



# **Ebtekar Electric Qomes**

**Manufacturer of Industrial Training Simulators**



## About us

Ebtakar Electric Company was established in 2009 as a ltd company. After a decade of continuous and dynamic activity, now, this company is known as one of the leading companies in manufacturing the industrial simulators in country.

In 2009, this company succeeded to design and produce the hardware type of the substation simulator using a team of experts in operation, relay and protection, dispatching and safety. Presenting this product to the regional electricity companies and educational institutions led to positive feedbacks from customers.

In 2013, due to the request of a number of regional electricity companies to make the software type, this company designed and completed the software type of the substation simulator. The mission of Qomes Ebtakar Electric Company is to design and manufacture educational simulators and educational content in cooperation with industry experts.

All specialized and committed personnel of the company do their best to design and develop the simulator software in such a way to be able to simulate the real situation in normal mode as well as the incident situation so that the frequent use of this software will lead to the increase in learners skills and decrease in future incidents.

# ابتکار الکتریک قوس

تاریخ: ۱۳۹۳/۰۷/۰۱  
شماره: ۹۸۳۲۱۰۰۹  
پست: تهران

پسمنه تعالی

سال ۹۶ انجمن مازور پی - انجمن

کلیه شرکت های برق منطقه ای - معاونت محترم بهره برداری

موضوع: افزایش آمار حوادث ناشی از خطای انسانی

با سلام

احتراماً، به اطلاع می رساند طبق بررسی های بعمل آمده در خصوص حوادث رخ داده در شبکه برق کشور ناشی از خطای انسانی گروه تعمیراتی طی دو ماه اخیر، در چندین مورد حوادث باعث آتشبار گروه های ریلوای در هنگام تعویض رله و یا اصلاح مدارات و... مشاهده شده است.

با توجه به گسترش شبکه شایسته است اقدامات لازم جهت کاهش این قبیل حوادث ناشی از خطای انسانی در اسرع وقت بعمل آید. در این زمینه پیشنهادات ذیل جهت هر گونه بهره برداری لازم اعلام می گردد:

۱- استفاده از سیمولاتور پست و سیمولاتور رله جهت آموزش عملی به گروه های ریلوای

۲- نظارت دقیق توسط مسئول گروه ریلوای در هنگام کار جهت جلوگیری از قله خوانی، استفاده از تجهیزات مناسب

وین تجارب همکاران قدیمی در این رابطه

تمرکز فکری کارکنان در هنگام کار

زمانی و مدت زمان انجام کار

مهندسین

مدیر کل دفتر فنی و نظارت شبکه انتقال

پسمنه تعالی

شماره: ۳۳۴۸۹۱۲۷  
تاریخ: ۱۳۹۳/۰۲/۰۱  
پست:

جمهوری اسلامی ایران  
وزارت نیرو  
شرکت مازور شخصی تو انجمن  
شرکت سبانی برق منطقه ای سمنان

سال انجمن مازور پی - انجمن

مدیرعامل محترم شرکت ابتکار الکتریک قوس

با سلام و احترام

در پاسخ به نامه شماره ۱۳۵/۳۳۴۰ مورخ ۹۹/۰۱/۱۹ در خصوص رضایت از کیفیت آزمون الکتریک مازور پست های فشار قوی، به استحضار می رساند این معاونت از کیفیت نرم افزار سیمولاتور پست سبانی طراحی شده برای آزمون و نحوه برگزاری آزمون - رضایت دارد.

همچنین خواهشمند است دستور فرمایید پیشنهادات ارائه شده توسط کارشناسان این معاونت، برای برگزاری آزمون های بعدی مورد توجه قرار گیرد.

