

INDUSTRIAL CASE STUDIES

KOTA MATSUO
HD-PLC ALLIANCE

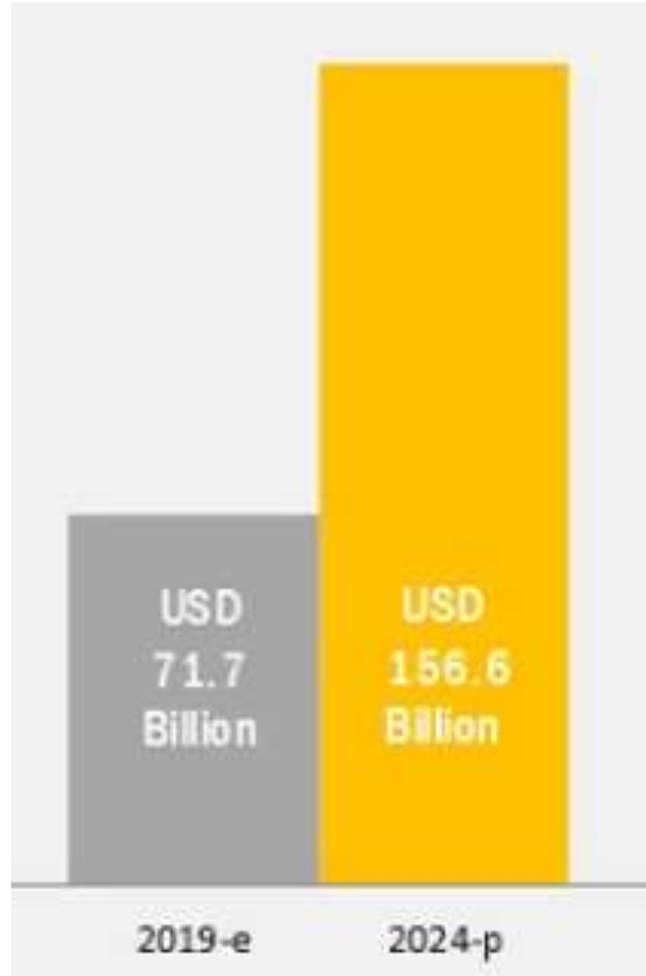
MARCH 18TH 2021

Agenda

1. Industry Market
2. Comparison of Network Standards
(HD-PLC Features)
3. Industrial Case Studies of HD-PLC

Industry 4.0 Market

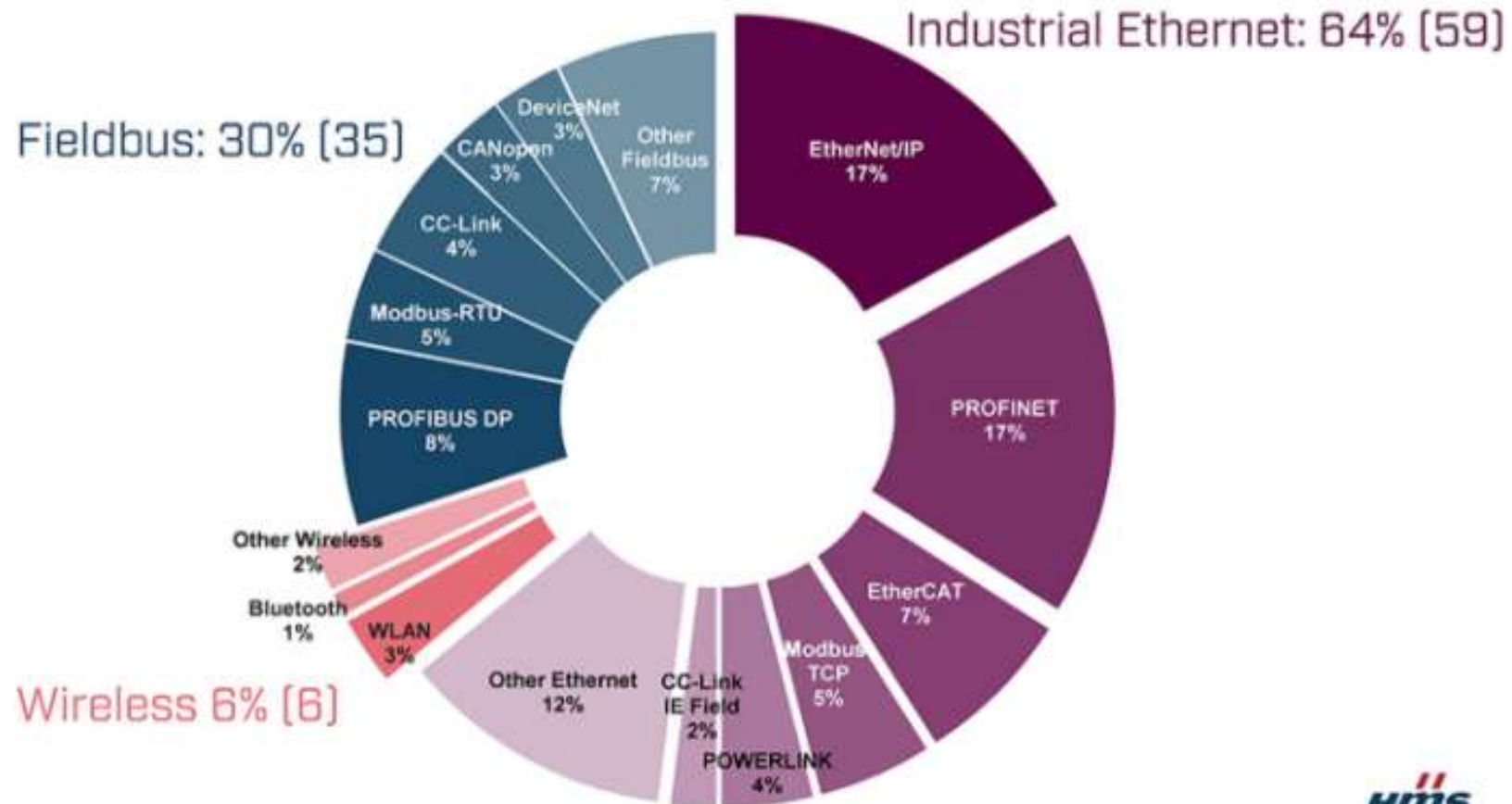
CAGR **16.9** %
From 2019 to 2024



<https://www.marketsandmarkets.com/Market-Reports/industry-4-market-102536746.html>

