04LX-UG01 or UTM-30LX can be an option.**
You can also connect as option, devices such as Firewire or IP camera (MJPEG or MPEG), GPS, Kinect, phidgets usb modules or different kind of custom electronic boards like analogue multi camera mini-pci H264 card etc...
You can develop your application on the robot or remotely using the VGA port or remote desktop via WIFI.
For controlling this robot, several GUI and API are available. The motor board can be programmed using MPLAD/ICD2/3 debugger or using the internal bootloader.
The RS232 or Ethernet protocol is open and simple and it can be used with any kind of framework (**ROS**, **RTMAPS, URBI, Matlab, etc…**)

Option

www.wifibot.com



Windows Embedded

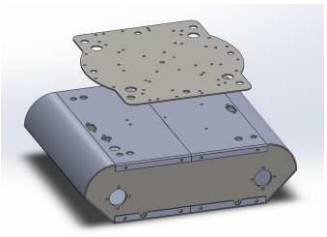
Wifibot *Lab V4*

Default Specifications

Motor sensor :	4 hall effect coders 336 tics / wheel turn
Speed control :	4 x PID DSPIC Microchip 33E coded in C RS232 Boot loader ICD2/3 (option)
Motors :	4x 12v Brushless motors 26:1 planetary gear 156 rpm
Dimensions:	L : 32 cm W : 37 cm H : 15 cm W : 3.8Kg
Power Batteries:	12.8V LIFEPO4 10AH Power supply 18V / 220V Path Power Management Charger inside the robot You can use the robot during charging
Control bus :	RS232. Simple protocol C/C++ API, (ROS, MatLab, RTMAPS, Robotics Studio, URBI … possible)
Distant Protocol :	Sockets TCP/UDP via WIFI or RJ45
CPU :	Intel Atom duo core SBC 1.8Ghz 2G Ram / 8G SSD HD 4 x USB 2.0 4 x RS232/485 1 x Mini-Pci + 1 mini pcie …
Sensors :	4 Infrared 1 web cam Pan &Tilt 1 Lidar Hokuyo 4m 30m (option)
Software:	C++ control API 1 HMI Embedded Camera Web Server

WIFI AP (included)

DC 18V POWER (included)



High level Architecture

a/b/g

Remote HMI

Robot deck

MJPEG Web Server

Embedded CPU Under Robot platform

Mini-PCI

(Option)

4m Lidar

USB

USB

Camera

Other Sensors

RS232
(Speed command
Battery level
Main Current
Odometer
Speed
....)

Robot chassis

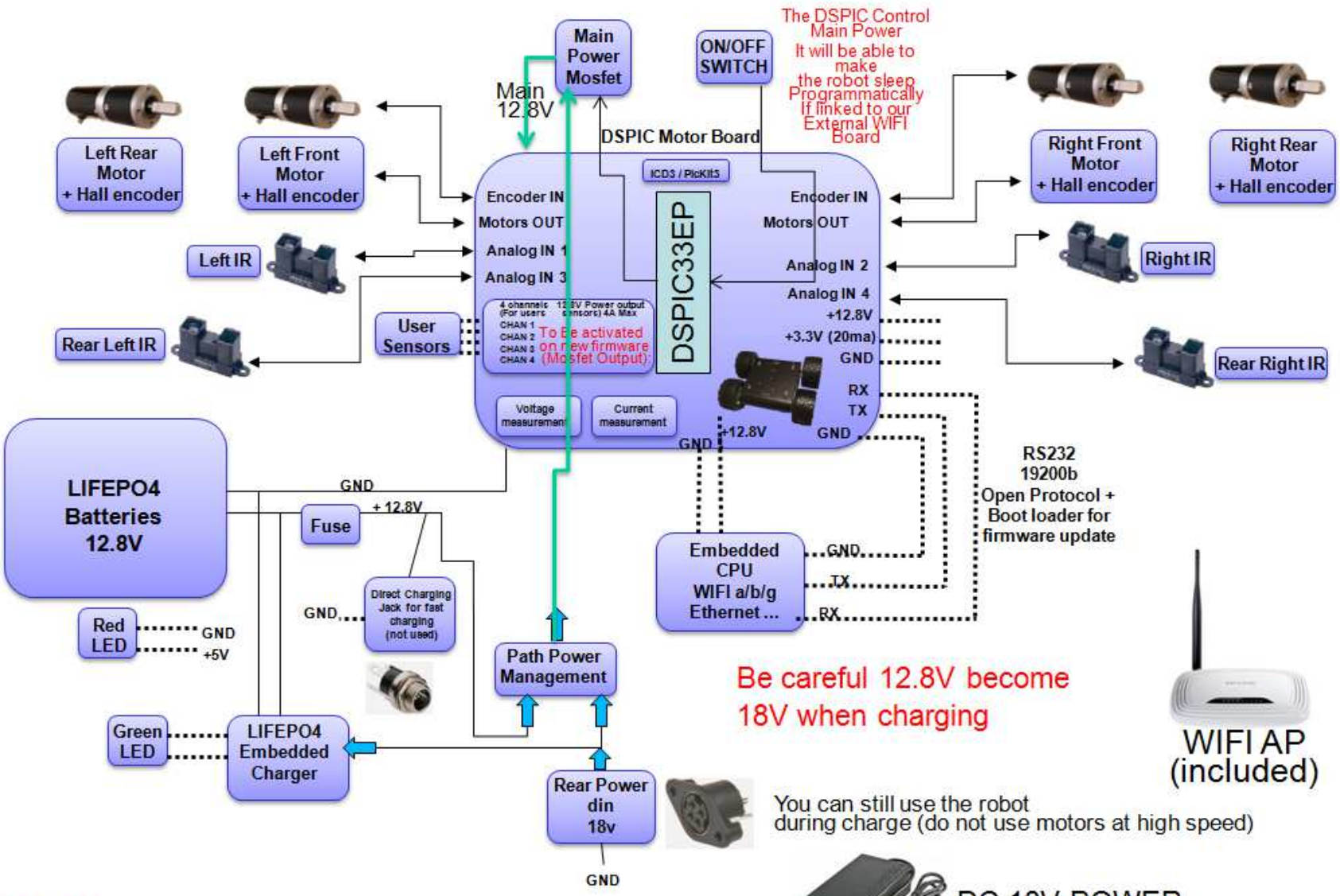
Firmware Update:
PicKit/ICD3
or embedded
RS232 boot loader

