

AutoSOC - SOC Automation Toolkit

A comprehensive automation suite for Safety Override Control (SOC) management, providing tools for importing, exporting, and controlling SOC overrides through web automation.

Project Overview

AutoSOC is a specialized automation toolkit designed to streamline Safety Override Control operations in industrial environments. It provides three main components for different SOC management tasks:

- **SOC Importer:** Import overrides from Excel files back into the web application
- **SOC Exporter:** Export SOC overrides data to Excel for backup and analysis
- **SOC Controller:** Automate SOC point management and role-based workflows

Architecture

The project follows a modular design with shared base functionality:

text

```
AutoSOC/  
├─ base_web_bot.py           # Core web automation base class  
├─ soc_base_mixin.py        # SOC-specific functionality mixin  
├─ soc_importer.py          # Excel-to-web import automation  
├─ soc_exporter.py          # Web-to-Excel export automation  
├─ soc_controller.py        # SOC point management automation  
├─ soc_DB.py                # Database utilities (referenced)  
└─ SOC.ini                  # Configuration file
```

Features

SOC Importer (**soc_importer.py**)

- **Excel Data Loading:** Parse override data from exported Excel files
- **Kendo UI Automation:** Handle complex Kendo dropdown controls
- **Bulk Processing:** Import multiple overrides sequentially
- **Error Handling:** Comprehensive validation and error reporting
- **User Confirmation:** Wait for manual confirmation steps

SOC Exporter (**soc_exporter.py**)

- **Data Extraction:** Extract SOC overrides from Kendo Grid components
- **Excel Generation:** Create formatted Excel files with metadata
- **Field Mapping:** Comprehensive field extraction for re-import capability
- **Auto-formatting:** Intelligent column sizing and styling

SOC Controller (**soc_controller.py**)

- **Role Management:** Automatic role switching (OAC/OAV)
- **Status Monitoring:** Real-time SOC status tracking
- **Point Updates:** Bulk update of SOC points to target states
- **Workflow Automation:** Complete SOC processing pipeline
- **Access Control:** Security and permission validation

Installation & Setup

Prerequisites

- Python 3.7+
- Chrome/Firefox browser
- Required Python packages:

```
bash
```

```
pip install selenium openpyxl configparser
```

Configuration

1. Copy **soc.ini** template and configure settings:

ini

```
[Settings]
user_name = your_username
password = base64_encoded_password
base_link = http://your-application-url/
MAX_WAIT_USER_INPUT_DELAY_SECONDS = 300
MAX_WAIT_PAGE_LOAD_DELAY_SECONDS = 30

[Roles]
SOC_roles = OAC, OAV
OAC = Исполняющий форсирование
OAV = Проверяющий форсирование

[Statuses]
good_statuses = принято для установки-запрошено для удаления-установлено, не
подтверждено-удалено, не подтверждено
SOC_status_approved_for_apply = одобрено для установки
```

Usage

Running the Importer

```
bash
```

```
python soc_importer.py
```

Workflow: Loads overrides from `soc_resources/overrides.xlsx` and imports them into the web application.

Running the Exporter

```
bash
```

```
python soc_exporter.py
```

Workflow: Extracts SOC overrides and saves to timestamped Excel files in `soc_resources/`.

Running the Controller

```
bash
```

```
python soc_controller.py
```

Workflow: Processes SOC through configured roles, updating points and handling status transitions.

Technical Details

Key Technologies

- **Selenium WebDriver:** Web automation and browser control

- **Kendo UI Integration:** Specialized handling of Kendo components
- **OpenPyXL:** Excel file manipulation
- **ConfigParser:** Configuration management
- **Base64 Encoding:** Secure password handling

Browser Compatibility

- Chrome (primary)
- Firefox (supported)
- Edge (theoretical support)

Data Flow

1. **Authentication:** Username/password + SOC ID input
2. **Navigation:** Role-based page routing
3. **Data Processing:** Extraction/manipulation of SOC data
4. **User Interaction:** Confirmation prompts and status updates
5. **Cleanup:** Safe browser termination

Configuration Options

Database Integration

Optional database connectivity for SOC ID resolution:

ini

```
[Database]
CONNECT_TO_DB_FOR_PARTIAL_SOC_ID = True
server = your_db_server
database = your_database
username = db_username
password = base64_encoded_db_password
```

```
[SQL]
SOC_query = SELECT Id FROM SOC_Table WHERE SOC_Number LIKE '%{soc_id}%'
```

SOC ID Patterns

- **Full SOC IDs:** 7-8 digits (`^\d{7,8}$`)
- **Partial IDs:** 4-8 digits (with DB lookup enabled)

Use Cases

Industrial Applications

- **Safety System Management:** Automated override handling
- **Audit Compliance:** Data export for regulatory requirements
- **Bulk Operations:** Efficient mass updates of SOC points
- **Disaster Recovery:** Backup and restore capabilities

Operational Benefits

- **Time Savings:** Automate repetitive SOC tasks
- **Error Reduction:** Consistent, validated operations
- **Traceability:** Complete audit trails via Excel exports
- **Access Control:** Enforce role-based security

Security Features

- Password obfuscation via Base64 encoding
- Role-based access control enforcement
- SOC status validation before operations
- Comprehensive error handling and logging
- Safe browser session management

Logging & Monitoring

Comprehensive logging throughout all operations:

- Process milestones and status updates
- Error conditions with detailed context
- Performance metrics and timing information
- User interaction tracking

Error Handling

The toolkit includes robust error management:

- **Validation Checks:** SOC status, access rights, data integrity
- **Graceful Degradation:** Continue operation when possible
- **User Feedback:** Clear error messages and guidance
- **Safe Termination:** Proper resource cleanup on failure



Dependencies

- **Core:** `selenium`, `openpyxl`, `configparser`
- **Optional:** Database drivers for SQL connectivity
- **System:** Compatible web browser (Chrome/Firefox)



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