Matter Announces Faraday a New Genre of Solar ENERGYsensor for the Internet-of-Things, that also fixes Wireless Dead Zones

- *Solar for Rentals, Digital Solar, Battery Storage and Energy Trading all require energy sensors to communicate energy measurements reliably in real-time;*
- *To reduce installation costs and time, some companies, install wireless energy meters that use Wi-Fi, ZigBee or 3G into electrical meter cabinets;*
- *The elephant in the room for many tech companies selling wireless meters is "Wireless Dead Zone" (WDZ) – wireless is problematic;*
- *Electrical cabinets are notorious for being wireless dead zones (WDZ) due to the 'Faraday Cage' effect - increasing installation costs and causing end-user frustration due from intermittent communications;*
- *Matter's Faraday a new kind of ENERGYsensor that measures energy accurately in real-time and reliably sends data over electrical wires (instead of wireless) using PLC eliminating the wireless dead-zones and avoiding running new wires;*
- *As well as reducing the cost and time to install solar monitoring and measurement Matter is sparking OEM Interest in Faraday.*

Matter has announced the much-awaited super intelligent energy nano-meter - the Faraday. It is a Power Line Communication (PLC) ENERGYsensor that is used for monetization of energy applications. It improves reliability and reduces the cost of installing intelligent solar energy meters. Faraday makes it faster and cheaper to install and measure Solar, Grid, Battery and Blended Energy. It fast tracks 'Solar for Rentals'. It can be used for Energy Trading applications. The Faraday is another world's first innovation for Matter.

Melbourne, Australia — July 18th 2017 — Matter Technology today announced the Faraday - a new kind of internet-of-things nano-size ENERGYsensor that can be used with its very popular 'Solar for Renters' service making money for property investors and tenants. Matter as part of a major announcement will officially launch Faraday at the Australian Clean Energy Summit in Sydney 19th July.

Matter has invented a new class of power meter that will lead to significantly lower costs for digital solar & battery real-time monitoring. Until now customers

either had a choice or either wireless or data wired meters. The Faraday is unique in that it uses Power Line Communications (PLC) to communicate avoiding WDZ (Wireless Dead Zones). PLC is a plug-and-play digital technology that uses the home's or business' existing power line to create a data network that's faster and more reliable than wireless technologies like Wi-Fi, 3G and ZigBee from within electrical cabinets. PLC significantly improves the reliability and security of communication of connected IoT devices in hard to reach spots like a basements, carparks, meter-boxes or electrical distribution-cabinets.

To establish a network between the Faraday and Matter's ground-breaking IoT 4G gateway the installer simply installs the Faraday onto the same power line as which the Matter IoT gateway is plugged into. A LED says, "I am connected". That's it and you're done! It really is plug and play.

Matter PLC technology opens up completely new options for transitioning solar and battery systems into the digital Internet-of-Things world. The Faraday is generating interest among OEM in the solar & storage industry. The approach Matter has taken is so original that Matter had to work closely Australian testing labs to devise new ways to certify the product class for sale in Australia.

ELIMINATING A MASSIVE INDUSTRY PAIN-POINT "WIRELESS DEAD ZONES"

What does Michael Faraday from the 1800s have to do with the internet-of-things, solar power and battery storage? Ironically an enclosure used to block wireless signals is called a Faraday cage and Matter's latest product that punches-out of this "cage" is also called Faraday.

Sadly, for Installers electrical meter-boxes and electrical distribution cabinets are built very much like faraday cages. Installing a wireless meter inside such a cabinet means that the meter will not be able to communicate well, or it will be impossible for it to communicate. While wireless sound like a great idea in practice it doesn't work really well in the environments where meters are typically installed.

The size of the hidden problem is considerable. There are 11,000 solar installations a month in Australia, and many of these are digital solar. Wireless-

Dead-Zones can increase the time to do an install by up to 2 hours. If all solar installs had Wireless-Dead-Zones that's 1,400 days of lost productivity a month. The customer pays for this. A WDZ makes an Installer's job harder and frustrating. So, Installers charge more for wireless to allow for the extra time that may be needed. To get around the problem of WDZ Installers sometimes run an antenna (if possible) to the outside of the meter box. For many devices, this just isn't practical. All this extra work means more things that can go wrong and additional expense. Having antenna wires running inside cabinets decreases safety and they can be accidentally disconnected by other trades working in the cabinet later.

And of course, when the cabinet is located in a bad signal place within the building (which they usually are) running an extra antenna will not work. All this adds costs, which points to poor service, reliability and eventually increased frustration and poor user experience.

This 'wireless-dead-zone' pain point is what drove Matter to invent the PLC ENERGYsensor, we named it the "Faraday". The fact that it is also a much cheaper option than most wireless meters makes the Faraday an easy first choice for solar or battery storage real-time measuring and monitoring.

