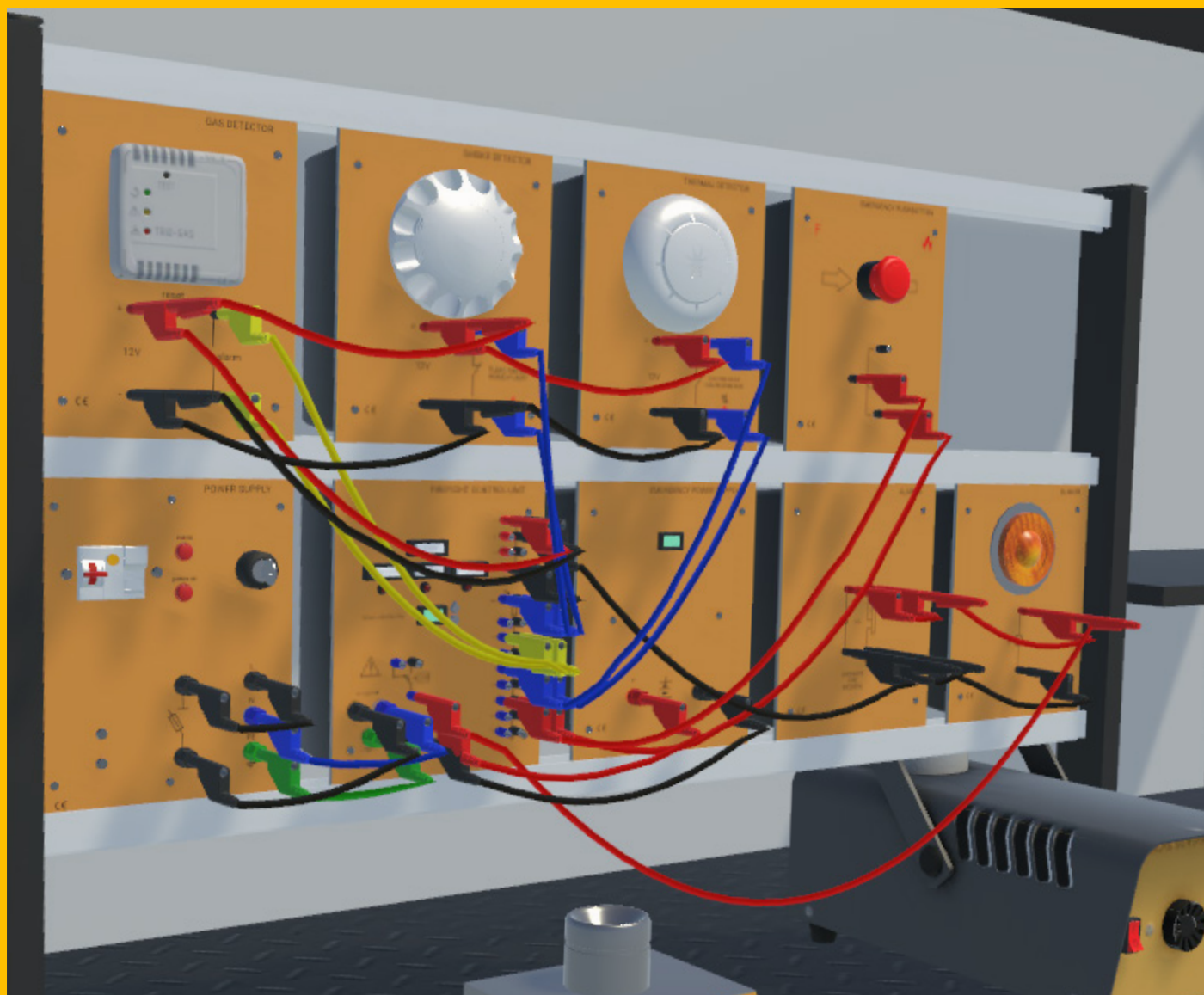




# SMARTSIM

DL SMART-CIVIL

CIVIL ELECTRICAL  
INSTALLATIONS TRAINING



DE LORENZO

# SMART SIMULATOR FOR CIVIL ELECTRICAL INSTALLATIONS TRAINING

The DL SMART-CIVIL is a software that has been developed to teach multiple applications such as lighting, signalling, house/building phoning, hotel/hospital services, fireproof protection and anti-intrusion systems, in a unique and effective way.

With this software, students can improve their individual experience on studying civil installations in practice.

Students will be able to develop several projects dealing with the following topics:

- ✓ Basic and advanced lighting systems;
- ✓ Signalling systems;
- ✓ House / Buildings phone systems;
- ✓ Hotel / hospitals services systems;
- ✓ Fire and anti-intrusion protection installations;

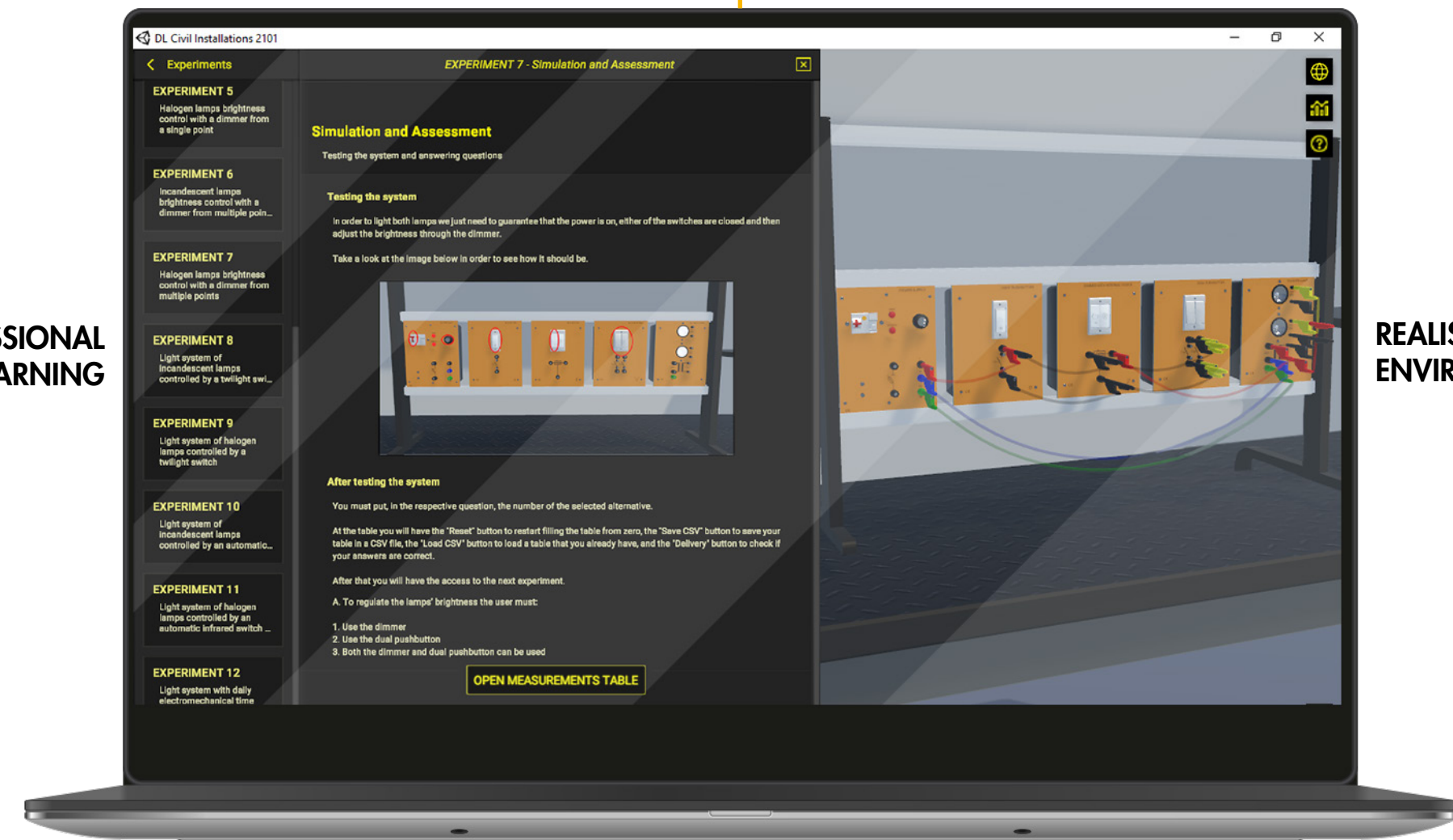
This software will be able to reproduce the features and behaviours of the DE LORENZO Civil installations trainer – DL 2101T.

