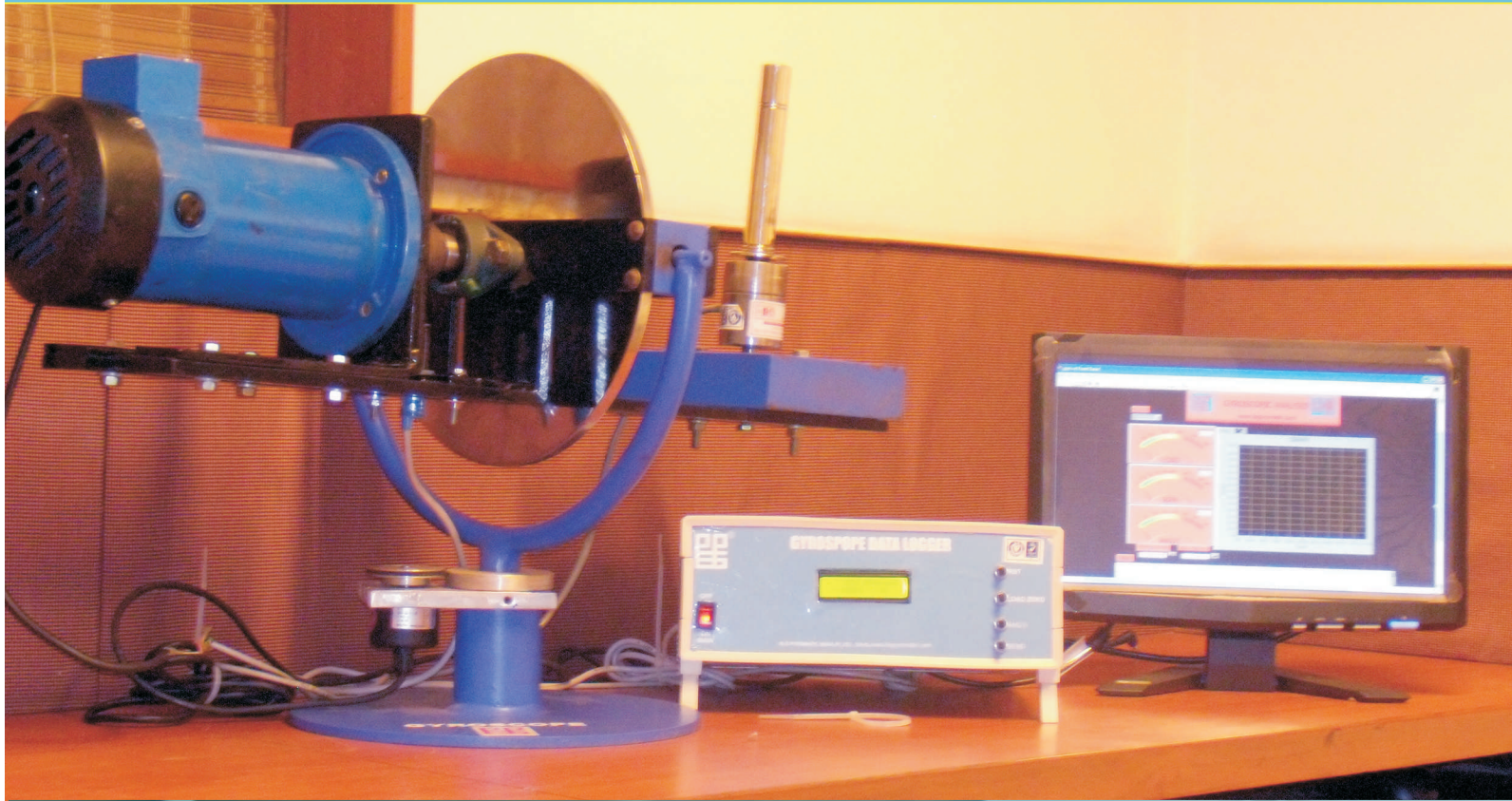


# GYROSCOPE DATA ANALYZER



## SPECIFICATION:

**DATA LOGGER**  
**NO OF CHANNELS** : Data logger of 3 channels can be provided.  
**Minimum requirement**  
**DISPLAY** : 16 X 2 line LCD display with backlight.  
**SCAN RATE** : 0.2 sec per channel.  
**SAMPLING RATE** : 30 samples per sec.  
**INPUT** : 3channels.  
**ANALOG** : 1 channels.  
**DIGITAL** : 2 channel for speed.  
**SERIAL OUTPUT** : RS-232 Serial output provided at 9600 baud rate with USB.  
**POWER** : 230V 50Hz.

**SOFTWARE** : GYROSCOPE ANALYSER Lab View Software 2009 to Monitoring and controlling the Data Acquisition, Tend Plot, Offline Analysis, Printing.

## SENSOR SPECIFICATIONS:

### ANGLE MEASUREMENT USING ROTARY ENCODER

A rotary encoder, also called a shaft encoder, is an electro-mechanical device that converts the angular position of a shaft or axle to an analog or digital code, making it an angle transducer. Rotary encoders are used in many applications that require precise shaft unlimited rotation including industrial controls, robotics, special purpose photographic lenses[1], computer input devices (such as optomechanical mice and trackballs), and rotating radar platforms. There are two main types: absolute and incremental (relative).