حمیدرضا توحیدی  
معاون بهره برداری

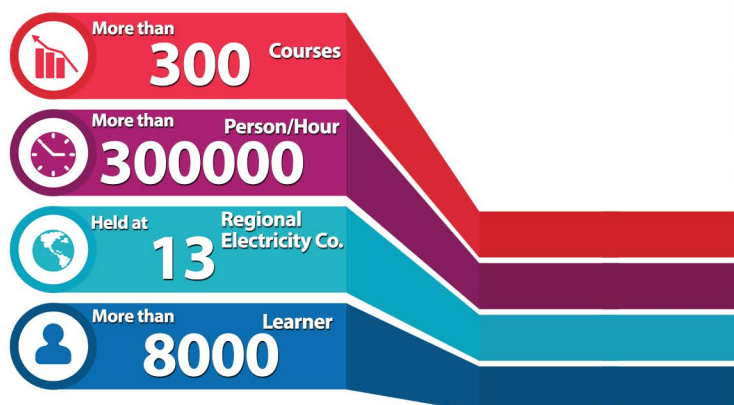




## Our Resume >

The mission of Qomes Ebtekar Electric Co. is to design and manufacture educational simulators and educational content in cooperation with industry experts and university professors. The software produced in collaboration with educational institutions affiliated to the Ministry of Energy, private institutions, universities, is used to in-person and virtual courses. All specialized & committed personnel of the company do their best to design and develop simulator software in such a way to be able to simulate the real situation in normal mode as well as the incident situation so that the frequent use of this software will lead to the increase in learners skills and decrease in future incidents.

The presence and participation of more than 8,000 experts and operators in a course titled substation simulator to increase the skills of operators and reduce the incidents, was one of the achievements of the Ebtekar Electric



Ebtekar Electric Company, in cooperation with higher education institutions across the country, has succeeded in holding in-service training courses for the personnel of regional electricity companies in Semnan, Sistan and Baluchestan, Yazd, Tehran, Khoraasaan, Gharb, Baakhtar, Hormozgan, Fars, Zanjan, Gilan and Mazandaran.

Due to the capabilities provided in the substation and relay simulation software and the protection of this company, it is possible to hold courses virtually and remotely via the Internet, which is important due to the global pandemic of Covid-19 virus and the risk of disease transmission in gatherings is one of the major advantages of this simulator.

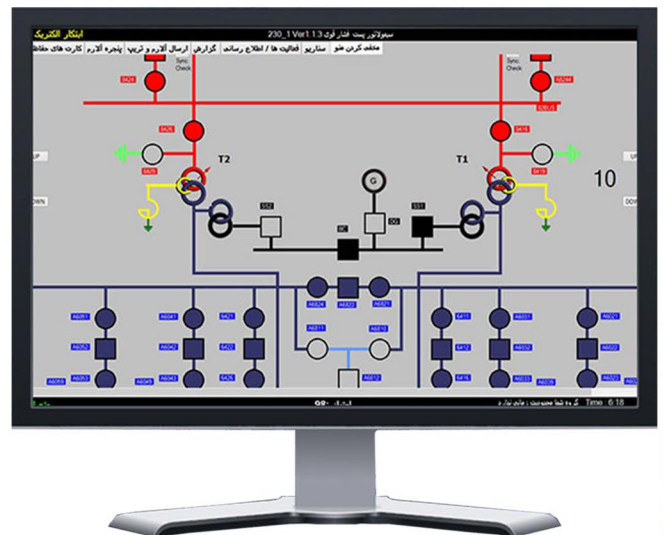


## substation simulator >

In the substation simulator software, the operator can perform the high voltage substations maneuvers with different scheme. Training with simulator plays a major role in increasing the operator skills and reducing the network incidents. Different substation schemes along with maneuver scenarios and incidents defined in the software, provide the necessary training platform for operators in training courses.

### Capabilities of substation Simulator Device

1. Simulating the scheme of the over-distribution and transmission substations at different voltages
2. Simulating all interlocks, alarms, trips and various safety tags
3. Automatic scoring to the operator maneuver operations
4. Ability to define and execute different maneuver and incident scenarios for test or self-study
5. Recording all operations performed by the operator and the system and the possibility of saving and video playback of the report
6. Ability to perform various actions and coordination by the operator
7. Running and updating the simulator using the Internet Network
8. Simulating the station transformer maneuver, tape changer and busbar coloring,



### Methods of Simulator Applications in Training

- Possibility of holding training courses, retraining and exams
- Holding courses in classroom and virtual
- Ability to guide and monitor the user remotely by the master



### Necessity of holding training courses with substation simulator

- Low number of maneuvers in normal situations and incidents
- Network incident simulation for all operators
- Familiarity with all common alarms and trips
- Execution of different maneuver scenarios in normal and incident situations
- The need to retrain experienced operators

