

مشاريع التخرج في الفصل الأول ١٤٣٠/١٤٣١ هـ

Digital IC Tester

عنوان المشروع

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ملخص المشروع

Design and implementation of a Digital IC Tester that examines the function of TTL and CMOS Digital ICs. The tester is a microcontroller-based system that examines combinational logic circuits by truth table comparison, and examines sequential logic circuits by sequence table comparison. The target ICs include various logic gates, flip-flops, counters, and registers.

Smart Grids in electric power systems

عنوان المشروع

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ملخص المشروع

The objective of this project is to review the topics of smart grid and super smart grids as applied to electrical power systems. The smart grid has the potential of improving the current problems experienced in power systems such as low reliability, low efficiency, uneconomical systems, and environmental impacts. Smart grid characteristics include: (1)it will enable active participation of consumer (2)it will accommodate all generation and storage options (3)it will optimize asset utilization and operate efficiently and (4)it will anticipate and respond to system disturbances (SELF-HEAL).

Smart grid will also make power system grid more secure and economical. Smart grid also supports using renewable energy resources which will make the grid more green and this is considered vital solution for today's environmental issues.

Analysis of a temperature controlled appliance

عنوان المشروع

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ملخص المشروع

Analysis of a temperature controlled appliance (oven, aircondition,...), Identification of the oven, Design & comparison of a microcontroller (Intel 8051 and a PIC) and conclusion.

Speed Control of DC Motor using PWM Technique and interfacing with Microcontrollers

عنوان المشروع

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ملخص المشروع

Motors are considered as a heart of the robotics. Without motors, the functionality of the robot is fail. There are always two options in front of the designer whether to use a DC motor or a stepper motor. Concerning speed, weight, size, cost..., etc. DC motors are always preferred over stepper motors. The most important control parameter of DC motor is its speed.

Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, remote controls, office machines, appliances, and power tools. By reducing the size and cost compared to a design that uses a separate microprocessor, memory, and input/output devices, microcontrollers make it economical to digitally control even more devices and processes. Mixed signal microcontrollers are common, integrating analog components needed to control non-digital electronic systems.

In this project, Pulse Width Modulation (PWM) technique will be utilized to speed control of DC motors. This technique will be applied using microcontroller. Usually H-bridge is preferred way of interfacing a DC motor. These days many IC manufacturers have H-bridge motor drivers available in the market like L293D is most used H-Bridge driver IC. H-bridge can also be made with the help of transistors and MOSFETs etc. Rather of being cheap, they only increase the size of the design board, which is sometimes not required so using a small 16 pin IC is preferred for this purpose.

High Accuracy Ultrasonic Distance Meter

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ملخص المشروع

This Project employs ultrasonic waves in order to design a high accuracy distance meter. The proposed system will measure distance up to three meters with one-centimeter accuracy. The system is composed of an ultrasonic transmitter, an ultrasonic receiver and a micro-controller. The ultrasonic waves are first transmitted in the direction of a reflecting wall or object. The reflected waves are received by the ultrasonic receiver. The micro-controller will calculate the distance to the reflecting object based on the propagation time of the ultrasonic waves.. The micro-controller will also display the distance on the display panel.

Phone Calls from anywhere using home phone

عنوان المشروع

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ملخص المشروع

Making phone calls from anywhere (outside home) by using your home phone line is possible with this project to save money (Broad Band Good plus offer from STC). This project covered how to design electronic and digital systems using DTMF, microcontroller, transistor and relays.

Smart home

عنوان المشروع

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ملخص المشروع

In this project, a circuit is designed to act as a PC based home control system. This system controls all the home appliances by switching them on or off. It acts as an alarm system that can sense any fire and switch on the alarm system and make mobile telephone calls to the home owner and the firemen. It also acts as a security system that can sense any moving bodies at certain places at home or if there is any intrusion attempt from any door or window and make a mobile telephone call to the home owner and to the police.

MV/LV DISTRIBUTION NETWORKS PLANNING

عنوان المشروع

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ملخص المشروع

A power distribution system is the segment of the overall power system that links the bulk electricity system to the consume service . Network distribution system provides better reliability and flexibility and is employed in large metropolitan cities where continuity of supply is the most important . The network distribution system is the most expensive and the reliable in terms of continuity of service . This project deals with the design the low voltage and medium voltage networks in a residential area according to the following items:

- ١ . - calculation of lighting and socket loads in each building
- ٢ . - calculation of power sockets loads
- ٣ . - determination of cable rating and across-section area
- ٤ . - design the required distribution panels
- ٥ . - determination the location ,number ,type and rating of distribution substation
- ٦ . - calculation of system voltage regulation
- ٧ . - calculation of short circuit capacity

On-Site RF Measurements for Checking Compliance of Mobile Base Stations with the National Guidelines set by the Communications and Information Technology Commission

عنوان المشروع

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ملخص المشروع

The number of cellular telephone users increases everyday. In order to support the increasingly growing number of users, the mobile base stations can be seen almost everywhere today. There has been a great concern about possible long term health consequences from exposure to RF fields produced by mobile network base stations. A common concern about a base station and its antennas relates to the area around the base station. As a reaction to this development, the *National Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields* has been issued by the Communications and Information Technology Commission (CITC) in accordance with the Act, Bylaws and Ordinance for the Kingdom of Saudi Arabia. CITC sets out a threshold level of 10dB (or 2Watt power density) for exposure to RF radiation generated by the RF site.

This project is concerned with measuring the power density of the electromagnetic fields which radiate from a selective set of mobile base stations located in the west region of Saudi Arabia. The main aim of the measurements is to ensure that the electromagnetic fields radiated from the base station comply with the *National Guidelines* set by the CITC for human exposure to RF radiations.

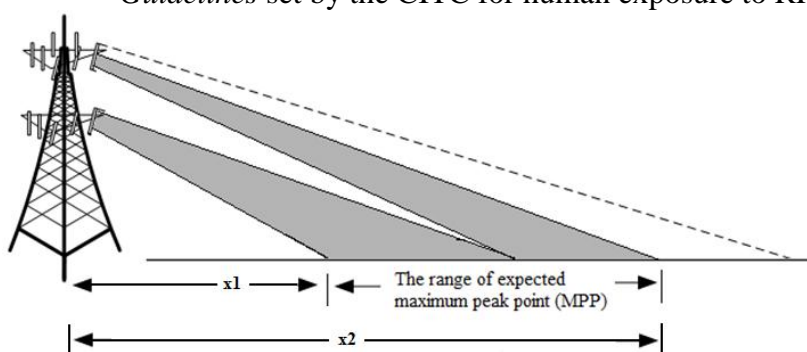


Fig.1: Schematic of a mobile base station showing the radiation pattern from a single sector antenna.

The project begins by a literature survey where basic concepts, terminologies and standards are introduced. Following this is the presentation and analysis of the results obtained from on-site measurements. The technique adopted to measure the maximum EM field location is by walking in the vicinity of the RF site along the beam of a

selected sector antenna (Fig.1) while observing the readings on the measurement device (which is the Narda Broadband Field Meter NBM-550, see Fig.2). If the maximum RF intensity level is found greater than the threshold level set by the CITC, further measurements and analysis are required to identify the field strength of individual RF sources and/or frequency bands at the measurement point. The device used for such type of measurements is the Narda Selective Radiation Meter SRM-3000. The project concludes by stating which sites – amongst the measured sites – need a modification to meet the standards mandated by the CITC.



Fig.2: The Narda Broadband Field Meter. The picture was taken while performing the RF measurements at Al Awali site in Makkah.