



# IETE Bengaluru Magazine

VOLUME 6 OCTOBER 2019 - DECEMBER 2019

## From the President's Desk

I am very glad to know that IETE Bengaluru Centre is publishing/releasing a quarterly magazine to share information amongst members, IETE Bengaluru Centre about the activities and knowledge through topical and state-of-the-art technical articles.

IETE Bengaluru Centre is one of the active Centres involved in organizing many programs; one such upcoming event is an International Conference being organized every year under the aegis during April 2020.

I appreciate the efforts of Chairman and Executive Committee, that a magazine is showcasing its multifaceted activities.

IETE HQ will always support and encourages all initiatives by its Centres in the pursuit of sharing the knowledge. I wish the Executive Committee and the magazine a grand success.

**Prof (Dr) J W Bakal**  
President, IETE

## From the Chairman

Dear IETE Members,

I am glad that this edition of the Magazine is being released on the occasion of the inauguration of the One Month Internship Program on IoT being undertaken by the Centre for the first time after installation of the IoT Lab.

During the quarter gone by IETE Bangalore conducted many technical activities and celebrated, among others, the IETE Foundation Day and Engineers' Day. Reports of our activities are given in these pages.

You may all be aware that your Centre was adjudged the Best Centre of 2018-19. It is a matter of great pride to all of us and I wish to share my joy with all of you. We are making all efforts to step up our activities and will be apprising you of our work through the medium of the Magazine.

We are, however, grieved that one of our founding fathers Prof. BS Sonde left us for the heavenly abode a few weeks ago. He was truly our guiding spirit. I pray that his soul may rest in peace.

Wishing you all a happy new year,

With warm regards,  
**HS Bhatia**  
Chairman, IETE Bangalore



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## IETE BENGALURU



## From the Hon. Secretary

This edition of the Magazine is special in many ways. It is being released on the occasion of the inauguration of the One Month Internship Program on IoT being undertaken by the Centre for the first time after installation of the IoT Lab. Next, it is the first issue after the Centre was awarded the Prize for the 'Best Centre 2018-19', an honour that places greater responsibility on us to maintain a reputation that we have worked hard to achieve. The Magazine has been an instrument to truthfully showcase the good work that we have been doing, as well as to involve all members and well-wishers of the Institution in our activities.

The Magazine contains the usual features. We have included a Calendar of Technical Activities. There is also a page dedicated to the memory of Prof. BS Sonde who had been our inspiration to undertake many activities including the launch of the Magazine.

I request the readers to send in their suggestions and criticism and also contribute articles for publication.

Wishing all a Happy New Year 2020

**C. Satyanandan**

Hon. Secretary  
IETE Bengaluru

## Technical Calendar of IETE Bangalore

SL NO.	Course Name	Commencing of Date	Duration	Remarks
1	Embedded Systems & Design	05-01-2020	8-10 Sunday	Sri. Malhar Deshpande
2	Adv. FPGA Design	12-01-2020	8-10 Sunday	Sri. Anil Kumar
3	IoT Internship	13-01-2020	4 Week	C-DAC
4	IoT & Augmented Reality	26-01-2020	6 Sunday	Sri. Avinash G
5	Electronic Board Design (PCB)	08 & 09 -02-2020	2 Day	NEILIT
6	MATLAB/SIMULINK	16-02-2020	8-10 Sunday	Dr. Shivaprasad Yadav
7	FPGA Based Prototyping	22 & 23 -02-2020	02 Day	NIELIT
8	IETE Students Day	Feb 2020		
9	Sir. C V Raman Memorial Lecture	28-02-2020		
10	Java & Android Applications	01-03-2020	8-10 Sunday	
11	Karnataka Students Technical Paper Context	Month of April	01 Day	
12	SUMMER SCHOOL IN ELECTRONICS & COMPUTERS (SUSIEC-2020)	25 Days	April & May	
13	Project Exhibition of Students	Month of May	01 Day	
14	C A Exams	02-18 May 2020	16 Days (07 May Holiday)	
15	SVC Aiya Memorial Lecture	17-05-2020		
16	N S Nagaraja Memorial Lecture	28-06-2020		

**IETE Bengaluru Magazine Editorial Board:** Shri. H Ramakrishna, Prof. HS Bhatia, Shri. C Satyanandan, Shri Jagannatha Rao, Prof. PN Sharada & Dr. M H Kori

## KNOW YOUR DISTINGUISHED PERSONS FROM IETE BANGALORE

IETE Bangalore has produced a large number of very distinguished eminent persons who have held high responsible positions who have made significant contributions to IETE, industry, research, academics, administration & public policy and in many technical domains.

