Matilda Floor Elevator PLC Control Circuit Design

Ye Liu, Udutech Inc., Shijiazhuang, China
Tao Gao, Udutech Inc., Shijiazhuang, China
Chong Yuan, Udutech Inc., Shijiazhuang, China
Tianze Li, Udutech Inc., Shijiazhuang, China

ABSTRACT

This design introduced the operation process of the lift. In accordance with the requirements of energy conservation design teaching building Mingde building automatic control of the lift. By setting the TDD slope integration time Siemens MM440 transducer to control the elevator has the speed, and by j1.1 jv tractors to carry and transfer power make the elevator running. The Siemens S7-200 series PLC as control host CPU226, and extends the S7-200 series of I/O extension module (EM223) to control the input and output, complete the elevator traction motor and frequency converter, direction, floor, according to the layer station call, capsules in operation, the safety protection command signal for management and control functions. From inside the elevator running status signals, hall, driving direction, traffic location floor integrated PLC program control internal rule.

KEYWORDS
Elevator, Inverter, PLC, Traction Machine

1. INTRODUCTION

Human beings use transport tools to transport goods, personnel history is very long. As early as 2600 BC the Egyptians in the construction of the pyramid on the use of the original lift system, the basic principles of this system is still no change: A counterweight to decline at the same time, rising load platform. Life continues, technology is developing, and elevators are also improving. 150 years, lift material from the black and white color, style of the straight road type, the manipulation of control is a new step by step - the handle switch, button control, signal control, set selection control, man-machine conversation and so on, elevator also appeared in parallel control, intelligent control. Today, in any city in our country, elevators are widely used. Elevator brings convenience to people’s lives, but also provides a strong guarantee for the accelerated development of China’s modernization. The elevator control system is divided into relay control system elevator and PLC control system. The most commonly used in life is the PLC control system elevator. This article is through the PLC (programmable controller) designed to control the elevator, in order to achieve easy to use. This design works from a brief introduction to the elevator, and then introduced in detail based on the Siemens S7-200 series PLC to achieve the teaching floor of the Mingde floor elevator control system.

1.1. Research Background and Significance of the Subject

Elevator is a high-rise hotel, shops, residential, multi-story factory buildings and warehouses and other high-rise buildings indispensable vertical transport. With the development of society, the scale of the building is more and more large, and the floor is more and more, which brings
forward higher requirements for the static and dynamic characteristics of the elevator speed control precision, speed range. Elevator is a complex system of mechanical and electrical integration, not only involves mechanical, electrical and civil engineering fields, such as, should also consider issues such as reliability, comfort and aesthetics. And for modern elevators, should have a high degree of security. In fact, a number of safety measures have been adopted on the elevator. In the design of the elevator, the mechanical parts and electrical components have taken a lot of safety factor and insurance factor. However, only the elevator manufacturing, installation commissioning, after-sales service and maintenance are to achieve high quality, so as to fully guarantee the final high-quality elevator. In foreign countries, had “regulations” to implement elevator manufacturing, installation and maintenance of integration, It provides the professional installation team maintenance units approved by the manufacturing enterprises, and undertakes the installation and commissioning, regular maintenance and inspection tests, thus providing the guarantee for the reliability and safety of the elevator operation. Therefore, it can be said to take the elevator more secure. An insurance company in the United States has done a serious investigation and scientific calculation of the safety of the elevator. The conclusion is that the elevator is five times safer than the stairs. According to statistics, the number of other means of transport in the United States is about 8 billion people a year, while the number of people taking the elevator every year there are as many as 54 million people.

At present, the programmable logic controller (PLC), which is composed of microcomputer, is developing rapidly. The elevator with PLC control has high reliability, easy maintenance and short development period. This elevator is more reliable and has great flexibility. It can complete more complicated control tasks and has become the development direction of elevator control. Programmable controller PLC in the modern industrial automation control is the most worthy of attention to advanced control technology. PLC has become one of the three pillars of modern industrial control (PLC, CAD / CAM, ROBOT), and is widely used in machinery, chemical industry, petroleum, metallurgy, light industry, electronics, textile, food and transportation industry.

1.2. Research and Design Content

The PLC system that controls the operation of the elevator is required to achieve the “stable, accurate and fast” operation of the elevator. The system is mainly composed of PLC, logic control circuit. Including AC asynchronous motors, relays, contactors, limit switch, button, led indicators and frequency changing consists of control system as a whole. The control unit of the machine adopts the programmable controller PLC of SIEMENS to control the whole process of the machine. The entire system by PLC, logic control circuit of the elevator door open, lift, acceleration, deceleration, leveling, starting, braking control. Requiring it to achieve a simple structure, high efficiency, leveling high precision, so that it can be easy to understand and master. Finally, the staff then governor Siemens PLC debugging software, designed to meet the requirements needed (Yan, 2007).

The main requirements of this design are:

1. Design Mingde floor 10-story elevator, according to energy requirements below 4 no stop;
2. To reach the designated floor automatically start, the elevator door automatically open, after 10 seconds automatically shut down;
3. After reached the top or bottom, automatically changes direction;
4. Show the direction of operation, ladder instructions, ladder call signal, complete the tasks automatically disappear;
5. Overhaul the local train, a fire run, will not answer any calls;
6. Anti-gripping function, manual control remains in the open State.
A Study of Applying RFID for Heat Block Management in IC Packaging Factory
www.igi-global.com/article/study-applying-rfid-heat-block/45136?camid=4v1a

Bionics: Learning fro "The Born"
www.igi-global.com/chapter/bionics-learning-fro-born/21762?camid=4v1a