4 Static Relay
4A

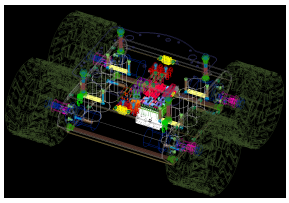
3 x free signal
Can be IO
Rs232, i2C, SPI ...

4 x IR Sensors

Low Level Architecture



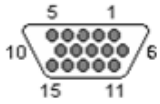
Wifibot LAB V4



Low Level Architecture (DSUB15 on the robot)

WifiBOT *Lab V4*

DSUBF



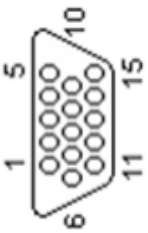
HD-D-sub-15 Female

Be careful 12.8V become 18V when charging so check that your device is18V tolerant or use a DC/DC

DsubF-1 et 2 -> +12.8V (8A Max, embedded PC, other device)
DsubF-6 à 10 -> GND
DsubF-15 -> 12.8V (Linked to the Main Switch, 300mA)

Power Mosfet Output :
DsubF-3 -> Channel 1 : +12.8V (4A)
DsubF-4 et 5 -> Channel 2 : +12.8V (4A)
DsubF-11-12 -> Channel 3 : +12.8V (4A)
DsubF-13-14 -> Channel 4: +12.8V (4A)

DSUBM



HD-D-sub 15 Male

Serial port for Embedded PC:

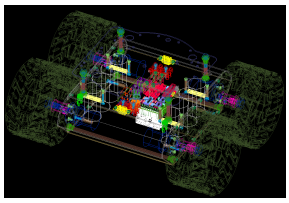
DSUB15M-6 -> DSUB9F-3 TX
DSUB15M-7 -> DSUB9F-2 RX
DSUB15M-9 -> DSUB9F-5 GND

Infrared Sensors:

DSUB15M-3 -> Infra1-data
DSUB15M-8 -> Infra1-gnd
DSUB15M-1 -> Infra1-+5V
DSUB15M-4 -> Infra2-data
DSUB15M-8 -> Infra2-gnd
DSUB15M-1 -> Infra2-+5V
DSUB15M-5 -> Infra3-data
DSUB15M-14 -> Infra3-gnd
DSUB15M-2 -> Infra3-+5v
DSUB15M-10 -> Infra4-data
DSUB15M-14 -> Infra4-gnd
DSUB15M-2 -> Infra4-+5V

FUTURE USE:
DsubM-11 -> free dspic IO (future use)
DsubM-12 -> free dspic IO (future use)

DsubM-13 -> free dspic IO (future use)
DsubM-14 -> GND
DsubM-15 -> 3.3V (20mA)



Annexe 1
EMBEDDED CPU

Wi-fibOT *Lab V4*

Intel® Atom TM processor D2550, 1.86 GHz

LE-379

3.5" embedded board with Intel® Atom™ dual-core Solution

LE-379D5S	Support Intel® Atom™ CedarTrail D2550 processor with Onboard VGA, LVDS, DVI, Giga LAN, USB2.0, HD Audio, SATAII, SMBUS, LPC, LPT, GPIO, Mini PCI, mSATA

