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Smart Energy IoT Solution

TIDE

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AMI(Smart Metering) Platform

Smart City Platform

Energy IoT Platform

kepco TRUSTED PARTNER

Tide Co., Ltd.

5F, 115, Seosomun-ro, Jung-gu, Seoul, Republic of Korea
Tel : +82-2-6673-0930 / **FAX :** +82-2-6673-0968
Contact : Peter Jung / Director
H.P : +82-10-2364-7606
Email : peter@tidekorea.com
http://www.tidekorea.com/

TIDE
Smart Energy Solution

Company Profile

“A hidden champion in the energy IoT solution industry”

Tide expects to become a global energy IoT solution company by solving the challenges in the smart grid market amidst the ever-evolving IoT age. As one of the core IoT solution providers, Tide offers intelligent power grids, energy management systems and services based on various wired/wireless communication technologies such as the PLC (Power Line Communication). Our domestic and overseas client portfolio consists of leading power, telecommunication and IoT companies such as KEPCO.

Over the last 10 years, Tide has been an innovative and reliable company by being the world’s first company to commercialize the AMI (Advanced Metering Infrastructure) system via the HPGP PLC technology, providing high-speed multi-channels and noise-resistant systems, and creating diverse integrated solutions such as Modem, DCU, HES and MDMS Server.

Tide strongly believes the importance of environment protection and energy efficiency in order to achieve a sustainable future for mankind. Thus, our technological commitment will foster mutual betterment of our allied companies, customers, shareholders, and employees. Tide pledges to always hold our management philosophy and values at heart.

The Broadband PLC Technology based Energy IoT System proven by KEPCO

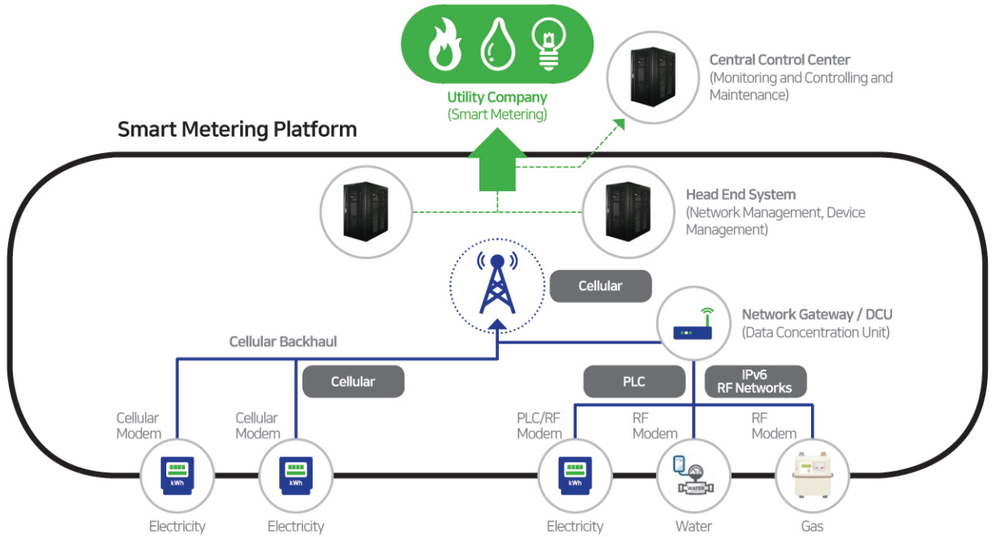
Roadmap

Broadband Internet of Things	Smart City Infrastructure Networks	Smart Utility Networks
		