With this type of software developed by DE LORENZO, students can learn in their own rhythm and teachers have more time to support the class, manage and improve the process because – unlike any other simple simulator – it grants the following benefits:

PROFESSIONAL  
LEARNING

ELECTRICAL TOOLS

POWERFUL 3D SIMULATOR

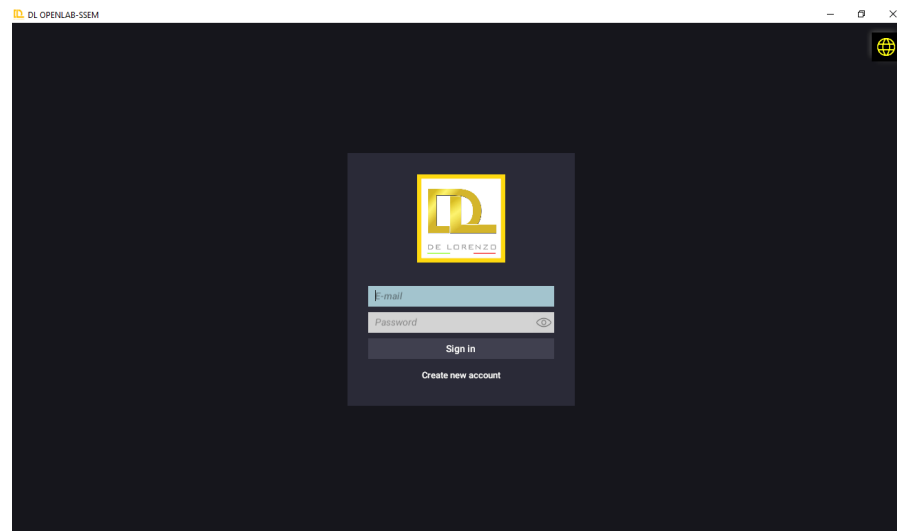

REALISTIC  
ENVIRONMENTS

PROFESSIONAL EXPERIENCE

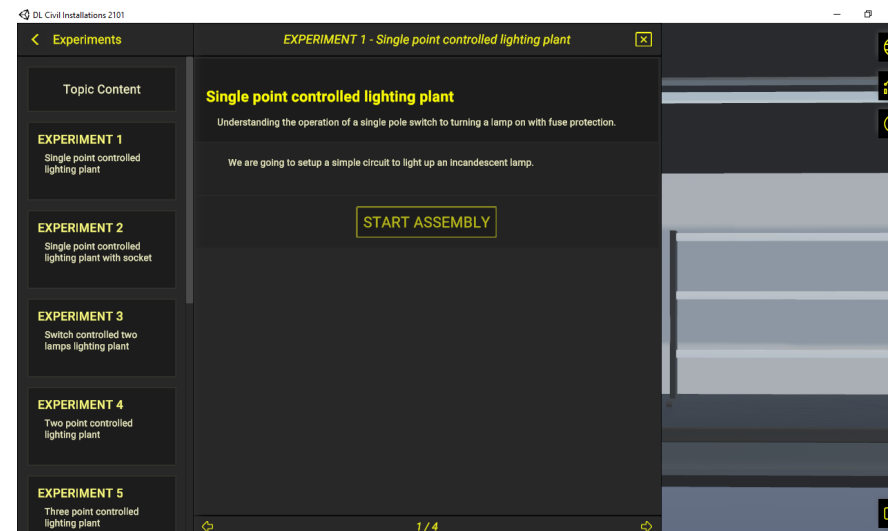
REAL-LIFE SITUATIONS

## 1. EFFECTIVE GUIDE FOR STUDENT

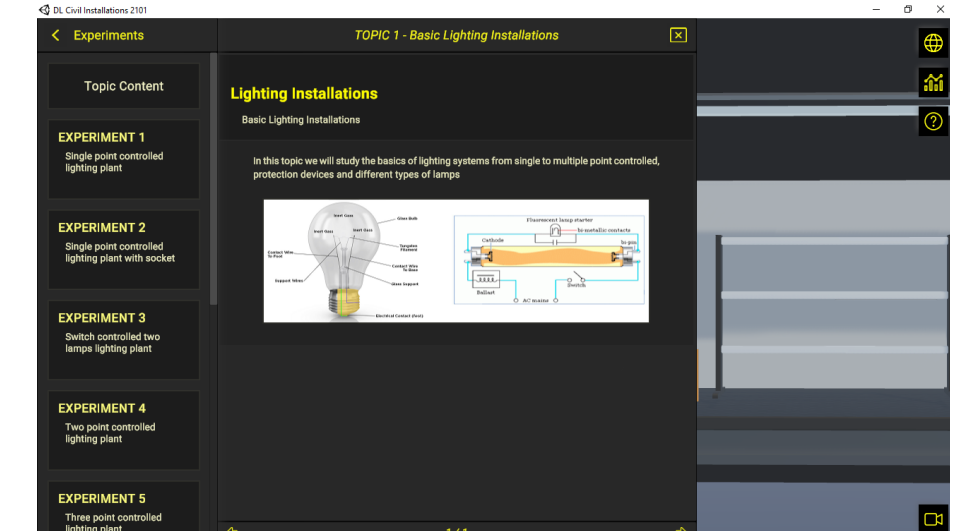
Possibility to access learning topics, with theory, instructions and experiment proposals. The software includes a virtual version of the DL 2101T system;



Student logs in, so his progress can be tracked.



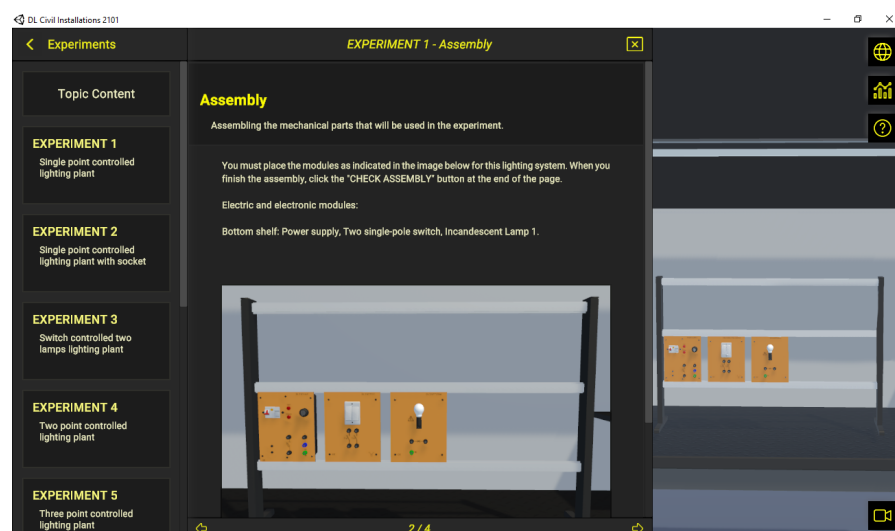
...chooses one of the learning topics



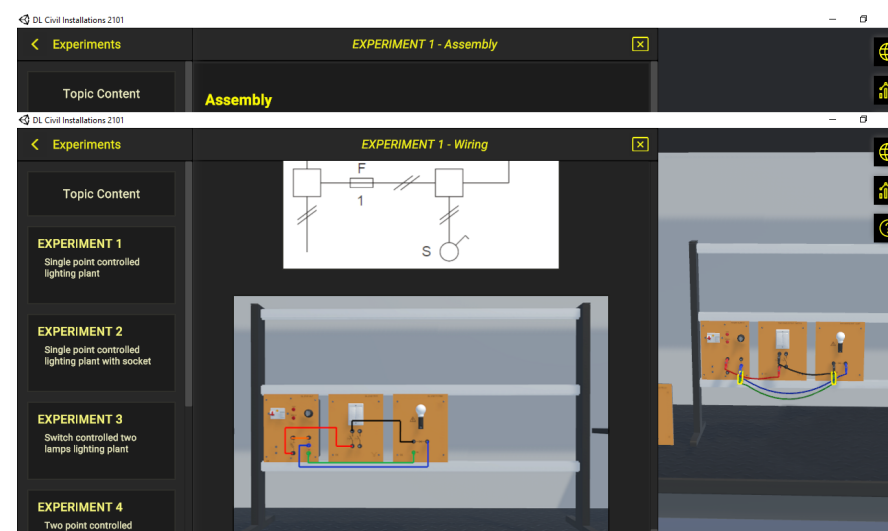
...accesses theory, experiments proposals and instructions.