Industrial Single Board Computer

3.5 Inches Mini board

LE-379

Intel® Atom™ Processor with DDRIII SO-DIMM, CRT, DVI, LVDS, Gigabit LAN, USB2.0, HD Audio, Serial ATAII, Mini PCI, PCIE mini card, LPC, LPT, CFast, mSATA, SATADOM

Form Factor	3.5 Inches Embedded Mini board
CPU	Intel® Atom™ CedarTrail Processor with optional D2700 or D2550 or N2800 Package type：FCBGA559
Memory	1 x DDRIII SO-DIMM 800/1066 MHz up to 4GB Support Non-ECC, unbuffered memory only
Chipset	Intel® NM10
Real Time Clock	Chipset integrated RTC with onboard lithium battery
Watchdog Timer	Generates a system reset with internal timer for 1min/s ~ 255min/s
Power Management	Supports ACPI 3.0 compliant
Serial ATA Interface	2 x serial ATAII interface with 300MB/s transfer rate(Optional support SATADOM)
Integrated Graphics	Intel® integrated extreme GMA 3650(Graphic Media Accelerator) Technology
VGA Interface	Onboard DSUB15 connector for VGA interface
LVDS Interface	Onboard 18-bit signal channel LVDS connector with +3.3V/+5V supply (N2800) Onboard 18 and 24-bit signal channel LVDS connector with +3.3V/+5V supply (D2700 / D2550)
DVI interface	Onboard DVI with 20-pin connector
Audio Interface	REALTEK ALC888 HD Audio
LAN Interface	1 x Intel® 82583V Gigabit Ethernet controller
GPIO Interface	Onboard programmable 8-bit Digital I/O interface
Extended Interface	1 x mini PCI, 1 x PCIE mini card(Optional support mSATA) CFast Card socket(shared with SATA2)
Internal I/O Port	4 x RS232, 1 x RS232/485/422, 1 x SMBUS, 1 x GPIO, 4 x USB2.0, 1 x IrDA, 2 x Serial ATAII, 1 LPT, 1x LPC, 1 x HD Audio, 1 x DVI , 1 x LVDS, 1 x CN_INV(Support LED Backlight)
External I/O Port	1 x PS/2, 1 x RJ45, 1 x VGA, 2 x USB2.0, 1 x RS232
Power Requirement	Full ranged 5V~24V(±5%) DC Input
Dimension	146mm x 101mm
Temperature	Operating within 0~60 centigrade Storage within -20~85 centigrade

Annexe 2

WLAN 802.11a/b/g mini-PCI Module

DCMA-81

SPECIFICATION

Frequency Band	➢ 2.312 – 2.472GHz, 2.484 GHz ➢ U-NII: 5.15 - 5.35GHz, 5.725 - 5.825GHz ➢ ISM: 5.725 – 5.850 GHz ➢ DSRC: 5.850 – 5.925 GHz ➢ Europe: 5.15 - 5.35GHz, 5.47 - 5.725GhHz ➢ Japan: 4.90 – 5.00GHz, 5.03 – 5.091GHz, 5.15 – 5.35GHz
Modulation technique	➢ **802.11 a/b/g** DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK,QPSK, 16-QAM, 64-QAM)
Host interface	Half size Mini PCI Type 3A
Channels support	➢ **802.11b/g** US/Canada: 11 (1 ~ 11) Major European country: 13 (1 ~ 13) France: 4 (10 ~ 13) Japan: 11b: 14 (1~13 or 14th), 11g: 13 (1 ~ 13) ➢ **802.11a** US/Canada:12 non-overlapping channels Europe: 19 non-overlapping channel Japan: 4 non-overlapping channels
Output power	➢ A Mode: +17dBm at 6, 9, 12, 18, and 24Mbps +16dBm at 36Mbps +14dBm at 48Mbps +13dBm at 54Mbps ➢ B Mode: +19dBm at 1,2, 5.5, and 11Mbps ➢ G Mode: +17dBm at 6, 9, 12, 18, 24 and 36Mbps +16dBm at 48Mbps +15dBm at 54Mbps
Operation distance	➢ **802.11a:** Outdoor: 85m@54Mbps, 250m@6Mbps Indoor: 20m@54Mbps, 40m@6Mbps ➢ **802.11b:** Outdoor: 250m@11Mbps, 300m@1Mbps Indoor: 30m@11Mbps, 50m@1Mbps ➢ **802.11g**: Outdoor: 80m@54Mbps, 250m@6Mbps Indoor: 15m@54Mbps, 35m@6Mbps
Operation System supported	➢ Windows® 2K, XP
Dimension	➢ 59.75mm(L) * 25.50mm (W) * 5mm (H)
Security	➢ 64-bit,128-bit, 152-bit WEP Encryption ➢ 802.1x Authentication ➢ AES-CCM & TKIP Encryption
Operation mode	➢ Infrastructure & Ad-hoc mode
Operation temperature	➢ 0°C ~ 70°C
Storage temperature	➢ -20°C ~ 70°C

Annexe 3

108M Wireless Access Point

TL-WA601G

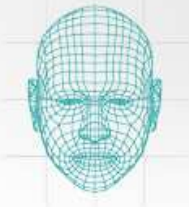
Specifications:

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).

