STEP7 LITE SOFTWARE IN THE AUTOMATED CONTROL SYSTEM OF THE COAL BRIQUETTE PRODUCTION PROCESS

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Abstract. *This article explores the implementation of an automated management system for coal briquette production using the STEP7 Lite software. It discusses the integration of automation technologies in managing the production process, including controlling machinery, monitoring production stages, and ensuring product quality. The article provides a detailed analysis of the STEP7 Lite software, its functionalities, and its application in optimizing the production process. The proposed system aims to improve efficiency, reduce operational costs, and enhance the overall quality of coal briquettes through automated control and monitoring.*

Keywords: *Coal briquette production, automated management system, STEP7 Lite software, automation, production process, efficiency, control systems, product quality.*

Introduction. The coal briquette production process is a complex and energy-intensive operation that requires precise control and monitoring to ensure efficiency and high-quality output. As industries strive to enhance productivity while minimizing costs, automation plays a key role in optimizing production processes. One of the leading solutions for automating and managing these processes is the use of advanced software, such as STEP7 Lite. STEP7 Lite, a widely recognized automation software, is designed to manage industrial processes by controlling machinery, monitoring real-time data, and improving the efficiency of production systems. In the context of coal briquette production, the integration of STEP7 Lite into the management system offers numerous advantages, including streamlined control, reduced human error, and enhanced operational efficiency. This article examines the implementation of an automated management system for coal briquette production using STEP7 Lite software. It discusses how automation can optimize the entire production process, from controlling raw material inputs to monitoring machine performance and ensuring the final product meets quality standards. The goal of this study is to demonstrate how incorporating STEP7 Lite software can lead to more efficient and cost-effective production processes while improving overall product quality.

STEP7 Lite software supply SIMATIC S7-300 control at the stations working logical programmable controller for standard software supply become is [1,2].

Software supply following functions does :

- Device technician condition about information to collect ;
- Technological parameters measuring from sensors incoming information again work ;
- Performer of mechanisms to adjust organ status about information to collect ;
- IMs automatic in mode management ;
- Technological of operations given management algorithm according to execution control to do ;
- Home parameters automatic in a way management ;
- Operator console through performer mechanisms remotely standing management ;
- The state of the system , its work mode and process changes online to show ;
- Accident status face when giving automatic protection , shutdown and blocking ;
- Accident face when giving sonorous or to give a light signal .

