

## SUCCESS STORY



### Data Acquisition & Transmission System for Online Air & Water Pollution Monitoring

**Location:** Nanjing, China  
**Order Date:** August 2007  
**Completion:** October 2007  
**Industry:** Environment

#### Executive Summary

The Nanjing Municipal Environment Monitoring Center (NMEMC) was looking for a better system that could be adopted for use in online pollution monitoring. For the following reasons, Yokogawa STARDOM autonomous controllers with embedded Web servers were selected for this air emissions and waste water surveillance data collection and transmission system:

- Utilizes an open and highly reliable non-Windows operating system that provides increased protection against common types of Web attacks
- Features an embedded Web server with remote operation and maintenance capability
- Has a modular system configuration and online download capability for easy system expansion
- Can flexibly connect to GPRS and other types of networks

“Simple installation, no data transmission distance limitation, low operation cost (by GPRS communication), secure network. Compliance with state and local standards regarding data transmission communication protocols for environment online monitoring purposes, also with protocols for communicating with environment equipment from different vendors. Compared with traditional remote monitoring units, the pollution source remote monitoring unit equipped with the STARDOM controllers is obviously more open, more intelligent, has better network flexibility, and has higher performance. I believe the STARDOM controllers will make a great contribution in the environmental monitoring domain and that they will be used in a wider range of applications.”

Zhang Zifan, Engineer  
NMEMC



Zhang Zifan, Engineer  
NMEMC

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## The Challenges and the Solutions

### Open and highly reliable system

A system was needed that could easily connect with existing 3rd party SCADA software, offering protection against most common Ethernet and TCP/IP layer attacks, and was stable under most network conditions. With its capability to integrate commercial-off-the-shelf components and use of a non-Windows operating system, STARDOM fulfills these key requirements, ensuring the reliable and secure collection of environmental data. As no fans are used in the controllers, they also exhibit excellent aseismic characteristics and are suitable for use in air quality monitoring vehicles.



Vehicle for air monitoring

### Flexible network capability

As GPRS communications are not particularly robust, disruptions occasionally occur. The STARDOM controllers are equipped with communication health check and automatic redial functions, and have a large memory capacity for the collection of time-stamped data. After a communications link is re-established, all the data can be sent to the SCADA server, without loss.

### Remote operation and maintenance capability

In this highly distributed application, it was essential to have a remote maintenance capability and to keep maintenance costs to a minimum. With their built-in Web server function, STARDOM controllers can be easily accessed from a standard browser such as Internet Explorer running on any PC that has a Web connection. All you need to do is input the controller's URL and enter your user name and password.



IE screen

### Modular type system and online download function

With the ever growing need to address environmental issues in urban areas, it is vitally important to have a system that is easy to expand and upgrade. Thanks to its modular construction and ability to download software updates online, the STARDOM system can be easily expanded and adapted to meet new challenges.

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### About the NMEMC



Nanjing Municipal  
Environment Monitoring Center

The NMEMC was founded in 1979 and is a state-run city-level monitoring center. It is responsible for monitoring the water, air, noise, and soil pollution in Nanjing as well as solid waste and emissions from nuclear and other types of facilities. The NMEMC also carries out pollution source surveillance and online monitoring of major companies, and is responsible for emergency monitoring and surveillance at accident scenes.

NMEMC is the first organization in the country to issue weekly public reports on air quality and the first city-level surveillance station in the country to provide weekly and daily air quality forecasts.



