



### Core Objective

- ✓ Optimize wireless coverage
- ✓ Ensure stable HD video
- ✓ Handle complex environments
- ✓ Reduce maintenance costs

# Smart Inspection Wireless Communication Solution for Coal Mine Tunnel Belt Conveyor

***Ensure Real-time Camera Data Transmission for Efficient Inspections.***

The project is located in a coal mine tunnel belt conveyor in Xinjiang. For the coal mine belt conveyor system, GPSENKE successfully implemented a wireless communication coverage solution for inspection robots. The site features a 10 km long conveyor belt, with inspection robots mounted on sliding rails on both sides. The robots transmit real-time video to the center via wireless clients. The terrain is relatively flat, but there are some significant height differences. Wireless APs provide directional coverage to ensure stable inspection tasks on both sides of the conveyor.



### Technical Challenges:

- Coverage Limitation: Directional APs cover up to 500 meters, but actual coverage is limited to 300 meters due to terrain.
- High bandwidth demand for HD video, ensuring no lag or distortion.
- Signal instability caused by complex environmental factors and interference.
- Need for precise AP deployment to avoid blind spots and ensure smooth connectivity.

## GPSENKE Recommend



Industrial Access Point      Directional Antenna



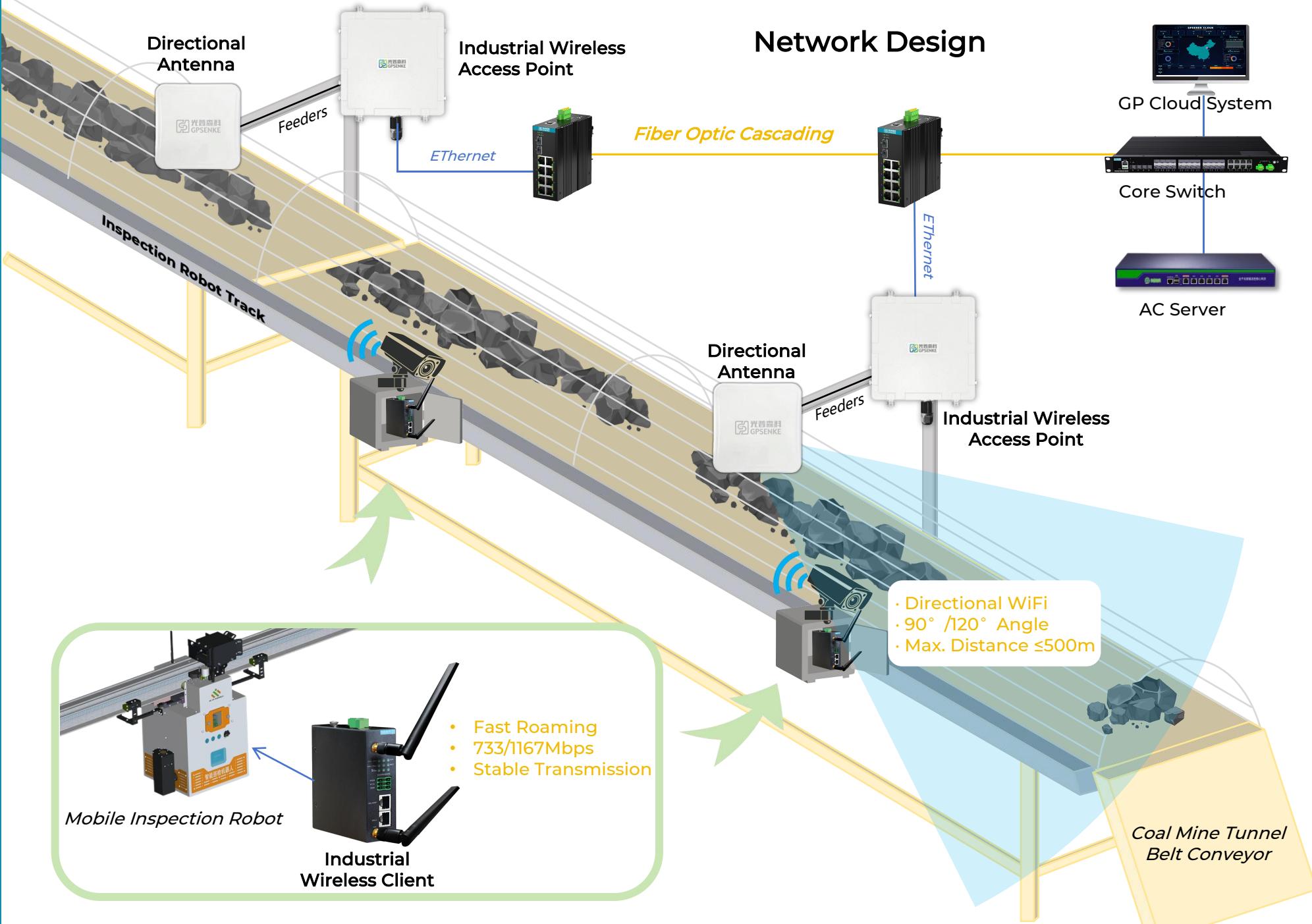
Wireless Client      Industrial Ethernet SW