## 2. AUTOMATIC VALIDATION OF STUDENTS' TASKS

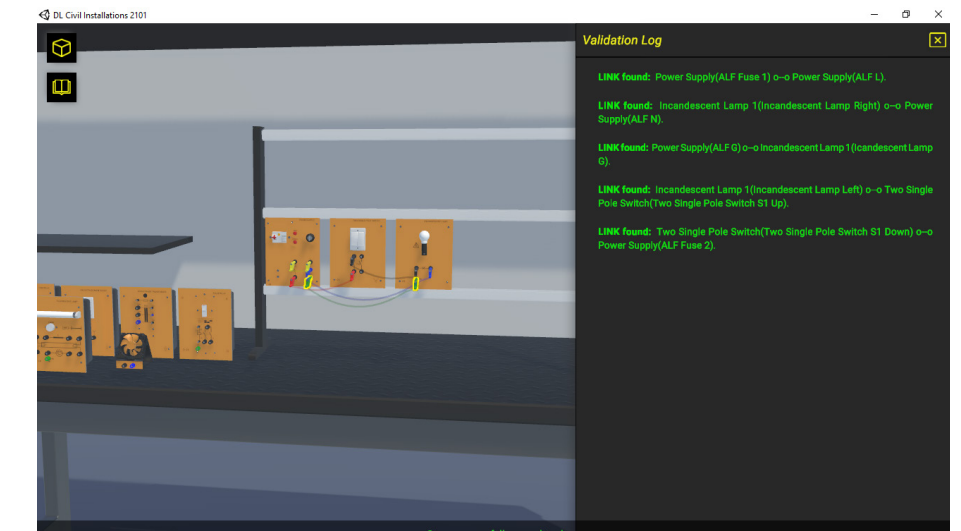
The software automatically verifies if the student completed successfully each task in order to allow him/her to go ahead with the next one;



Student works on the assembly of the electrical machine

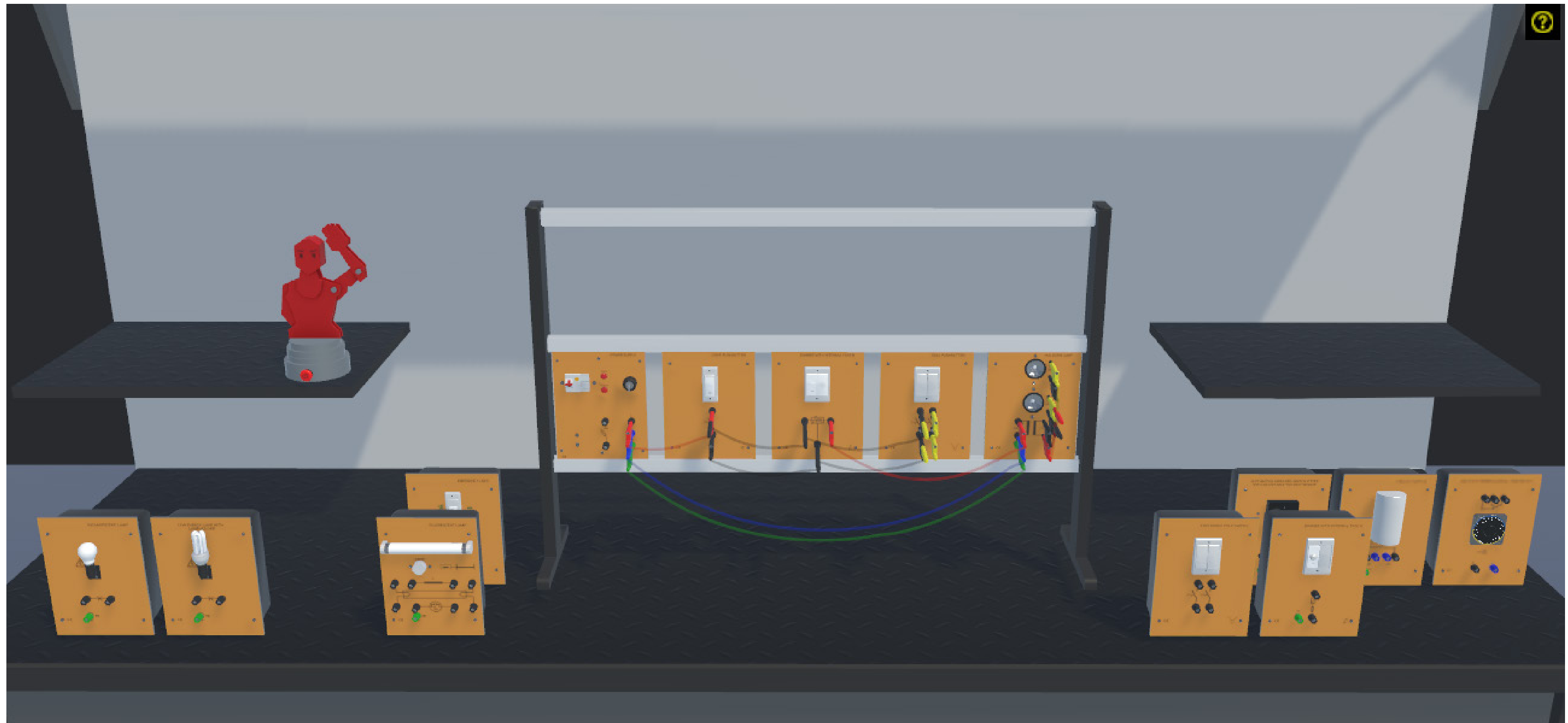


...then makes the electrical connections



...and with all that correctly done, runs the experiment and answers questions about it

## 3D ENVIRONMENT TO PROVIDE A REAL PRACTICAL EXPERIENCE TO STUDENTS





## WHY IS IT A SMARTSIM?

## IT CONNECTS PROFESSOR, STUDENT AND SCHOOL

De Lorenzo's cloud server receives students activities and provides reports and analytics to professors and institutions. Besides, a student can start working at school and continue at home or vice-versa.

That means that the professors can monitor the students and based on the report that De Lorenzo's cloud provides, the professors can give the support that a specific student might be needing.



**COMPATIBLE WITH THE DL SMART-DASHBOARD (SOLD SEPARATELY)**

## PROFESSORS CAN FOLLOW STUDENTS PROGRESS

The professor can do and access everything the student can. Besides, he/she can also access the dashboard's portal. It includes interesting reports and analytics that help the professor to monitor the group in real time, as well as to identify students who are doing very well, as well as those who need help, who are not working at all and who seem to be "cheating".

## Tasks report

This is an important tool since it provides evidence of the activities a student worked on. That means the school has evidence of the practical activities the distance learner has done with detailed information about it.

| Curso                                     | Tarefa                                    | Timestamp              | IsDon |
|-------------------------------------------|-------------------------------------------|------------------------|-------|
| Scripts                                   | 1.1 - Abrindo uma tela modal              | 3/9/2020 6:33:37 PM    | False |
| Desenvolvimento de sistemas supervisórios | 2.6 - Implementar Gráficos                | 11/22/2019 7:14:00 PM  | False |
| Desenvolvimento de sistemas supervisórios | 2.5 - Montar interface principal          | 11/18/2019 5:04:15 PM  | True  |
| Desenvolvimento de sistemas supervisórios | 2.4 - Construindo os objetos da aplicação | 11/18/2019 4:28:54 PM  | True  |
| Desenvolvimento de sistemas supervisórios | 2.3 - Explorando Recursos                 | 11/15/2019 5:35:44 PM  | True  |
| Desenvolvimento de sistemas supervisórios | 2.2 - Conhecendo o Elipse E3              | 11/15/2019 5:10:00 PM  | True  |
| Desenvolvimento de sistemas supervisórios | 2.1 - Comunicação OPC                     | 11/14/2019 12:57:42 PM | True  |
| Desenvolvimento de sistemas supervisórios | 1.8 - Comandos pelo supervisório          | 11/14/2019 11:25:14 AM | True  |

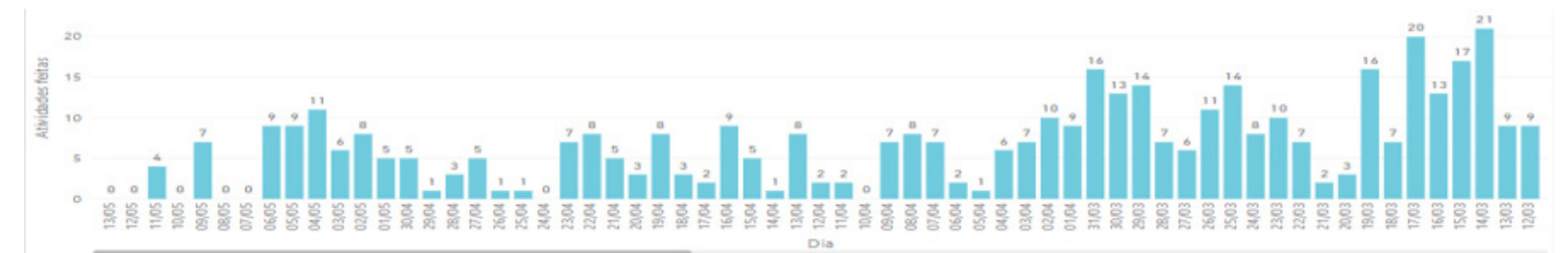
## PROFESSOR CAN SEE WHICH STUDENTS ARE ON SCHEDULE

With this interface, the professor may choose which groups he/she wants to monitor, to verify who is on schedule, who is pending and so on. It is possible to define the expected progress percentage in relation to the tasks available in the course.

