

CASE STUDY

Hangzhou Metro Line 4 Deploys Reliable and Secure Solution



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Lei Zhao
Hangzhou Metro Line 4
Project Manager



The Hangzhou Metro Line 4 is Hangzhou city’s third metro line to enter trial operation. Built entirely underground, Phase 1 of the project measures 20.8 km. The initial section of the line includes 10 stations at 9.6 km in length, and began operation in 2015. The southern section is 11.2 km long, has 8 stations, and is expected to start serving the area in November 2017.

Challenge

Hangzhou Line 4 is an integral part of the city’s public road system. It has to provide a rapid, highly efficient commute for passengers, while ensuring the safety of all commuters and staff on the trains. Therefore, the access control solution in place had to be highly reliable and secure.

Previously, the access control solutions deployed for other Hangzhou Metro Lines were plagued with instability and had issues arising during system calibration. As such, the operator of Hangzhou Metro developed a list of requirements for the access control solution to be deployed at Hangzhou Line 4. At the top of the list were three key areas that the solution had to fulfill: it had to be highly stable, have the capability to integrate workflows, and be compatible with a range of equipment.

Solution

Facing an access control system of this scale and complexity, Hangzhou Metro chose to deploy HID access controllers and card readers, as they met the stringent requirements set by the operator. The equipment deployed includes 17 HID VertX V1000P networked controllers, 330 HID VertX V100P door/reader interfaces, 585 iCLASS SE® R951 card readers and 30 iCLASS SE RK40 keypad card readers.

The V1000P networked controllers support dual Ethernet ports, and when connected to the door/reader interfaces, they support a total of 485 dual communication lanes for high reliability with ample redundancy and backup for the entire communication channel. iCLASS SE readers also support highly secure encryption models, and are compatible with the access cards used by metro staff.

The access control solution deployed for Phase 1 of the Hangzhou Metro Line 4 is set up in accordance to national standards, and the HID Global products all have internationally recognized certifications including UL, CE, FCC, and ROHS. The products were manufactured according to the highest quality control standards, ensuring the operator that they would still run reliably and securely -- even if they were to undergo extended period of operation.

The products are located in the equipment room, staff passageways, station master’s room, ticketing rooms, and various other locations. Each station has approximately 50 to 60 points of access, with each metro line requiring an individual management system that is centrally managed by the network center.



Technologies:

- V1000P
- V100P
- iCLASS SE

Management Platform

HID Global opted for a two-tier management, three-tier control distributed network structure, which served as the foundation that helped the operator of Hangzhou Metro build its interline authorization management network center.

The management platform includes the central tier and station tier. Personnel responsible on the central tier are stationed at the control center, where the central server, central authorization workstation and central management workstation are located. To realize standardized management and data maintenance across the entire access control system, staff with central tier authorization are responsible for monitoring the operation status of station equipment and setting up user access permission at the points of access, in addition to the access rights of system administrators.

Workstations for station tier personnel are set up in each station's control room. These workstations are mainly used for displaying the status of each station's access control equipment, but they can also be used for controlling and querying the equipment.

The two tiers communicate through a TCP/IP network. The central server combines the distributed station-tier databases to form a complete database with data on all lines. This resultant database holds all stations' data on access control management and transaction data, which can be queried, edited and exported as a report. In scenarios where communication with the central-tier system fails, the station-tier system can still monitor and control the respective station's access control system on its own.

Deployment timeline

Due to the unique nature of underground metro construction work, the window for solution deployment was extremely narrow. The HID Global's products were deployed and calibrated in only one day for each station, and the total deployment was completed in only five months. For the operator, the short deployment time translated into significantly lower costs.

Conclusion

Currently, Phase I of the Hangzhou Metro Line 4 project has 10 points of access and one parking area using HID Global's access control system. Thanks to the exceptional software interoperability, integration capability and operation stability of HID Global solutions, the system has been instrumental to ensuring the safety of the stations, despite operating in the high traffic metro environment.

"The excellent software compatibility, flexible user interface and quick adjustability of HID Global's products enable our trains to run stably and efficiently," said Lei Zhao, Hangzhou Metro Line 4 project manager. "Stakeholder feedback has been very positive and, more importantly, HID Global's products deliver high levels of security along with a very favorable price-to-performance ratio. The company's reputation is outstanding, and HID Global has also given us important new capabilities that reduce costs while improving operations."