

FirstCon Intelligent Water-saving Irrigation Control System

Intelligent water-saving irrigation control system is to conserve water and improve the efficiency of agricultural water use as the core of agriculture, is an important connotation of modern agriculture. Its core is under limited water conditions through the use of advanced engineering technology, appropriate agricultural technology, water management and other comprehensive technical measures, fully improve agricultural water use efficiency, water productivity and efficiency, to ensure sustained and stable development of agriculture. Due to the existing water-saving irrigation system, although it's effective in reducing crop irrigation execution costs and improved to a certain extent on crop yields, but the conventional drip irrigation system has many problems to be resolved, resulting in rationality of irrigation cannot be implemented effectively. Thus, intelligent water-saving irrigation control system has a very important role in solving the agricultural irrigation water and mitigating the problem of the lack of water resources.

1. System Introduction

FirstCon intelligent water-saving irrigation control system (referred to as: FC_WSIS) is the use of intelligent sensing chip, mobile embedded systems and other IOT technology which used in modern agriculture through irrigation control systems, environmental monitoring systems, and soil temperature and humidity monitoring system, to achieve remote control for crop irrigation terms, the temperature, humidity, wind, air pressure, rainfall and soil nitrogen and concentrated PH value. Further realize refinement, remote and automation of agricultural production, to change the traditional mode of agricultural production. Through intelligent water-saving irrigation system that can improve agricultural

water use, improve management level and irrigation water use efficiency.

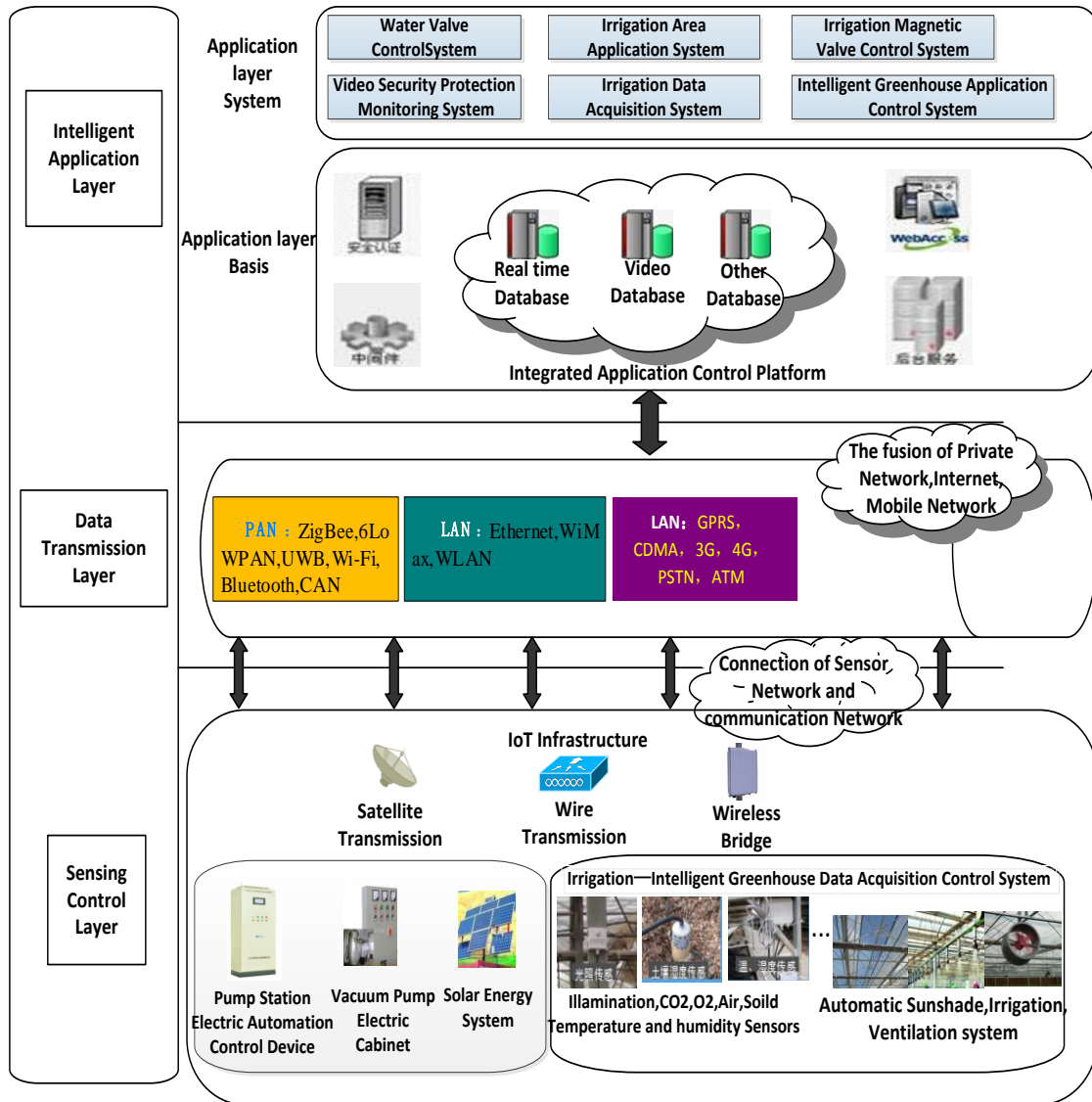
Intelligent water-saving irrigation system functions:

Give full play to the role of the existing water-saving devices, optimal scheduling, improve efficiency;

- Through the application of automatic control technology, the more water and energy conservation, reducing irrigation costs and improve the quality of irrigation;
- Make irrigation more scientific, improve the management level;

2. System Architecture

Intelligent greenhouse control system uses three-tier networking of IOT, it's divided into perceived control layer, data transport layer and intelligent application layer, combined with video surveillance system for remote monitoring of crop growth, real-time detection of greenhouse environmental parameters and environment adjustment control mechanism.



3. System Functions

By implementing automatic irrigation control, can reduce or avoid the impact of human factors. Because crop needs water and fertilizer supply, and the supply of water and fertilizer achieved by precision irrigation, drip irrigation technology and automatic control technology are the most effective technology solution channels of precision irrigation. Drip irrigation technology provides a technology guarantee for crop growth, but also provides an application platform for automatic control technology. Therefore we can say that drip

irrigation automatic control and intelligent management technology will enable real-saving irrigation to achieve the purposes of increasing production and efficiency.

Water Metering Management Functions

Take metering and monitoring of export meter as the total water amount of irrigation area, using pressure sensor of each branch pipe to collect data in real time and calculate irrigation water of each branch pipe, combined with valve automatic control functions to achieve the water consumption statistics of each valve control unit. Meanwhile, pumps use PID and flow control, so as to achieve a constant voltage supply and regional water restrictions of irrigation.

Valves Automatic Control Functions

By monitoring a small weather station and soil sensors, reach for real-time monitoring of climate information, farmland soil moisture information and crop condition information. Using wireless or wired technology to realize remote open and close of the valve and achieve the effect of regular rotation irrigation. According to the information collected, combined with local crop water demand, the development of irrigation schemes, automatically turn on pumps, valves; achieve unattended automatic irrigation, to achieve subdivision control and prevent human operation errors.

Operational Status Monitoring Functions

Through the outlet pressure and flow, flow and pressure of network pipe sub dry pipe, pump current and voltage as well as the water level in the grit chamber and video surveillance, able to discover burst pipes, leaks, low voltage operation, irrigation water conditions and other failure events in time which appeared in drip area. Use sound and

light alarm or SMS to inform system maintenance personnel, in order to ensure the efficient operation of the drip irrigation system.

Management Platform Functions

Through configuration status in real time of the platform monitoring to manage system operation, and process statistics and cost accounting of regional water, power, irrigation, maintenance, material consumption, etc. Use system-generated reports and trends, to understand the effect of irrigation and generate regular maintenance schedule and record maintenance conditions to irrigation facilities, to achieve the refined maintenance operation and management of the irrigation projects. Relying on and cooperating with technology strength in various universities, to form experts database of Anhui FirstCon, constantly optimize the intelligent irrigation system, to reach the operation strategy that suits to local conditions best.

4. System Features

FirstCon intelligent water-saving irrigation system consists of a wireless valve controllers, solenoid valves, wireless repeaters, wireless pump controller, wireless water acquisition, wireless weather stations and other equipments and monitoring centers, realize real-time pressure adjustment, remote monitoring and control valve motor start and stop, to meet users' needs of irrigation process monitoring, irrigation quality analysis and irrigation process improvement.

Wireless integrated: wireless communication saves wiring costs, integrated design is

easy to install and maintain;

Extensive coverage: built-in power enhancement and routing, covering a wide radius;

Strong scalability: The system component design, large scale of node, compatible with multiple solenoid valves;

Easy to use: automatic diagnostics, real-time alarm, remote service, report generation;

Stable operation: valve switches status feedback; improve the reliability of irrigation systems;

Powerful features: support for multiple modes of irrigation, irrigation algorithms embedded, analysis and prediction of irrigation quantity and time;

Expert guidance: relying on experts and technical personnel in university, to form our own expert database of Anhui FirstCon, integrate and optimize the system continuously;

By advantages of flexible stationing, easy construction, easy maintenance and low cost, change irrigation methods, improve crop quality, increase crop products, save irrigation water, improve irrigation management to achieve automatic operations of irrigation analysis process, in order to achieve social and commercial benefits.



5. Service System

- Energy-saving services: Energy-saving design / energy-saving projects
- Technical support service: System upgrade / system diagnostics / system

maintenance

- Energy monitoring service: Monitoring program design / IOT integration / project
- implementation