[illegible]

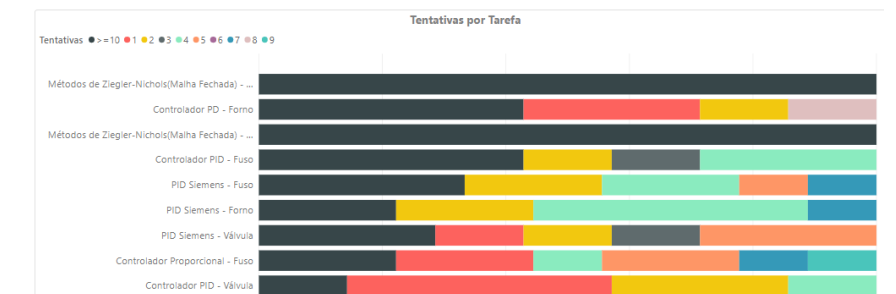
## RHYTHM

This other dashboard shows the number of activities the students did daily and weekly. The professor may decide to verify it regarding a whole group/class or a specific student.



## TRIALS PER TASK

This chart helps the teacher to understand which task may be the most difficult and which one may be the easiest in order to adjust the deadlines.

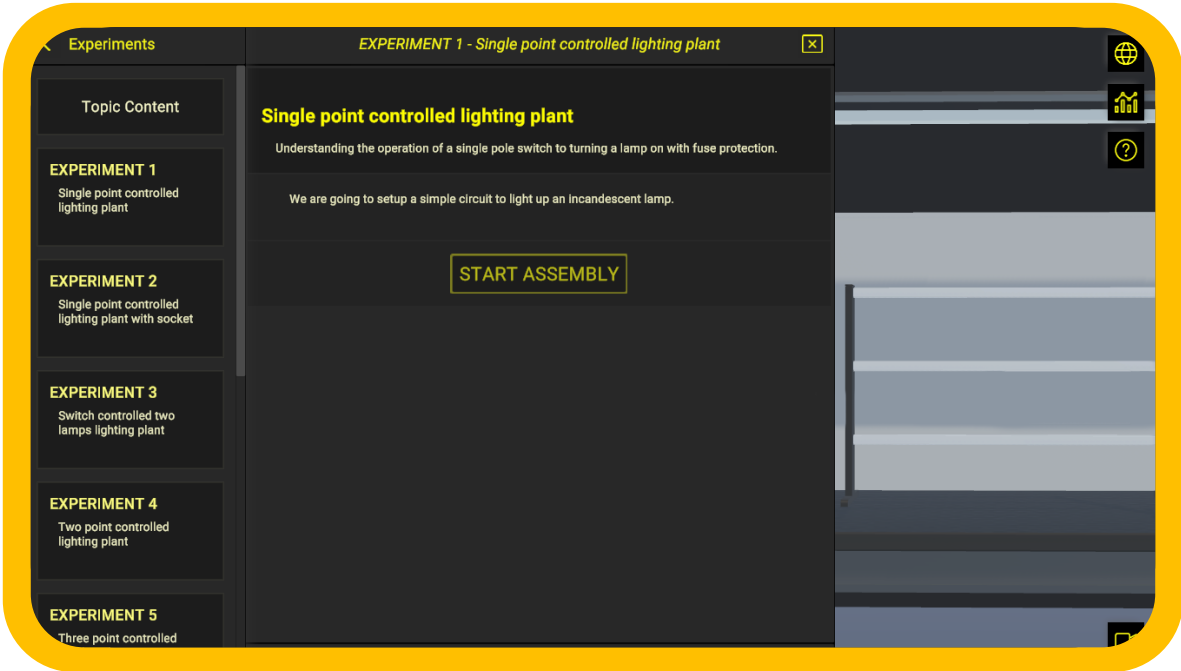


# SUMMARY OF FEATURES

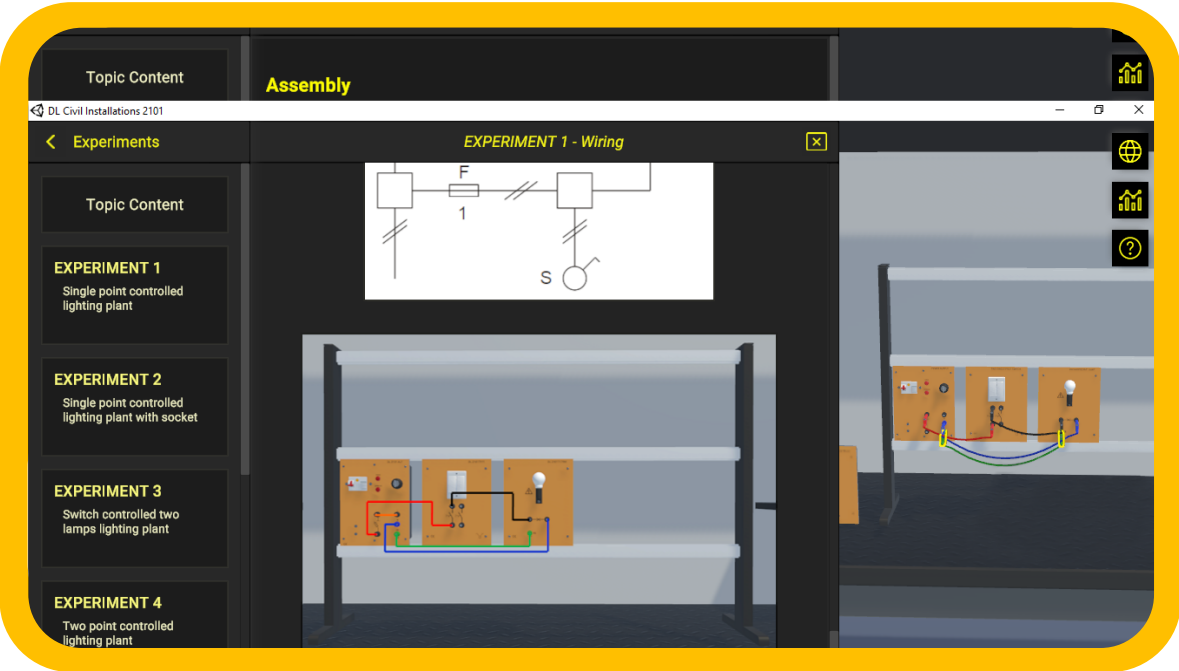
IT'S A 3D SIMULATOR



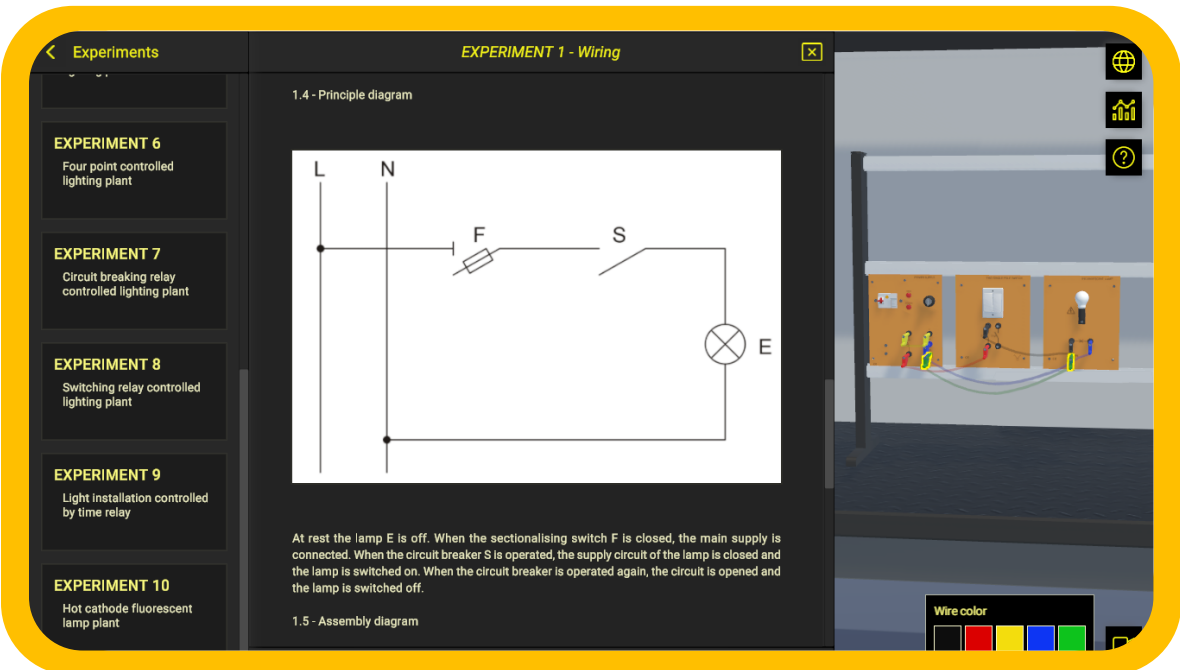
IT HAS BUILT-IN EXPERIMENTS



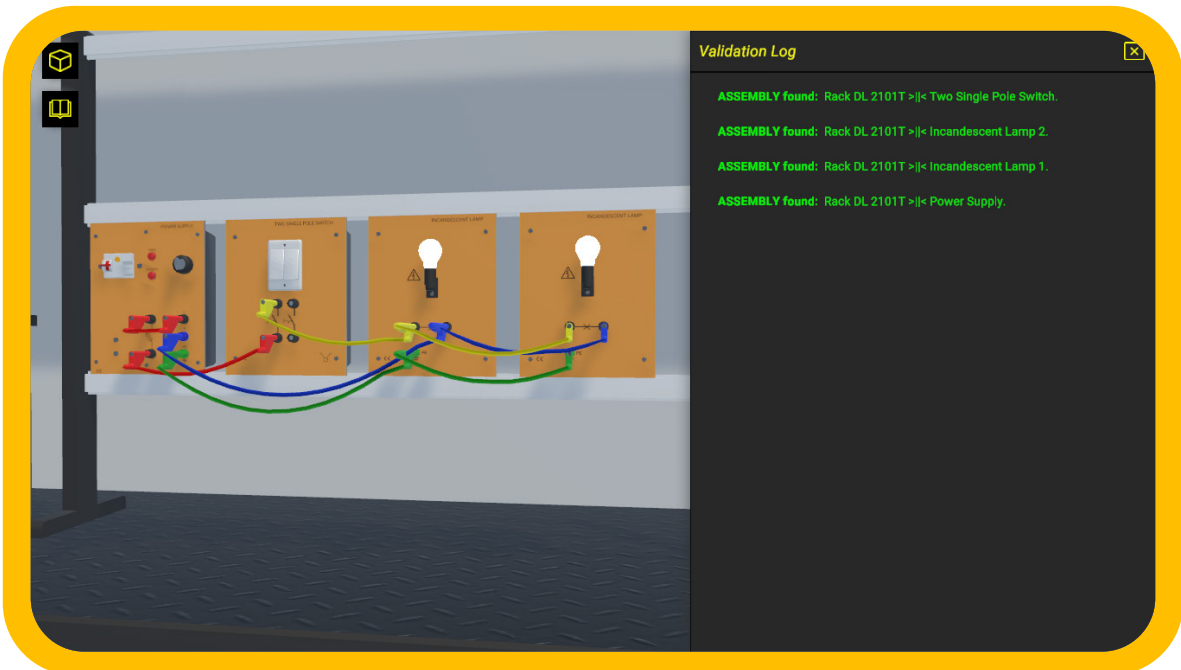
