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High-speed Wired Communications Solution for the IoT Era

Licensing IP Core for Semiconductors Complying with the IEEE 1901-2020 International Standard

Osaka, Japan - Panasonic Corporation has begun licensing the HD-PLC™ 4*1 IP core required for the design of semiconductors with technologies and functions that comply with the IEEE 1901-2020*2 international standard. This IP core is the fourth generation of the HD-PLC series. Although conventionally HD-PLC have used power lines for transmission, this new series enables transmission through existing metal wires, such as control lines and coaxial cables as well as power lines, expanding its range of applications. This new HD-PLC technology also enables higher speeds, greater distance, and less wiring for wired communications.

By using this IP core, semiconductor and peripheral equipment manufacturers will be able to flexibly meet to a range of IoT service requirements and manufacture products that respond to these needs.

As a wide range of equipment in society becomes digitalized and connects to the IoT devices, communication technologies are becoming increasingly important. While the adoption of wireless technologies such as 5G and high-speed fiber optic internet gains pace, there are some locations in which it is difficult to access wireless communication. Here, the use of existing metal wires—in the walls and ceilings of buildings, underground facilities, and equipment—as communication mediums fulfils a vital role. This IP core is a solution that can rapidly meet to the requirements of the era of IoT, such as higher-speed networks, enhanced security, and internet protocol networks. By combining the IP core with wireless and other technologies, it can help create optimal networks in a range of environments, from living spaces to social infrastructure.

Using its experience and achievements with the HD-PLC 3 IP core, which is currently on the market, in addition to licensing of this new IP core, Panasonic will provide one-stop development support to users which will include proposals for analog front-end circuitry—key to the mounting of semiconductors. Further, as a high-speed wired communication solution, Panasonic will seek to use this technology to expand the adoption of IoT PLC, ultimately applying the technology to large-scale networks that cover living spaces, buildings, factories, smart cities, and other social infrastructure.

This IP core is first licensed to Socionext Inc. This enables the supply of higher performance semiconductors with lower energy consumption using fourth generation HD-PLC. It is expected that these will then be built-in to a range of IoT-connected devices.

Panasonic launched a dedicated website with more information about this technology. Please note that the global IEEE SA and HD-PLC Alliance*3 Webinar will be held on March 18, 2021.

Main Features

- The standard mode communication band (250 Mbps) can be doubled or quadrupled, allowing a 500 Mbps*4 communication speed in double mode or a maximum of 1 Gbps*4 in quadruple mode on coaxial cable or dedicated line.
- The standard mode communication band can be compressed on two levels (half or quarter), concentrating and extending the communication distance up to twice*5 the distance in standard mode.
- With the multi-hop function, it is possible to operate a wide area network of up to 1024 nodes.

■ Main Specifications

Communication bandwidth	High-speed mode (1 Gbps, 500 Mbps) *Optional Standard mode (250 Mbps) Long-distance mode (2 x or 1.5 x the range of standard mode)
Approved standards	IEEE 1901-2020 ITU-T G.9972 (Coexistence mechanism for different PLC systems) ITU-T G.9905 (Multi-hop) *Optional EN 50561-1:2013 (Dynamic notch and dynamic power control)

Inquiries Regarding IP Core Licensing

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*1: HD-PLC™ is the name of the high-speed power line communications system proposed by Panasonic Corporation, and is a trademark or registered trademark of Panasonic Corporation in Japan and other countries. HD-PLC™ 4 is the name of the fourth-generation semiconductor IP core.

*2: Formulated by the IEEE Standards Association (a communication standards subsidiary of the Institute of Electrical and Electronics Engineers) on January 19, 2021, this is a standard for technologies with higher speeds and longer distances than those outlined in IEEE 1901-2010.

IEEE 1901-2020 - IEEE Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications: <https://standards.ieee.org/standard/1901-2020.html>

*3: An alliance formed on September 25, 2007, to support, promote and implement the HD-PLC system for High-Speed Power Line Communications and to ensure mutual compatibility.

Website: <https://hd-plc.org/>

*4: 500 Mbps and 1 Gbps are theoretical speeds at the physical layer.

*5: Maximum distance may change depending on communication environment.

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