

AUTOMATIC IRRIGATION USING MULTI-PARAMETER MONITORING

Under the guidance of

Mr. YATHISH SIDDAIAH

Department of ECE

Submitted by

Santhosh R M	1BT09EC073
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Shashidhar N	1BT09EC075
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Siddappa Dollin	1BT09EC077
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Sreeharsha G V	1BT09EC081
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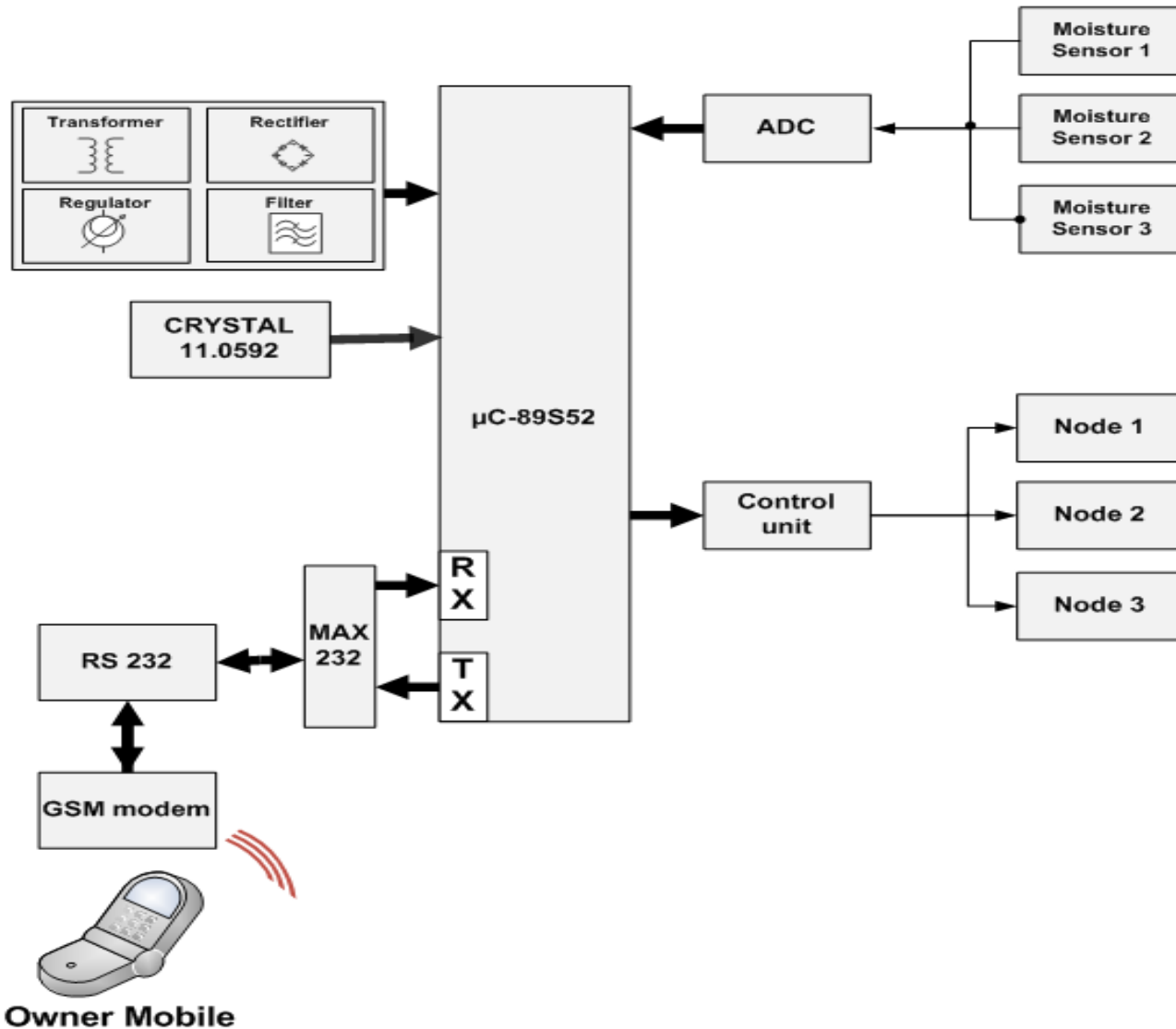
BRIEFING

- Irrigation is the artificial application of water to the land or soil.
- It is used to assist in the growing of agricultural crops, maintenance of landscapes, and revegetation of disturbed soils in dry areas and during periods of inadequate rainfall.
- irrigation also has a few other uses in crop production, which include protecting plants against frost.