"Many construction materials like concrete or bricks, and typical building layouts have always been a challenge when trying to establish reliable wireless data networks like 3G, Wi-Fi or ZigBee from the meter box," said Chris Mrakas CEO Matter *"the Faraday provides a solution for this because it utilizes a new break-through PLC technology to achieve more reliable and secure performance".*

Mrakas also added, *"Meter cabinets or electrical distribution boards with obstacles such as interior walls, solid exterior walls, metal studs and multiple floor levels really push wireless networks by reducing their signal strength. Matter's Faraday will be a big hit with those sites that have 'wireless-dead-zones', like metal meter boxes, electrical cabinets or solid walls".*

We have listened to the "Tradies" (electricians, solar installers) pain-points and appreciate their frustration when installing wireless meters inside electrical cabinets. So, after a year in research & development Matter has eliminated one of the industry's biggest unseen notorious problem – the wireless dead zone. By

eliminating WDZ, Mrakas says, Matter's ENERGYsensor would make it possible for solar installers to reduce the time and problems associated with installation of meters.

HOW IT WORKS

Matter's Faraday measures solar power and it is a very advanced special kind of energy sensor that has its own special computer module on board. After doing some complex calculations to work out measurements the Faraday sends the energy measurement data through the home or businesses electrical wires. It uses the power lines as data communication lines for the internet-of-things. The Faraday can talk and listen using this new exciting plug-and-play PLC technology. So, there is no need to run new wires or drill holes in walls to install data cables like Ethernet. Matter's power line technology creates a sophisticated secure network automatically to eliminate weak signals or wireless dead zones and provides reliable secure internet-of-things connectivity.

Now mains powered internet-of-things devices using Matter's technology can communicate in the hardest-to-reach areas of your home or business.

"As the number of connected devices in the smart home increases, so does the demand on the home network for reliable secure connectivity for internet-of-things. There are areas in the home where wireless signals suffer due to building materials and you don't really want to put holes through walls to run wiring, potentially hitting plumbing or electrical wires" said Chris Mrakas, CEO Matter. *Matter's Faraday PLC ENERGYsensor addresses these challenges so you have connectivity where you need it, and at incredibly fast reliable speeds. And plug-and-play setup is easy and fast reducing installation costs and time"*

HOW IS THE FARADAY INSTALLED?

The electrician simply installs the Faraday into an electrical cabinet and plugs-in the companion Matter IoT gateway into the power-point on the same circuit as the Faraday in the house. They can locate the Gateway using its signal strength LED indicators to identify the best electrical outlet for placement. As Faraday can easily talk for up to 100 meters this should not be a problem. The data connection

to the Faraday is able to leap through cabinets, walls and floors, putting an end to dead zones even in basements and other hard-to-reach areas.

One Matter IoT Gateway with PLC can support many Faradays talking on one circuit, theoretically up to 128 Faradays. While most homes don't need that many circuits monitored it's good to know that you can have lots of Faradays at one site. The most Matter expect in a residential site is 10 circuits, and this is what is recommended. The average Solar for Rentals site with battery storage requires three circuits that is one Faraday. Dual occupancy requires can require six circuits (two Faradays).

Each Matter's IoT Gateway talks on one circuit is able to support many Faradays so you can monitor as many power circuits as you need wherever you need. We recommend using no more than 10 Faradays. One Faraday can monitor up to three single-phase circuits or a set of three phase circuits. That's up to 30 circuits in a home or business.

The Faraday PLC ENERGYsensor is among the exciting innovations for smart homes & the internet-of-things that Matter has engineered and built.

The PLC ENERGYsensor can meet the needs of families and small businesses it comes with
- Plug and play configuration with no setup required.
- 128-bit AES encryption for secured data
- A range of up to 100 meters over existing electrical wiring
- 10 Faradays (30 Circuits) per IoT Gateway with PLC
- ARM® 32-bit Cortex™-M4F CPU

THE FUTURE

The Faraday is the first product use-case that uses Matter's PLC technology. Faraday uses the industry standard G3-PLC® (ITU-T G.9903) operating in CENELEC A band in Australia.

Matter's IoT gateway can communicate using LTE 4G Cat-1 to Matter's cloud can also communicate inside the home using Wi-Fi, Ethernet and ZigBee.

A new gateway variant has PLC enabled to communicate with the Faraday. This means future IoT product uses cases will be able to communicate with Matter's Gateway without wiring. This now opens up lots of future pathways for Matter product road-map for new and exciting internet-of-things devices. And for Matter's partners such as inverter and battery storage manufacturers (OEM).

We are expecting to see Faraday's PLC technology being incorporated into solar inverters and battery systems by manufacturers. We have started to reach out to speak with leading manufacturers (OEM) to partner with Matter to incorporate Faraday's into their product line-ups. Grid companies (Poles & Wires Businesses) if given permission by Customers with "secret keys" can also connected to the Faradays to obtain energy data from outside the site. This opens up new commercialization opportunities for the poles & wire companies to do things that were not possible because of the limitations of WDZ. Matter is bridging the home into the smart grid.