THE PROJECTS INCLUDE GUIDANCE



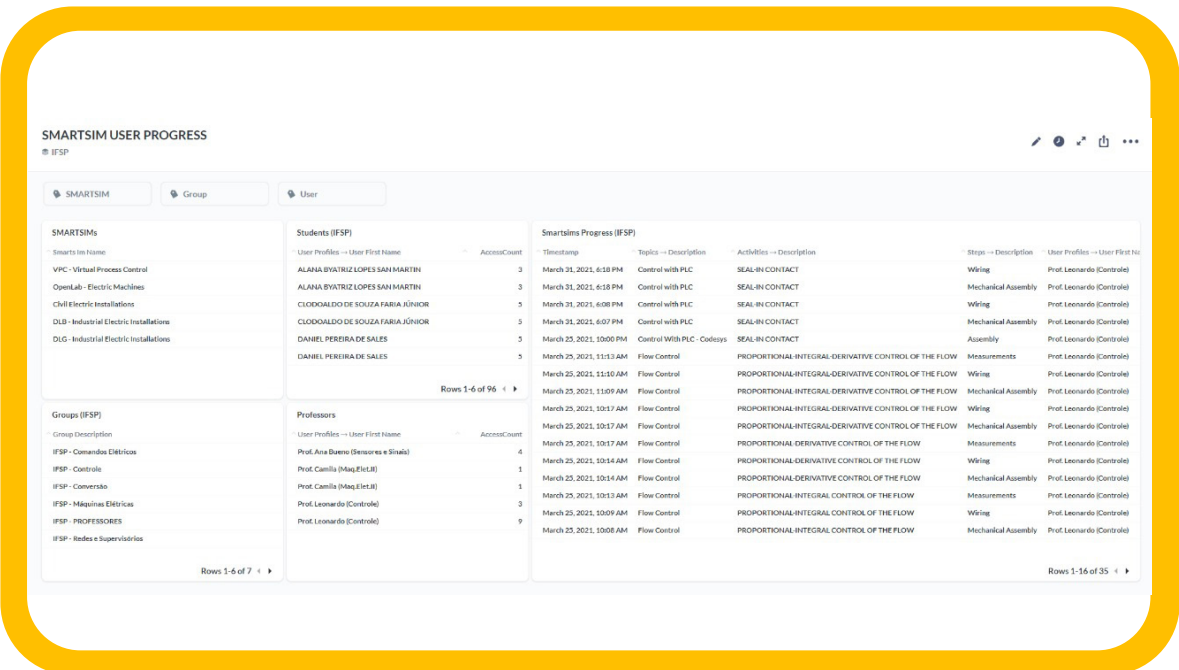
+ CONTENTS AND SUPPORT MATERIALS, SO THEY CAN LEARN BY THEMSELVES



IT AUTOMATICALLY CHECKS STUDENT ACTIVITIES TO LET THEM MOVE ON, LIKE IN GAME



PROFESSORS CAN MONITOR STUDENTS AND VERIFY WHICH POINT THEY NEED HELP (Option available with the Dashboard)





# COMPLETE CONTENTS

## HOW DOES IT HELP THE PROFESSOR?

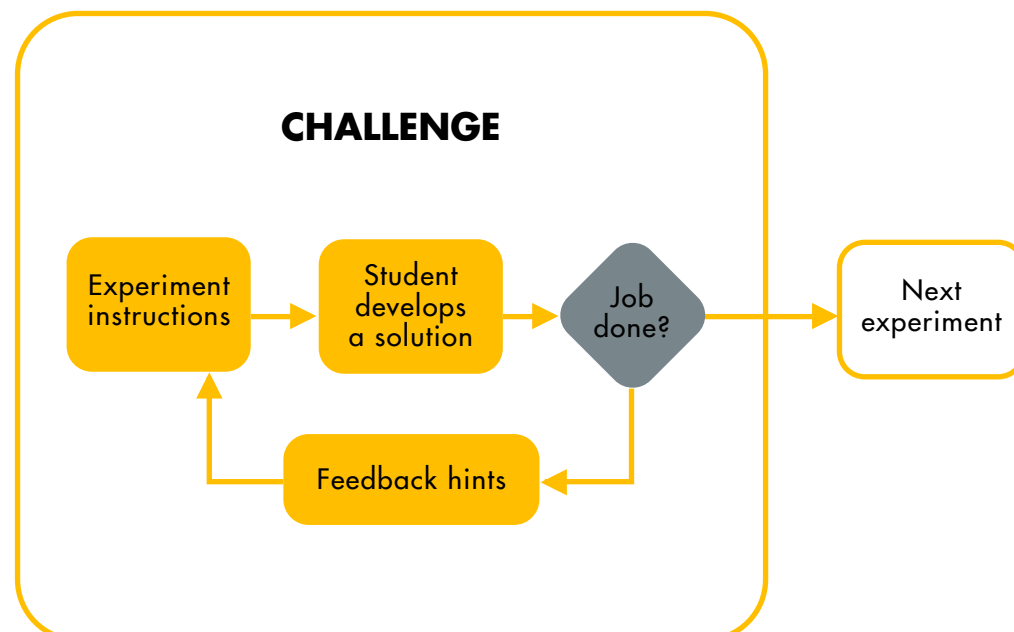
With this software, the teacher spends less time explaining topics, verifying students' activities and helping students to identify mistakes that do not allow the successful completion of the experiment.