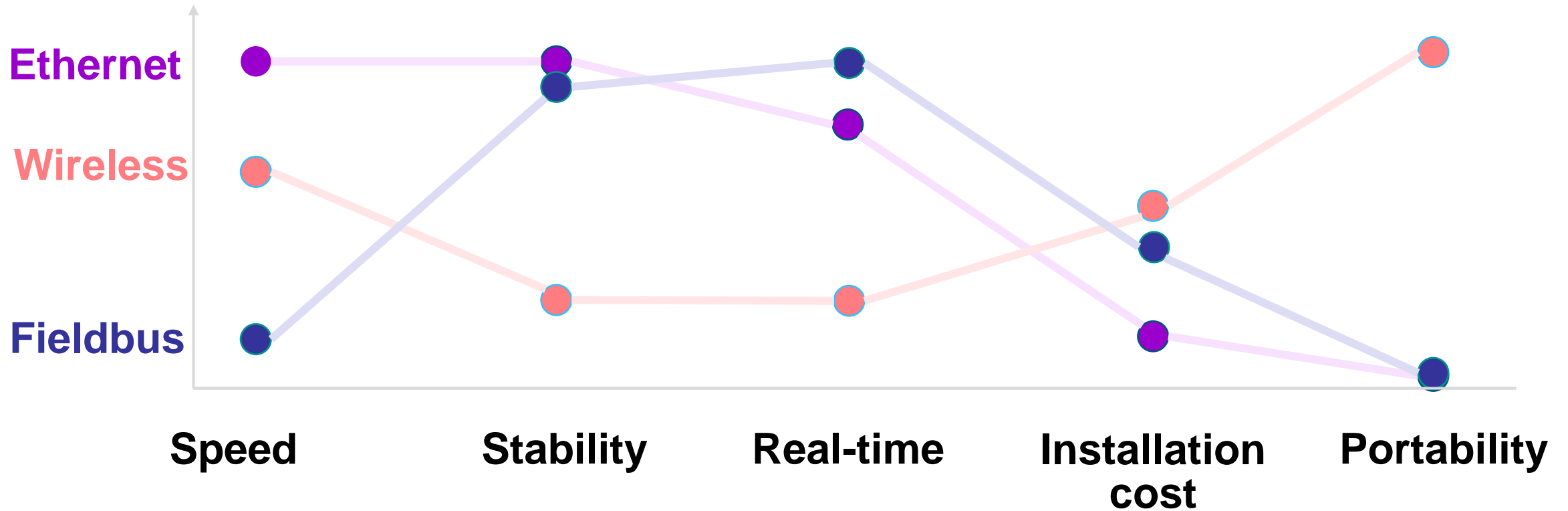


Industry Network Market Share

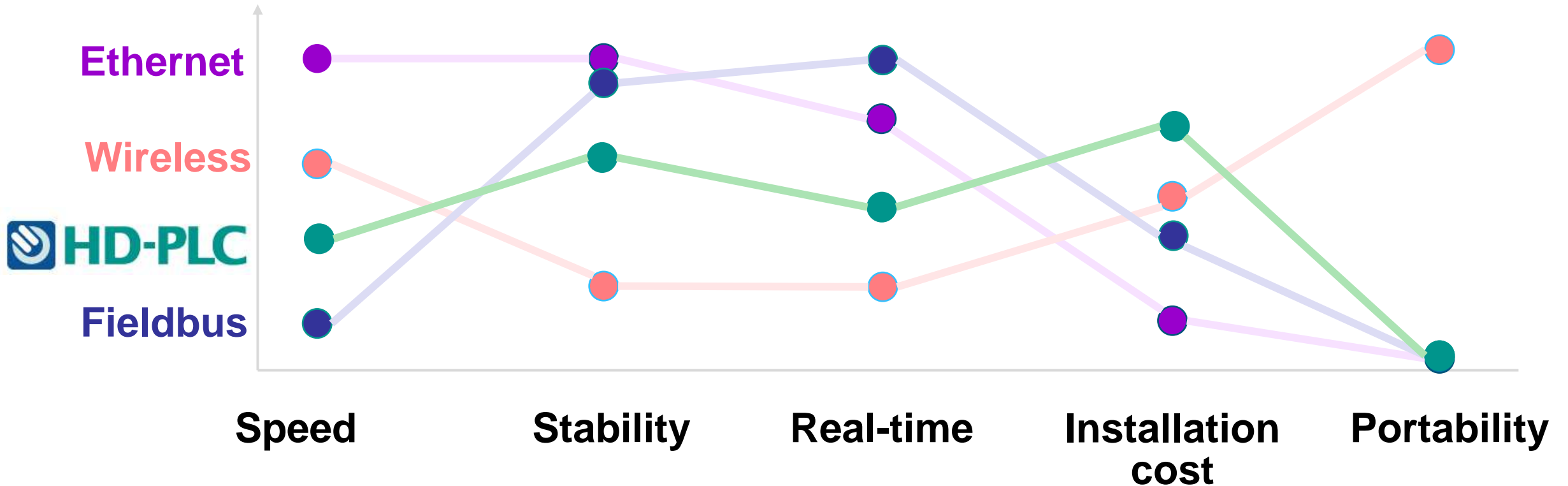


<https://www.hms-networks.com/ja/news-and-insights/2020/05/29/industrial-network-market-shares-2020-according-to-hms-networks>

Comparison of Network Standards

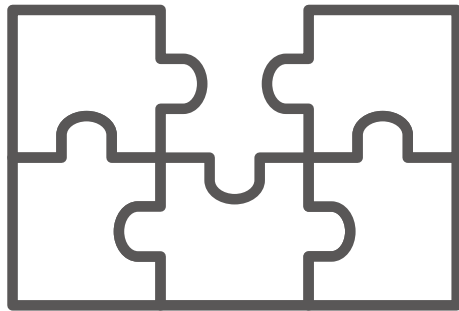


Comparison of Network Standards



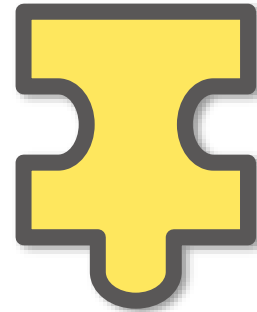
An Important Piece that Fills Customer Network Needs

Cost?
Stability?
Portability?