In this feature "**"KNOW YOUR DISTINGUISHED PERSONS FROM IETE BANGALORE"**", we are attempting to recognize all these eminent people.

In this issue we are listing all the eminent people who have held position of Chairperson of Bangalore IETE and have led from the front to make IETE Bangalore as one of the best IETE Centres.

### CHAIRPERSONS OF IETE BANGALORE CENTRE FROM 1960 TO 2020

<b>1960 - 61</b>	<b>Prof. S V C Aiya</b>	<b>1986 - 87</b>	<b>Sri. G T Narayan / Sri. R Somasundaram / Prof. A Kumar</b>
<b>1961 - 62</b>	<b>Sri. S K Kanjilal</b>	<b>1987 - 89</b>	<b>Prof. A Kumar</b>
<b>1962 - 63</b>	<b>Sri. N V Shenoi</b>	<b>1989 - 91</b>	<b>Wg. Cdr. C P K Menon</b>
<b>1963 - 65</b>	<b>Sri. Uma Shankar</b>	<b>1991 - 93</b>	<b>Sri. Avinash Kumar Srivastav</b>
<b>1965 - 66</b>	<b>Sri. C R Subramanian</b>	<b>1993 - 94</b>	<b>Sri. Desikamani</b>
<b>1966 - 67</b>	<b>Brig. B J Shahaney / Sri. G U Menon</b>	<b>1994 - 96</b>	<b>Sri. M G Chandrasekhar</b>
<b>1967 - 68</b>	<b>Col. D Swaroop</b>	<b>1996 - 98</b>	<b>Sri. P Kailasnath</b>
<b>1968 - 70</b>	<b>Brig. S K Malhotra</b>	<b>1998 - 00</b>	<b>Dr. M H Kori</b>
<b>1970 - 72</b>	<b>Brig. B Bhasin</b>	<b>2000 - 01</b>	<b>Wg. Cdr. R N Rao</b>
<b>1972 - 74</b>	<b>Sri. D K Sachdev</b>	<b>2001 - 04</b>	<b>Dr. K Soundararajan</b>
<b>1974 - 76</b>	<b>Brig. N Dayal</b>	<b>2004 - 06</b>	<b>Prof. C Murali</b>
<b>1976 - 78</b>	<b>Prof. B S Sonde</b>	<b>2006 - 08</b>	<b>Sri. G R Joshi</b>
<b>1978 - 79</b>	<b>Sri. U V Nayak</b>	<b>2008 - 10</b>	<b>Sri. R Lakshminarayana Rao</b>
<b>1979 - 80</b>	<b>Sri. U V Nayak / Prof. B S Sonde</b>	<b>2010 - 12</b>	<b>Wg. Cdr. HR Parthasarathy</b>
<b>1980 - 81</b>	<b>Brig. R C Dhingra</b>	<b>2012 - 14</b>	<b>Sri. Rajagopal D</b>
<b>1981 - 82</b>	<b>Brig. R C Dhingra / Dr. R P Shenoy</b>	<b>2014 - 16</b>	<b>Dr. D C Pande</b>
<b>1982 - 83</b>	<b>Dr. R P Shenoy</b>	<b>2016 - 18</b>	<b>Sri. G Ramesh</b>
<b>1983 - 84</b>	<b>Sri. K Swaminathan / Dr. R P Shenoy</b>	<b>2018 - 20</b>	<b>Prof. H S Bhatia</b>
<b>1984 - 86</b>	<b>Dr. S Srikantan</b>		

We deeply appreciate and recognize your leadership & contributions!



**15-09-19**    '**Engineers' Day**' celebrations (Report in this Issue)

**07-10-19**    **Mahanavami / Ayudha Pooja** was celebrated at IETE Bangalore. Wg. Commander (Retd.) Parthasarathi, Past Governing Council Member performed the rituals and members offered prayers.