Open, standards-based, secure, reliable network platform

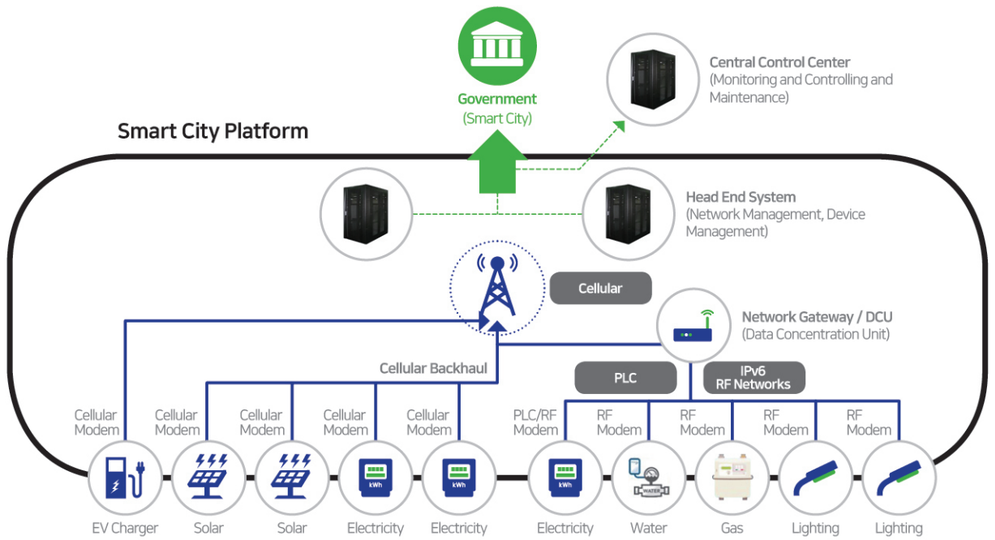
1. Utility AMI(Smart Metering) Platform

QUALCOMM Made with Qualcomm technology



2. Smart City Platform

QUALCOMM Made with Qualcomm technology



Energy IoT Devices

Made with Qualcomm technology

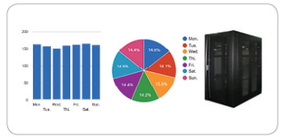
Network Gateway / DCU
(Data Concentration Unit)

PLC
(Power Line Communication)

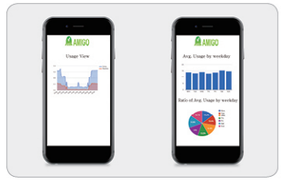
Cellular Modem
(GPRS/NB-IoT/LTE)

RF Repeater
(HPGP PLC Based)

(For Operator)



(For Client)



Head End System
(Network Management,
Device Management,
Data Collecting)

1. DCU

Made with Qualcomm technology

- Data communication with HES(Head End System) server (IP communication based)
- Collecting the metering data based on DLMS(IEC62056) international protocol from smart meters
- Data communication with smart meters through Broadband PLC(IEEE1901, HPGP (Home Plug Green PHY)) and/or RF(WI-SUN) communication Modem
- 128-bit AES Encryption Function Support
- Multi Authentication and Encryption Function Support (Specific Encryption technologies)
- Remote DCU Firmware upgrade function support from Server and Emulator.
- Transformer Monitoring Function :
  - Voltage, Current, Active/Reactive Energy, Power Factor, etc per each phase
  - IEC 62053-21 Class 1.0 Compatible
- Remote WIFI Connection Support for DCU Configuration and Monitoring the status
- Front side LED Indicator Support for DCU Status Monitoring
- Vent holes on Bottom Side for preventing from safety issues related to condensation and Flooding.
- Ambient temperature (-40℃~ 85℃), IP56, 3P4W, 50/60Hz

2. PLC modem

Made with Qualcomm technology

<External Type>

<Internal Type>

- Broadband PLC(IEEE1901, HPGP (Home Plug Green PHY)) communication technology
- Collecting the metering data based on DLMS(IEC62056) international protocol from smart meters
- Reliable PLC Communication based on high-speed multi-channels and noise-resistant technology
- 128-bit AES Encryption Function Support
- Multi Authentication and Encryption Function Support (Specific Encryption technologies)
- RS-485 Port for smart meter connection (Max. 30units)
- Front side LED Indicator for Modem Status Monitoring
- IP Level: IP53 (External Modem)
- Remote Modem Firmware upgrade function support

3. Cellular modem

Made with Qualcomm technology

<External Type>

<Internal Type>

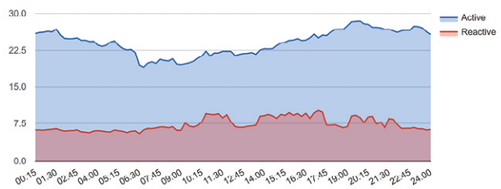
- LTE Cat.1, LTE Cat.M1, and NB-IoT based Cellular communication technologies
- Collecting the metering data based on DLMS(IEC62056) international protocol from smart meters
- Multi Authentication and Encryption Function Support (Specific Encryption technologies)
- Front side LED Indicator for Modem Status Monitoring
- IP Level: IP53 (External Modem)
- External and Internal Antenna.
- Remote Modem Firmware upgrade function support

