The Hashemite Kingdom of Jordan

Tafila Technical University

المملكـة الأردنيـة الهاشميـة

جامعـة الطفيلـة التقنيـة

لجنة العطاءات المركزية

جامعة الطفيلة التقنية

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رقم البند	اسم المادة ومواصفاتها		الوحدة	الكمية المطلوبة	الماركة	المنشأ	مدة التسليم	الأسعار بالدينار الأردني			
								السعر الإفرادي		السعر الإجمالي	
								ف	د	ف	د
1	Power hardware in the loop based microgrid testbench that contains the following 4 items:	**1.** Real-time network simulator (RTNS)	عدد	1							
		2.Software license to run the models	عدد	1							
		3.Distributed Energy Resources (DER) Emulator	عدد	3							
		4.Grid Emulator PHIL	عدد	1							
2	Desktop PCs For data acquisition and system monitoring		عدد	3							

المواصفات الفنية الدقيقة لكل مادة تابعة لنظام المحاكى المطلوب موضحة حسب الجدول التالى :-

البند (الأجهزة) Item (Equipment)	الوصف Description	العدد
Real-time network simulator (RTNS)	• The RTNS must offer computation capability in order to run power systems models in real-time • The real-time simulator must offer a set of standard I/Os (Analogue Input-output channels, [-15 V; + 15 V], 16-bits resolution, Digital Input-output channels (0-30 V) • The RTNS must be controlled by dedicated software modules define and manage the simulation environment. These software modules include the real-time operating systemand a function to convert Simulink models into an executable simulator model file. • The modeling environment must be based on Matlab/Simulink. • The modeling environment must involve dynamic simulation of power systems in phasor mode and be used for the testing and integration of energy management systems. • The System must be able to simulate microgrid models with 500 buses in minimum at10 ms in real-time. • The system must include a set of models ready to be used:	1

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	• Grid model / Microgrid Model
	• Distributed Energy Resources models. These Distributed Energy Resources can represent:
	  - Wind turbine
	  - Solar system
	  - Battery with discharging and charging capability.
	  - AC Loads
	  • The grid/microgrid model must:
	  - Offer fault capability
	  - Offer islanded mode capability
	  - Be controllable through a user-friendly GUI.
	  - Be open for modification by the user.
	  • The DER models must
	  - Offer fault capability
	  - Be selected and configured through a GUI.
	  - Be based on MATLAB/Simulink/Simscape Power Systems
	  - Be open for modification by the user.
	
	<u>Note</u>: Integrated renewable energy module should include real-time network simulator (RTNS) to allow simulating a real network and investigating real models.
	
	In general, the module should allow a fully controlled (based on voltage and frequency) low voltage grid, fully controlled emulators, fully instrumented equipment and Software programs.	

Software license	Software license to run the models MATLAB/Simulink.	1
Distributed Energy Resources (DER) Emulator	• Minimum 5 kVA • Voltage range of 380/220 V three/single phase system • 100 % sinking capability (four-quadrant operation) • Maximum Total harmonic distortion (THD) of 0.5 %	3

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	• Feedback of three voltages and three current measurements to real-time network simulator. • Dynamic response less than 5 µs.	
Grid Emulator PHIL	• Minimum 5 kVA. • Voltage range of 208 - 253 Vac per phase. • 100% sinking capability (four-quadrant operation). • Minimum of 5 kHz bandwidth at -3db. • Maximum Total harmonic distortion (THD) of 0.5 %. • Feedback of three voltages and three current measurements to real-time networksimulator (RTNS) • Dynamic response less than 5 µs. • Direct connection to the micro grid Bus (AC). No additional hardware to connect the DERto the 3-phase bus.	1
Desktop PCs For data acquisition and system monitoring	• Processor – quad core 2.4 GHz+ (i7 series Intel processor or equivalent AMD) • RAM – 16 GB or more • Hard Drive – 256 GB or larger solid-state hard driveGraphics Card – any with Display Port/HDMI • Monitor – 19" widescreen LCD with Display Port/HDMI • Operating System – Windows 10 Professional edition.	3

شروط خاصة للعطاء:

-كفالة صيانة لمدة 3 سنوات.

-دعم فني لمدة 24 شهر من تاريخ استلام لجنة الاستلام في الجامعة.

الاسم :

التوقيع :

الختم :