**14-10-19** IETE Student Forum (ISF) was opened at Dr.T.Thimmaiah Institute of Technology, KGF. Shri. C Satyanandan Hon. Secretary who was the Chief Guest inaugurated the ISF. He explained the benefits that students who become members enjoy and gave details of the activities of IETE Bangalore. He invited students and Faculty members to attend all programs conducted by the Bangalore Centre.

Prof. C Murali Past Vice President IETE and Guest of Honour gave a Technical Talk on IoT and 5G. Principal Dr. Ariff, Dean of Administration Dr. Rukmani Divakaran, and HoD ECE Dr. Palaniswamy participated



**20-10-19** One-Day workshop on "Machine Learning and its Applications" (Report in this Issue)

**22-10-19** Prof. C Murali was the resource person for the open course on 'Electronic fundamentals as applicable to Industrial needs' at BMS Institute of Technology & Management, Bengaluru.

**01-11-19 to 20-11-19:** Institute of Chartered Accountant India (ICAI) Exams were conducted.

**04-11-2019** Prof. C Murali delivered a technical talk on 'Wireless Generations' at RNSIT, Bengaluru.

**10-11-19** Foundation Day of IETE (Report in this Issue)

**19-11-19** Computer Science branch of Sri.Venkateswara College of Engineering organized one day awareness program on AI & ML for Social benefits. Dr. M H Kori was the speaker



## IETE Bangalore's finest hour



The Centre was awarded the 'Best Centre for 2018-'19' prize by the IETE Governing Council. The Trophy was received from the President IETE Dr. KTV Reddy by the Office Bearers of IETE Bangalore on the occasion of the 62nd Annual IETE Convention & International Conference on 'Industry 4.0' at Dr. Ram Manohar Lohia Avadh University, Ayodhya on Saturday 28th September 2019.

### **A Report on Engineers' Day Celebration at IETE Bangalore**

As part of 'Engineers' Day' celebrations a Foundation course on Internet of Things was jointly conducted by IETE Bangalore and C DAC Bangalore at IETE on 15th September. The objective of the course was to bring the students, academicians, research scholars and professionals in the field to share their knowledge, views and ideas on the concepts of Internet of Things.

The course focused on i. IoT Device Technologies: Sensors, Actuators, Gateways, Servers / Cloud computing in IoT / Big Data in IoT

- ii. IoT Protocols: Network Technologies WSNs, Networking protocols, Application protocols.
- iii. IoT Security: Security of devices and networks with resource constraints
- iv. IoT Applications

The lectures were followed by a Panel Discussion among experts drawn from Industry.



The Course was inaugurated by Shri. Shashi Prakash Gupta, Director, HR, ITI Ltd. Bangalore. The function was presided over by Prof. HS Bhatia Chairman. Shri. Satyanandan Hon. Secretary delivered the Welcome address and conducted the program. Shri. CP Dwivedi, Vice Chairman introduced the Chief Guest and Shri. Jagannatha Rao Hon. Treasurer proposed the Vote of Thanks. The function concluded with National Anthem.



The Chief Guest Shri. Shashi Prakash Gupta then inaugurated the IoT Lab installed at IETE. The Lab, where 25 students can work at a time, is equipped with a C-DAC Research Lab kit and Desktop PC's.



Engineers' Day Celebrations were inaugurated in the evening at 5 by the Chief Guest Ms. J Manjula, Director General (ECS) DRDO. The program began with a welcome address by the Hon. Secretary who also anchored the proceedings. Shri. CP Dwivedi, Vice Chairman introduced the Chief Guest. Prof. HS Bhatia Chairman presided and Shri. KS Ravi Executive Committee Member proposed the Vote of Thanks.



The fifth edition of the quarterly journal 'iete bengaluru magazine' was released on the occasion by the Chief Guest Ms. Manjula who handed copies to the senior members of IETE Bangalore. 'Jana Gana Mana' was sung to conclude the function



### A Report on One day Workshop: "Machine Learning and its Applications"

A One-Day workshop on "Machine Learning and its Applications" was organized by IETE Bangalore and International Micro Electronics Packing (IMAPS), India Chapter in association with Dept. of Electronics & Communications, Ramaiah institute of technology, Bangalore on 20th October 2019 at RIT Campus. The inauguration ceremony was attended by Prof. Bhatia, Chairman, IETE, Bangalore, Dr. M.H Kori, Chairman, IMAPS, India Chapter, Dr. S Sethu Selvi, HOD, Dept of EC, RIT, Bangalore, Dr Ashok Rao, Former Professor, IISc, Bangalore, Dr. C.G. Raghavendra, EC member, IETE, Bangalore and Shri. K. Sreedarshan, Assistant Professor, Dept of EC, RIT, Bangalore.