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.

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°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	°C
Storage temperature	T_{stg}	−40 to +70	°C

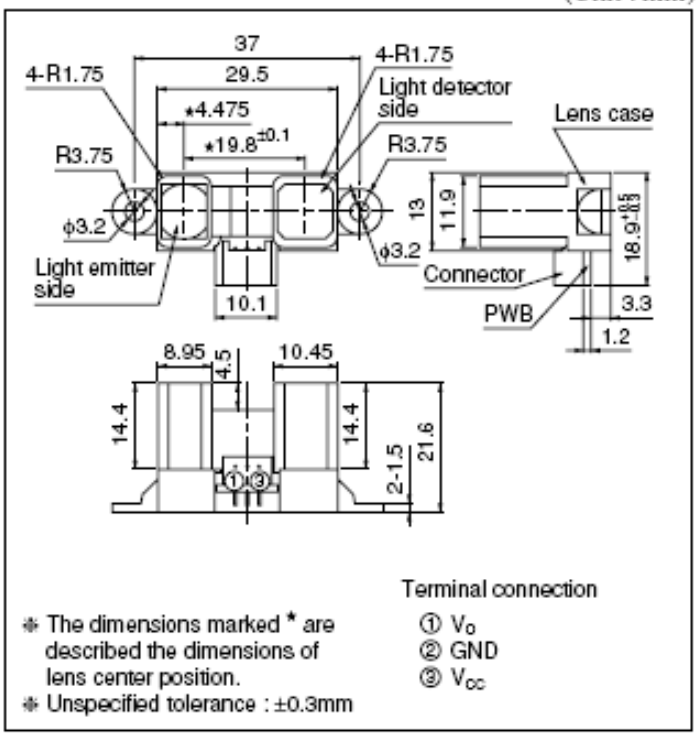
*1 Open collector output

■ Recommended Operating Conditions

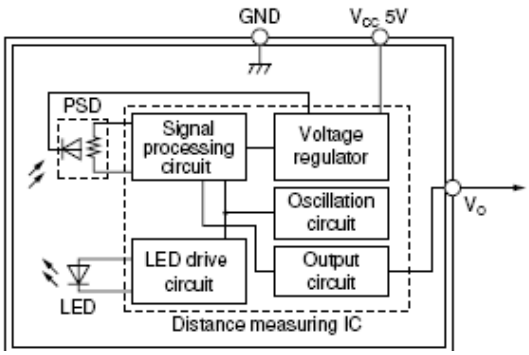
Parameter	Symbol	Rating	Unit
Operating Supply voltage	V_{CC}	4.5 to 5.5	V

■ Outline Dimensions

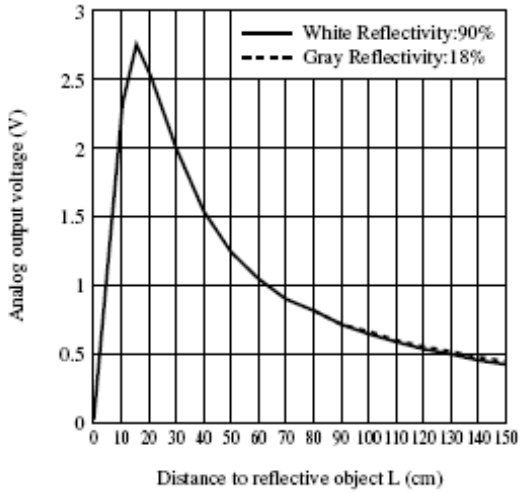
(Unit : mm)



