

INDUSTRY 4.0 WITH YOUR '1AM' SMART METERING SOLUTION

J&D brings you its new brand '1AM' or first advanced metering system, with a compact CT-integrated smart meter flexible enough to accommodate various communication methods.

Leading global electric companies face many issues as they build smart grid systems for their customers. It is required that they use smart meters, which feature advanced metering technology along with the flexibility of various communication methods.

New regulations, in addition to the current electricity metering standards, are inevitable in order to have more effective smart grids. Therefore, many countries are working to improve the rules and regulations regarding the specification and standards of electric metering. For instance, Korea Electric Power Corporation (KEPCO) and the smart meter certification organisation in Korea are working together to add new standards for smart grid technology to the existing electric metering standards.

In order to drive the transition forward, J&D is releasing an innovative smart metering system. Instead of trying to integrate a

CT inside of the meter, J&D has done the opposite, integrating a complete smart meter into a split-core CT. Together with the external wireless gateway converter module (GCM), this new system simplifies the job of next-generation electric power companies.

CSSM – current sensor smart meter

The CSSM is a split-core CT with an entire smart meter inside. In addition, it allows the electric company to specify the communication method via the gateway-converter module (GCM).

The CSSM is available in a wide range of amperage ratings from 5A to 400A upon request and can be connected to up to 32 single phases using RS485. It uses the DLMS protocol over RS485 communication. The CSSM receives the voltage data from the GCM via RS485 and adds the voltage data to the current data measured directly by the CSSM to calculate energy consumption (Watt-hours) in real time. Via two-way communication technology, the measured data is transmitted to the GCM, which communicates with the host system through its built-in wireless

communication module. The most outstanding function is that multiple CSSMs could transmit all the measured data at once to a single GCM via a RS485 connection.

In addition, since the CSSM is a split-core CT, it enables fast and easy installation without cutting the existing power lines. Furthermore, the CSSM has a compact design, which makes it possible to install it in cramped spaces or within existing distribution boards.

GCM – wireless gateway-converter module with high flexibility for communication

GCM not only supports LTE wireless communication, but also offers various communication options including LoRa, Modbus, Wi-SUN, ZIGBEE, RF-MESH, PLC and GPRS, which can be installed upon request. Moreover, because it uses an open protocol, it can be integrated alongside other communication methods already in place. GCM has been drawing customer attention with its user-friendly features such as wide communication options and open protocol support.

Consequently, electric power companies using CSSM and GCM will be able to save time and cost when installing and implementing smart metering systems. In addition to energy bill calculations, it performs highly accurate and effective monitoring, based on the real-time energy consumption data transmitted by wireless communication. These advantages make it an excellent solution for setting up next-generation smart grids.

Suggesting a new concept for smart meters to global energy industry, J&D would like to cooperate with the electric power companies which are willing to advance the current electricity metering market to the next level.

Advanced AC/DC power monitoring system JAGUAR 2000 and JHAO-SD series

The high AC energy, supplied from the power utility company, is converted to the lower DC or AC energy to be used for trains or stations. With the existing power monitoring



CSSM with GCM overview diagram for multi-family and multiplex housing and electric cars



AC/DC Monitoring System for Traction & Trackside

system of railroad industry, it was required to install different types of electric meters for each measuring point. Therefore, there has been market demand for advanced power monitoring which enables to calculate the accurate electricity bills and diagnose the condition of entire system, by measuring power factor.

In order to meet the needs of the railroad industry, J&D has developed the AC/DC meter JAGUAR 2000 as a joint work with Mars-Energo, the leading instrument manufacturer in Russia. JAGUAR 2000 can measure AC and DC at the same time, without using any external equipment. It helps power utility companies save time and cost when installing and implementing the meters in their railway systems.

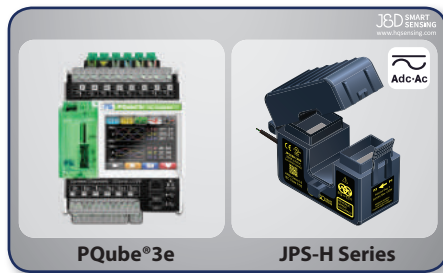
In addition, J&D has launched split-core AC/DC CT, JHAO-SD series as an optimised accessory for JAGUAR 2000. Since JHAO-SD series applies the Hall effect technology, it can directly measure AC or DC current without any external equipment or setting. Furthermore, its split-core type structure enables easy installation

on the existing power lines. J&D also has a patent registered for the minimisation of position errors for JHAO-SD series.