The workshop was focused on training students, faculty and industry experts working in the area of Machine learning. Students & Faculty from Engineering Colleges of Karnataka and Andhra Pradesh, and Industry participated.

During the inauguration, Prof Bhaita talked about effective mutual learning and knowledge sharing. Dr M.H Kori, spoke on the importance of Machine learning, also relating it cosmology and radio astronomy.

The signals which are received from outer space had to be eventually processed and hence processing is of prime importance. He stressed on how interlinking of technologies is important for effective solutions. Interfacing with the help of sensors in mobiles, development of smart cities will lay focus on signal processing. Signal acquisition which requires a strong background of mathematics along with signal storage and processing will indeed be challenging.

Dr. C.G. Raghavendra, EC Member, Bangalore Centre and Shri.K. Sreedarshan, Assistant Professor, Dept of EC, RIT, Bangalore were instrumental in organizing the workshop.



### **12-12-2019 12th International Radar Symposium India 2019 (IRSI-19)**

A Three day IRSI- 19 Symposium was inaugurated on 12th December 2019 at NIMHANS Convention Centre, Bangalore on the theme "Cognition in Radar sensing".

Pre-symposium Tutorials were conducted on 10th & 11th December. Experts from India and abroad gave the presentations.

The Inaugural Session was held from 0900 to 1100 hrs. on the 12th December 2019.

IETE - IRSI awards 2019 were presented on the occasion by Dr. JW Bakal, President IETE who felicitated the awardees. A Radar India Exhibition with participation of key players from the Industry was also inaugurated by Dr. Bakal.





**Dr. JW Bakal, President IETE visited IETE Bangalore on 12th December 2019 at 4 pm.**

On his first visit to the Centre on assuming the office of President, Dr. Bakal was felicitated by the Executive Committee.

On this occasion Dr. Bakal and Executive Committee Members of IETE Bangalore interacted with Dr PV Ananda Mohan, Editor-in-Chief, IETE Journal of Education, resident of Bangalore, who was a Special Invitee, Dr. Ananda Mohan too was honoured with a shawl and memento on the occasion.

### IETE Zonal Seminar

An IETE Zonal (South) Seminar & ISF Congress on 'Smart Engineering for Sustainable Development' was held at Sri Sairam Engineering College, Chennai on 20th – 21st September 2019 under the aegis of IETE Chennai Centre. President IETE and a few members of the Governing Council IETE as well as representatives of South Zone Centres participated in the two-day event.

Prof. KTV Reddy, President IETE inaugurated the program on 21st Sept. 2019

Dr. DC Pande, IETE Governing Council Member from Bangalore gave the keynote address on 20th Sep. on Radar. Prof. HS Bhatia, Chairman and Shri. C Satyanandan, Hon. Secretary represented IETE Bangalore.



# Prof. B S Sonde (27-07-1937 to 09-11-2019)

## Tribute by Prof. H.S. Bhatia, Chairman, IETE Bengaluru

As a doyen of Science and one of the founding fathers of IETE, Prof. Sonde is known to every IETEian. My association with him dates back to as early as 1975.

The great man, resident of Bangalore, was in our midst, talking to us, discussing issues concerning IETE and revealing his sharp mind even just days before his passing away at age 83. Nothing else could shock and pain us more. At IETE meetings we used to refer to him endearingly as the youngest among us; so sharp and energetic was he. The last occasion on which he came to IETE Bangalore was the Valedictory Function of the Summer School in Electronics and Computers on 19th May 2019. He spoke at length about the early days of IETE Bangalore which became a full-fledged Centre in 1969 and recalled how the idea of SUCIE was born in 1972.

On an earlier occasion the same year Prof. Sonde blessed us as our Guest of Honour on the National Science Day 2019



and spoke on the great Sir CV Raman. He regaled the audience with many little-known facts about Raman as well as his great contributions.

Prof Sonde was our guiding spirit. He wrote in the 3rd edition of this magazine an article 'IETE- Past, Present and Future' revealing his deep interest in the institution he helped build. Sadly, he was to leave us a day before we celebrated the 66th Foundation Day on 10th Nov. 2019.

