

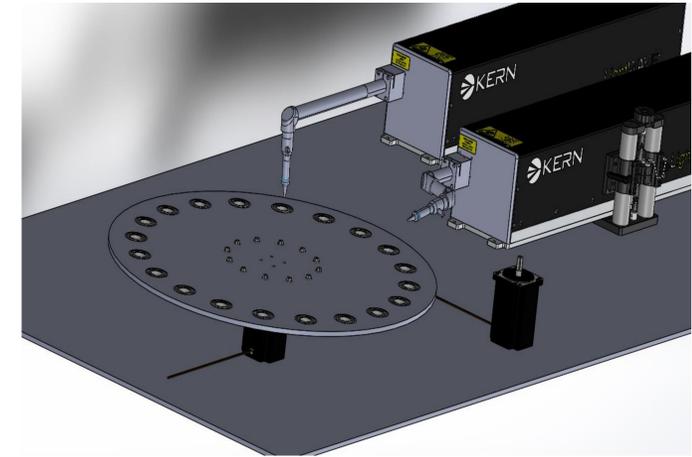


CySER PROJECT

Laser-Cutter System Password

TEAM MEMBERS:

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SolidWorks drawing of the laser-cutter system

Darcova Industries from Billings, MT is purchasing a new laser cutter system through capstone at Montana State University. This system will be able to cut various sizes and shapes of seating and valve cups for the oil industry. This system has certain parameters for cutting that can be dangerous if misused.

How can this system be more secure and safe?
The students created a password authentication code for only authorized users to modify the laser parameters. This will prevent unauthorized personnel from accessing and potentially harming the machine and/or others. Thus, the system will be more secure and safe.

The Objective

To create a secure code adaptable to the laser cutter system that can do the following:

- Allow access to system parameters for a general user
- Allow access to change system parameters for an administrator user
- Allow an administrator user to change the password

The Method

The code runs in the following order:

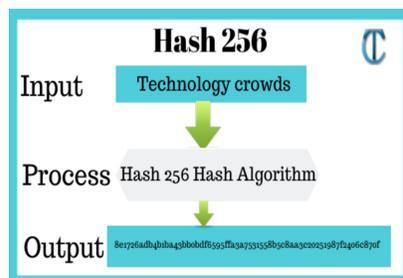
1. It stores the correct passwords for general and admin access and encrypts them using the hash function "Sha256"
2. It prompts the user for an attempt to enter the system.
3. It hashes the user's attempt and compares it to the two passwords in Step 1.
4. If the attempt matches the encrypted hash for the general password, the user is allowed access to a limited parameter scope to run the laser.
5. If the attempt matches the encrypted hash for the administrator password, the user is allowed access to any parameter scope to run the laser.
6. It will allow the administrator access to change the password and authenticate the change.

The Results

Due to unforeseen circumstances, design flaws, and time constraints, the laser-cutter system will not be completed by the end of the academic year.

As a result, this code has been run as a simulation. Once the laser-cutter system is assembled, the code can be integrated into the system. Mike Baugh, the owner of Darcova Industries, will then create a general and administrative password to make the system more secure.

"Sha256" is one of the most secure hashing method, using 256 bits for encryption.



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