

Very first step for Smart Grid! Wireless Green Energy Meter with ZIGbee Solution

by J&D Electronics

Dream comes into reality in field of Smart Grid by J&D. They show new wireless green energy meter (Wi-GEM) to create most effective, economical and convenient energy saving device.

International society thinks main reason of global warming is CO₂. Recently many companies and factories are asking for a policy which can control CO₂ emission and a new technology to reduce energy usage. Actually this requested technology has developed long time ago, but this technology couldn't come into wide use since installation and wireless technology were so complicated.

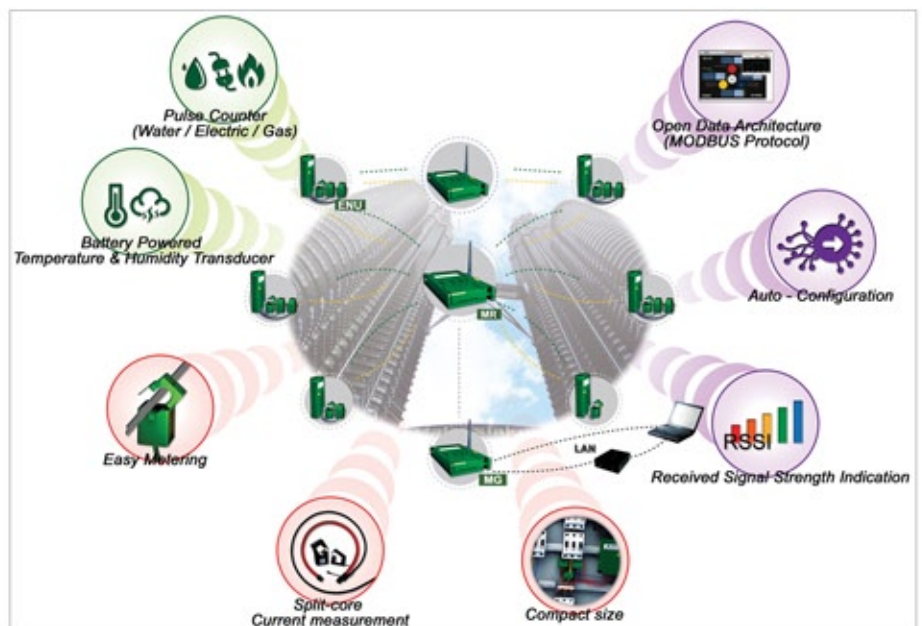
The managing department of company and factory has asked energy consumption data for each process line, division and facility, but the request was not satisfied easily because of wire communication. If you choose wire communication, the cost of wire and conduit installation, recovering interior will be higher than Wi-GEM price.

To reduce these problems, the other wireless watt-hour-meters were already released to market, but market volume is not activated yet because price is still too high. Therefore, as a solution, J&D is developing and launching a new Green Energy Wireless Watt-Hour Meter (Wi-GEM) which has better economic price and performance. Wi-GEM makes very effective management to reduce CO₂ emission and good policy of energy consumption. Wi-GEM is accurate measuring and monitoring system even at instant burden changing situation to use Split Core Current Transformer and Clamp-on Rogowski Coil. Any power outage doesn't occur in field of office, industry, factory or electric facility. Wi-GEMs main features are compact size, wireless system and simple installation with DIN rail and auto IP detecting. It measures instantaneous low voltage and over current so it makes very precise measurement of usage of power during operating instant motor or electric welding machine.

Wi-GEM meets IEC62053-21 and active accuracy is class 1.0. Zigbee network supports not only advanced Mesh Network but also 1 : 1

solution. Wi-GEM consists of several node steps. Mostly simple configuration is 1 EMU, 1 MG and 1 computer for monitoring. When you need more complicated configuration, you can install several MR between EMU and MG. EMU's main function is collecting and keeping electric energy information and transfers to either MR or MG. MR performs transmission to make good communication between EMU and MG. MG performs as electric information gateway to pass collecting information from EMU to computer.

Please take a look at these 3 elements as below.



■ EMU meets IEC62053-21 and measures active/reactive power and cumulative energy. It supports MODBUS communication protocol. Power supply uses SMPS and operating voltage is AC 90V to 440V. Supplied and rated current are 5, 20, 50, 100, 200, 500, 1000, 2000, 5000A.

Wi-GEM wiring supports 3 kinds such as single phase, 3phase-3wire delta, and 3phase-4wire and it is possible to install on uninterruptible power supply by using Split Core Current Transformer and Clamp-on Rogowski Coil. It is mounted to DIN rail and makes easier installation. You can measure voltage, current, active, reactive energy, demanded power and frequency with EMU. Instant low voltage and over current are also possible to be measured.

Interval Based Values Configurable Reading Interval (5-30 min)														
	Interval Values (KW/KVAR/KVA)									Accumulated Values (KWh/KVARh/KVAh)				
	L1			L2			L3			SUM	L1	L2	L3	SUM
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max					
Current (A) rms														
Voltage (V) rms														
Active Energy (KW/h)														
Reactive Energy														
Apparent Energy (KVAh)														
Power Factor (PF)														
Frequency (Hz)														

- Providing general atmosphere for surveillance, analysis and control of energy facility
- Saving energy and environment contribution about CO2 emission

As a couple of accessories with Wi-GEM, Linearity Split Core CT and Clamp-on Rogowski Coil are developed by J&D for voltage and current monitoring with high accuracy.