As a next-generation railway power monitoring system, JAGUAR 2000 and JHAO-SD series are being implemented for test operation in South Korea and Russia.

JPS series delivers the best certified power analysis in combination with PQube 3e.

Recently, J&D launched PQ-CT, the new split-core CT brand for JPS and JPS-H series. The JPS series has 0.2S / 0.5S class accuracy,



making it optimal for use in revenue grade and power quality monitoring – the key benefit of the PQube 3e. In addition, the JPS-H series can measure AC and DC at the same time.

The PQube 3e is truly an ultra-accurate power quality analyser from Power Standards Lab, with Class A certification as per IEC 61000-4-30 Edition 3. When connected with PQ-CT, the PQube® 3e complies with ANSI/IEEE C62.41 C3 and B3 standards, and meets Class 0.2 revenue grade accuracy.

Additionally, the PQube 3e can be used to monitor four three-phase loads, 14 single-phase loads, or any combination. It can also measure sag, swell, voltage interruptions, harmonics up to 50th, THD, flicker, imbalance, in-rush currents, 4-quadrant energy and much more. Further, the PQube 3e offers high-frequency sampling up to 4 MHz for impulse detection and event-triggered recording features for most of the parameters, making it an excellent device to analyse power quality.

The PQube 3e communicates via Ethernet, supporting various protocols such as Modbus/TCP, SNMP, FTP/HTTP, NTP/SNTP and also secure protocols FTPS, and HTTPS.

Combining the PQube 3e and JPS series is the best solution for renewable energy smart metering, sub-metering, internal motor monitoring, and many other applications. ■

Remarkable features

CSSM + GCM	JAGUAR 2000 + JHAO-SD series	PQube 3e + JPS / JPS-H series
<p>Current Sensor Smart Meter</p> <ul style="list-style-type: none"> • Split-core CT with an entire smart meter inside. • MAX 32 single-phase loads • DLMS protocol over RS485 communication method • Communicating with GCM via RS485 to transmit the all measured data <p>Gateway-converter module</p> <ul style="list-style-type: none"> • Various communication option: LTE, LoRa, Modbus, Wi-SUN, ZIGBEE, RF-MESH, PLC, and GPRS • Modular structure to meet different demands (e.g. pre-paid electricity billing, communication methods etc.,) 	<p>JAGUAR 2000</p> <ul style="list-style-type: none"> • Measuring AC and DC energy at the same time, without any external device • Various connection supports: USB, Ethernet, RF module • Built-in voltage divider up to 3000V • Measuring range up to 7500A <p>JHAO-SD series</p> <ul style="list-style-type: none"> • Using Hall effect technology - to measure AC or DC current without external setting • Minimized position error - Patented • Wide measuring range up to 8000A 	<p>PQube 3e</p> <ul style="list-style-type: none"> • Using with JPS / JPS-H series, it complies with ANSI/IEEE C62.41 C3 and B3. • 4 three-phase / 14 single-phase loads • Class 0.2 revenue grade accuracy • Measuring range from 1A to 6000A <p>JPS series + JPS-H series</p> <ul style="list-style-type: none"> • JPS series: 0.2S / 0.5S class accuracy, available to use for revenue grade and power quality monitoring • JPS-H series: Hall effect technology used available to measure AC or DC current without external setting



ABOUT THE AUTHOR

Wang Sam Jang is the CEO of J&D Electronics. He is a pioneer who makes an effort to invent innovative high performance products with endless challenge and passion, contributing to the great progress of the smart grid industry.

ABOUT THE COMPANY

Since 1994, **J&D Electronics** is a worldwide leader company for developing high performance sensor technology in the smart grid industry. J&D serves as a specialist of OEM/ODM and has customers in USA, Europe, South Africa and Asia. J&D will contribute to invent best quality products for the smart grid market.