

# Convergence of 5G + AI to Accelerate the Digitalization in Traditional Mining Industry

The 5G AR Helmet use case in smart mining  
- Embedded with Fibocom 5G smart module SC171

Award Category: Industry & Construction



# Content

## Content Table

- **Industry and challenges**
- **5G-enabled AR helmet solution**
- **Fibocom 5G smart module SC171**
- **Customer testimonial**

# The Industry

Coal still supplies just over a third of global electricity generation and it will continue to play a crucial role in iron and steel production until newer technologies are available, according to the IEA (International Energy Agency), updated July 11<sup>th</sup> 2023. Safety and efficiency is inherently the top priority in mining industry due to the hazardous environment and limited communication approaches.

## Challenges

1

Inefficient collaboration between underground workers and remote management centers restricted by geography locations. Heavy investment on the cable deployment which leads the business owner seeking for fast and flexible network deployments.

2

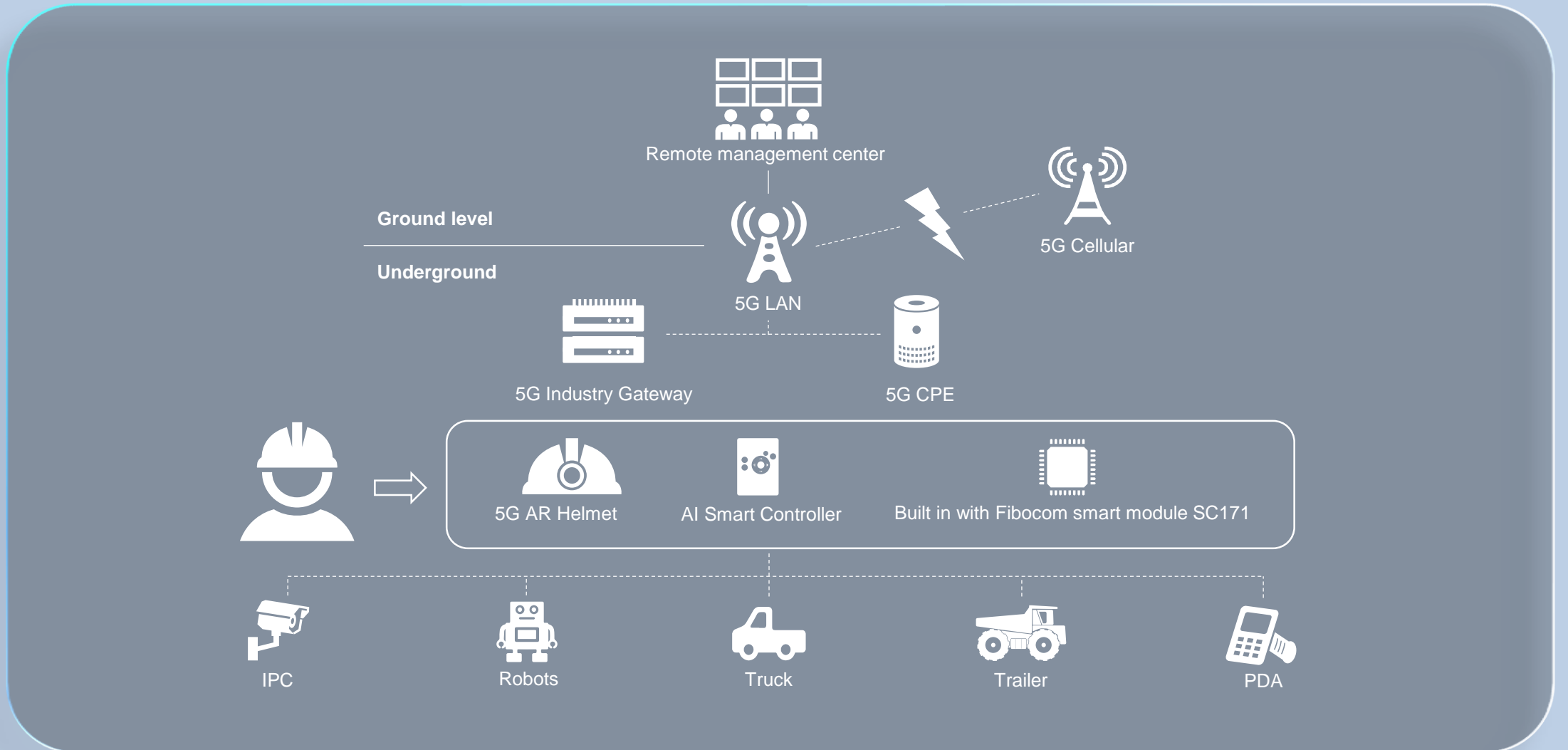
Harsh environment: dust, humidity, extreme temperature, toxic gas, thin air, dim light...etc. Preventive monitoring measurements are necessary to protect the safety of operators.