I pay my humble homage to the great soul, who will ever remain in our hearts.

**(HS Bhatia)**

## Reminiscences by Shri. G.Ramesh Immediate Past Chairman IETE Bengaluru

I was shocked to receive a call from Madam Sonde around 7:00 PM on 9th November 2019. Prof is no more. It was the greatest loss to the IETE fraternity and me. The first time I saw Prof Sonde was during an AGM of IETE held at Hotel Chalukya in the year 1984. I was not a formal student of his at IISc, but as a student of IETE I was fortunate to learn a lot from him. He was a great academician, researcher, scientist, an institution builder and above all a great human being. He was always available for all the IETE activities. IETE has provided me an opportunity to study him from close quarters and learn a lot in strategic management. As President of IETE Prof Sonde revolutionized the functioning of IETE. The IETE Student Forum (ISF) was his brainchild. It was because of Prof. Sonde that Bangalore Centre became one of the IETE centres to get Norwegian Government Aid to conduct computer training classes for Urban Needy Women.

Prof Sonde was the Chief Guest at Prof U R Rao Satellite Centre on Satellite Technology Day, May 2019. During his lecture he recalled his association and contributions to Indian Space program as a Member / Chairman of many review committees

(even as Vice-Chancellor of Goa University). Sonde Sir was one of the founding members of IETE Bengaluru Centre and Founder of International Society for Hybrid Microcircuits (ISHM) India Chapter (now, IMAPS). He was instrumental in the setting up of Microelectronics laboratories in public / private sector industries and in R&D institutions. Prof Sonde was also a member of Electronics Commission, Chairman of many academic boards and committees. All those students who have become scientists / Engineers like me in ISRO are immensely indebted to Prof. Sonde. It was because Sonde sir's good offices that ISRO recognized Grad IETE in the year 1985.

It was with the support and blessing of Prof Sonde that I could successfully function as Chairman IETE Bengaluru Centre and the mission is on to make IETE Bangalore a temple of learning and a role model for the rest of IETE.

I join the IETE fraternity and academic and research community in praying the almighty to rest his soul in peace forever.

**(G Ramesh)**

## IoT Laboratory at IETE Bangalore

IETE Bangalore carried out several technical activities in the year just concluded. One such effort was to establish a state-of-the-art IoT laboratory at the centre with the following goals in mind:

1. Technical activities for students:
  - a. Workshops around IoT
  - b. Internship for 3rd and final year students
  - c. Industry interaction with students
  - d. Discussion on actual Case Studies
  - e. Provide Final year student projects
2. Training and Certification programs
3. Access to IoT laboratory for interested students
4. Organise programs for Faculty:
  - a. Faculty Development Program
  - b. Round Table with Industry Leaders
  - c. Provide platform for research work for Faculty to embark on PhD
5. To collaborate with Departments at educational institutes to organise technical events

### Steps taken so far:

1. IoT Laboratory has been established with 10 workstations in a dedicated room
2. The detailed IoT specification is attached at the end
3. A qualified engineer has been appointed as Lab Instructor
4. A number of faculty from Industry experts have been identified who available as resource persons for the events and to provide guidance for projects
5. Two One-day workshop on IoT have been conducted
6. A 4-week student Internship with a certification program has been planned to start in mid January
7. Several other activities planned for the ensuing year and to replicate this activity in other IETE centres also.
8. A strong technical committee is being planned at the centre level to coordinate the above activities.