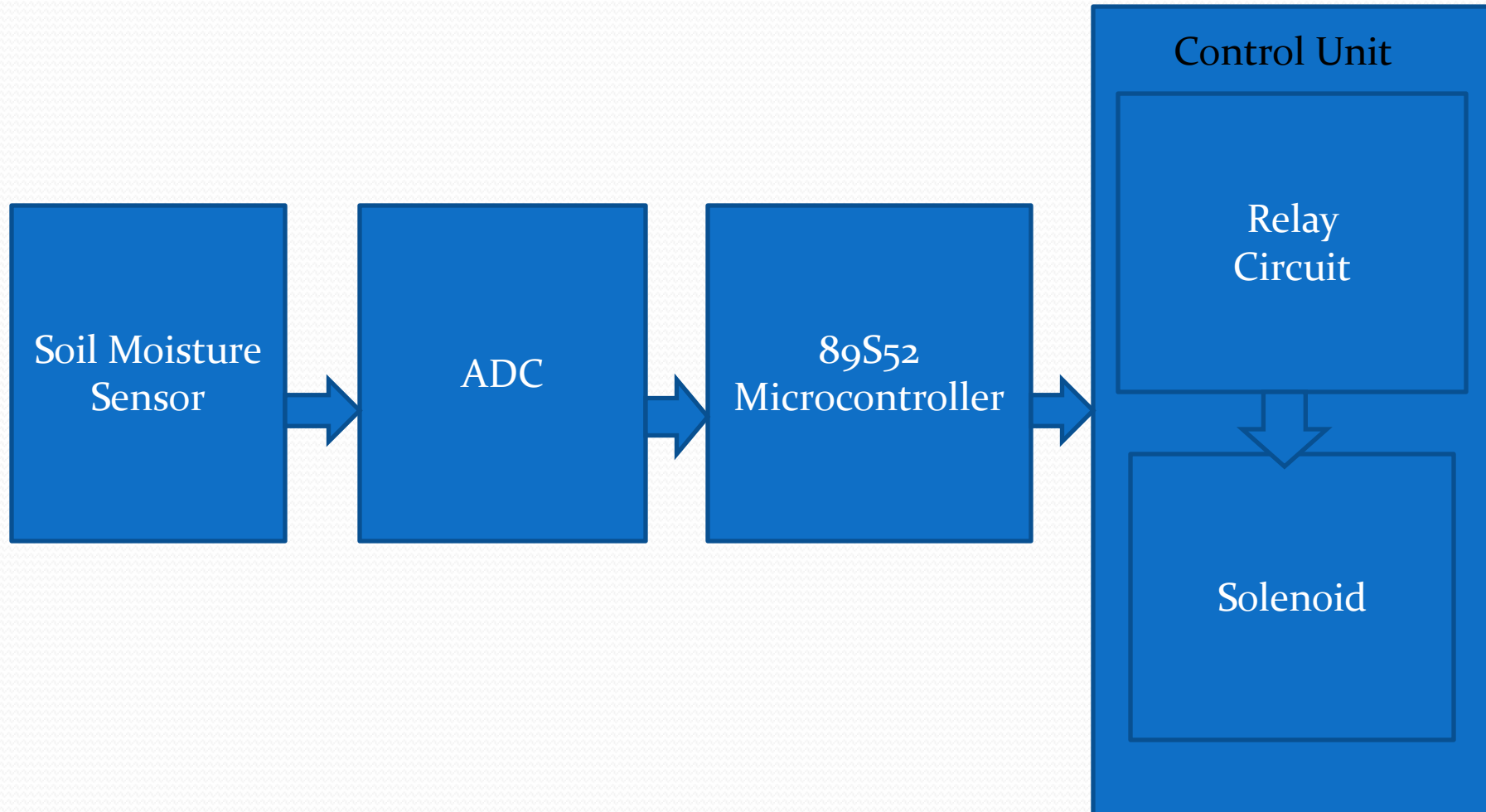
PROBLEMS

- Overirrigation because of poor distribution uniformity or management wastes water, chemicals, and may lead to water pollution.
- Underirrigation leads to increased soil salinity with consequent build up of toxic salts on soil surface in areas with high evaporation.
- Farm Lands & Fields situated miles away from your home. Extensive travel required, sometimes several times in a day to start & stop the irrigation water pumps.