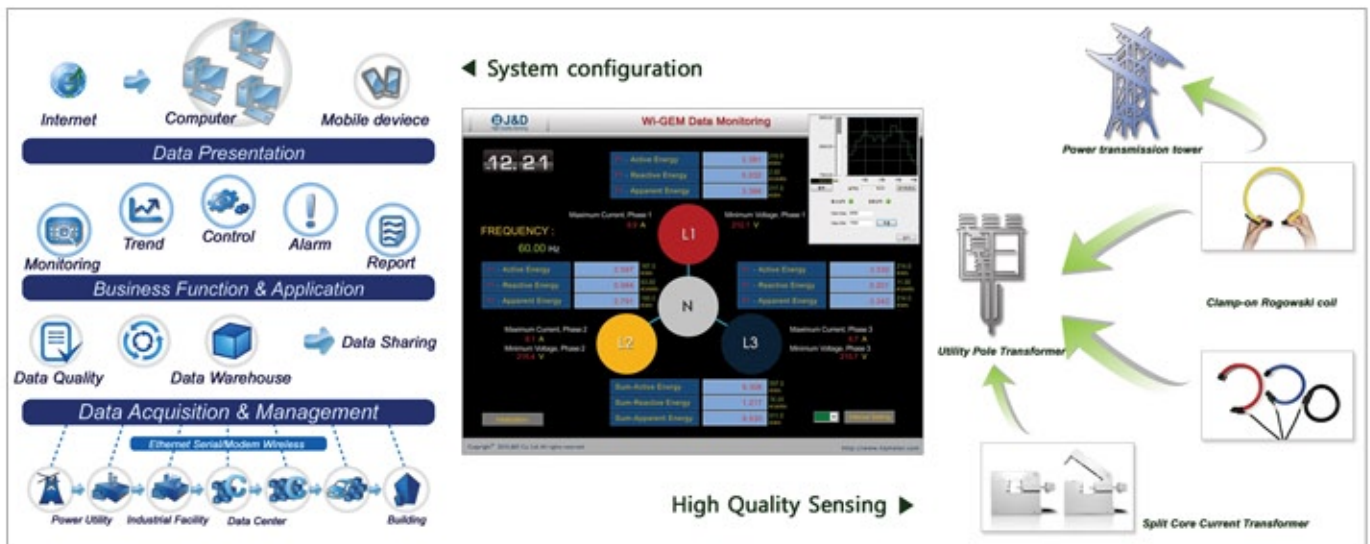
With 2.4Ghz Zigbee Network which is possible to address up to max. 65,000 installation, Wi-GEM can transfer collecting data from EMU to each personal PC in the office. You can check transferred data by monitoring software of PC. Measuring and logging period of these data can be set 1, 5, 6, 10, 12, 15, 30min.

■ MR(Mesh Router) is installed between EMD and MG to amplify with data and it expands data transferring distance and makes higher credibility between data. MR detects MG(Mesh gate) automatically and makes child node up to 8. Output applies for 2 kinds, such as standard (1mW) and extend(10mW) type and it builds up to 4 depth of Zigbee network. It also gives RSSI and HOPS Network information.

■ MG helps transferred data collecting from EMU to be available monitoring on PC. Data communication uses MODBUS protocol and supplies RS232 and RS485 interface. Wi-GEM-EDM (Energy Dash board Management) Solution forms in Wi-GEM-HMI, RDBMS and application software. It provides information for energy efficiency improvement and analyzing data based on collecting and saving data function in real time.

Smart Split Core Current Transformer is made up standard inner diameter such as 25Ø, 40Ø, and 65Ø. Its accuracy is 0.5% from 50mA up to 2000A. As main advantages, it is designed to know artificial opening problem on split core CT from outside and to find out easily harmful material problem on cutting side of Split core CT. It is very suitable for monitoring and measuring of sub-metering, PLC transformer equipment (PTE) and utility pole transformer application. One tip, it can be provided with lid on split core CT and VT for voltage monitoring as option if required from customer.

Clamp-on Rogowski Coil is made up standard inner diameter such as 40Ø, 65Ø, 120Ø and 150Ø. Its accuracy is 1.0% from 1A up to 20,000A. Standard length of Clamp-on Rogowski Coil for metering and over current monitoring are 40Cm, 60Cm, 100Cm and 180Cm. Various power and current monitoring are possible current range from 0.5mA to 100KA. As main advantages, it improves accuracy highly by advanced winding technology and excellent safety from external magnetic field. It has several colors such as red, blue, yellow and black for easy monitoring of R, S, T, N phase. As applications, it detects lighting damage by leakage current of power transmission tower and supplies optimized



■ Main application of Wi-GEM
 Wi-GEM utilizes management such as servermanagement of internet data center (IDC), generated energy, controlling loads, instant loads, monitoring of energy usage in factory or office.

monitoring and controlling function for leakage current, power plant, substation, panel board, SCADA system and utility pole transformer.

- Efficiency of business improvement and reducing extra energy cost
- Optimized utilizing of energy and saving operation cost
- Supplying smart layer of energy assets



ABOUT THE AUTHOR :

Wang Sam Jang is the Chief Executive Officer of J&D Electronics.

ABOUT THE COMPANY : Founded in 1994 on the principles of best-quality and efficient development, J&D Electronics has been providing customers with ideal solutions and is a global leader in Split-core Flexible Rogowski Coil Current Transformers and Split-core Flexible Rogowski Current Transducers.

www.hqmeter.com / sales@hpsensing.com