### STANDARD BINARY ENCODING

An example of a binary code, in an extremely simplified encoder with only three contacts, is shown below

Sector	Contact 1	Contact 2	Contact 3	Angle
1	off	off	off	0° to 45°
2	off	off	ON	45° to 90°
3	off	ON	off	90° to 135°
4	off	ON	ON	135° to 180°
5	ON	off	off	180° to 225°
6	ON	off	ON	225° to 270°
7	ON	ON	off	270° to 315°
8	ON	ON	ON	315° to 360°



### ROTARY ENCODER SPECIFICATIONS

NOMENCLATURE	SPECIFICATIONS
Series	Shaft type: to mounted at the side
Shaft dia	8mm
Output phase	3:A,B,Z
Output	NPN open collector output
Power supply	12-24vdc
MODEL	E508-500-3-T-24
ELECTRICAL CONNECTIONS	5 WIRES



### LOAD MEASUREMENT S TYPE TRANSDUCER

In the load measurement unit we are using strain gauge. A strain gauge is a long length of conductor arranged in a zigzag pattern on a membrane. When it is stretched, its resistance increases. Strain gauges are mounted in the same direction as the strain and often in fours to form a full Wheatstone Bridge. An downward bend stretches the gauges on the top and compresses those on the bottom. A load cell may contain several similar strain gauges elements.

Load measurement is stainless steel round-type load cell which can be used either in tension or compression.

## NOMENCLATURE

NOMENCLATURE	SPECIFICATIONS
Input voltage	5-30V DC
Electrical connections	4 wires
Load capacity	1 to 10 kg
Metal	Stainless steel
Output	0 to 50mv

## PROXIMITY TRANSDUCER SPECIFICATIONS: RPM MEASUREMENT

A proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact. A proximity sensor often emits an electromagnetic or electrostatic field, or a beam of electromagnetic radiation (infrared, for instance), and looks for changes in the field or return signal. The object being sensed is often referred to as the proximity sensor's target. Different proximity sensor targets demand different sensors.

Nomenclature	Specifications
Input voltage	5-12VDC
Electrical connections	Type 3 wire connection
Red wire	+12VDC
Black wire	Ground
Green wire	Output
Output	DC pulse wave form out put
Type	PNP



## MICROCONTROLLER SPECIFICATIONS:

40-PIN 8-BIT CMOS FLASH MICROCONTROLLERS

PIC16F877

Microcontroller Core Features:

- High performance RISC CPU
- Only 35 single word instructions to learn
- All single cycle instructions except for program Branches which are two cycle
- Operating speed: DC - 20 MHz clock input DC - 200 ns instruction cycle
- Up to 8K x 14 words of FLASH Program Memory, Up to 368 x 8 bytes of Data Memory (RAM) Up to 256 x 8 bytes of EEPROM Data Memory
- Pinout compatible to the PIC16F877A
- Interrupt capability (up to 14 sources)
- Eight level deep hardware stack
- Power-on Reset (POR)
- Direct, indirect and relative addressing modes
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code protection
- Power saving SLEEP mode
- Selectable oscillator options
- Low power, high speed CMOS FLASH/EEPROM technology
- Fully static design
- In-Circuit Serial Programming! (ICSP) via two pins
- Single 5V In-Circuit Serial Programming capability
- In-Circuit Debugging via two pins
- Processor read/write access to program memory
- Wide operating voltage range: 2.0V to 5.5V
- High Sink/Source Current: 25 mA
- Commercial, Industrial and Extended temperature ranges
- Low-power consumption:
  - < 0.6 mA typical @ 3V, 4 MHz
  - < 20 µA typical @ 3V, 32 kHz
  - < 1 µA typical standby current

## Peripheral Features:

- Timer0: 8-bit timer/counter with 8-bit prescaler
- Timer1: 16-bit timer/counter with prescaler, Can be incremented during SLEEP via external Crystal/clock
- Timer2: 8-bit timer/counter with 8-bit period Register, prescaler and postscaler
  - Two Capture, Compare, PWM modules
  - Capture is 16-bit, max. resolution is 12.5 ns
  - Compare is 16-bit, max. resolution is 200 ns
  - PWM max. resolution is 10-bit
- 10-bit multi-channel Analog-to-Digital converter
- Synchronous Serial Port (SSP) with SPI! (Master mode) and I2C! (Master/Slave)
- Universal Synchronous Asynchronous Receiver Transmitter (USART/SCI) with 9-bit address detection
- Parallel Slave Port (PSP) 8-bits wide, with external RD, WR and CS controls (40/44-pin only)
- Brown-out detection circuitry for Brown-out Reset (BOR)

## PIN OUT

Pin	Function	IO
1	VDD	IO
2	VDD	IO
3	VDD	IO
4	VDD	IO
5	VDD	IO
6	VDD	IO
7	VDD	IO
8	VDD	IO
9	VDD	IO
10	VDD	IO
11	VDD	IO
12	VDD	IO
13	VDD	IO
14	VDD	IO
15	VDD	IO
16	VDD	IO
17	VDD	IO
18	VDD	IO
19	VDD	IO
20	VDD	IO
21	VDD	IO
22	VDD	IO
23	VDD	IO
24	VDD	IO
25	VDD	IO
26	VDD	IO
27	VDD	IO
28	VDD	IO
29	VDD	IO
30	VDD	IO
31	VDD	IO
32	VDD	IO
33	VDD	IO
34	VDD	IO
35	VDD	IO
36	VDD	IO
37	VDD	IO
38	VDD	IO
39	VDD	IO
40	VDD	IO

## FUTURES:

Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, and toys. 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

## SOFTWARE FOR MICROCONTROLLER

MPLAB IDE is used for developing the program to microcontroller. In this Hitech c compiler is used to developing c programs

## SOFTWARE SPECIFICATION

Lab view  
 LabVIEW (Laboratory Virtual Instrumentation Engineering Workbench) is a platform and development environment for a visual programming language from National Instruments. This software is used to developing of .exe file to our application .