BLOCK DIAGRAM



COMPLETED TOPICS



SOIL MOISTURE SENSORS

- Soil moisture probes can be permanently installed at representative points in an agricultural field to provide repeated moisture readings over time that can be used for irrigation management.
- Soil moisture content may be determined via its effect on dielectric constant by measuring the capacitance between two electrodes implanted in the soil.

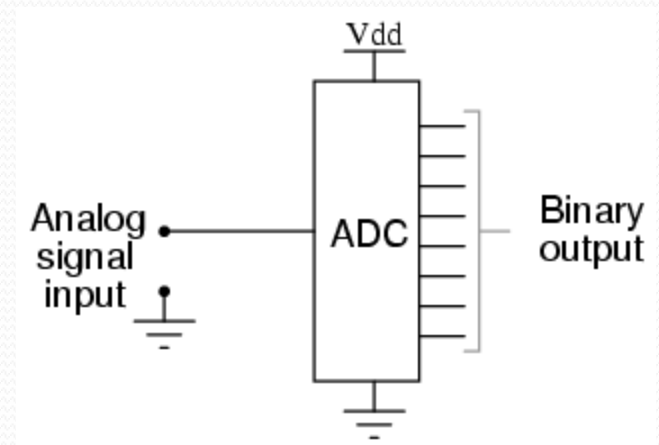
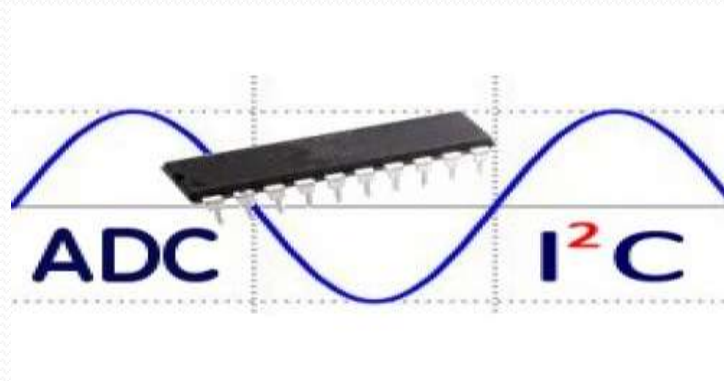


Moisture Determination by Dielectric Measurement

- Dielectric is the electrical property of a material relating to its behavior when subject to an electric field.
- Water exhibits a very high dielectric.
- Dielectric testing is particularly suited to determine moisture content in soil.
- The dielectric constant is directly proportional to moisture content of the soil.

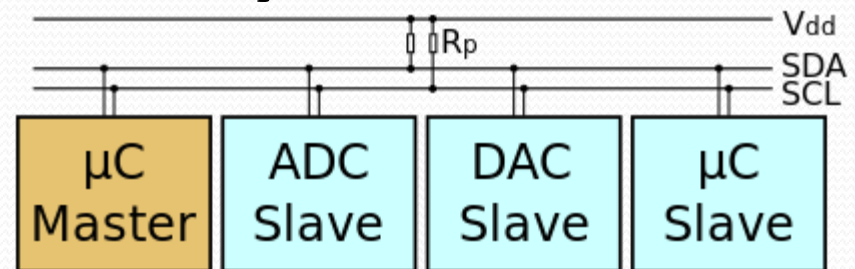
ADC

- The ADC translates an analog input signal to a digital output value representing the size of the input relative to a reference
- Then the digital value is given to given to the controller as input.



I2C PROTOCOL

- Only two bus lines are required; a serial data line (SDA) and a serial clock line (SCL).
- ICs can be added to or removed from a system without affecting any other circuits on the bus.
- No need to design bus interfaces because the I2C-bus interface is already integrated on-chip.
- It's a true multi-master bus including collision detection and arbitration to prevent data corruption if two or more masters simultaneously initiate data transfer.