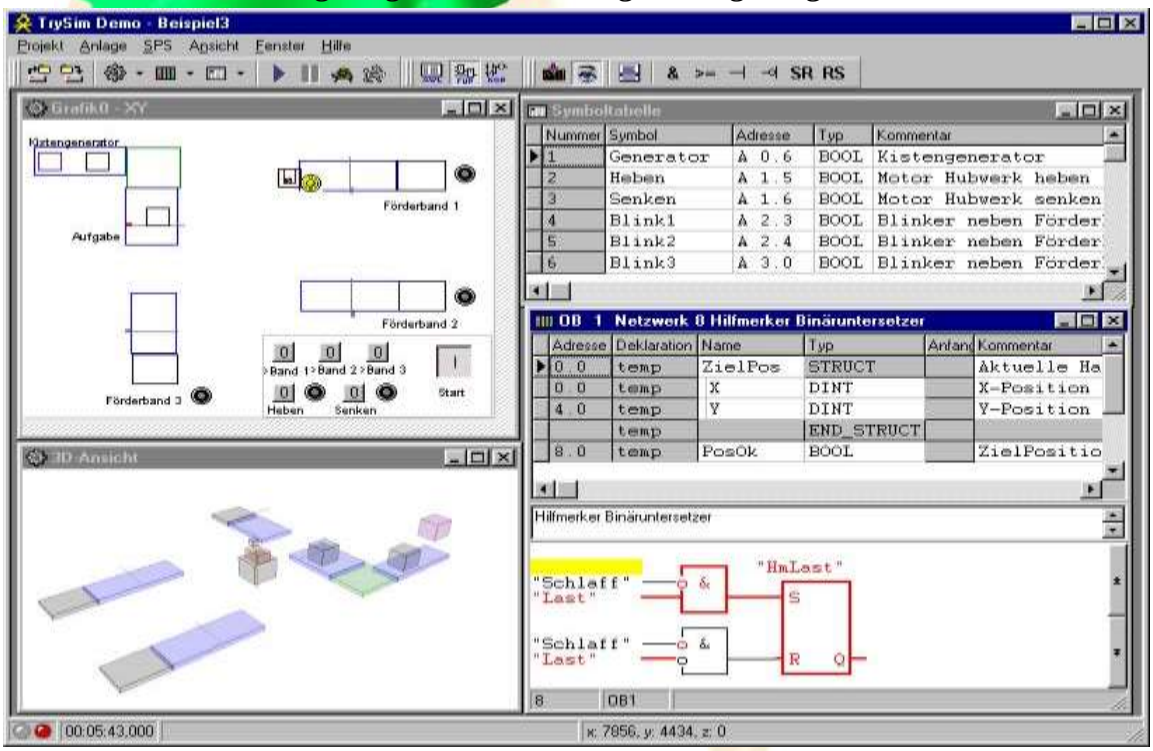

Figure 1. Device configuration

Input / output in STEP7 Lite signals addresses, memory bits, counters, timers, data blocks and functional blocks with to work correct comes.This to addresses their absolute value application through appeal to grow opportunity available.But of addresses symbolic appearance If used, the program reading easier It's happening. for symbols schedule This project requires creation in creation second stage become is [3].

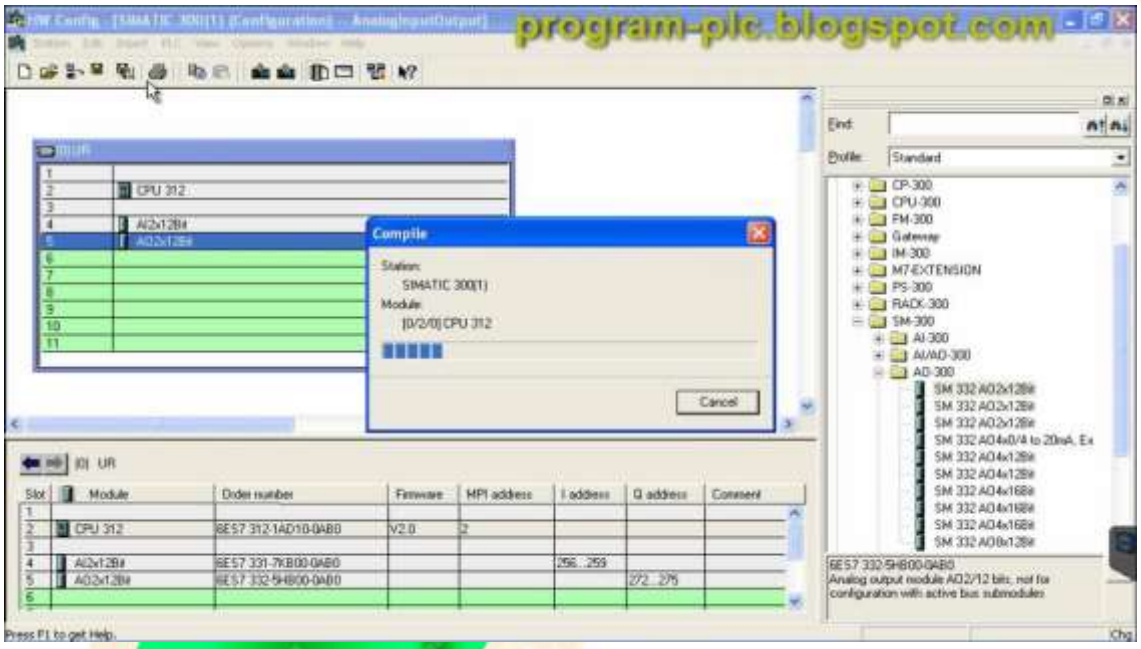

Figure 2. Symbols table

Project of creation third stage management program to compose is considered. For this programming language selection is required. SIMATIC programming used in STEP7Lite languages to DIN EN 6.1131-3 standards suitable become is considered.

Programming languages :

- LAD (Ladder Logic) plan)) – this graphic programming language . Its syntax orders switching of the scheme to the syntax like goes . LAD language of signals different from contacts, organization provider from elements and outgoing from the drums the passage control to do opportunity gives.
- STL (Statement List (Operators composition)) – this to the record based on machines intended programming. If the program is in STL language structured if, most in cases his/her fulfillment Steps CPU program again at work doer to the steps suitable comes in STL language programming relief for the purpose one how much programming languages constructions usage possible.
- FBD (Function Block Diagram (Functional plan)) – This is it algebra elements in itself embodied graphic programming and outside this programming in the language complicated functions (mathematical functions etc.) logical blocks with together application is also possible [4].

The program cyclical again work programmable logical controllers for standard regime is considered . Operation system periodic How to contact OB1 does and that's it through user of the program cyclical fulfillment status begins .

