

Wireless project



Application of OneWireless to CNPC Northwest Sales Center Xigu Oil Depot:
Wireless monitoring, wireless mobile work station and wireless interconnection of oil depot measuring points

Project overview

In the project of reconstruction of CNPC Northwest Sales Center Xigu Oil Depot, it is required to add oil pipeline pressure measuring points; support real-time acquisition of control system data and real-time entry of loading data and information in the operation of railway loading bridge; support real-time acquisition of Beitan Oil Depot data to realize data sharing.

Honeywell provides the following wireless equipment for the project: 5 multi-functional nodes; 20 wireless pressure transmitters; 4 mobile work stations / RESS Server; wireless management plat.

Honeywell also provides PKS control system to realize stock management system, oil product mobile system, highroad automatic oil filling system, railway ration loading system, order management system, online equipment management system, CCTV monitoring system, wireless communication and broadcasting system, access control system and performance management system.

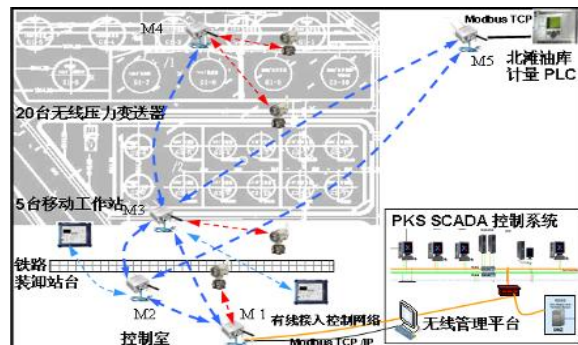
The wireless network architecture constructed through 5 multi-functional nodes supports 3 wireless applications simultaneously:

- 1). Support 4 mobile work stations to realize on-site mobile operation, real-time browsing of PKS control system picture, configuration, report and alert and entry of process data of railway loading and unloading platform;
- 2). Support communication with 20 wireless pressure transmitters and process data monitoring;
- 3). Support wireless communication between Beitan Oil Depot measuring system and Xigu Oil Depot PKS control system.



Wireless solution

5 multi-functional nodes are collocated on the oil depot site to construct mesh backbone wireless network for quick communication with self organization and self healing, support wireless communication of on-site wireless transmitters, mobile work station and PLC wireless interconnection: M1 as wireless gateway is located on the roof of the central control room, connected to PKS SCADA system as gateway through the wire mode and integrate data of the



standard communication protocol Modbus TCP adopted by wireless network data with Experion PKS control system. M2 and M3 are located on the railway bridge. M4 is placed near the pump room. M5 is used as wireless transit for Beitan Oil Depot measuring system;

1) . Wireless network supports wireless transmitter:

Wireless pressure transmitters are installed to oil pipelines near the pump room, oil pipelines on the northern side of the main control room and measuring points near the railway bridge. Wireless transmitter can automatically select wireless communication with the multi-functional nodes, M2, M3, M4 or M1; wireless communication between multi-functional nodes constructs mesh wireless backbone network. Multi-functional nodes in the control room are used as gateway to transmit all the data to PKS control system for data integration. Wireless backbone network constructed by multi-functional nodes supports redundancy, multi-path and frequency hopping communication. Wireless network integrates multi-functional nodes into control system and adopts the standard communication protocol Modbus TCP.

Communication of wireless transmitter adopts 2.4GHz common band hopping (ISM) with self organization and self healing; wireless network is flexible in scale and convenient in installation; wireless equipment is verified and approved by State Radio Administration Commission. The refreshing speed of wireless transmitter can be set as 1 sec max. ; wireless temperature transmitter can select explosion suppression; the service life of wireless transmitter battery can be predicted that it is 4.5 years with 1-second refreshing at the normal temperature.

2) . Wireless network supports mobile work station:

The high-efficient mobile solution of mobile work station supports on-site mobile operation. It is certified that the durable mobile work station that can be used for a dangerous environment supports employees' accessing key process parameters, historical data, graphics, process pictures, maintenance information and other important data of Experion PKS SCADA control system on the railway loading and unloading dock through a wireless mode and direct entry of process parameters. Through mobile work station, the operators can control the influence of on-site operation on the production process in a real-time manner.