3

Once encountered with unexpected emergencies such as collapse, loss of communication signals, water leaking, the “golden rescue time” is crucial for survival.



# Topology

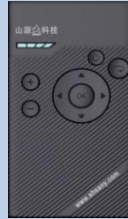


# 5G AIoT Solution Fueling Traditional Mining with Premium Intelligence

In collaboration with Shanghai Sany Electronic Technology Co., Ltd. (hereinafter referred to as “Sany”), Fibocom supplies 5G smart module SC171 as the key wireless solution for the 5G AR helmet that Sany developed for the smart mining industry.



5G AR Helmet



AI Smart Box



Built in with Fibocom  
smart module SC171

By integrating the digital information from the mining site, the 5G AR helmet enables the real-time transmission in the form of three-dimensional to the management center remotely. This revolution can unleash a variety of innovative functions, further reducing the work burden operators face, while enhancing efficiency.

In terms of remote collaboration scenarios, the AR glasses integrate technologies including Augmented Reality, real-time audio and 4K video transmission, as well as 5G capabilities, to build an AR collaboration space connecting front-line field personnel and remote experts. In the case of emergencies such as equipment failures, experts can provide professional support for field personnel even if they are thousands of miles away.

# Application Scenarios

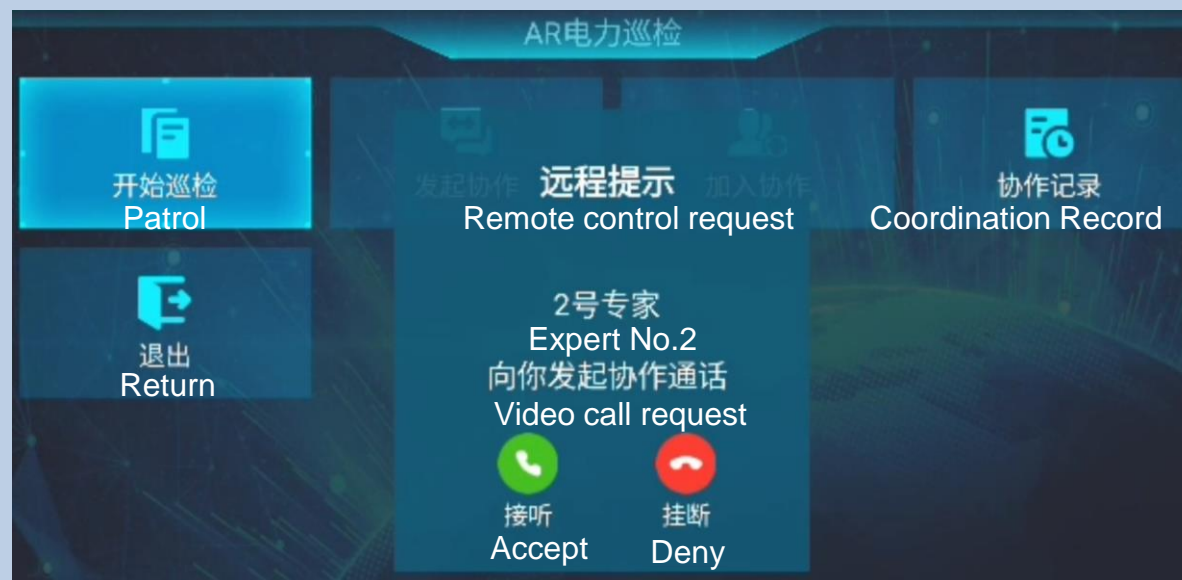
The 5G AR helmet equips with AR glasses and a HD camera to realize the 3D scanning and modeling, transmitting the underground environment video via 5G network in real time. Moreover, by setting up the helmet for each worker, it is able to build a two-way channel for remote experts to assist the mining operation and troubleshooting.

