

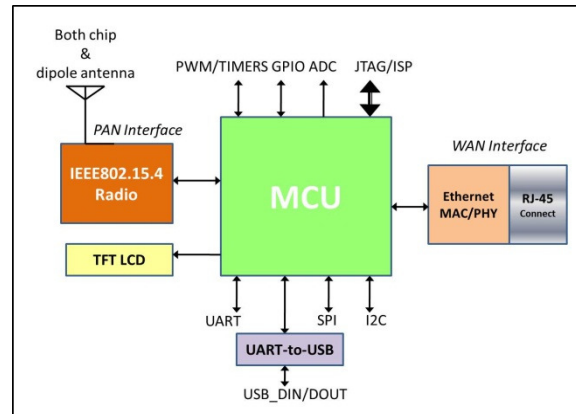
Zigbee to Ethernet LAN Gateway for Wireless Sensor Networks

Dwara™ is Indrion gateway platform for converging all or any low range personal area networks (PAN) to wide area networks (WAN) leading to ambient intelligence based wireless sensor network applications/controls outdoor.

Features

- Traffic convergence from IEEE802.15.4 ZigBee to Ethernet networks & vice versa
- Data acquisition, configuring, debugging, on-chip serial port access from PC and many more simply via on-board USB interface
- Support for embedded Free RTOS
- Supports 6LoWPAN stack
- Support for dual TCP/IPv4 & IPv6 stacks
- Tool chain supported are ARMGCC(Yagarto)
- On-board TFT display available
- Ability to work as router in mapping Sensor Network to WAN
- Ability to administer activity of wireless personal area networks
- Ability to indigenously manage localized sensor & actuator networks

Block Diagram



Target Applications

- As gateways in
 - ✓ Smart homes & offices
 - ✓ Residential townships
 - ✓ Shopping malls
 - ✓ Community places like airports, railway stations, multiplexes etc.
 - ✓ Factory space

Highlights

This Dwara™ platform (DP) embarks as one of the few wireless sensor network (WSN) platforms to build real world, low cost, self sustaining sensor network applications and solutions.

The hardware architecture of Dwara is thoughtfully planned & built with processor, interfaces options, memory footprint, user controls all suiting to build a complete & sustainable ecosystem for WSN. It's consistency with all wireless sensor motes in Indrion's development platform (IDP) necessitates fast & easy development of a complete WSN ecosystem based on wireless ambient intelligence.

The heart of the DP is the ARM MCU core *STM32*. This is a 32-bit core computing unit with 128 KB in-system programmable flash while the personal area based sensor network interface on one side comes with low-power IEEE 802.15.4 Zigbee radio chip *CC2520* and WAN interface is provided by integrated Ethernet MAC/PHY chip *ENC28J60* on other side.

Table 1: Summary of characteristics – Dwara™ STM32 ARM based gateway platform

Component Characteristics	Specifications	Comments
Microcontroller	STM32	
Performance	MIPS throughput	
In-system programmable Flash Memory	KB	
RAM	KB	
Configuration EEPROM	KB	
Operating Voltage	V to V	
Current consumed	mA mA	

Component Characteristics	Specifications	Comments
Programming Interfaces	ISP & JTAG	
PAN Transceiver		Part # CC2520
Radio Protocol	IEEE 802.15.4 Compatible	
Operating Frequency Band	ISM 2.4GHz	
Data rate	upto 250 Kbps	
Current consumed	18.5 mA (Rx) 33.6 mA (Tx)	
Receiver sensitivity	-98	In dBm (1% packet error rate)
Supported network topologies	Point-to-point, Point-to-multipoint, Peer-to-peer & Mesh	
Outdoor range	75~100 meters	
Indoor range	20~30 meters	
WAN Transceiver		Part # ENC28J60
Protocol	Ethernet	
Data rate	upto 10Mbps	
Tx/Rx Current consumed	180 mA	
Software		
Embedded OS	Free RTOS	
Protocol stacks supported	6LoWPAN (WPAN) TCP/IPv4/IPv6 (WAN)	
Tool chain	ARM GCC(Yagarto)	
Others		
PC Interface	via UART -to- USB	
User Interface	TFT display	



Snapshot of Zigbee to Ethernet LAN Gateway for WSN

Programmers & debuggers supported

Are available as a separate module on request. Contact Indrion for the same.