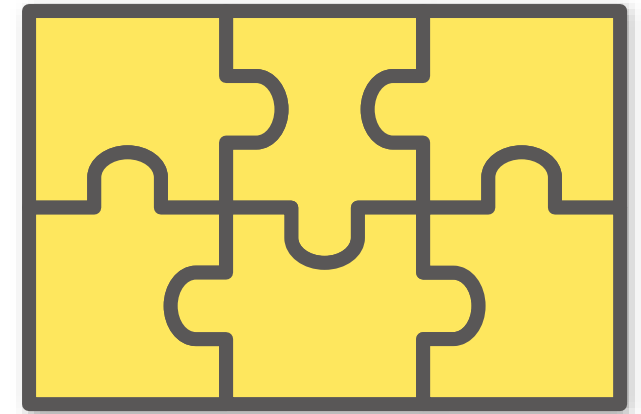


Industrial Ethernet
Wi-Fi/Bluetooth/5G
Fieldbus etc...

+



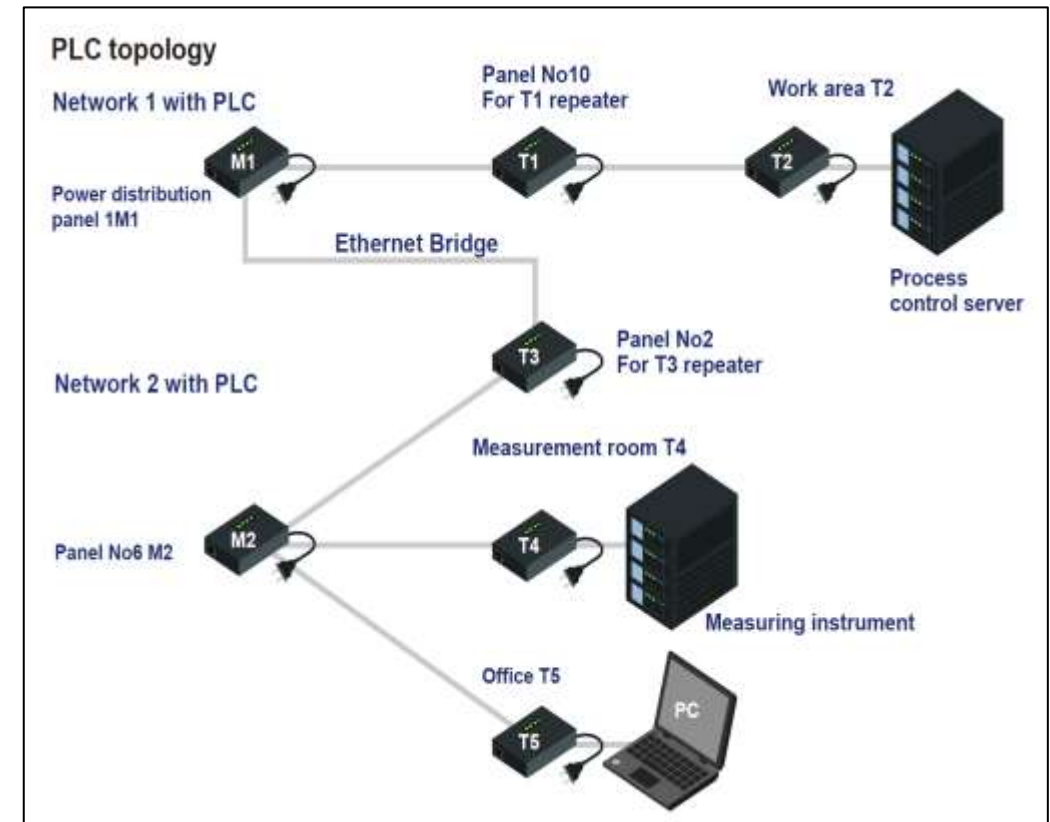
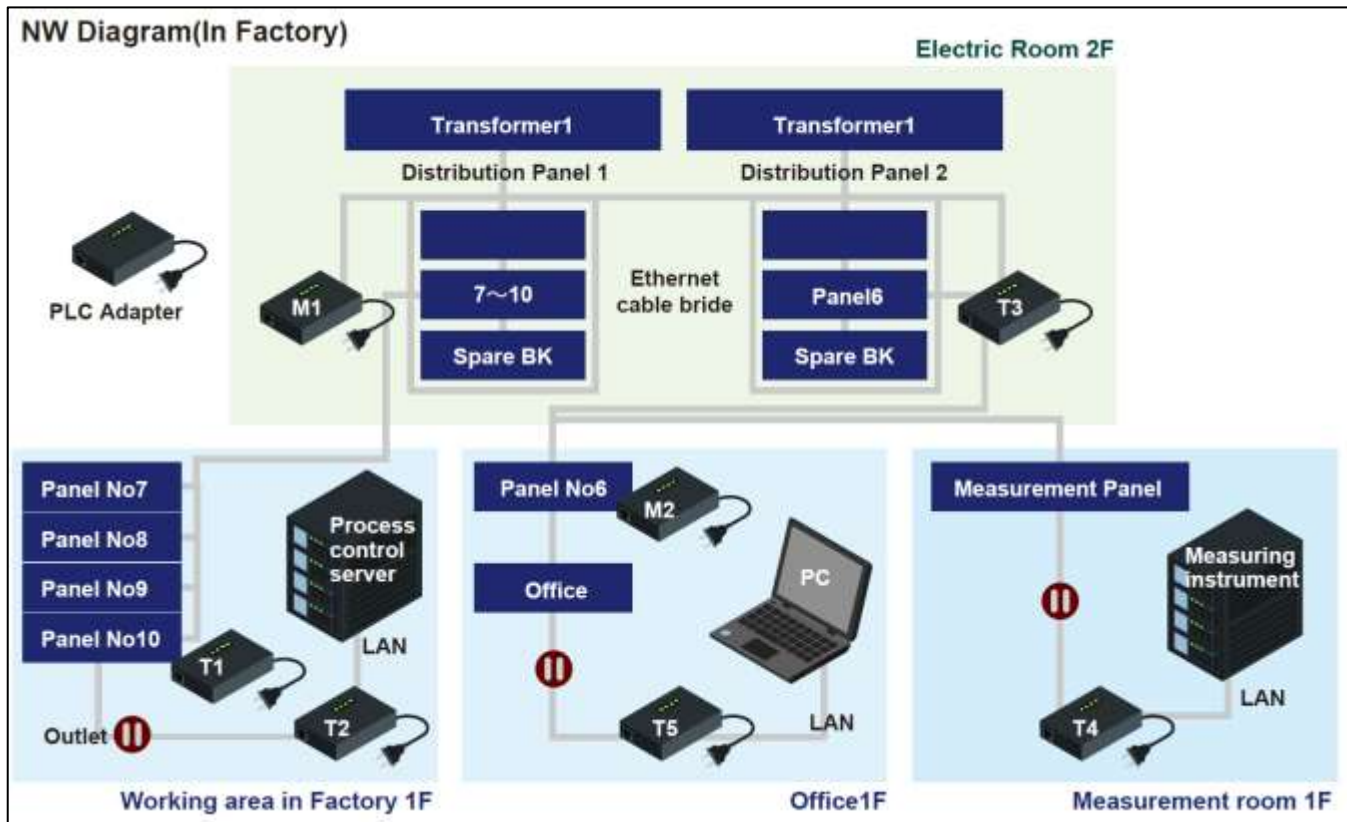
HD-PLC