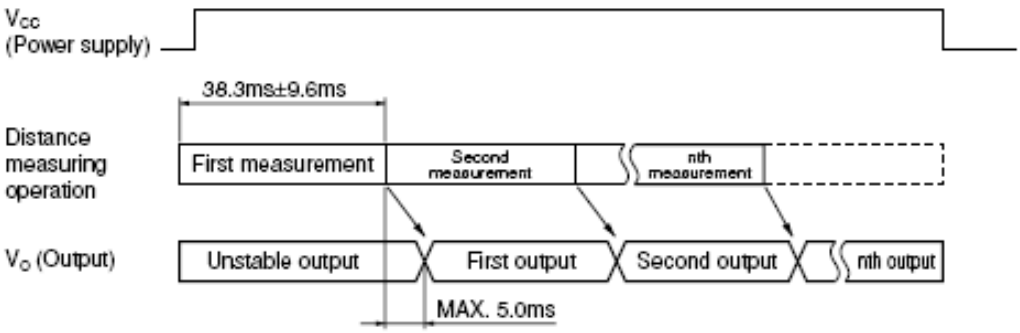
Internal Block Diagram



Analog Output Voltage vs. Distance to Reflective Object



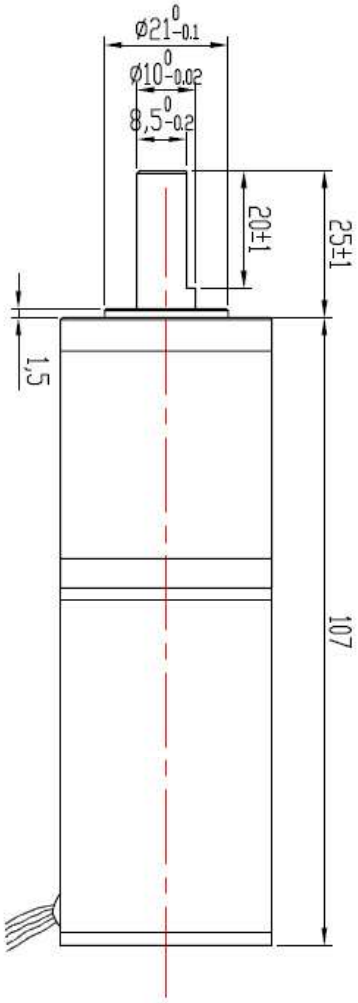
Timing Chart



Annexe 6 (Brushless Motor 12V 1/28)

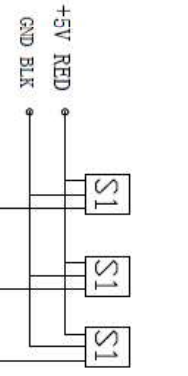
Wi-fibOt

REV:A
DATE:20120810

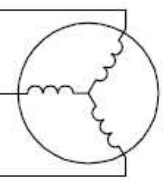


Electrical Spec:

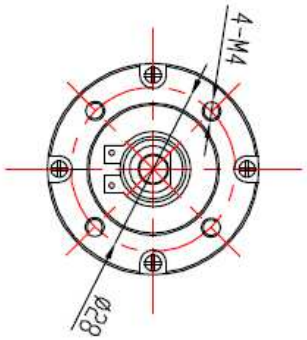
Model		
ITEM	UNIT	SPEC
PHASE	PHS	3
VOLTAGE	VDC	12
NOLOAD SPEED	RPM	5200REF
NOLOAD CURRENT	A	0.3REF
RATED SPEED	RPM	3000
RATED POWER	W	16
RATED TORQUE	N.m	0.051
RATED CURRENT	A	2.4
INSULATING STRENGTH	VAC	500
IP CLASS		IP40
INSULATION CLASS		B
RATIO		28.5:1
RATED SPEED FROM GEARBOX	RPM	105
RATED TORQUE FROM GEARBOX	N.m	1.1



Hall Wire :UL1007 26AWG
300mm



Motor Wire :UL1007 22AWG
300mm



Annexe 7 (OPTION)

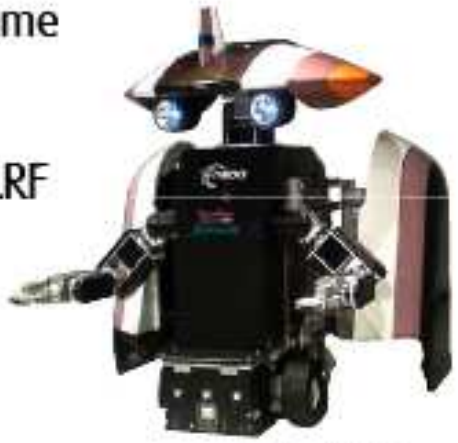
Robotics

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



Detection performance in the indoor environment with the existence of two pedestrians

- 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 7 (OPTION)

UTM-30LX

FDA approved
SOKUIKI sensor for intelligent robots

30m and 270° scanning range. Suitable for robots with higher moving speed because of the longer range and fast response.

Model No.	UTM-30LX
Power source	12VDC ± 10%(Current consumption:Max:1A,Normal:0.7A)
Light source	Semiconductor laser diode(λ =905nm) Laser safety Class 1(FDA)
Detection Range	0.1 to 30m(White Square Kent Sheet 500mm or more),Max.60m 270°
Accuracy	0.1 to 10m:±30mm, 10 to 30m:±50mm[*1]
Angular Resolution	0.25° (360° /1,440 steps)
Scan Time	25msec/scan
Sound level	Less than 25dB
Interface	USB2.0(Full Speed)
Synchronous output	NPN open collector
Command system	Exclusively designed command SCIP Ver.2.0
Connection	Power and Synchronous output:2m flying lead wire USB:2m cable with type-A connector
Amblent(Temperature/Humidity)	-10 to +50 degrees C, less than 85%RH(without dew and frost)
Vibration Resistance	Double amplitude 1.5mm 10 to 55Hz, 2 hours each in X, Y and Z direction
Impact Resistance	196m/s^2, 10 times in X, Y and Z direction
Weight	Approx. 370g(with cable attachment)