Mobile work station of the railway loading and unloading platform realizes direct wire communication with multi-functional nodes, M2 or M3 installed near SCADA control room to browse all the information and data in SCADA through a real-time mode. M1 is connected to SCADA control system through a real-time mode and the communication protocol is the standard Modbus TCP. Terminal client installed on mobile work station) accesses the remote client end server (RESS Server)through wireless network through a wireless mode and gateway M1 so as to realize real-time browsing of process information of control system, authority setting and read and write data of Experion dynamic picture.

3) . Wireless network supports wireless interconnection:

Xigu Oil Depot adopts wireless network to connect Beitan Oil Depot local PLC and Xigu control system and support real-time acquisition of Beitan Oil Depot running data by Xigu Oil Depot control center without the inconvenient and non real-time communication modes as telephone or interphone. A multi-functional node, M5, installed near Beitan Oil Depot measuring system connected to Beitan Oil Depot measuring system (TCP communication or Modbus RS485 communication, this project adopts Modbus TCP) through the wire mode; M5 can realize direct wireless communication with multi-functional node M2 on Xigu Oil Depot site, transmit to wireless gateway through wireless backbone network and realize data integration with Xigu Oil Depot control system so as to collect data of Beitan Oil Depot measuring system in a wireless manner.

4) . Integration of wireless network with PKS control system:

Gateway in wireless network can realize CDA direct integration communication with Experion PKS control system (R311.2 version and above). Users can, through integrated embedded tool in Experion Configuration Studio, conveniently increase or reduce wireless I/O points, establish control strategy and configuration and monitor wireless equipment; realize safety management of wireless network; communication diagnosis and maintenance of wireless network. I/O points, measuring and state parameters of wireless transmitter are indicated as native Experion points in Experion HMIWeb Display Builder without SCADA point or OPC parameter. Wireless equipment, wireless gateway and mobile work station can be monitored in Experion System Status. Data of wireless network are completely integrated in Experion database.

5) . Wireless network management platform:

Wireless management platform realizes the following functions: 1) Communication diagnosis of wireless network: used for managing and diagnosing radio communication status of equipment in wireless network; graphic function interface supports monitoring radio communication state and wireless communication topology structure with the graphic mode; 2) Support remote online configuration or maintenance of wireless transmitter; 3) Unified and safety management of wireless network. Such functions are fully embedded and integrated in Configuration Studio and Control Builder of Experion control system: users can, through integrated embedded tool in Configuration Studio, conveniently increase or reduce wireless I/O points, establish control strategy and configuration and monitor wireless equipment; realize safety management of wireless network; communication diagnosis and maintenance of wireless network. I/O points, measuring and state parameters of wireless transmitter are indicated as native Experion points in Experion HMIWeb Display Builder without SCADA point or OPC parameter. Wireless equipment, wireless gateway and mobile work station can be monitored in Experion System Status. Data of wireless network are completely integrated in Experion database.

Project schedule

The reconstruction project is planned to go into operation in July 2010.

Advantages of wireless technology

In Xigu Oil Depot reconstruction project, the pressure measuring points of oil pipelines and the control center are separated by railway and the existing bridge and cable tunnel have been up to a full load; it is difficult for the wire solution to realize supporting employees' mobile operation on the railway bridge and real-time understanding real-time data of Beitian Oil Depot.

With regard to Honeywell's wireless solution, it is not required to consider wiring and laying of cable during project reconstruction and install bridge and cable protecting tube so as to obviously reduce the reconstruction workload, the installation cost, the time for installation and debugging and later maintenance workload, support on-site mobile operation and acquire real-time data and information of control system without shuttling between the site and the control room.

In addition, the control room and the site are simply collocated: no connection box, safety grid and I/O; reduce DCS load; reduce maintenance workload and failure location. Wireless network can be conveniently extended. When the measuring points are added in the future, wireless transmitter can be directly installed, which realizes easy replacement and flexible plug-and-play.

A wireless architecture supports wireless transmitter, mobile work station, wireless interconnection with remote control system, which can bring the strengths in cost and technology to Xigu Oil Depot users. Full integration of wireless system with control system and management functions of wireless network fully built in control system facilitate users and help them realize high-efficient reconstruction of the tank field and running of the tank field with a high automation level and a high technical level in a high efficient manner in the future.

More information

For more information related to Honeywell wireless solution ,
please access www.honeywell.com/ps/wireless ,
or contact your Honeywell customer manager.
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