Industrial AC Server



Industrial Core Switch



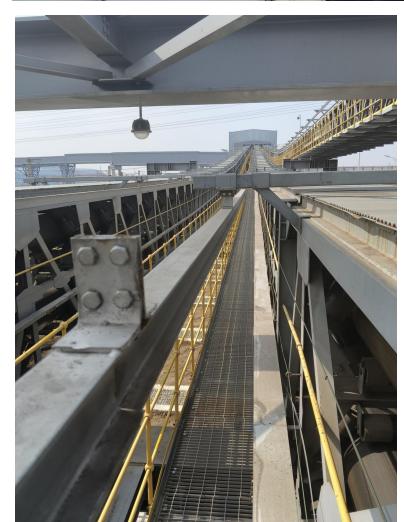
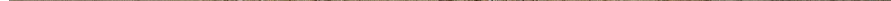
## Project Case Conveyor Belt Site

Project Location: Xinjiang, China

Project Timeline: 2024

Industry: Mining

Project Duration: 15 Days





## Actual project results and customer feedback

Optimized deployment ensured clear, stable video transmission with no interruptions or distortion, fully meeting client requirements.

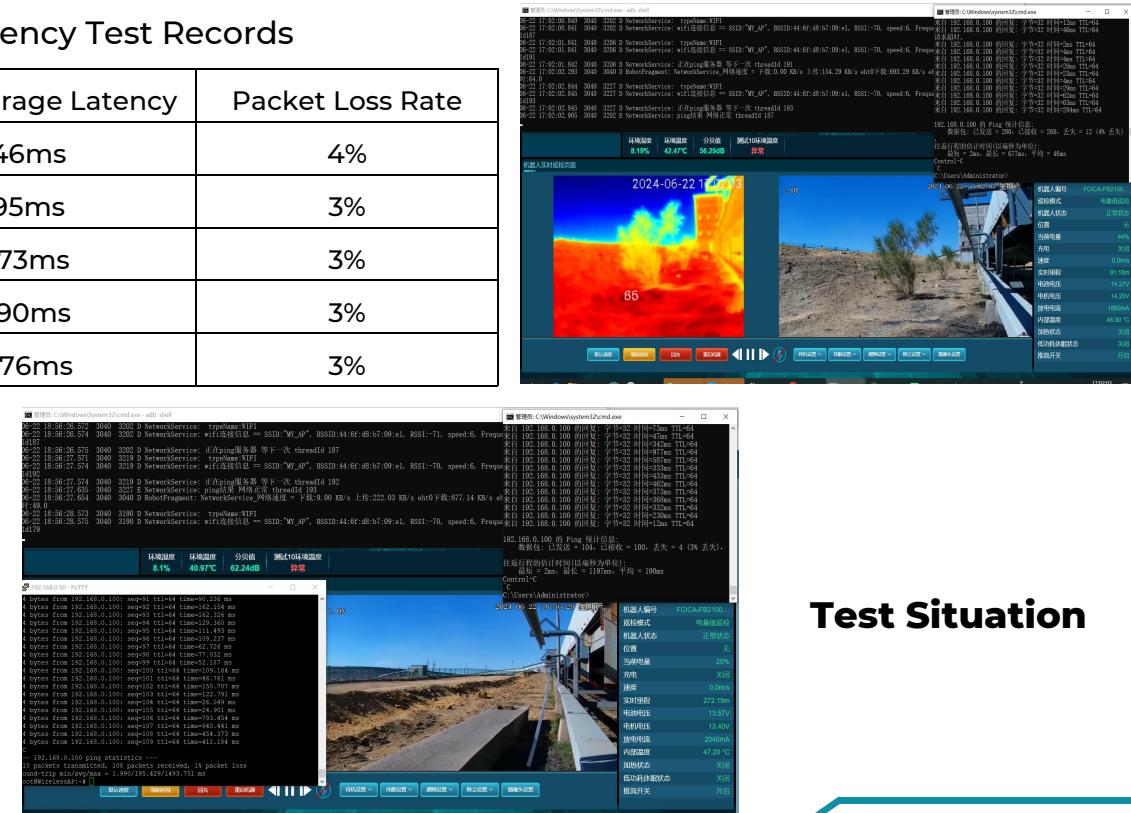
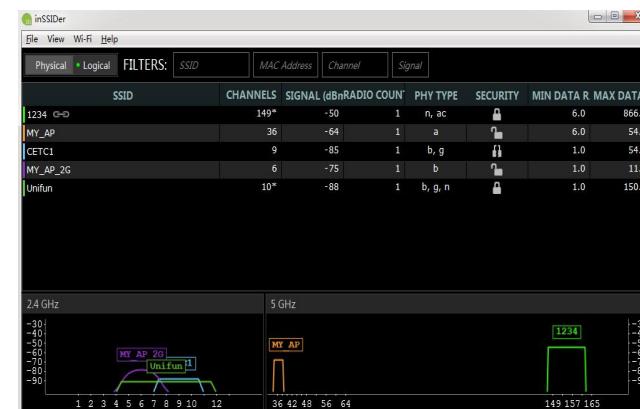
**Client Feedback: Client was satisfied with the wireless solution, which solved signal instability in the complex coal mine environment, ensuring smooth robot operation and improved efficiency!**

## WiFi Signal Strength Test Records

Position	Signal	Signal Fluctuation Compliance: $\leq 5\text{dBm}$
100 meters	-64	Pass
200 meters	-72	Pass
300 meters	-72	Pass
400 meters	-75	Pass
500 meters	-80	Pass

# Client Latency Test Records

Position	Ping Average Latency	Packet Loss Rate
100 meters	46ms	4%
200 meters	95ms	3%
300 meters	173ms	3%
400 meters	190ms	3%
500 meters	276ms	3%



## Test Situation