

January 18, 2022
TeraPixel Technologies, Inc.
Fujikura Ltd.
intoPIX SA.

Successful Transmission of High-Quality, Ultra-Low-Latency Video over 60 GHz Wireless Communications System

—High-quality real-time video transmission achieved by combining endpoint AI equipment, JPEG-XS
codec, and 60GHz band wireless communication—



TeraPixel Technologies, Inc. (CEO: Naoki Kawahara), Fujikura Ltd. (President & CEO: Masahiko Ito) and intoPIX SA. (CEO & Director of Technology: Gaël Rouvroy) announced that they have succeeded in a joint experiment on a high-definition, ultra-low-latency real-time video transmission using 60GHz band millimeter-wave wireless communication.

Toward the realization of Society 5.0^{*1} and Industry 4.0^{*2}, we have been seeing growing demand in the recent years for video applications that require real-time operation, such as hazard detection and remote control at various workplaces and factories. In particular, real-time wireless video transmission devices, which allow flexibility in installation and incorporation into mobile devices, are in great demand.

In this experiment, an endpoint AI device^{*3} being developed by TeraPixel Technologies connected with low-latency JPEG-XS^{*4} IP developed by intoPIX, was combined with 60 GHz millimeter-wave wireless communication module developed by Fujikura to transmit a video in real indoor and outdoor environments.

The results show that a high-quality (Full HD: 1920×1080 at 60 fps), ultra-low-latency video has been successfully transmitted. This has been enabled by combining the following features of the JPEG-XS coding built in the endpoint AI device and the 60 GHz millimeter-wave wireless communication module.

Features of JPEG-XS coding built in the endpoint AI device:

- Low-latency compression/decompression (less than 0.5 ms)
- High-quality visually lossless image with lightweight HD/4K/8K codec IP: TicoXS

Features of 60 GHz millimeter-wave wireless communication module:

- High-speed communication (> 3 Gbps) equal to that with optical fibers
- Low transmission latency (around 2 ms)

Furthermore, an experiment for video transmission from a camera mounted on a moving vehicle was conducted using the automatic beamforming and long-distance (> 500m) transmission performance of Fujikura's 60 GHz millimeter-wave wireless communication module.

(Video of the experiment: <https://www.youtube.com/watch?v=weUjEdMuvKg>)

Aiming at enterprise customers who pursue smartification in various workplaces such as factories, the three companies will jointly proceed with developing cutting-edge millimeter-wave video transmission products and services. The key is combining the license-free 60 GHz band communication system, which enables low-cost, high-speed network construction, and the endpoint AI equipment, which allows low-latency, high-quality image processing and AI-based image recognition.

About TeraPixel Technologies, Inc.

Founded in 2014, TeraPixel Technologies is a venture company based in Shin-Yokohama, Japan, primarily engaged in system and semiconductor development and contract development.

Utilizing its capabilities of developing leading-edge semiconductor processes (7 nm, 5 nm) and the systems, this company is developing businesses such as supplying OEM products to customers. The company is currently developing devices and semiconductors for the endpoint AI, which is one of the hottest applications now by drawing on its vast experience of working on imaging applications since its inception.

Corporate website: <https://www.terapixel.co.jp/en/>

About Fujikura Ltd.

Fujikura has been providing highly reliable products and services in the four business fields of energy, information and communications, electronics, and automotive electrical equipment through "Tsunagu (connecting) technology" cultivated in its electric wires and cables business since its establishment in 1885.

Currently, this company is working in the millimeter-wave wireless communication field as its new business. The company is developing millimeter-wave devices for the 60 GHz and 28 GHz bands, making full use of its proprietary technologies of phased array antenna design, flexible printed circuit board manufacturing, and electromagnetic field analysis.

Corporate website: <https://www.fujikura.co.jp/eng/>

Millimeter-wave related products website: <https://mmwavetech.fujikura.jp/>

About intoPIX SA.

Founded in 2006 and located in Belgium, intoPIX is a leading technology provider of innovative compression, image processing and transmission solutions. This company delivers unique FPGA/ASIC IP cores and efficient software solutions (on CPU and GPU) to manage more pixels, preserve quality with no latency, save cost and power, and simplify connectivity. The company is passionate about offering users a higher quality image experience.

Corporate website: <https://www.intopix.com>

JPEG-XS codec (TicoXS) website: <https://www.intopix.com/jpeg-xs>

Explanation of terms:

- *1 **Society 5.0:** A human-centered society that achieves both economic development and solutions to social problems through a system that highly integrates cyberspace (virtual space) and physical space (real space).
- *2 **Industry 4.0:** It is defined as the 4th Industrial Revolution, and its focus is on building an ecosystem (Business environments where businesses, products, and services are interdependent) centered around smart factories.
- *3 **Endpoint AI device:** A processor conducting complete AI processing (image recognition, inference, etc.) only within the device at the end of the network
- *4 **JPEG-XS:** An international standard for image compression technology (ISO/IEC 21122) created by the JPEG Committee, a joint working group of the International Standardization Organization (ISO) and the International Electrotechnical Commission (IEC). Visually lossless image compression has been achieved by the low-delay, low-complexity coding system.