Industrial Case Studies of HD-PLC

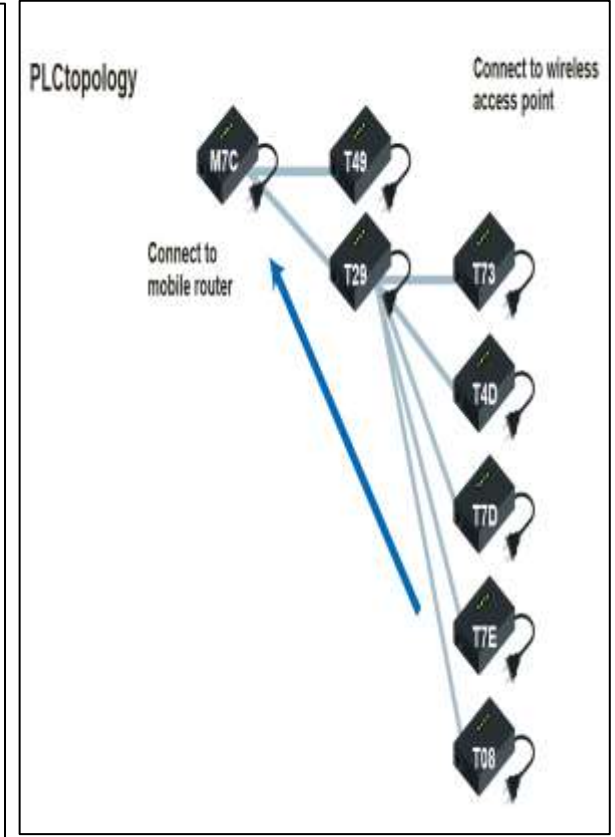
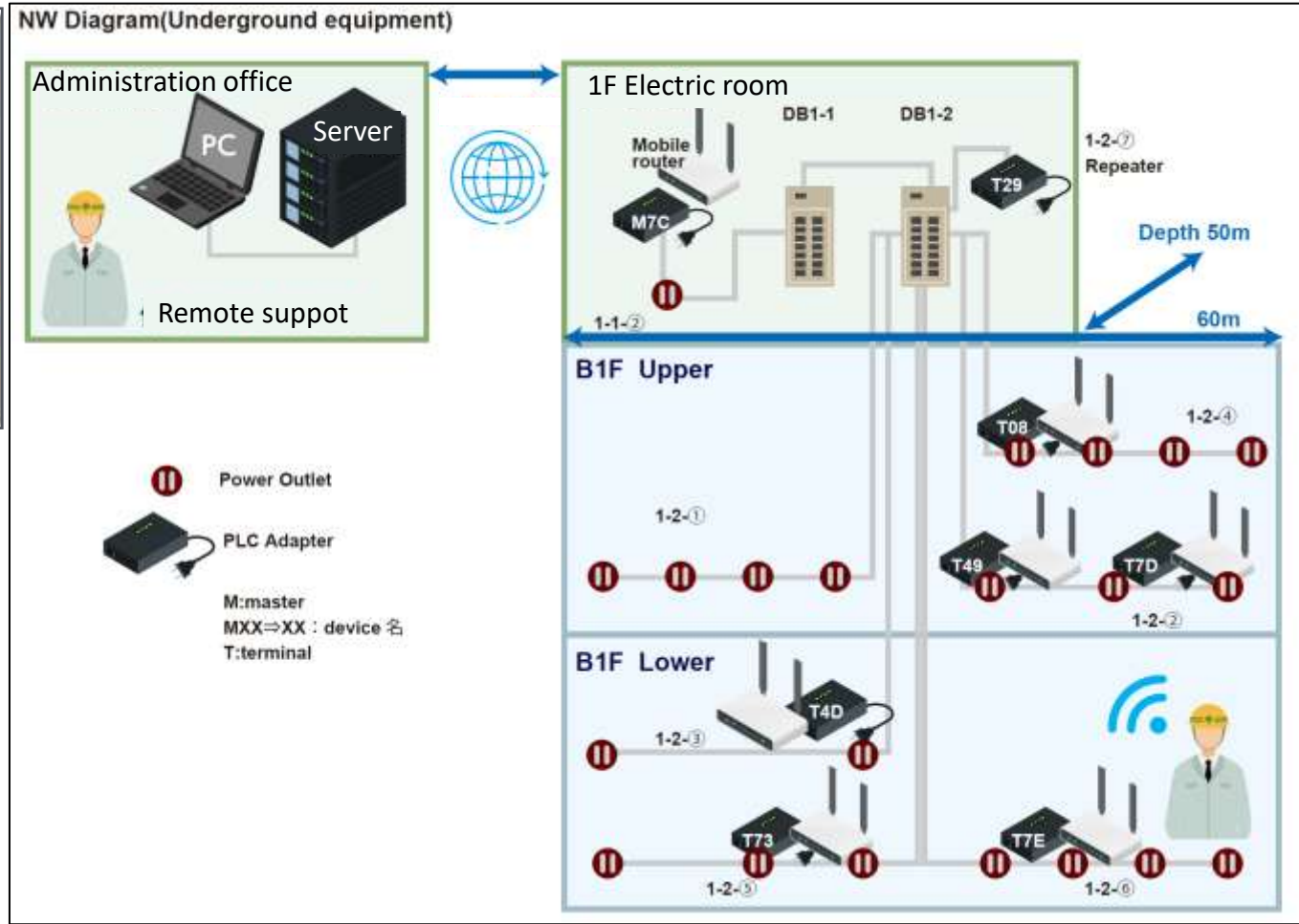
Data Acquisition at the Factory