That means that the professor has more time to manage the class, help students who need more attention and make improvements. The two following points grant such benefits:

### 1) The software automatically verifies the experiments carried out by the students and it gives relevant feedbacks:

Like in a game that has different phases with challenges and missions, the DL CIVIL INSTALLATIONS software includes practical experiments that need to be successfully completed to let the student access the next one.

The teacher does not need to verify continuously if the student carried out the experiment. Moreover, many questions that students would make about "what could be wrong" are automatically "answered" by the software when the student does not perform the experiment successfully. The image below summarizes this process.



### 2) The software tracks the students' progress and it allows exporting reports:

At any time, the professor may verify how many and, specifically, which experiments the student have completed. That report can be used to track students' activities and it can be considered as an evaluation tool.

This report can be generated and displayed directly in the system or it can be exported to a spreadsheet (see image below).

| Timestamp        | Student  | Topic          | Experiment                                               |
|------------------|----------|----------------|----------------------------------------------------------|
| 2020-11-11 10:28 | Da Vinci | Basic Lighting | 1.1 - Single point controlled lighting plant             |
| 2020-11-11 12:14 | Da Vinci | Basic Lighting | 1.1 - Single point controlled lighting plant with socket |
| 2020-11-12 14:27 | Da Vinci | Basic Lighting | 1.1 - Switch controlled two lamps lighting plant         |

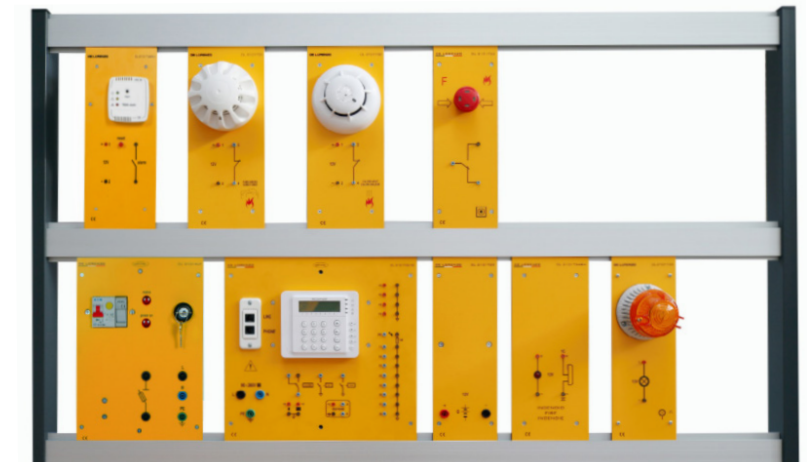
## DIDACTIC EXPERIENCE AND APPLICATION

The software guarantees a complete experience in the field of several civil installations. Students can approach this topic starting from the basic concepts, such as lighting installations, up to advanced experiments such as firefight protection system.

Through this system, it is possible to assemble a relevant number of civil installations to carry out the following didactic experiences:

- Basic lighting installations;
- Advanced lighting installations;
- Signalling installations
- House phone signalling systems;
- Hotels and Hospitals systems;
- Firefight protection systems;
- Anti-intrusion installations;
- Video house phoning systems.

## SET OF COMPONENTS



The system is based on a set of components that allow the assembly of installations. The set consists of the following components:

1. Power supplies
2. Lamps
3. Relays
4. Switches
5. Sensors
6. Push buttons
7. Control units
8. Signalling devices
9. Phones

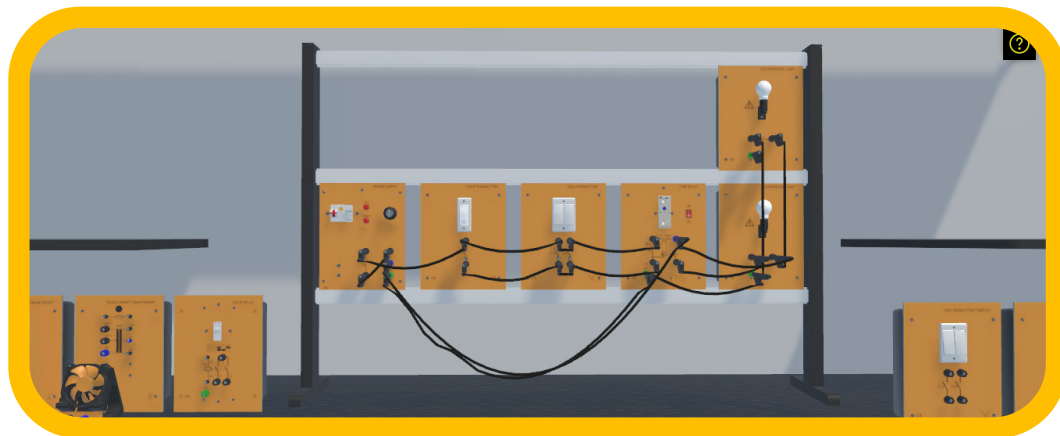
The system also includes transformer, socket, fan, dummy to simulate movements and activate sensors, etc., in order to perform all the experiments

## LEARNING TOPICS

This software covers 8 topics and proposes 44 experiments for the students. The experiments are listed below, grouped by learning topics.

# LEARNING TOPICS

## BASIC LIGHTING INSTALLATIONS



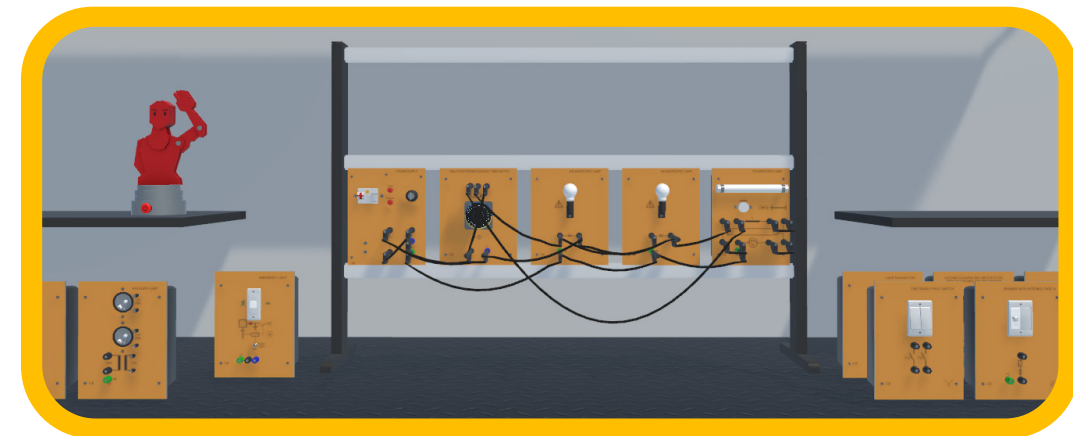
With this kit, it is possible to perform the following experiments:

- Single point controlled lighting plant
- Single point controlled lighting plant with socket
- Switch controlled two lamps lighting plant
- Two point controlled lighting plant
- Three point controlled lighting plant
- Four point controlled lighting plant
- Circuit breaking relay controlled lighting plant
- Switching relay controlled lighting plant
- Light installation controlled by time relay
- Hot cathod fluorescent lamp plant

Smart simulator environment with 10 experiments regarding multiple point control, control with relays, fluorescent lamp, each one including brief theoretical mentions and practical diagrams of the main circuits that are used in lighting installation for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer to an assessment form related to the experiment in order to unblock the next one.