Annexe 7 (OPTION)

Robotics

UTM-30LX-EW

Long Range HOKUYO LRF

Model	UTM-30LX-EW
Power Source	12V DC +/- 10% , Current usage Max 1A at start-up, Normal use 0.7A
Light Source	Pulsed laser diode (λ=905nm), Laser safety class 1
Principle	Direct Time of Flight
Detection Range	0.1m to 30m (500mm x 500mm or more, White Kent Sheet)
Multi-Echo function	Max 3 output of distance per step
Accuracy	0.1m to 10m +/- 30mm, 10m to 30m +/- 50mm
Scan Window & Resolution	270° Resolution 0.25°
Scan speed	25ms/scan
Communication protocol	SCIP2.2 (Exclusive command)
Interface	Ethernet 100 Base-TX (Auto-negotiation) TCP/IP Synchronous output: NPN open collector
Connection	Power / synchronous output cable 2m Ethernet RJ-45 with male connector 30cm (female connector included)
Physical dimensions	62 x 62 x 87mm Weight 370g
Operating temperature / humidity	-10 to +50°C @ 85% humidity (no condensing or icing) (Storage -25 to +75°C)
Vibration resistance	Double amplitude 1.5mm, 10 to 55Hz each for 2 hours in X,Y,Z Directions
Impact Resistance	196m/s² each 10 times in in X,Y,Z Directions

- 30 metres range
- Designed for outdoor use
- 270º scan 0.25º resolution
- 40 scans per second
- Compact: 62 x 62 x 87mm
- Lightweight: 400g
- Power frugal: 12VDC, 8.4W
- Ethernet connectivity
- Multi-Echo functionality
- Effective in adverse weather

SENTEK solutions

Annexe 8 (Option)

<u>Optional Sensor: Kinect</u>
<u>(+DC/DC + special mounting)</u>

Annexe 9 (Option)

(OpenWRT Mesh Network possible)

UBIQUITI NETWORKS

TECHNICAL SPECS / DATASHEET

PicoStation M2-HP 2.4GHz Hi Power 802.11N Outdoor Radio System

SYSTEM INFORMATION	
Processor Specs	Atheros MIPS 24KC, 400MHz
Memory Information	32MB SDRAM, 8MB 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, CE
RoHS Compliance	YES

OPERATING FREQUENCY 2412MHz-2462MHz

TX POWER SPECIFICATIONS

	DataRate	Avg. TX	Tolerance
11g	1-24Mbps	28 dBm	+/-2dB
	36Mbps	27 dBm	+/-2dB
	48Mbps	26 dBm	+/-2dB
	54Mbps	24 dBm	+/-2dB
Airmax 11n	MCS0	28 dBm	+/-2dB
	MCS1	28 dBm	+/-2dB
	MCS2	28 dBm	+/-2dB
	MCS3	28 dBm	+/-2dB
	MCS4	27 dBm	+/-2dB
	MCS5	25 dBm	+/-2dB
	MCS6	24 dBm	+/-2dB
	MCS7	23 dBm	+/-2dB

RX SPECIFICATIONS

	DataRate	Sensitivity	Tolerance
11g	1-24Mbps	-97 dBm min.	+/-2dB
	36Mbps	-80 dBm	+/-2dB
	48Mbps	-77 dBm	+/-2dB
	54Mbps	-75 dBm	+/-2dB
Airmax11n	MCS0	-96 dBm	+/-2dB
	MCS1	-95 dBm	+/-2dB
	MCS2	-92 dBm	+/-2dB
	MCS3	-90 dBm	+/-2dB
	MCS4	-86 dBm	+/-2dB
	MCS5	-83 dBm	+/-2dB
	MCS6	-77 dBm	+/-2dB
	MCS7	-74 dBm	+/-2dB

ANTENNA & RANGE PERFORMANCE	
RP-SMA Antenna Included	Outdoor Omni-directional. 6dBi
Indoor/Outdoor Range	Over 200m / 500m
PHYSICAL / ELECTRICAL / ENVIRONMENTAL	
Enclosure Size	13.6 cm. length x 2.0 cm. height x 3.9cm. width
Weight	0.10kg
Enclosure Characteristics	Outdoor UV Stabalized Plastic
Max Power Consumption	8 Watts
Power Rating	Up to 24V. POE Supply included
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

Annexe 10 (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

Annexe 11 (Option)

Optional CPU (core I5 520M or core I7 620M)

Industrial Single Board Computer

3.5'' Miniboard

LS-377

Support Intel® Core™ i7, Core™ i5 and Core™ i3 CPU with DDRIII SO-DIMM, CRT, LVDS, DVI, Gigabit LAN, Mini PCI, PCI Express mini card, Serial ATAII, 7.1Channel HD Audio