### Maneuver and Incident Scenarios

Each scenario is a set of commands and the simulator asks users to perform them step by step. Scenarios are defined in the software design section. For each substation scheme, it is possible to define twenty different scenarios. Each scenario can contain up to twenty commands. Performing maneuvers or the occurrence of various incidents can be simulated in the scenario section and the output of the report can be used to replay, evaluate and score the operator. Due to the possibility of defining a large number of scenarios, it is possible to simulate most of the common maneuvers of the substation in the simulator

The screenshot shows the 'Scenario' section of the substation simulator. The main window displays a substation diagram with various components labeled with codes like ACS27, A92774, A92, A928, A3289, A3283, A9271, A9814, A9419, A941, A9812, A9413, A9811, and A92. A central dialog box titled 'پیام' (Message) displays a scenario command in Persian: 'دستور 4 از 7: ابطال اجازه کار و انجام مانور برقراری باس 92 و خط AB928 طبق دستور العمل و هماهنگی لازم'. The dialog has an 'OK' button. The interface includes a top menu bar with options like 'اصلی', 'مخفی کردن منو', 'سناریو', 'فعالیت ها / اطلاع رسانی', 'گزارش', 'ارسال آلازم و تریپ', 'پنجره آلازم', 'کارت های حفاظتی', and 'اصولی'. On the right, there are buttons for 'مرحله بعد' (Next Stage) and 'نمایش دستور' (Show Command). Annotations with blue boxes and lines point to specific features: 'Show Previous Scenario Commands' points to the 'نمایش دستور' button; 'View the Latest Request for Scenario Commands' points to the 'مرحله بعد' button; 'Execution of the Next Stage of the Scenario' points to the 'مرحله بعد' button; and 'Scenario Command Message' points to the central dialog box. The bottom status bar shows 'Time: 12:19' and 'گروه شما محدودیت زمانی ندارد' (Your group has no time limit).



## Protective Relay Simulator >

Given the importance and complexity of protecting power networks and the widespread use of digital relays, it is essential to provide appropriate training in the industry and academia. Protection relay is taught by various methods such as the use of laboratory equipment and software facilities in laboratories and training centers. Due to the high price of relays and test equipment and their variety, it is not possible to provide comprehensive and up-to-date training by using traditional methods.

The use of protection and relay simulators is a new training method aimed at solving the training problems. This simulator covers a large part of the training objectives of laboratories and specialized courses. Holding the electronic courses by using this simulator is less expensive and easier to implement.

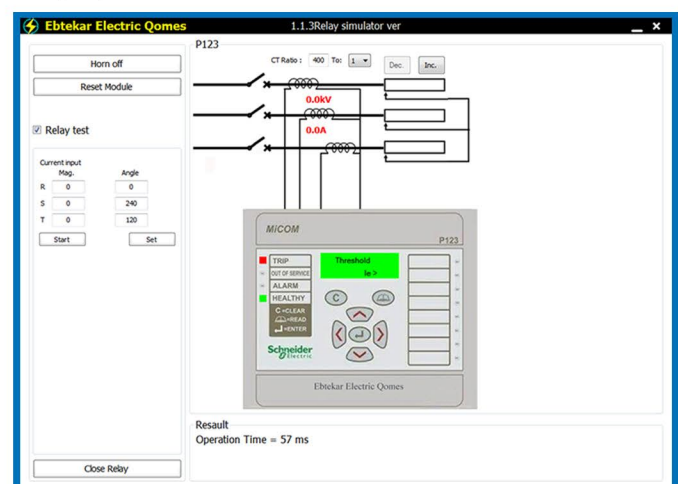
### Features of Protective Relay Simulator

- Simulation of the performance of the main protection functions such as differential distance, overcurrent, auto recloser.
- Ability to test the mentioned relays and functions from the primary and secondary circuit and simulate various errors
- Providing the possibility of adjusting numeric relays with menus similar to the main relay
- Widely used relays in industry, such as MiCOM, have been simulated and, if necessary, the type of the relays can be selected according to the goals and needs of the laboratory.
- No risk of electric shock or damage to equipment
- Ability to use and train outside the laboratory virtually without the need to purchase a test device or power supply
- Automatic software updates via the Internet and provide training and support files through website.