## Smart Grid Management Center



The powerful QCM6490 chipset platform to support AR inspection in real time with 3D technology.

## AR Patrol Automation



Remote management includes: multi-channel video calling, screensharing, video recording, note writing, and transmitting and receiving the images/videos, etc.

# Fibocom 5G Smart Module SC171 Solution

Fibocom 5G smart module SC171 is specially designed for high-end AIoT market, which integrates powerful CPU, GPU, ideally suitable for applications such as VR, smart robots, IIoT, smart payment, IPC, automotive aftermarket, drones, logistics, smart home, etc.

## Powered by the Qualcomm® QCM6490

Powerful CPU, GPU to Support Rich AI Algorithm Integration, 13 TOPS computing capability



## Powerful Encode & Decode Capability

4096\*2160 @ 60fps  
H.264/H.265/VP9



## High-performance Graphic Engine

Multi-channel camera input and output (up to 5 channels simultaneously), smooth 4K video



## 5G SA/NSA, Sub-6GHz

4x4 MIMO DL, 2x2 MIMO UL, Wi-Fi 6E Supported



## Rich Interfaces

MIPI/ USB/ UART/ SPI/ I2C, etc.



## Precise Navigation and Positioning

Multi-constellation GNSS (L1+L5)

# Value Brings to the Mining Digital Transformation

1. In terms of remote collaboration scenarios, experts can provide professional support for field personnel even if they are thousands of miles away.
2. In terms of intelligent inspection scenarios, AR glasses can not only improve inspection efficiency but also help standardize.
3. The AI recognition function of the glasses can meet equipment inspection requirements as well as those relating to violation assessments regarding command.
4. In terms of training and teaching scenarios, AR glasses can meet the personnel training needs in modernized mines.

## Endorsement from Sany

The application of 5G mining AR glasses requires 5G cellular access. In addition, it is also necessary to meet power consumption limitations while maintaining video capture quality, sufficient local computing power, and high reliability and stability in the mine working environment. Based on the Qualcomm QCM6490 IoT solution, the solution developed by Fibocom has achieved excellent performance in terms of power consumption and computing power, as well as 5G and Wi-Fi 6 full connection capabilities, providing us with strong technical support.

Bibo Liu

Deputy Deneral Manager of Sany & President of the Central Research



# PERFECT WIRELESS EXPERIENCE


广和通致力于将可靠、便捷、安全、智能的无线通信解决方案普及至每一个物联网应用场景，为用户带来完美无线体验，丰富智慧生活。


We are committed to enabling industries with reliable, accessible, secure, and intelligent IoT wireless solutions and wireless module products to maximize their value, providing a perfect wireless experience to people and enriching smart life of the whole society.

**Copyright©2023 Fibocom Wireless Inc. All Rights Reserved.**  
The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Fibocom may change the information at any time without notice.

Fibocom Wireless Inc.



 0755-26733555

 Floor 10-14th, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan Shenzhen, 518000, China

 [www.fibocom.com](http://www.fibocom.com)

**Fibocom**