- **Customer needs:** Temperature and humidity data of measuring instruments are stored on servers in the factory.
Access server data from office PCs.
Speed requirement: 1Mbps
- **Reasons for HD-PLC adoption:** Network construction cost and workability
design: 1 person-day, installation: 2 person-days



Inspection of Underground Equipment in the Sewage Plant

- Customer needs: Build a network for inspecting underground equipment with a wearable camera
Rate requirement: 1 Mbps per IP camera
- **Reasons for HD-PLC adoption:** Low-cost network construction in an environment where wireless is difficult to reach
design: 1 person-day, installation: 3 person-days



IP Camera Usage at the Warehouse

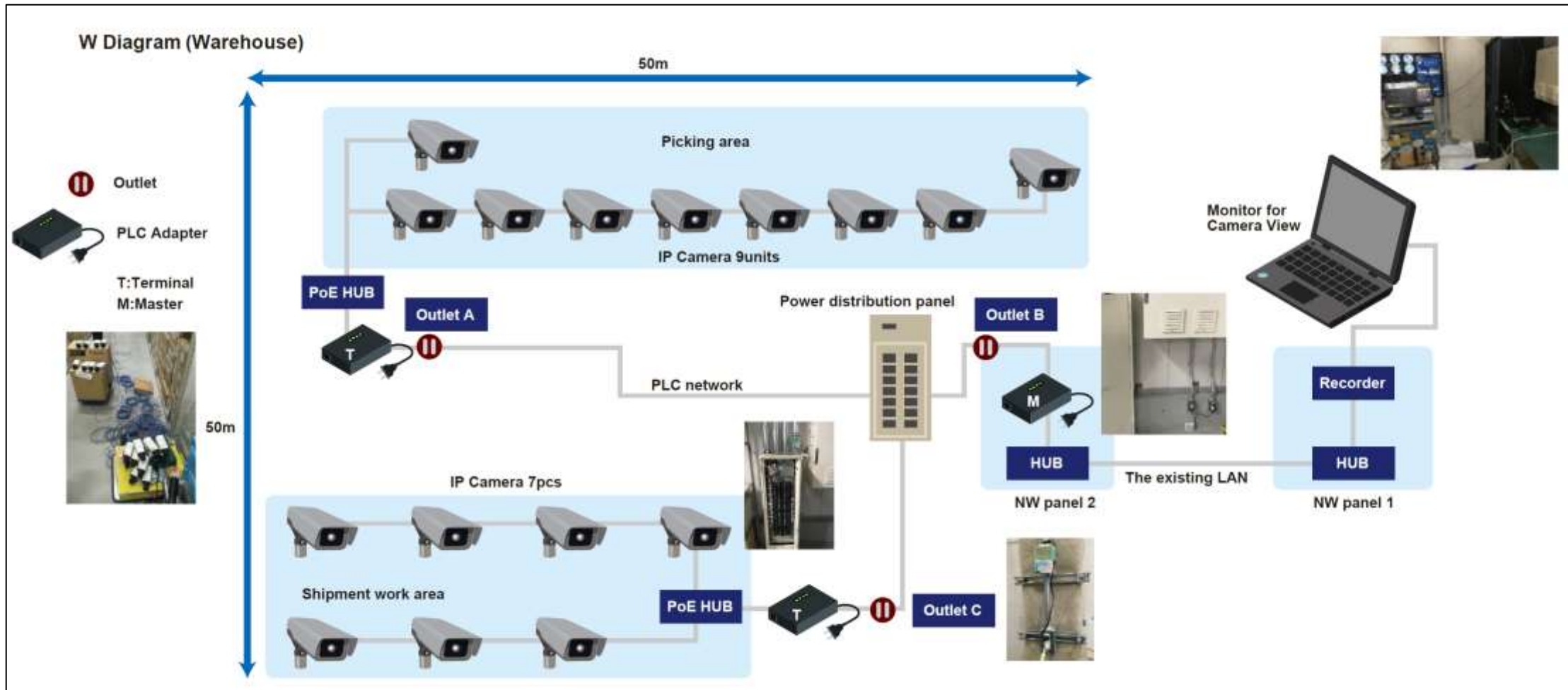
● Customer needs:

- Use: Video recording analysis of picking site
- Rate requirements: 2 Mbps/IP camera per 1 unit×16 units
- Units/Configuration of IP camera: 16 units, 10 fps, Fine quality
- No need for drilling holes in walls or ceilings, wiring work in the ceiling, work at high places, etc., and no electrical work

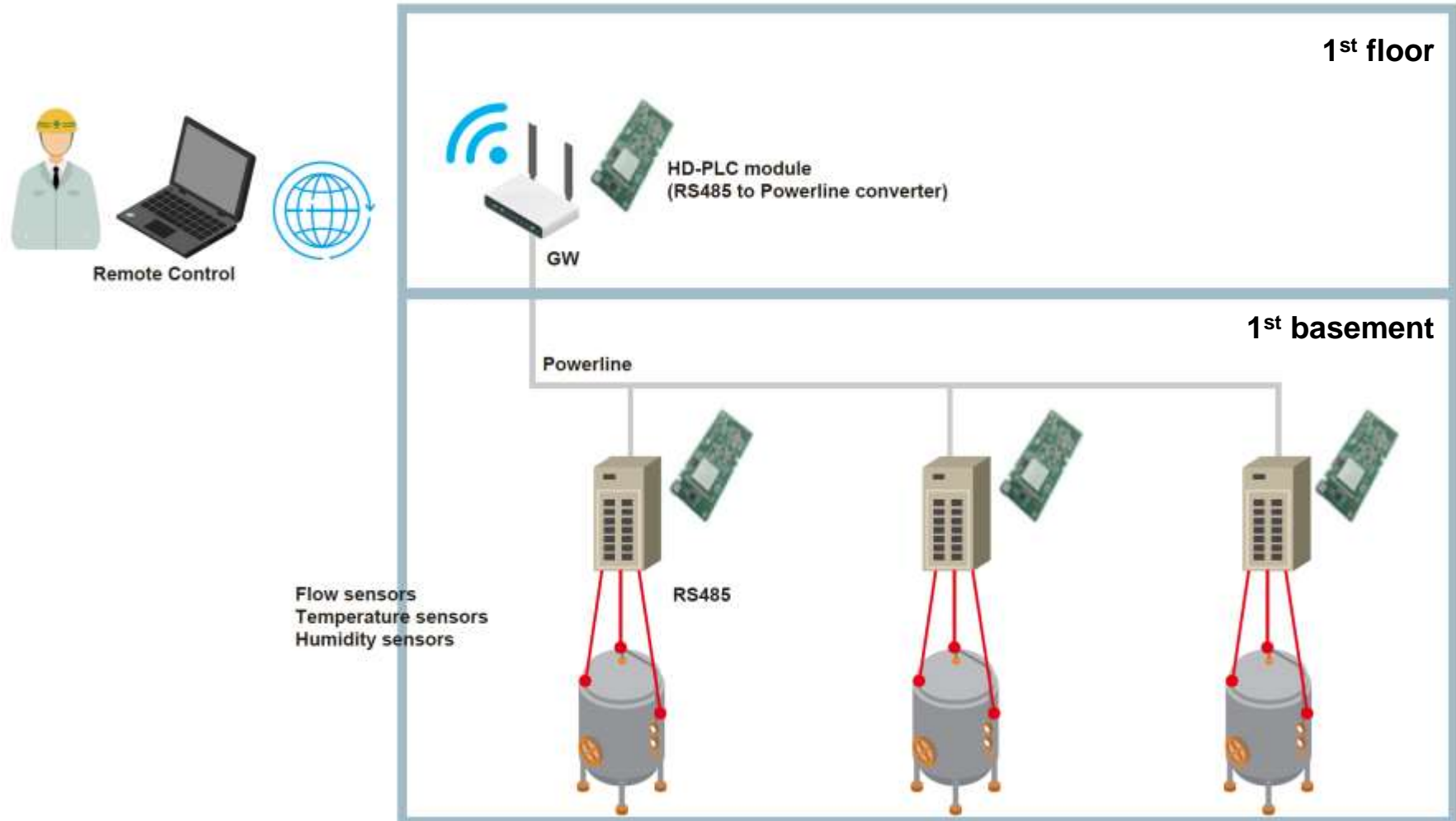
● Reasons for HD-PLC adoption: Low-cost network construction

design: 1 person-day, installation: 1 person-day

There was no need to perform construction work for a building by using existing lines.

