



**SEM-SEM**

**Smart Control Systems for Energy Management**

Erasmus + #: 561703-EPP-1-2015-1-UK-EPPKA2-CBHE-JP



Co-funded by the  
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## TABLE OF ACHIEVED RESULTS

<b>Title and reference number of the work package</b> <b>(WP5)</b>	<i>Development of Manuals for training and labs</i>
<b>Indicators of achievement and or/performance as indicated in the previous approved report</b>	Laboratory Equipment, Booklets and training courses, online courses

### Activities carried out to date to achieve this result:

Activity N°	Activity Title	Start date	End date	Place	Description of the activity carried out	Specific and measurable indicators of achievement
5.1	Preparation of laboratories	15/2/2016	14/8/2016	EG/JOR	<p>Each Egyptian and Jordanian University Started their survey and have chosen the proper equipment for the assigned laboratories according to the proposal.</p> <p>➤ There are 5 laboratories for EG partners AASTMT will have 2 Laboratories:  Smart Industrial Autonomous Systems</p>	Tenders and purchasing orders



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					<p>Energy management and saving Laboratory.</p> <p>ASU will have energy management laboratory.</p> <p>NU and HU will have autonomous robotics system laboratory.</p> <p>➤ 4 laboratories for JOR partners MU will have 2 laboratories; in smart autonomous systems, and energy management systems.</p> <p>UJ laboratory will be oriented towards energy saving systems.</p> <p>JUST equipment will be ordered towards the autonomous smart system laboratory.</p> <p>The was a problem with getting prices for the laboratory of smart Autonomous systems from Jordan. So MU partner are delaying the process of this laboratory.</p>	
5.2	Mounting of experimental rigs and lab development	15/4/2016	14/1/2017	EG/JOR	<p>Due to delays in receiving the grant by from the PI SU. Therefore, not all the equipment and laboratories from each partner had been ordered on Time. For example, the equipment for the Jordanian partners are delayed. AASTMT had ordered only part of the smart industrial autonomous laboratory.</p>	Working equipment's with experiments booklets



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				<p>The second installment had reached the partners on by March and April 2018, as a result the project consortium asked for extension and the extinction had been granted for extra 6 months.</p> <p>In all cases the partners have managed to fulfill most of the proposed equipment.</p> <p>Egypt: AASTMT established two laboratories: Smart Industrial Autonomous Systems equipped with PROCESS CONTROL MULTIVARIABLE SYSTEM to allow the theoretical analysis and the experiments. In addition to, PLC PANEL Semines TRAINING BOARD, FREQUENCY CONVRETER BOARD GL20 and SIMATIC ENERY SUITE SOFTWARE with Complete PC WORKSTATION</p> <p>Autonomous Robotics Systems with two arm robots and maze robot system.</p> <p>Energy management software Laboratory: Consists of LabVIEW System Design Software and Building design builder software.</p> <p>ASU have established energy management laboratory including control packages for a smart building and a standalone wind turbine with building integration capabilities.</p>	
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					<p>NU and HU had integrated autonomous robotics system laboratory equipped with: 6 DOF industrial Robot (MELFA Basic RV-2F-B-D) and Robot station with MPS modules.</p> <p>The laboratories Purchased by the JOR partners MU Established energy management systems Laboratory Consists of LabVIEW System Design Software.</p> <p>UJ laboratory Smart Energy saving Management. Which consists of: power quality analyzer, light meter, data logger, thermal imager, air quality monitor, etc....</p> <p>JUST have oriented their laboratory equipment towards field of energy management. Which includes Energy Audit Equipment, Thermal Microclimate Measuring system</p>	
5.3	Development of the training setup	15/10/2016	14/4/2017	EG/JOR	EG, JOR and EU academic staff installed all hardware and software, adopted the instruments to each experiment and applied the designed experiments to assure that they work as planned and report any errors.	Training for the operating staff
5.4	Development of the training documentation	15/11/2016	14/4/2017	EG/JOR	All laboratories experiments have been tested and booklets provided by the equipment manual had been used.	Booklets n reports
5.5	Development of e-learning training docs courses	15/4/2017	14/10/2017	EG/JOR	An online presence of the project has been created on SU server (in addition to the project website) and the courses materials (Lectures, tutorials and lab experiments) have been already uploaded to the	Training courses materials



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					server. Currently the project partners have access to these materials.	
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**Changes that have occurred in this result since the previous approved report:**

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