PC BASED TRANSFORMER HEALTH MONITORING

AIM:

Design and Development of PC based transformer health monitoring.

PURPOSE:

Transformers are most valuable asset in power distribution stream. There are several kinds of transformers like step up and step down. All kinds of transformers have same type of physical design like oil maintenance and coil wire. Every transformer has life with warranty. But because of variations in load, transformer life will decrease. Because of it, sudden failure of transformer will occur and it will become very costlier to rectify. To avoid such kind of issues we will propose a solution that can do transformer health monitoring using Arduino microcontroller.

DESCRIPTION:

Arduino and USB-TTL cable connected with each other through UART port. Level sensor is a resistive type that can read liquid level (oil level) with conductive leads. LM35/34 temperature sensor connected to Arduino analog port. 10K pot connected to power variable circuit that can vary voltage and current to load.

WORKING:

Three level sensor leads immersed in liquid (oil), using these three leads Arduino calculates level of liquid and displayed on 16x2 LCD display. Temperature sensor placed on transformer and that can read temperature of transformer. Here small bulb acts as load of transformer. By varying 10K potentiometer input power to load will vary. Based on input power, brightness of light will vary. If Load consumes high power then transformer will gets heated, but that heat will reflects on transformer after some time. Also voltage and current will vary. All this information will display on 16x2 LCD

display and upload to PC. PC has C# application that can display data in GUI (graphical user interface) and stored in local file with respective to date and time. This file will act as local database and available forever.

TECHNICAL SPECIFICATIONS:

HARDWARE:

Microcontrollers	:	Arduino Uno
Crystal	:	16 MHz
LCD	:	16X2 LCD
Communication Cable	:	USB-TTL
Level Sensor	:	Resistive based
Transformer	:	230 to 12VAC
Temperature Sensor	:	LM35/34
Power Source	:	12VDC adaptor

SOFTWARE:

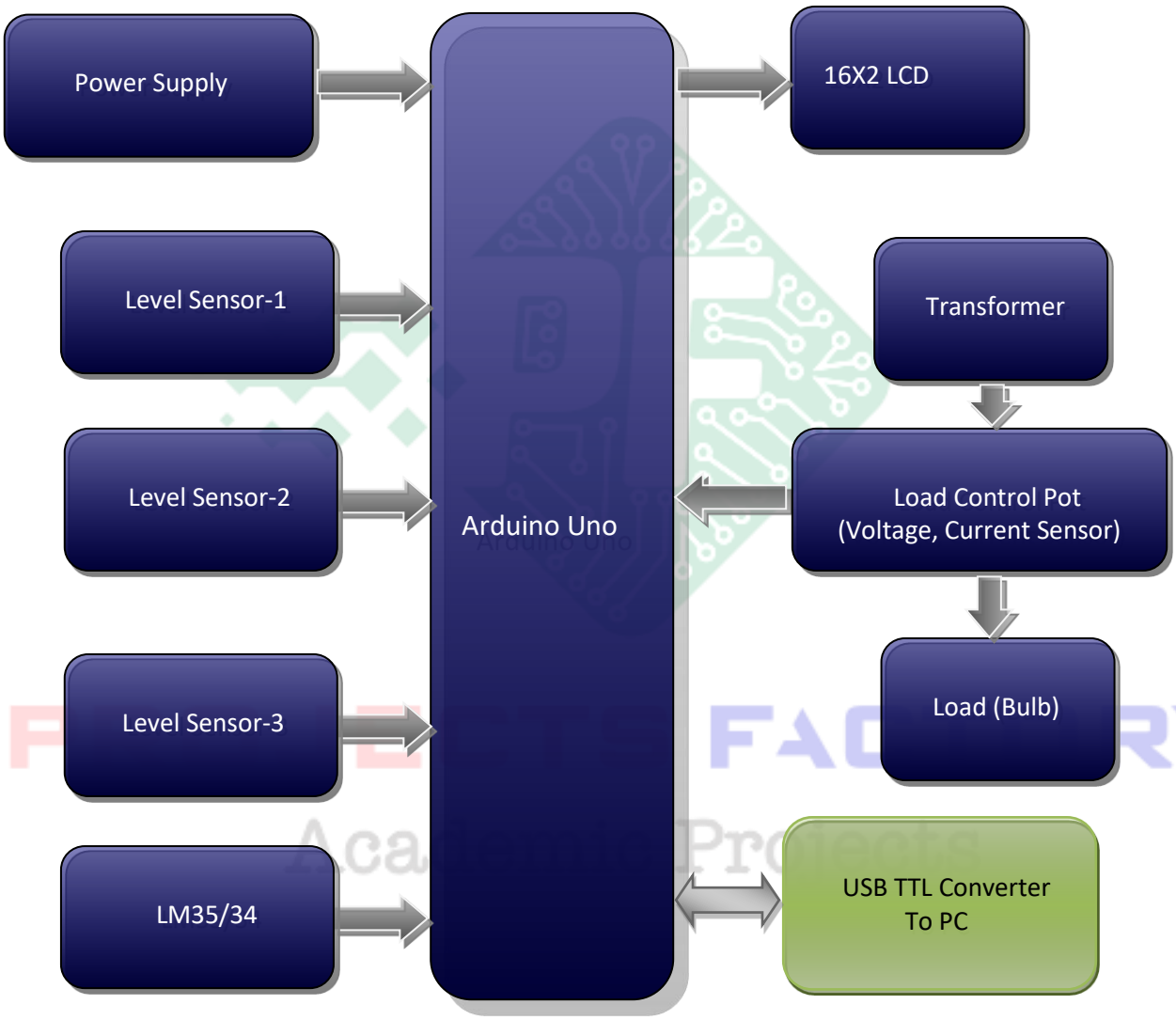
Arduino IDE

Proteus based circuit diagram

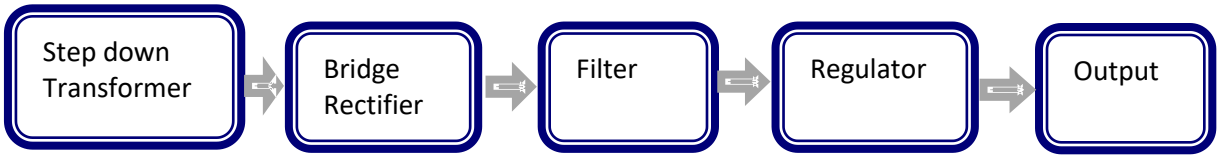
APPLICATIONS:

- Transformer Health Monitoring Applications
- Power Distribution Management Applications
- Power Transmission Applications

BLOCK DIAGRAM:



POWER SUPPLY BLOCKDIAGRAM:



INTERFACES COVERD:

- We have covered Arduino and PC interface
- LM35/34, Level sensor and Transformer load variation circuits interface