### IoT Lab Kit - Specifications

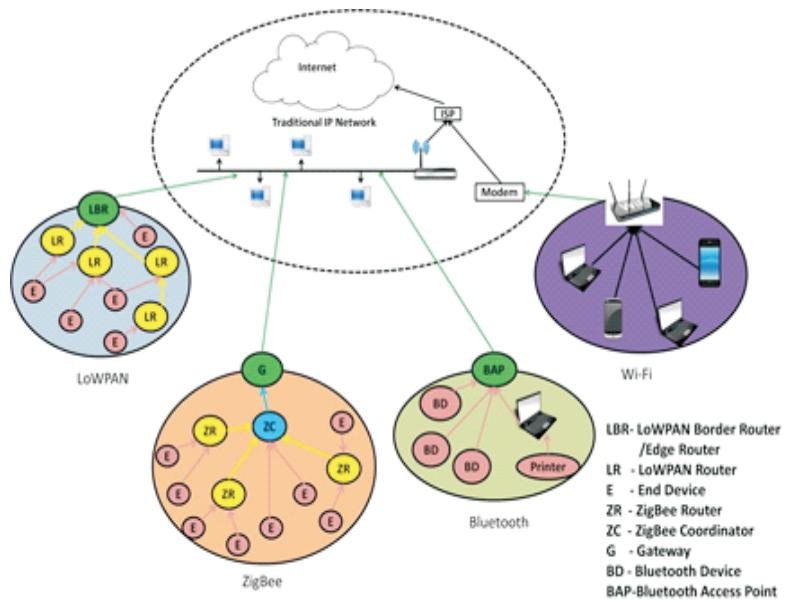
**Brief Description of Product/Solution:** Internet of Things (IOT) provides IP connectivity to various Things apart from Desktops, Laptops and Mobile Devices. The term "THINGS" means any physical parameter that could

be sensed and connected to Internet. For example, a device monitoring temperature and humidity at certain location and relaying the data will become a "THING" in IOT domain.

IOT is a connecting bridge between physical world and cyber world and Machine to Machine communication i.e. with automation as one subset. IOT Refers to uniquely identifiable objects and their virtual representations in an Internet like structure. IOT all together a new environment in which current Internet will be smartly utilized by all new range of embedded connected things.

Sensors are the building blocks of IOT which can collect parameters and low power wireless embedded systems transmit information to gateway devices. Gateway device will make the parameters available over internet so that parameters are globally accessible. Till now there is no dedicated network stack defined for IOT, as it is a heterogeneous network of networks. The most popular protocols used for realization of IOT are ZigBee and 6LoWPAN (IEEE 802.15.4), Bluetooth and Wi-Fi.

Sample network architecture of IOT is depicted below for reference

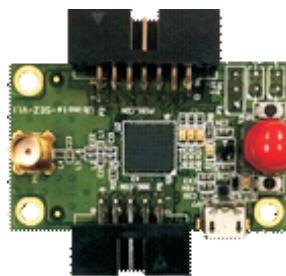


**Main uses and domain:** Comprehensive Lab setup to enhance the skills of students, researchers and academicians. The lab kit comes with various nodes supporting different protocols and Gateway. Also comes with a lab manual to streamline the learning process on various communication technologies and networking topologies. Also comes with Required Software and APIs to interface sensors to plug and play with nodes in implementing newer algorithms.

### Features and Technical Specifications:

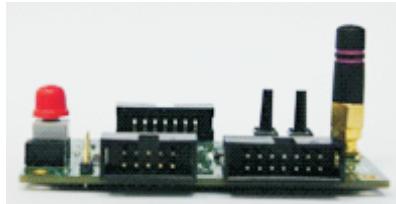
#### **WINGZ (Wireless IP Network Gateway for ZigBee)**

- ARM Cortex-A9 application, up to 1GHz
- 1 GB/2 GB DDR3 SDRAM, 4GB/8GB onboard eMMC flash memory
- External Micro-SD card support (up to 32GB)
- Onboard Gigabit Ethernet, USB 2.0 with OTG Support
- Supports various Serial Communication protocols like SPI, I2C, UART, CAN
- High Definition Video Output through HDMI Port and 7" LCD with capacitive touch panel
- High quality Stereo audio codec with 3.5mm audio port for Audio In/Out
- High Range IEEE802.15.4 (ZigBee/6LoWPAN) Transceiver (upto 22dBm Tx power)
- WLAN (IEEE802.11b/g/n), Dual mode Bluetooth (BLE), 3G, GPS
- Temperature & Relative Humidity Sensor, Digital Ambient Light Sensor and 3-Axis Digital Accelerometer
- Linux, Android



#### **Wi-Fi mote**

- High-performance ARM Cortex-M4 MCU



#### **Ubimote**

- Highly integrated IEEE 802.15.4 System on Chip with ARM Cortex M3 microcontroller with 32kB RAM, 512kB Flash
- Modes of operation as Coordinator, Router and End device
- Intelligent power system with rechargeable lithium polymer battery and solar energy harvesting
- State of the Art Security Engines for RSA, SHA2, AES and Random number generator.
- Expansion headers for connecting UbiSense and External Sensors
- High range variant for Longer coverage area