Form Factor	3.5'' Miniboard
CPU	Intel® Core™ i7, Core™ i5, Core™ i3, Celeron®, and Pentium® Mobile Processor Package type: rPGA988A
Memory	1 x DDRIII SO-DIMM 800/1066 MHz up to 4GB
Chipset	Intel QM57
Real Time Clock	Chipset integrated RTC with onboard lithium battery
Watchdog Timer	Generates a system reset with internal timer for 1min/s ~ 255min/s
Power Management	Supports ACPI 2.0 compliant.
Serial ATA Interface	2 x serial ATAII interface with 300MB/s transfer rate
VGA Interface	Onboard VGA (depend on CPU)
LVDS Interface	Onboard 24-bit dual channel LVDS connector with +3.3V/+5V/+12V supply
DVI Interface	DVI interface
Audio Interface	Realtek ALC888 HD Audio
LAN Interface	1 x Intel 82574L Gigabit LAN
GPIO Interface	Onboard programmable 8-bit Digital I/O interface
Extended Interface	1 x Mini PCIE socket, 1 x Mini PCI socket to support Mini PCI Type IIIA
Internal I/O Port	1 x RS232/422/485, 1 x SMBUS, 1 x GPIO, 4 x USB ports, 1 x IrDA, 1 x LVDS, 1 x DVI, 1 x LCD, 2 x Serial ATA, 1 x LCD Inverter, 1 x HD Audio, 1 x DIO, 1 x DCOUT and 1 x CDIN
External I/O Port	1 x PS/2, 1 x LAN ports, 1 x VGA port, 2 x USB2.0 ports, 1 x RS232 port
Power Requirement	9~24V full range DC Input
Dimension	146mm x 101mm
Temperature	Operating within 0~60 centigrade Storage within -20~85 centigrade

Annexe 12 GPS (Option)

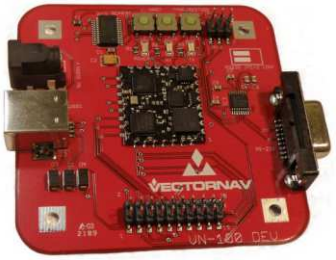
Module GPS "XBU-353" à sortie USB

Le "XBU-353" est un récepteur GPS ultra compact à sortie USB livré dans un petit boîtier magnétique étanche très esthétique. Livré avec un CD-ROM comprenant des drivers ainsi qu'un logiciel de test, ce modèle 20 canaux est basé sur un chipset SiRF StarIII™ qui lui confère une sensibilité exeptionnelle de l'ordre de -159 dBm.

Capable de supporter la démodulation WASS™, le "XBU-353" dispose d'un câble d'une longeur de 1,50 m et d'une Led de contrôle allumée lors de la recherche de position et clignotante lorsque la position a été trouvée. Une "super capacité" de sauvegarde est également intégrée au module.

Dimensions	Diamètre: 53 mm x 19.2 mm
Alimentation	+4.5 à +6.5 Vcc
Consommation	80 mA
Canaux	20
Position	10 m, 2D RMS
Vélocité	515 m/sec.
Altitude maxi.	18.000 mètres
Accélération	< 4 g
Temps de réacquisition	0.1 sec.
Hot Start	1 sec.
Warm Start	38 sec.
Cold Start	42 sec.
Signal de sortie	SiRF binary : Position, Velocity, Altitude, Status et Control NMEA 0183 : GGA, GSA, GSV, RMC

Annexe 13 IMU (Option)

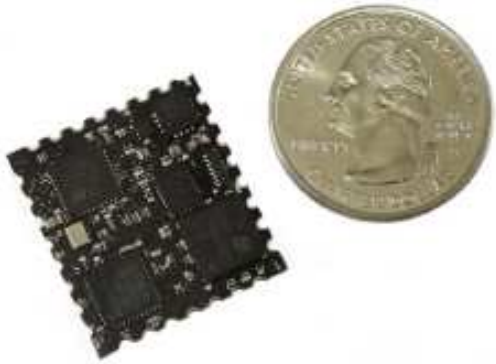


VECTORNAV

Embedded Navigation Solutions

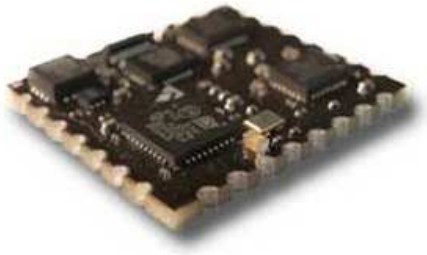
VN-100

Embedded Attitude Heading Reference System



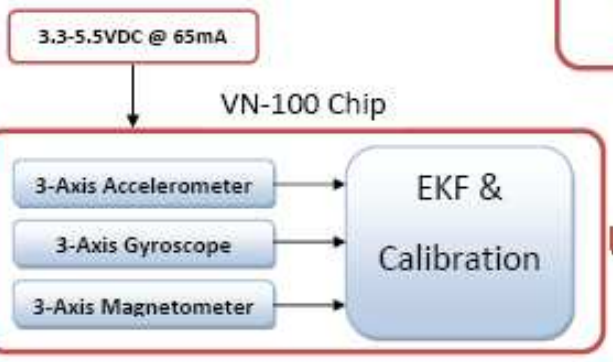
The VN-100 is the world's first Attitude Heading Reference System (AHRS) integrated into a single chip sized module. It's small size and high performance opens the door for numerous embedded applications.