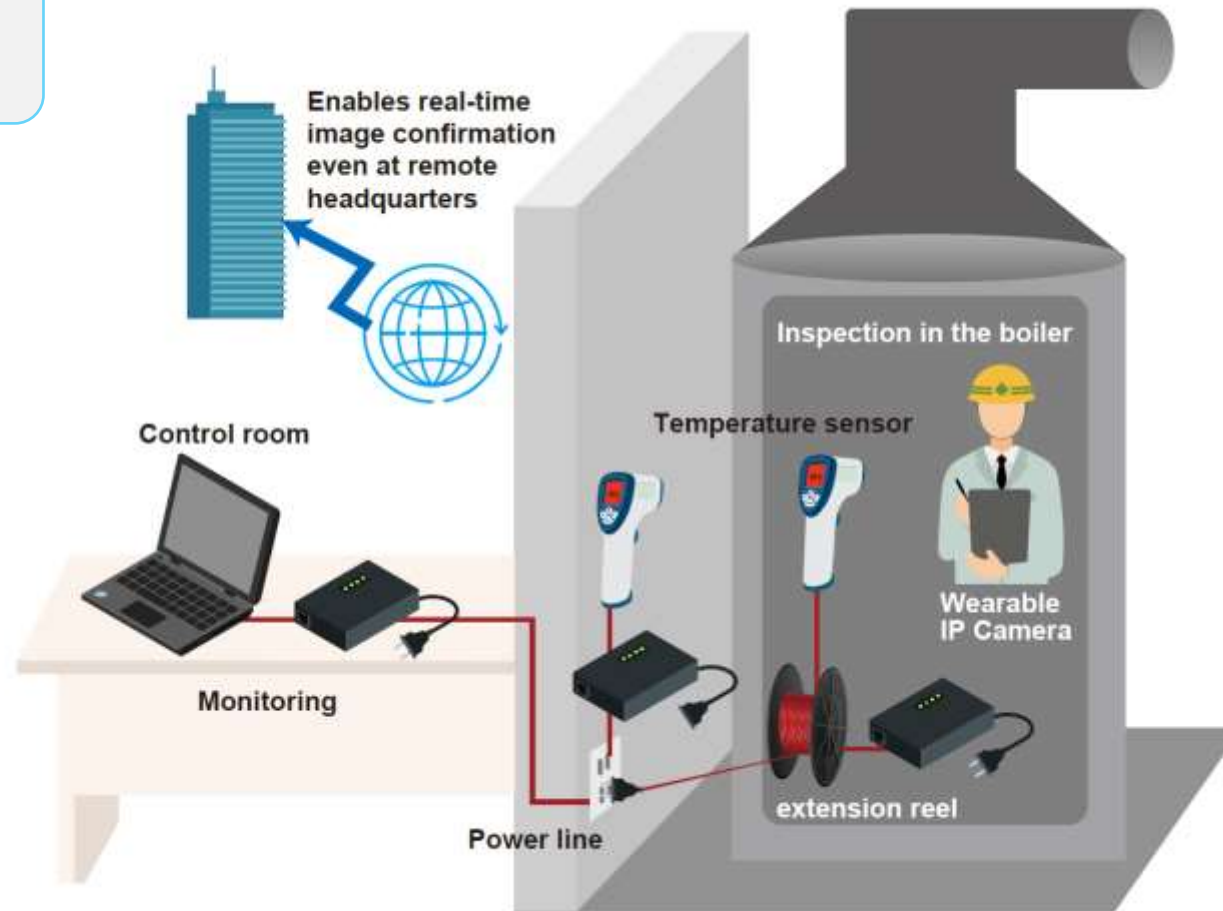


Condition Monitoring of Boiler Feedwater Pumps



Boiler Monitoring with Extension Cord Reel

Streamlined inspection of underground boilers,
Use of power line *HD-PLC* for real-time Data transfer



Tunnel Construction

● **Customer needs:**

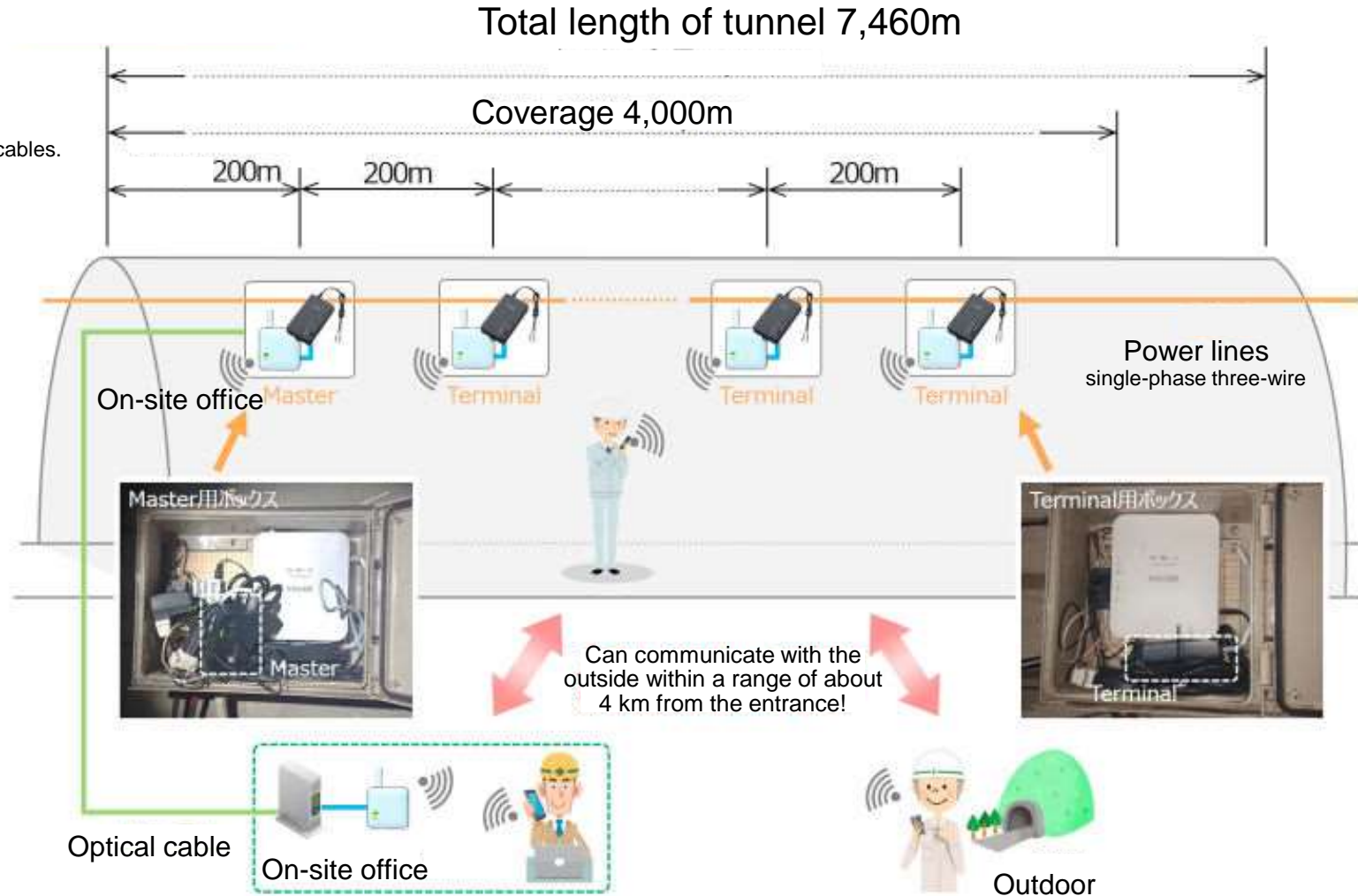
To be able to contact the work sites in the tunnel and outside the tunnel.
 There is a problem that radio waves do not reach.
 With a total length of 7,460 meters, the cost of construction is large for laying ethernet cables.