Matter's Faraday Three-phase Series

The Faraday Three Phase Series is a cost-effective building block for energy monitoring and management solution for properties with applications in Solar for Renters, Digital Solar and Energy storage. Faradays stand tall when you have wireless-dead-zones and you require fast installation and a reliable service.

Matter's Faraday is a power-line networked electricity sensor based on the robust industry G3-PLC® standards. G3-PLC is used in the smart-grid and supported globally. This technology is an important part in enabling households and building owners to monitor power production from solar and consumption in real time - securely and accurately. It supports battery storage as well.

Faraday series energy sensors support single-phase three-wire and three-phase three-wire systems. One Faraday can accurately monitor three circuits with a high degree of accuracy. The Faraday also support a flexible power supply compatibility of AC 110-240V which means that it can be used internationally. User can be able

to monitor the status of device via the LED indicators on the front panel easily. Integrates into Matter's IoT Gateway for back to the cloud connectivity using either LTE/4G Cat-1 or Internet available at the site via a router.

"Matter had to collaborate with testing labs in Australia to devise unique tests for the Faraday because testing such a product genre never been done before. We are really proud of our engineering team they have excelled at delivering an outstanding product" Mrakas said.

Comprehensive Measurement Capability

Faraday support comprehensive measurement functions including Active Power (W), Total Accumulated Electricity Consumption (kWh), Interval Electricity Consumption (kWh), Voltage (V), Current (A), frequency (Hz), Power factor (PF), Reactive & Active power, Reactive and Active import energy, Reactive and Active export energy and phase measurements. It has been designed to intelligent services to monitor solar and battery storage. All measurements in the Faraday are 'buffered' within the Faraday for a considerable period of time as extra precaution and integrity.

Out of the box the Faraday comes with high measurement accuracy it supports Matter's 'Solar for Rentals', Digital Solar, Battery Storage. Solar for Rentals a service that allows property investors to sell solar power to their tenants.

The Faraday ENERGYsensor allows users to monitor energy usage and take precise measurements for real-time usage profiling, machine learning and data mining analysis. This is an important step in adjusting energy behavioral patterns, ultimately saving money, creating value and reducing grid energy consumption. The Faraday allows you to measure the energy usage or production of devices anywhere in your building.

High Measurement Accuracy

Faraday is capable of measuring very small energy production, flows and consumption up to 0.001kWh, allowing users to monitor every moment of

energy. Its measurement accuracy is in the range of ± 1% (At PF=1.0, based on rated current).

It has been designed for use cases requiring accuracy for monetization use case like Solar for Rentals, Battery Storage Monetization, Energy Trading and Digital Solar.

Features

In addition to the conventional real-time remote solar energy metering the Faraday fully supports a set of advanced functions: bi-directional communication, over-wire-updates, data encryption and remote commands. 6loPAN (Ipv6 over 802.15.4), supports Point-to-Point or Mesh and AES128/256 encryption for data transport.

Power line communications (PLC)

Faraday uses existing electrical wiring in a building as the data network cables.

This is known as Power Line Communications (PLC). Which means no extra wiring is required. The data network can be extended into new places without adding new data cables reducing installation costs and delays.

Faraday is typically installed in a meter cabinet and will automatically detect and speak with Matter's IoT Gateway over the existing electrical wiring. Matter's IoT Gateway are plugged into a wall socket and automatically creates a network connection via the electrical wiring in between the wall socket and Matter's Faraday ENERGYsensor. This adds no new wires.

A PLC connection has many advantages of a wireless connection and can extend the range quite significantly. The quality of the connection still depends on the quality of the electrical system and if there are line filters that distort the signal on the power line this may prevent the Faraday speaking lengthy distances. Faraday uses G3-PLC® (ITU-T G.9903) industry standard commands operating in CENELEC A band in Australia.

The Faraday series is a compact-sized smart energy sensor, which can be used as a standalone unit. Faraday is a high quality and reliable smart technology for electricity metering of solar generation, its consumption, export and storage.

For more about Matter, please visit http://www.matter.solar/

Availability

Faraday will be available from 1st August 2017

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About Matter

Solar panels collect energy. Matter lets landlords sell it.

Matter is an Australian-based technology start-up and the emerging leader in 'Solar for Rentals'. Matter is redefining the way consumers and businesses buy energy and how property investors make more through such leading product and service innovations. Matter's service enables landlords to earn money from solar by charging their tenant for daytime electricity generated from their roof. For tenants this means lower prices, clean electricity and more in their pocket. Matter's goal is to use technology to help make energy cheaper and cleaner for everyone whilst putting more in property investors pockets. Matter's advanced platform delivers outstanding experience to tenants who are unwilling to compromise on service quality and value.

For more information, please visit http://matter.solar