

TECH OFFER

Cost-Effective Wired Communication Technology Using Existing Wire



KEY INFORMATION

TECHNOLOGY CATEGORY:

Green Building - Sensor, Network, Building Control & Optimisation

Green Building - Heating, Ventilation & Air-conditioning

Infocomm - Networks & Communications

Infocomm - Smart Cities

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **JAPAN**

ID NUMBER: **TO175094**

OVERVIEW

In the development of communication networks, various challenges emerge in achieving wireless signal coverage in certain areas, while the cost of deploying traditional wired Ethernet remains prohibitive in specific locations. Industries accustomed to slower wired communications now seek high-speed alternatives to facilitate IoT integration and enhance operational efficiency, yet they are hesitant to undertake extensive rewiring efforts.

Building networks across diverse settings, including buildings, condominiums, and factories, often encounters significant cost hurdles. This is primarily due to the need for multiple Wi-Fi repeaters to cover areas with poor signal reach, as well as the requirement for numerous network switches and construction work involving cable installation under floors and above ceilings.

A solution lies in technology that facilitates data communication over existing wires within facilities, such as flat cables, twisted pair wires, coaxial cables, and power lines. The effective communication speed varies from several Mbps to several tens of Mbps, depending on the type of cable and the wiring environment. Moreover, this technology seamlessly integrates with Wi-Fi, Ethernet, and other existing infrastructures, providing a cost-effective approach to network construction. By leveraging these technologies, it becomes feasible to establish society's network infrastructure at a reduced cost, particularly in challenging environments such as concrete structures, underground areas, tunnels, and spaces with metal walls.

TECHNOLOGY FEATURES & SPECIFICATIONS

- IP communication is possible using existing wire
- Effective speed can range from several Mbps to several tens of Mbps, depending on the type of cable and wiring environment (Ethernet : several hundreds of Mbps to several Gbps)
- Maximum communication distance (1-to-1 connection)
 - Coaxial cable : 2,000m
 - Intercom cable : 1,200m
 - CPEV cable : 1,200m
 - Telephone cable : 1,200m
 - Twisted pair : 1,200m
 - VVF cable : 1,000m
- *Up to 10 times the communication distance can be achieved by using the automatic relay function
 - (Ethernet : 100m)
- Up to 1024 terminals with single master
- Free topology including star, tree, daisy chain, ring, etc.

POTENTIAL APPLICATIONS

- **Cost-effective network construction**
 - Surveillance camera, video intercom system, smart street light, tunnel lighting, warehouse, EV charger
- **Faster wired communication than old low-speed communication, without requiring new wiring**
 - PV, HVAC (Heating, ventilation, and air conditioning), video intercom system, smart meter
- **Higher Security**
 - Chemical/ Oil & Gas plant
- **Wireless complement**
 - Elevators, underground facility (smart meter, water purification plant, boilers, dam), tunnel construction site, tunnel lighting, cable tunnel, shipboard network
- **Long distance**
 - Smart meter, smart grid, substation, building automation, BEMS, wind power generation, smart street light
- **Reduce cables**
 - Robot, underwater drone

UNIQUE VALUE PROPOSITION

The technology contributes in a wide range of fields, from utilization in areas and facilities where wireless communication is not

possible, to wiring reduction and wiring construction cost reduction

- Possible to build a network at low cost
 - E.g. cost could range from 20% to 50% (depending on environment)
- System upgrade without new wiring
 - Enables higher image quality for video intercom system and more efficient air conditioning and energy management without new wiring
- Wire saving within equipment
 - Improved fuel efficiency due to lighter weight, lower failure rate, and reduced assembly man-hours