● **Reasons for HD-PLC adoption:**

Low-cost network construction



Nagasaki Prefecture, Japan



PLC: communication using single-phase three-wire



(Source: HD-PLC Alliance Member companies)



Various Uses of HD-PLC in Wireless Dead Areas

- ◆ Used for human sensor/IP camera communication for environmental monitoring in the factory



Used for confirming flow lines and safety management of workers

(Source: HD-PLC Alliance Member companies)

- ◆ Use surveillance IP camera and Wi-Fi-AP communication for power management board of substation



Used for remote work instructions to maintenance/inspection workers and communication with IP cameras that capture analog control instruments

(Source: HD-PLC Alliance Member companies)

- ◆ Maintenance inspection of the management, underpass in the dam, Wi-Fi-AP installation communication use



Use underground single-phase/three-phase electric lighting line with PLC.
Used for ground communication by inspectors.

(Source: HD-PLC Alliance Member companies)

- ◆ Installed communication cable, power wiring, and Wi-Fi-AP, which are under verification, for maintenance and inspection of underground tunnels (assuming use of three-phase power line)



Utilize underground single-phase and three-phase lighting lines to communicate between the ground and inspectors with PLC.

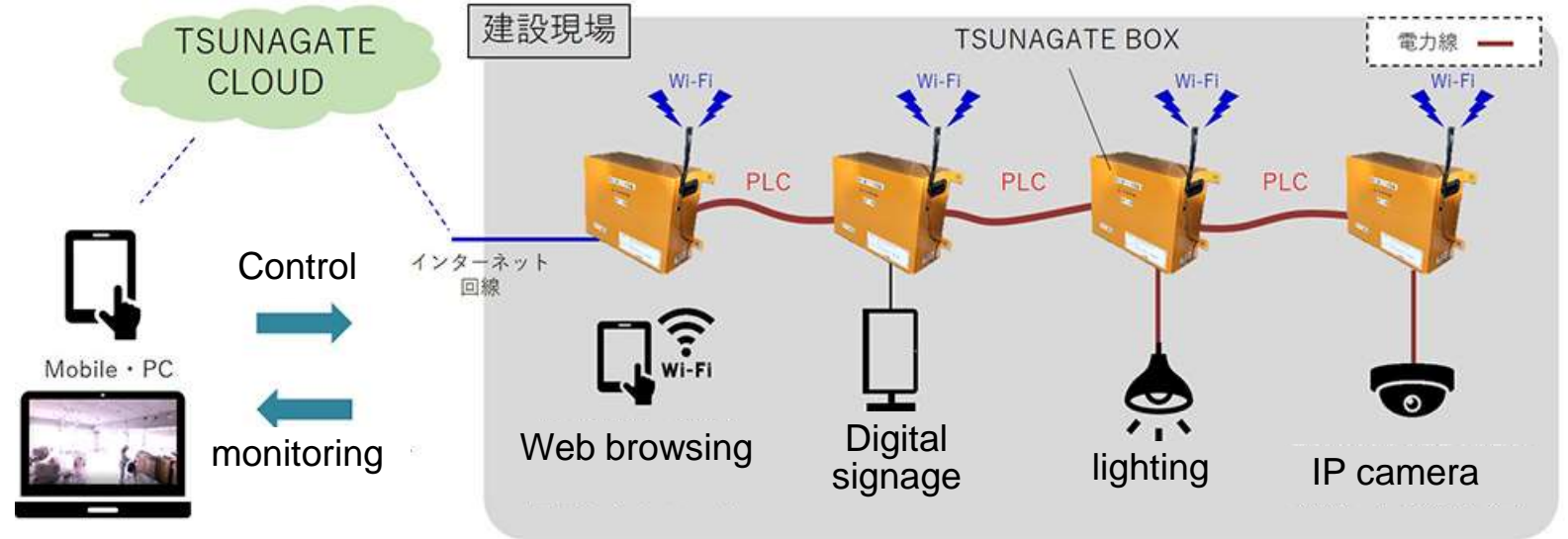
IoT Platform at Construction Site

Challenge:
Chronic labor shortages in the construction industry
It is necessary to make construction sites IoT.
At construction sites, there are many places where radio waves can not reach, such as tunnels and underground.

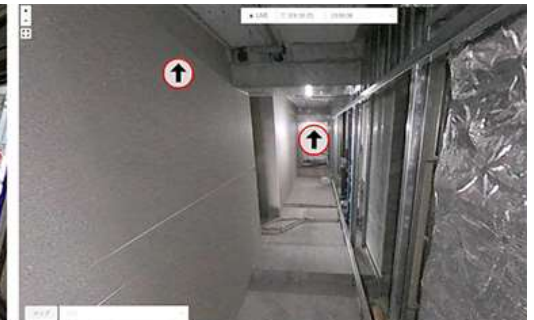
IoT platform TSUNAGATE

A platform that can build a communication network using "temporary electrical wiring" used in construction work by utilizing PLC technology that can communicate using power lines

<https://www.takenaka.co.jp/solution/topics6/>



IP camera



You can switch the indications to patrol the site remotely

On-site confirmation
With IP cameras

Conclusion

- **HD-PLC is an important piece that fills customers network needs!**
- **Useful for industrial customers**
 - **Network construction at low cost**
 - **Complements an environment where wireless is difficult to reach**



Contribute to industrial digital transformation!

THANK YOU!

info@hd-plc.org



@hdplc_alliance



Hakataku Minoshima4-1-62, Fukuoka, Japan