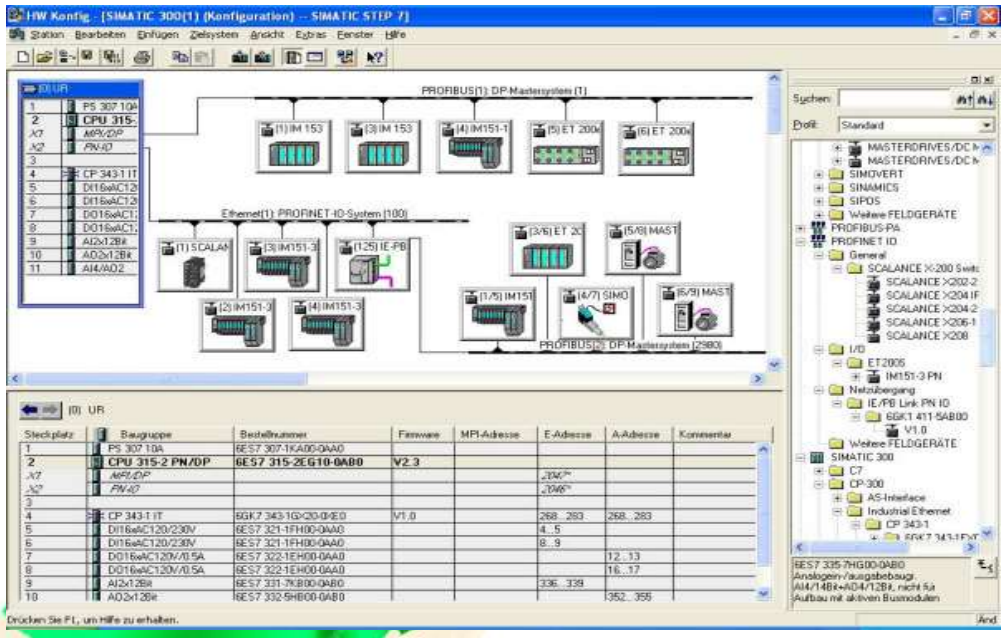

Figure 3. Control program written in FBD language

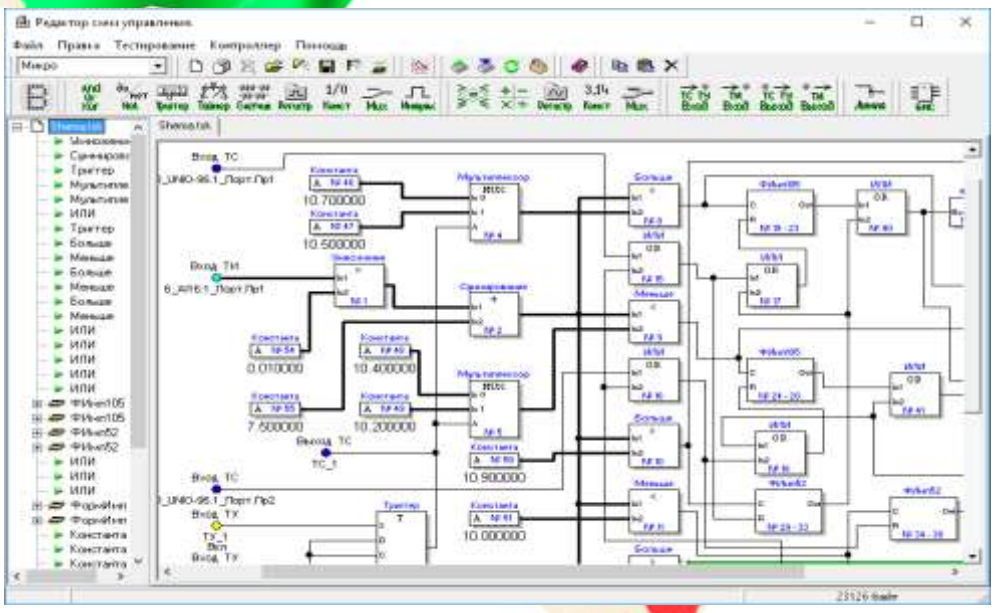

Figure 4. LAD programming in the language structured management program

Conclusion. In conclusion, the integration of STEP7 Lite software into the automated management system for coal briquette production offers significant improvements in both efficiency and product quality. By automating key aspects of the production process, such as machinery control, data monitoring, and production stage tracking, the system reduces human error, minimizes operational costs, and enhances overall performance. The use of advanced automation technologies like STEP7 Lite enables manufacturers to optimize their processes, streamline operations, and maintain consistent product standards. This approach not only boosts productivity but also contributes to more

sustainable and cost-effective coal briquette production. As industries continue to seek innovative solutions for improving production systems, the adoption of automation tools like STEP7 Lite proves to be a valuable step towards achieving greater operational excellence and meeting growing demands for high-quality products.

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