## ADVANCED LIGHTING INSTALLATIONS



With this kit, it is possible to perform the following experiments:

- Switch controlled two lamps low energy lighting plant
- Emergency lighting plant
- Incandescent lamps brightness control with a dimmer from a single point
- Halogen lamps brightness control with a dimmer from a single point
- Incandescent lamps brightness control with a dimmer from multiple points
- Halogen lamps brightness control with a dimmer from multiple points
- Light system of incandescent lamps controlled by a twilight switch
- Light system of halogen lamps controlled by a twilight switch
- Light system of incandescent lamps controlled by an automatic infrared switch fitted with adjustable twilight
- Light system of halogen lamps controlled by an automatic infrared switch fitted with adjustable twilight
- Light system with daily electromechanical time switch

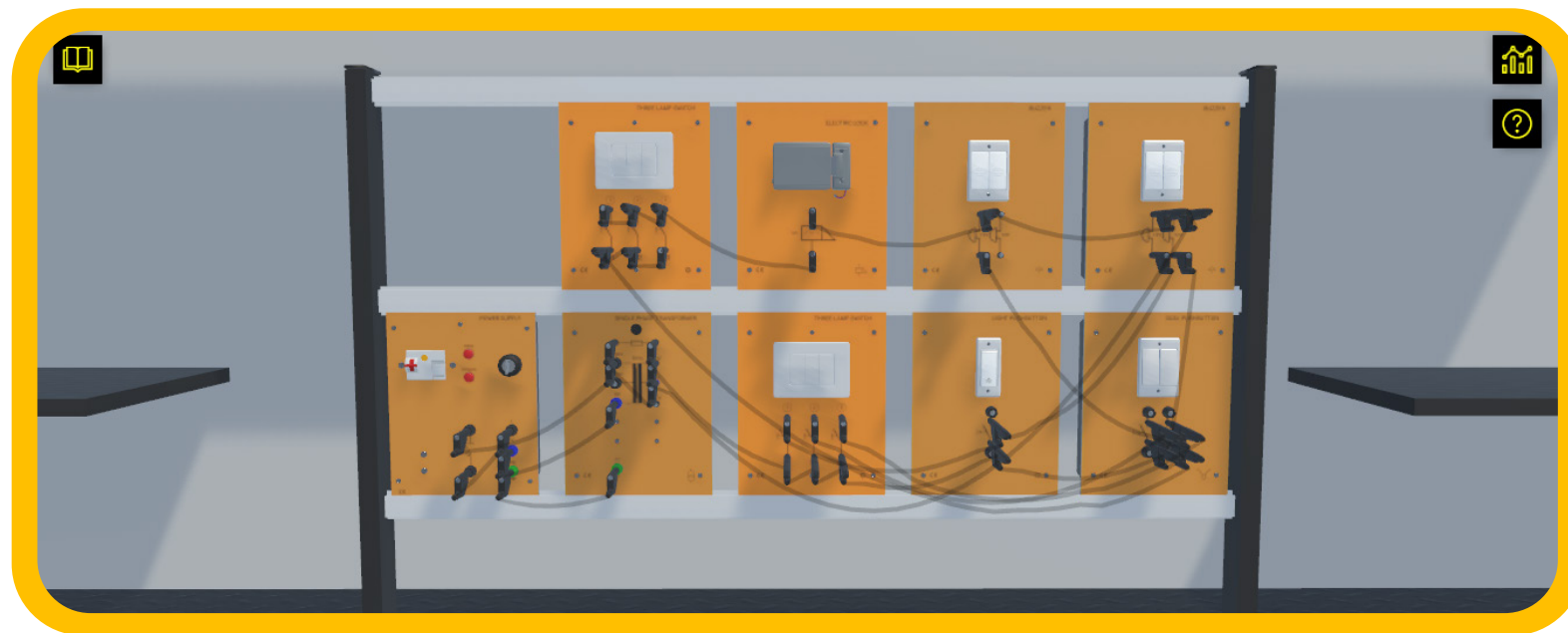
Smart simulator environment with 12 experiments regarding emergency lighting, brightness control with dimmers, twilight switch, infrared switch, daily switch, each one including brief theoretical mentions and practical diagrams of the main circuits that are used in lighting installation for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer to an assessment form related to the experiment in order to unblock the next one.



# LEARNING TOPICS

## SIGNALLING INSTALLATIONS



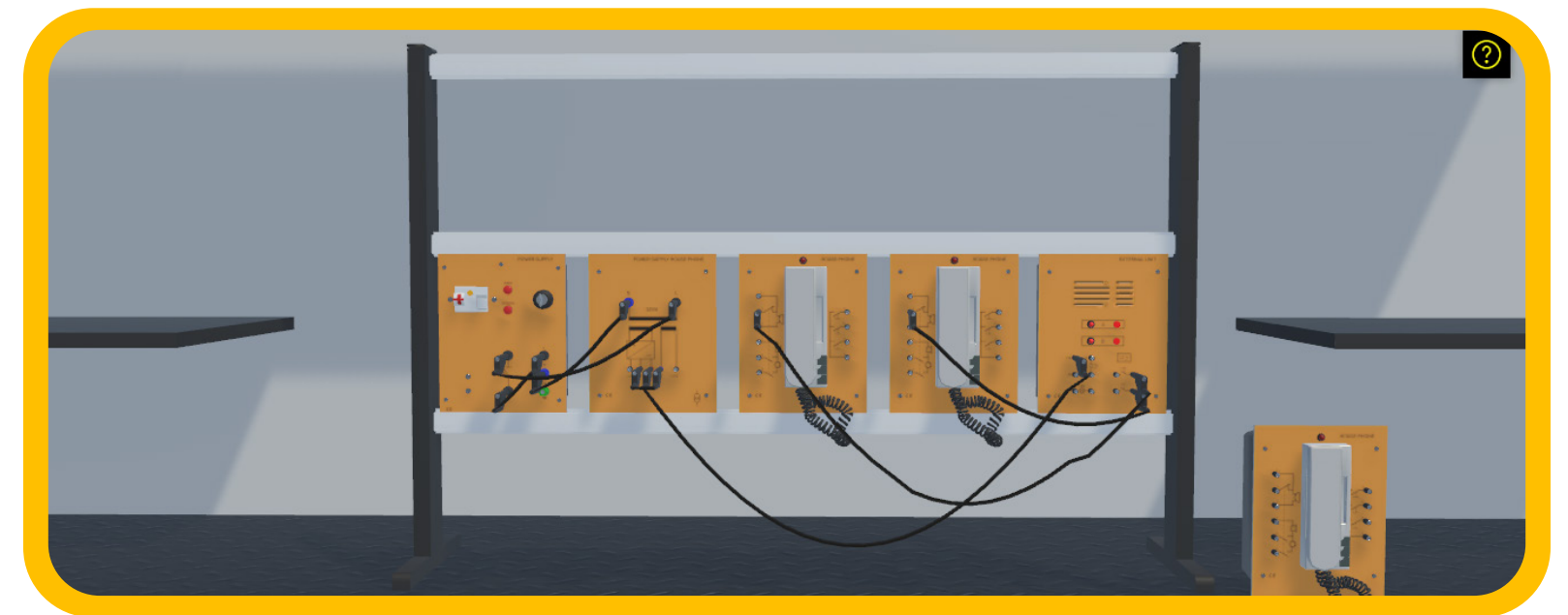
With this kit, it is possible to perform the following experiments:

- Signalling plant
- Single control signaling plant
- Reciprocal control signaling plant
- Light signalling plant
- Ringing plant with a door and a main entrance control
- Electric lock ringing plant

Smart simulator environment with 6 experiments regarding signalling systems, like condominium concierge, each one including brief theoretical mentions and practical diagrams of the main circuits that are used in signalling installations for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer to an assessment form related to the experiment in order to unblock the next one.

## HOUSE-PHONE SYSTEMS



With this kit, it is possible to perform the following experiments:

- Two reciprocal call house – Phone plant at short distance
- Two reciprocal call house – Phone plant at long distance
- Coupled two house – Phone plant
- Main house – Phone and two shunted house-phones plant
- Communicating house – Phone plant
- Connection between two derivatives and 1 external unit

Smart simulator environment with 5 experiments regarding house and building phone systems like a porter – tenants communication, each one including brief theoretical mentions and practical diagrams of the main circuits that are used in phone systems for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer to an assessment form related to the experiment in order to unblock the next one.