4. RF Repeater

Made with Qualcomm technology

- RF(Radio Frequency) and Broadband PLC(IEEE1901) communication technologies combined.
  - RF Spec.: 42x MHz, Freq. band, 8xx MHz, 9xx MHz Freq. band support. (up to 300Kbps)
  - PLC Spec.: 2MHz ~ 30MHz Freq. band support.
- Repeating the metering data encrypted based on DLMS(IEC62056) international protocol between PLC Modem and DCU.
- RF Coverage between Repeaters: up to 400M
- LED Indicators for monitoring the status of communication.

5. HES(Head End System), EMS



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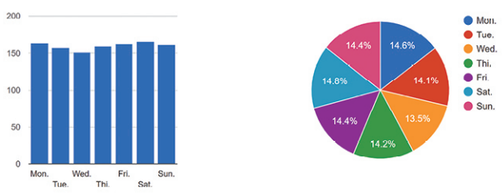
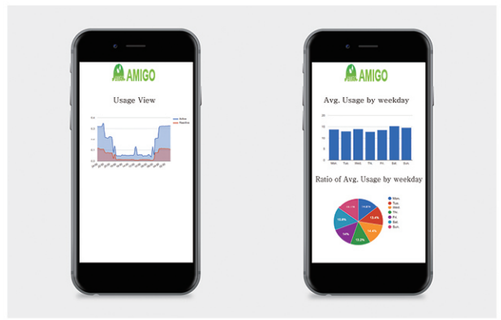


<Weekday Usage Views>

- HES (Head End System) and EMS(Energy Management System)
  - A. Connection to MDMS(Meter Data Management System)
  - B. Monitoring, Managing and Saving the 15min. based metering data
    - i. The active and reactive energy consumption data
    - ii. Monthly, Weekly based energy usage
    - iii. Power Quality data(like Frequency, Power Factor and Blackout)
    - iv. Smart Meter's status(like Cover Open, Communication Status, Connection status(ON/OFF), Sag-Swell and so on)
  - C. Customized for Utility Company and Customers
  - D. Management and Configuration of Equipment
    - i. HES(Head End System)
    - ii. Communication Modem
    - iii. DCU(Data Concentration Unit)
    - iv. Smart Meter
    - v. Client Information
  - E. WEB Based Monitoring Service for each clients

- MOBILE Version



References & Business Development Status

No.	Project Name	Comm. Type	Year	Q'ty (Household)	No.
1	Solar Energy Remote Monitoring System in Korea	LTE	2019 ~	30,000	DBK
2	AMI Pilot Project in Jakarta INDONESIA	Broadband PLC	2018 ~	500	STT-PLN
3	AMI(Low Voltage Residential) Project with KEPCO(Utility Company) in Korea	Broadband PLC	2020 ~	800,000 (Estimated)	KEPCO
4	AMI(Low Voltage Residential) Project with KEPCO(Utility Company) in Korea	Broadband PLC	2018 ~	1,000,000	KEPCO
5	AMI(Low Voltage Residential) Project with KEPCO(Utility Company) in Korea	Broadband PLC	2017 ~	130,000	KEPCO
6	AMI(Low Voltage Residential) Project with KEPCO(Utility Company) in Korea	Broadband PLC	2015 ~	11,000	KEPCO
7	AMI Project with LG U+ for KEPCO(Utility Company) in Korea	LTE	2019 ~ 2020	1,000,000 (Estimated)	LG U+
8	AMI Pilot Project in Romania with CEZ(Utility Company)	Broadband PLC	2016 ~	1,000	CEZ
9	AMI Project in Jamaica with JPS (Utility Company)	Broadband PLC	2014 ~ 2015	1,500,000	JPS
10	Smart Grid Deployment Project (2014)	Broadband PLC	2014 ~	652,000	SK Telecom
11	Smart Grid Deployment Project (2013)	Broadband PLC	2013 ~	302,000	LOTTE IC
12	Kuwait Smart City Project	Broadband PLC / LTE	2019 ~ 2020	40,000 (Estimated)	LH