Wang Hesheng  
Vice Director of NMEMC



Yu Yiyong  
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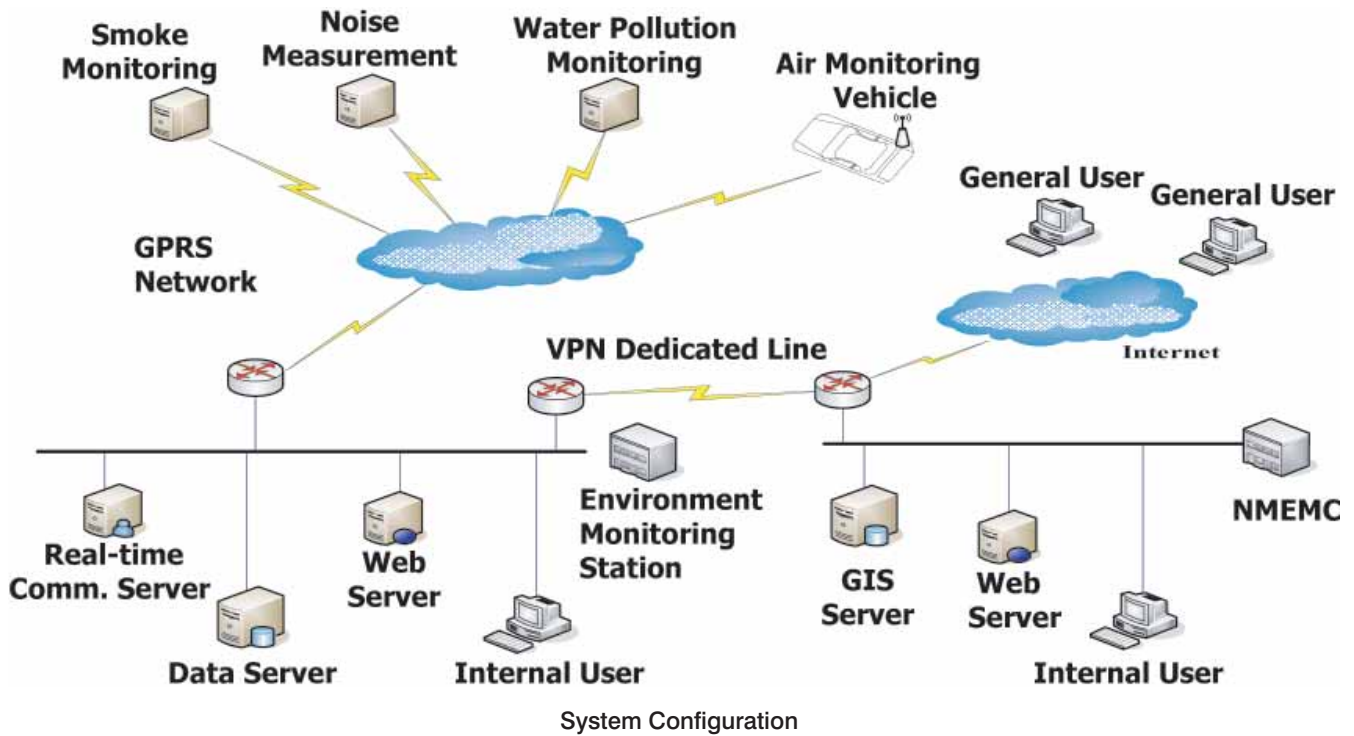
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### About the air & water pollution monitoring project



For air monitoring, an FCN controller is installed in an environmental monitoring vehicle and connected to air quality analyzers and climate instruments. For waste water surveillance, an FCJ controller is connected to a water analyzer. The collected data is sent to a SCADA server (3rd party) via a GPRS communications link. Environmental data is transmitted in real time via socket communications. Daily and weekly reports for environment management purposes are sent by FTP.

The SCADA system for environmental monitoring consists of:

CEMS – Environmental monitoring platform provided by a 3rd party Chinese company

STARDOM FCN/FCJ – Hardware components that handle the gathered data from environment analyzers. CEMS and the STARDOM FCN/FCJ controllers are integrated to provide environmental monitoring and management functions. Communication between CEMS and the STARDOM FCN/FCJ controllers is done via a GPRS link.

#### <System Details>

**STARDOM Autonomous Controllers: STARDOM FCN/FCJ with GPRS Communications**

**Built-in SCADA etc.: InfoWell + PPPKeeper + Data Logging, Environment instruments**