Rural Traffic Management System: A Solution to improve commuting in Seoul's Highway System

The Ssangyong Information & Communications Corp. applied a new PC-based control technology. This program aimed to develop a low-cost, real-time highway management system with high integration and scalability to improve traffic efficiency.

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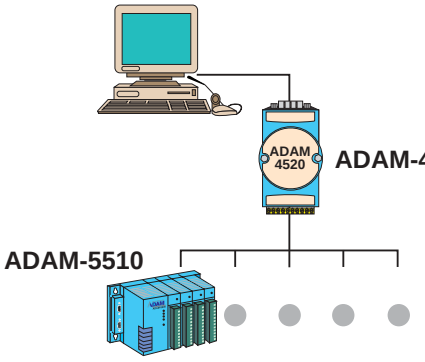

INTRODUCTION

SsangYong Information & Comunications Corp. (SICC) is an enterprise providing system integration, consulting & education, and communications & network for the information and communications industry. Committed by an Korean Institute of Construction Technology, the SICC ITS (Intelligent Transport System) business was requested to establish an efficient traffic service system connecting Seoul with suburbs and outlying areas. The first stage of this system covers around 45km from Sungnam to Taipeong.

SYSTEM REQUIREMENTS

According to the evaluation, typical road systems in Korea generally suffered from a lack of information about road management and highway environment and an inability to handle the traffic load at toll stations during peak-hours. Even worse, personnel had to go through great efforts to communicate with other systems.

To improve traffic quality and eliminate bottlenecks, the SICC developed the concept of Rural Traffic Management System (RTMS). RTMS serves as a smart traffic system with:

- Real-time traffic control and information uploading
- Congestion and heavy vehicle management
- Auto-enforcement of traffic violators
- Good communication with other systems

SYSTEM DESCRIPTION

The architecture of RTMS included Speed Detectors, Visual Management Systems, Local Centers, Sub-Regional Centers, SCADA Systems, etc.

Speed Detector Systems were installed at 37 sites, each site has an Advantech's

ADAM-5510's SCADA Functionality in RTMS Monitoring and protecting:

- Power supply & main equipment
- Speed detector and supporting equipment
- Communication equipment
- VMS and supporting equipment
- Lightning-protection
- Disaster-preventing and safety equipment
- HVAC equipment
- Entrance-prohibiting equipment
- Condition of computer equipment
- Vibration (shock) resistance

MIC-2350 Intel all-in-one Pentium CPU modules and PCM-3810 solid state disk modules. Every site included a pole and a control-box to process and manage the detecting sensor and I/O signals. The detector watches every lane of the road, and information is responded to in real-time.

For the SCADA System, the ADAM-5510 PC-based Controller, along with various ADAM modules for analog input and digital input/out, was applied as the main component in the central

system. The ADAM-5510 is responsible for monitoring Local Centers's equipment and providing present road status. This helps to establish and manage every facility's maintenance plan and to connect

information
with the whole traffic system.

The Local Center included Power Supplies, Speed Detectors, Lighting Equipment, HVAC and Security Systems. (Please refer to the System Diagram). Here, the ADAM-5510 Controller acts not only as an open PC-based control platform to link up different systems but also supports 3 flexible communication ports. As for communication with office computers, the ADAM-4520 converter transfers long distance industrial RS-485 signals to RS-232 PC signals.

Programmers can configure and download Turbo C/Visual Basic program from a remotely located Central Control Room. This made the Local Center operate independently and enhanced the total performance of traffic systems.

WHY ADVANTECH

The Advantech ADAM-5510 product provides benefits that other PLC products do not have:

- Remote program download & reset
- Lower programming & hardware costs
- Easy integration with other systems by communication ports

Only increased budgets and tremendous engineering efforts can give PLC products such benefits. This is precisely why the SICC choose Advantech ADAM-5510 -- it provided a full range of user-friendly functions at low cost.

CONCLUSION

Once the first 45km section was installed, the Ministry of Construction and Transportation was satisfied with the test results of RTMS. On the fields of cost, operation and system integration, the ADAM-5510 PC-base controller has done an excellent job in the Rural Traffic Management System.

What will be the next? After three years of research, the SICC now has plans to expand RTMS from the Seoul area to nationwide around the year 2000. ■