# LEARNING TOPICS

## HOTEL / HOSPITAL SIGNALLING SYSTEMS



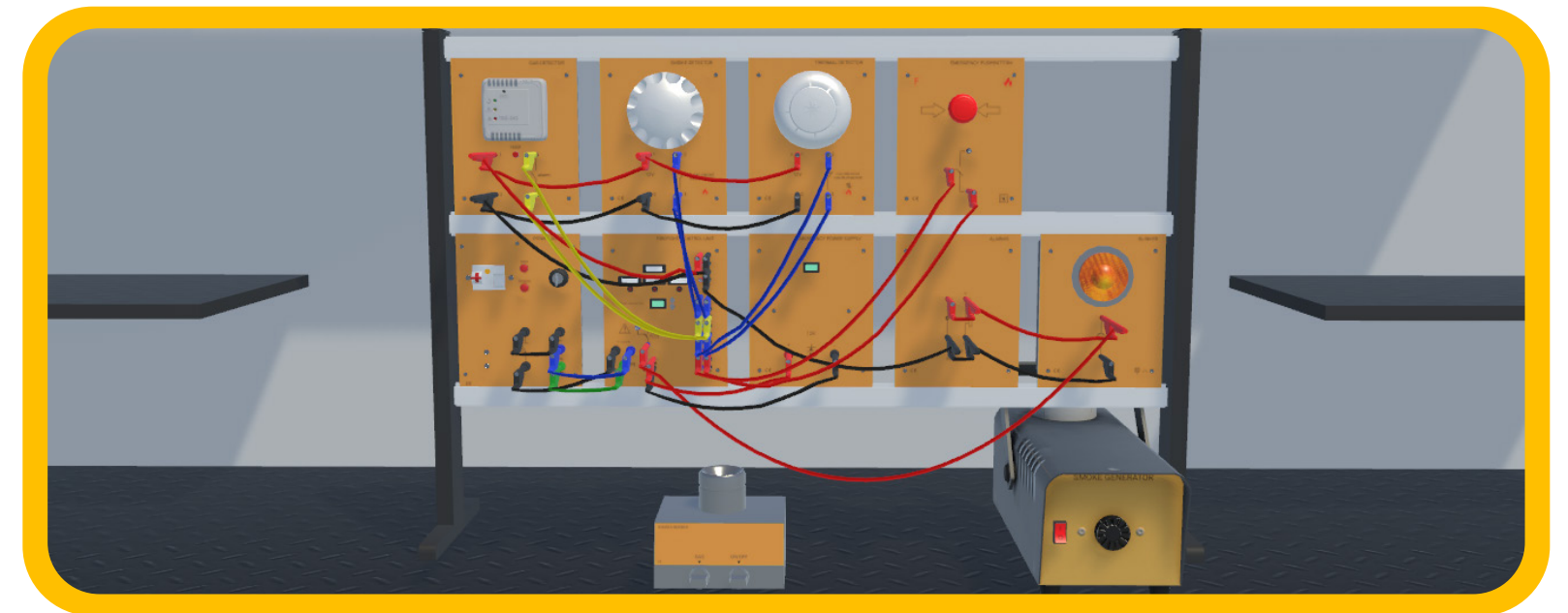
With this kit, it is possible to perform the following experiments:

- Installation for audience request
- Installation for hotel
- Installation for nurse calling

Smart simulator environment with 3 experiments regarding hotel and hospitals services, like hotel services request and nurse assistance call, each one including brief theoretical mentions and practical diagrams of the main circuits that are used in hotel and hospital systems for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer an to assessment form related to the experiment in order to unblock the next one.

## FIREFIGHT PROTECTION SYSTEM



With this kit, it is possible to perform the following experiment:

- Implementing the firefight protection system

Smart simulator environment with 1 general experiment regarding firefight protection systems with 3 sensors for gas, heat and smoke and a central unit to activate / deactivate detectors as well as the trigger time. Including brief theoretical mentions and practical diagrams of the main circuits that are used in firefight systems for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer to an assessment form related to the experiment in order to unblock the next one.

# LEARNING TOPICS

## ANTI-INTRUSION INSTALLATIONS



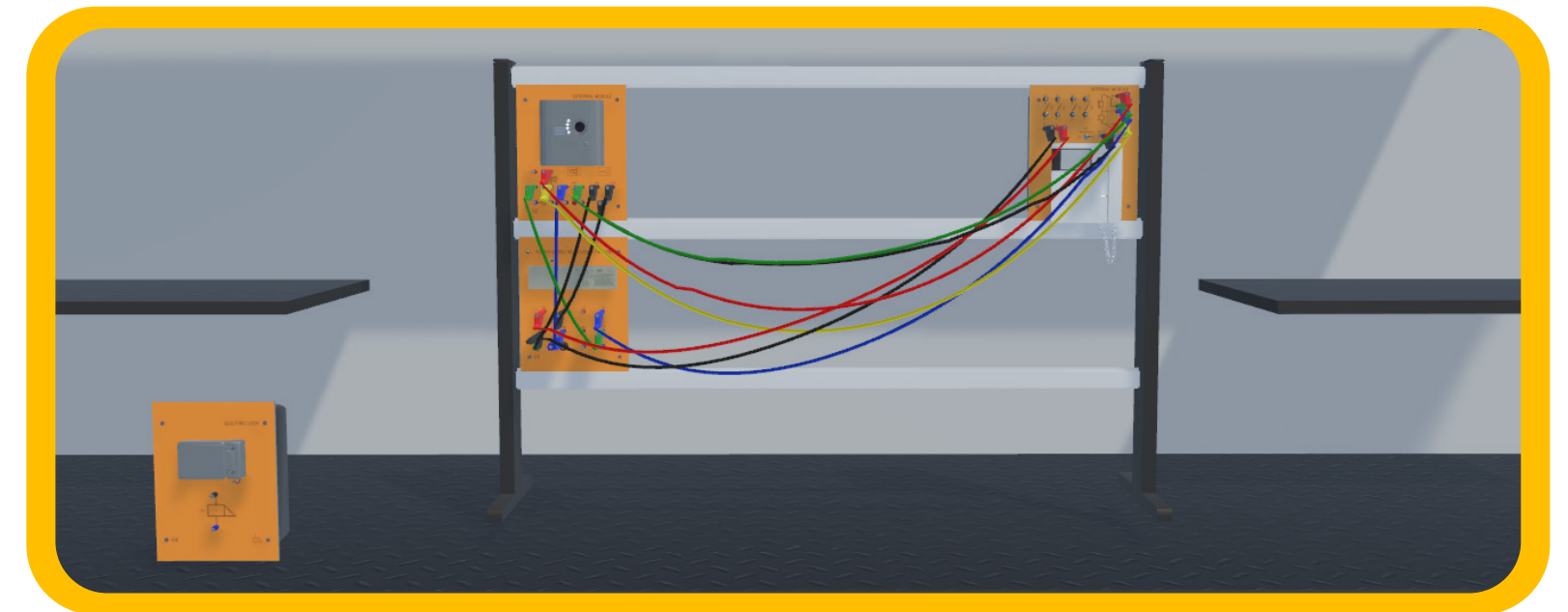
With this kit, it is possible to perform the following experiment:

- Implementing the anti-intrusion protection system

Smart simulator environment with 1 general experiment regarding anti-intrusion protection systems with 3 sensors of infrared, microwave and perimeter and a central unit to activate / deactivate detectors as well as the trigger time. Including brief theoretical mentions and practical diagrams of the main circuits that are used in anti-intrusion systems for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer to an assessment form related to the experiment in order to unblock the next one

## VIDEO HOUSE PHONING SYSTEMS



With this kit, it is possible to perform the following experiments:

- Connecting the ring
- Connecting the alarm and the light plate
- House phone installation
- Video outdoor station
- Video house phone installation

Smart simulator environment with 5 experiments regarding installations of a video house / buildings phone systems, with audio-visual connection between an external loud speaking unit and an internal one. Including brief theoretical mentions and practical diagrams of the main circuits that are used in video house systems for civil buildings.

Each one is divided in three steps: Assembly of the modules that will be used, wiring connections and simulation. After the simulation, the student will have to answer to an assessment form related to the experiment in order to unblock the next one.



# SYSTEM REQUIREMENTS

| MINIMUM REQUIREMENTS               |
|------------------------------------|
| OPERATIONAL SYSTEM                 |
| 64-BIT WINDOWNS 10                 |
| DIRECTX VERSION                    |
| DIRECTX 11                         |
| PROCESSOR                          |
| INTEL i5 9400F OR AMD RYZEN 5 3600 |
| MEMORY                             |
| 8GB                                |
| GRAPHIC CARD                       |
|                                    |
| STORAGE                            |
| HDD (1GB)                          |

| RECOMMENDED REQUIREMENTS             |
|--------------------------------------|
| OPERATIONAL SYSTEM                   |
| 64-BIT WINDOWNS 10 PRO               |
| DIRECTX VERSION                      |
| DIRECTX 12                           |
| PROCESSOR                            |
| INTEL i7 9700 OR AMD RYZEN 7 3700X   |
| MEMORY                               |
| 16 GB                                |
| GHRAPHIC CARD                        |
| NVIDIA GTX 1050 TI 4GB OR RX 550 4GB |
| STORAGE                              |
| HDD (1GB)                            |