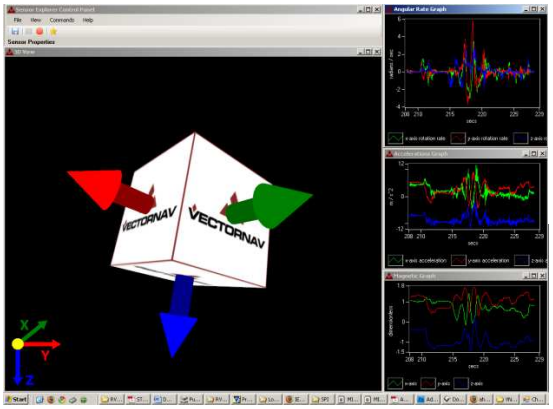
Watch our video demonstration at:
http://tinyurl.com/vectornav



Features

- Single surface mount solution
- Small SMT footprint < $1in^2$
- Accuracy < 0.5 deg rms (static)
- Fully calibrated at room temp
- Extended Kalman Filter (EKF) attitude solution at 200 Hz
- Serial TTL, SPI Outputs
- Euler angles, quaternion, DCM, acceleration, angular rates, magnetic outputs
- Low cost





Performance

Heading	
Range	±180 °
Accuracy (rms)	< 2.0 °
Resolution	< 0.2 °

Attitude	
Range: Pitch, Roll	±180 °, ±90 °
Accuracy	< 0.5 °
Resolution	< 0.06 °

Angular Rate	
Range: Heading	±300 °/sec
Range: Pitch, Roll	±500 °/sec
Bias Stability: Heading	< 0.1 °/sec @ 25°C
Bias Stability: Pitch, Roll	< 0.06 °/sec @ 25°C
Resolution: Heading	< 0.2 °/sec
Resolution: Pitch, Roll	< 0.06 °/sec
Bandwidth: Heading	80 Hz
Bandwidth: Pitch, Roll	140 Hz

Acceleration	
Input Range: X/Y/Z	±2 g, ±6 g
Bias Stability: X/Y	< 0.5 mg @ 25°C
Bias Stability: X/Y	< 1.6 mg @ 25°C
Resolution: X/Y	< 0.4 mg
Resolution: Z	< 2 mg
Bandwidth	50 Hz

Annexe 14 IMU (Option)

Technical Brief

YEI 3-Space Sensor™
Product Family

Miniature High-Performance Attitude & Heading Reference Systems / Inertial Measurement Units

Overview

The YEI 3-Space Sensor™ product line is a family of miniature, high-precision, high-reliability, Attitude and Heading Reference Systems (AHRS) / Inertial Measurement Units (IMU). Each YEI 3-Space Sensor uses triaxial gyroscope, accelerometer, and compass sensors in conjunction with advanced processing and on-board quaternion-based Kalman filtering algorithms to determine orientation relative to an absolute reference in real-time. The product family offers a breadth of communication, performance, and packaging options ranging from the ultra-miniature TSS embedded to fully integrated battery-powered wireless and data-logging versions.

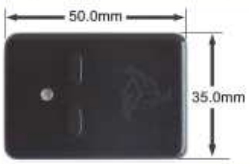
Orientation can be returned in absolute terms or relative to a designated reference orientation. The proprietary multi-reference vector mode and 24-point ortho-calibration process increase accuracy and greatly reduce and compensate for sensor error. The YEI 3-Space Sensor system also utilizes a dynamic sensor confidence algorithm that ensures optimal accuracy and precision across a wide range of operating conditions.

The YEI 3-Space Sensor system features are accessible via a well-documented open communication protocol that allows access to all available sensor data and configuration parameters using a variety of communication interfaces. Versatile commands allow access to raw sensor data, normalized sensor data, and filtered absolute and relative orientation outputs in multiple formats including: quaternion, Euler angles (pitch/roll/yaw), rotation matrix, axis angle, two vector (forward/up).

Applications

- Robotics
- Motion capture
- Positioning and stabilization
- Personnel / pedestrian navigation and tracking
- Unmanned air/land/water vehicle navigation
- Education and performing arts
- Healthcare monitoring
- Gaming and motion control
- Accessibility interfaces
- Virtual reality and immersive simulation

Product Family



- USB2.0, RS232 serial
- 50x35x15 mm, 17 grams
- USB communications via virtual COM port
- RGB status LED, two buttons
- Hand-held or strap-down case style

Annexe 15 (Option)

AC/DC Multi-Functional Balance Silent Fast Charger/Discharger (must switch off the robot)

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