89s52-CONTROLLER

- 8K Bytes of In-System Programmable (ISP) Flash Memory.
- 4.0V to 5.5V Operating Range.
- Fully Static Operation: 0 Hz to 33 MHz.
- 256 x 8-bit Internal RAM.
- 32 Programmable I/O Lines.
- Three 16-bit Timer/Counters.
- Eight Interrupt Sources.
- Full Duplex UART Serial Channel.
- Low-power Idle and Power-down Modes.
- Interrupt Recovery from Power-down Mode.
- Watchdog Timer.
- Dual Data Pointer.
- Power-off Flag.
- Fast Programming Time

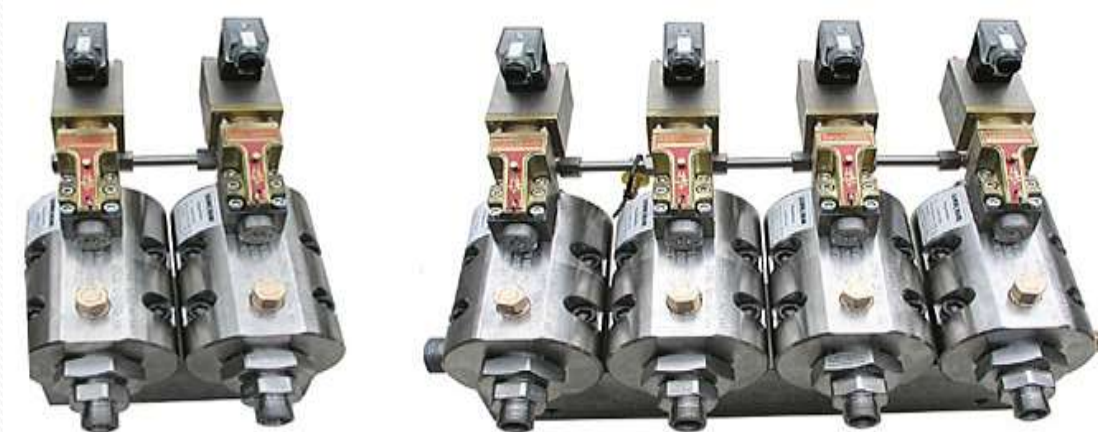
CONTROL UNIT

- The basic operation of control unit is the controlling solenoid by microcontroller which is defined by particular program.
- solenoid is connected with an output pin of microcontroller via a relay circuit which is connected with a transistor.



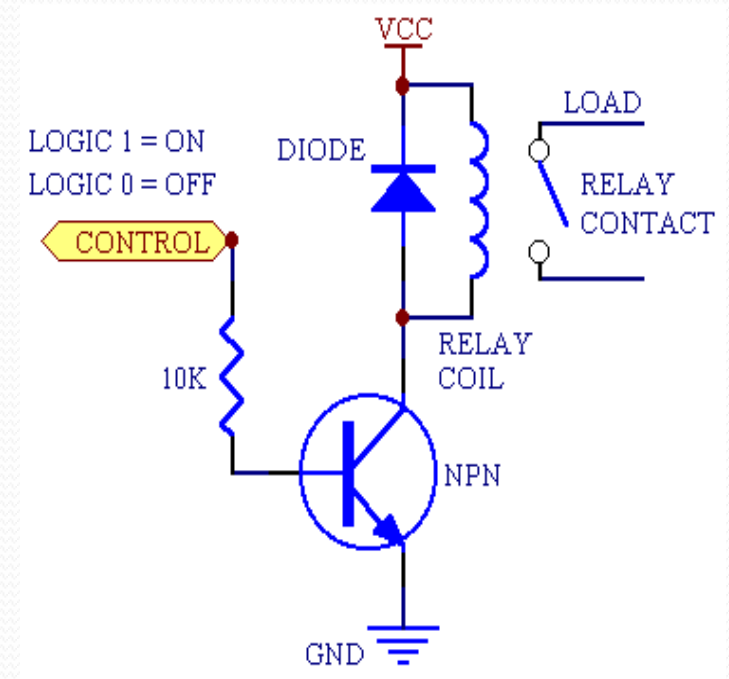
SOLENOID

- Electromagnetic device which produces a magnetic field when electric current passed through it.
- These are used mainly in opening and closing of valves.
- Operation of valves is done using a relay circuit.



RELAY CIRCUIT

- A relay is an electrical switch that uses an electromagnet to move the switch from the off to on position instead of a person moving the switch .





QUESTIONS???