### Technical Specifications of Simulator Software

#### ■ Module P123:

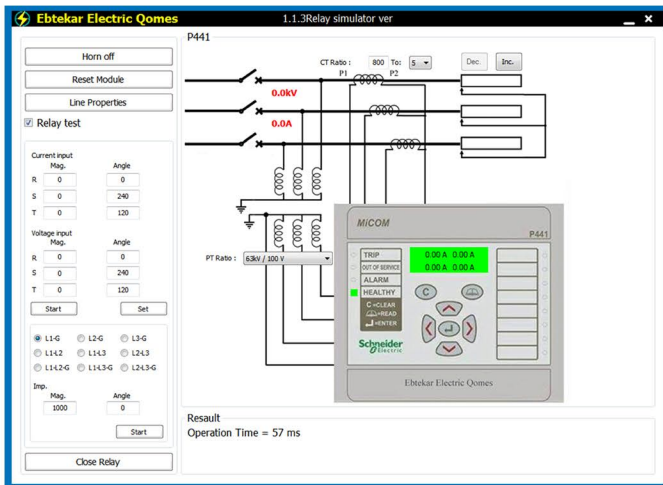
Possibility of creating all kinds of errors on the primary side, injecting current and testing the relay from the secondary side, the possibility of adjusting the relay and LED configuration and displaying the relay operation time





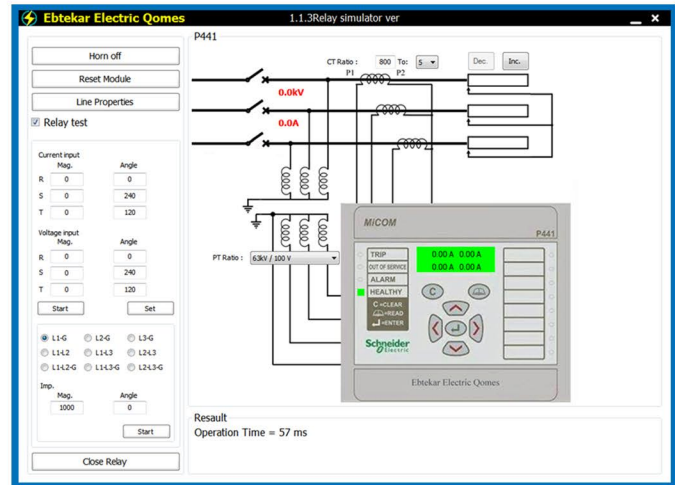
### ■ Module P632:

Possibility of creating error on the primary side, possibility of injecting current and testing the relay from the secondary side, possibility of adjusting the relay, display of the relay operation time



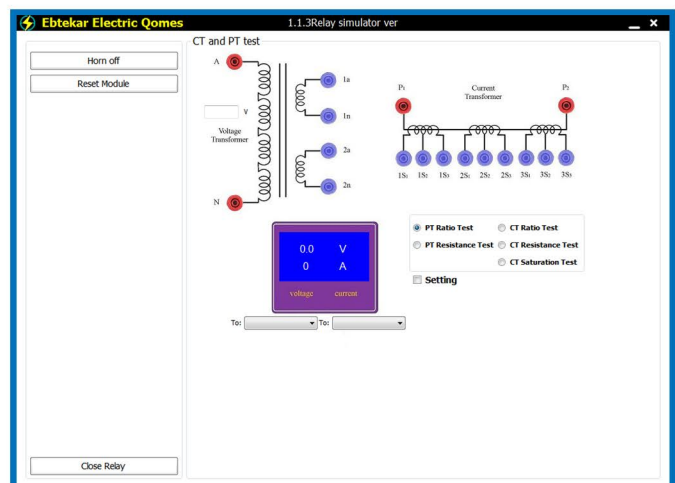
### ■ Module P441:

Possibility of creating all kinds of errors on the primary side, possibility of injecting current and voltage and testing the relay from the secondary side, possibility of adjusting the relay, possibility of adjusting the line specifications and measuring transformers, displaying the relay operation time



### ■ CT & PT module:

Possibility of selecting the specifications of measuring transformers  
Selecting different tests





## Ebtekar Electric Qomes

Qomes Ebtekar Electric Company was established in 2009 as an Ltd company. After nearly a decade of continuous and dynamic activity, Ebtekar Electric is now recognized as one of the leading companies in the manufacturing of industrial simulators in country. The management structure of this complex has always tried to dynamically and systematically recognize the needs of the country's industry in the field of simulation, especially the country's electricity industry, and to play a role in the development and excellence of this infrastructure industry by providing appropriate solutions and to achieve goals such as development and expansion of the use of simulators in the country's industry by relying on the knowledge and experience of its human resources



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