



Advanced Sensor Experimental System

Model: SS1102C

Features:

Industrial-standard sensors and transducers

With USB interface

Open-ended design, ideal for expansion

Offer a sensing data acquisition software

Specification

Sensor Main Unit

1. Power Supply Unit
Fixed DC power supply
 - (1) Output voltage : +5V, -5V, +12V, -12V
 - (2) Max. output current : +5V/3A, -5V/0.3A, +12V/1A, -12V/0.5A
 - (3) With output overload protection
2. A/D Converter : 1x12-bit ADC
 - (1) Input voltage range : 0 ~ +5V
 - (2) Time pulse frequency : 3.58MHz
 - (3) Control signals : status, pole, over range indication
3. Interface Port
USB interface : type B
4. D/A Converter : 1 x 12-bit DAC
Analog output& control
OUT+ : +DC OFFSET 0 ~ +4.096V unipolar
OUT- : -DC OFFSET 0 ~ -4.096V unipolar
OUT BP : DC OFFSET -2.048V ~ +2.048V bipolar
5. Preset Level : 4-digit thumbwheel switch, Max. value : 4095
6. Status Display & DCV
Input voltage measurement
 - (1) Range : 2000mV, 20V
 - (2) Accuracy : $\pm 0.05\%$ of reading + 4 counts
 - (3) Input impedance : 10M ohms
 - (4) Display : 4 1/2 digits
7. Mode Selector : manual/single-chip
8. Buzzer : Max. input signal voltage : +12V
9. Micro Controller Signals : 5 control line outputs
10. Model Holder : X4
11. Potentiometer : 100K ohms B-type
12. Comparator : V-, V+ input, Vo output
13. Differential Amplifier : V-, V+ input, Vo output



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14. Instrumentation Amplifier : V-, V+ input, Vo output, adjustable gain

Experiment Modules

1. 2mm plugs and sockets used throughout
2. Comprehensive experiment manual
3. Modules secured in plastic housings
4. Connected by 2mm-2mm test leads
5. Dimension : (255 x 165 x 30)mm
6. Circuit symbols, blocks and components printed on the surface of each module
7. Power supplied from either power module or through main unit

Graphic User Interface Software

System Requirement

1. PC : 1GHz or faster 32-bit (x86) or 64-bit (x64) processor, 1GB RAM, 1GB more free disk space
2. OS : Windows XP/Vista/7/8/10

Specifications & Features

1. Real time acquire signal
2. Adjustable acquire frequency
3. Current, Min and Max value displayed
4. Data save, load and print function
5. X-axis : TIME/DIV
Y-axis : VOLT/DIV
6. Storage format : excel format

List of Modules

1. General Sensor Module
2. General Transducer Module
3. AD590 Transducer Module
4. Thermocouple Transducer Module
5. PT100 Temperature Transducer Module
6. Humidity Transducer Module
7. Load-Cell Transducer Module
8. LVDT Transducer Module
9. Photovoltaic Transducer Module
10. Counter Module
11. Linear Scale Module
12. Infrared Transducer Module
13. Multi-Channel Remote Controlled Module
14. Ultrasonic Transducer Module
15. Pressure Transducer Module
16. VFC Module
17. FVC Module

List of Experiments

1. D/A and A/D Converters
2. Characteristics of Sensors
 - (1) Photo transistor
 - (2) Photo interruptor
 - (3) Magnetic sensor
 - (4) Pyroelectric detector
 - (5) Thermistor
 - (6) Reed switch
 - (7) Inclination sensor
 - (8) Limit switch
 - (9) Mercury switch
 - (10) Vibration switch
 - (11) Condenser microphone
 - (12) Dynamic microphone
3. General-Purpose Transducers
 - (1) Gas/smoke detector
 - (2) Ethanol detector
 - (3) Digital magnetic detector
 - (4) Analog magnetic detector
4. AD590 Temperature Transducer
 - (1) Characteristics and transduction circuit of AD590
 - (2) The application of AD590 - Temperature controller



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- (3) The application of AD590 - Digital thermometer
5. Thermocouple
 - (1) Thermocouple characteristics
 - (2) Transduction circuit of thermocouple
 - (3) The application of thermocouple - Digital thermometer
6. PT100 Temperature Transducer
 - (1) R vs. T characteristic of PT100
 - (2) Transduction circuit of PT100
 - (3) The application of PT100 - Fire alarm
 - (4) The application of PT100 - Digital thermometer
7. Humidity Transducer
 - (1) Impedance characteristic of humidity sensor
 - (2) Transduction circuit of humidity sensor
 - (3) The application of humidity sensor - Digital hygrometer
8. Load-Cell
 - (1) Characteristics and transduction circuit of Load-Cell
 - (2) The application of Load-Cell - Overweight alarm
 - (3) The application of Load-Cell - Digital scale
9. Linear Variable Differential Transformer (LVDT)
 - (1) Characteristics of LVDT
 - (2) The application of LVDT - Digital position indicator
10. Photovoltaic Cell
 - (1) Photovoltaic characteristics
 - (2) Photovoltaic transducer circuit
 - (3) The application of photovoltaic - Auto-Streetlamp controller
 - (4) The application of photovoltaic - Digital illuminometer
11. Linear Scale
 - (1) Linear scale characteristics and transducer circuit
 - (2) Distance measurement of linear scale
12. Infrared Transducer
 - (1) Infrared transducer DC characteristic test
 - (2) Infrared transducer AC characteristic test
 - (3) The application of infrared transducer - Event counter
 - (4) The application of infrared transducer - Remote controller
13. Ultrasonic Transducer
 - (1) Ultrasonic transducer characteristic test
 - (2) The application of ultrasonic transducer - Space disturbance detector
14. Pressure Transducer
 - (1) Transduction circuit of pressure sensor
 - (2) The application of pressure transducer
15. V/F and F/V Converters
 - (1) VFC converter
 - (2) FVC converter
 - (3) The application of V/F converter - FSK modulation
 - (4) The application of F/V converter - Encoder

Load Units

1. Humidity & Temperature Load
 - (1) Temperature load
 - a. Provides heat source for AD590, PT-100 and thermocouples
 - b. Temperature range : ambient ~ 170 degree Celsius
 - c. Manual/automatic selection
 - d. Insulated for safety reasons
 - e. Digital temperature control : SSR driven voltage output
 - f. ON/OFF LED indicator
 - (2) Humidity Load
 - a. Provides humidity source for Humidity Transducer
 - b. Humidity Range : ambient ~ 99% RH
 - c. Stainless steel tray for water storage
 - d. With a humidity / temperature switch
 - e. With humidify / dehumidify functions



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2. Pressure Gauge
 - (1) Pressure gauge : full scale 5000mm Ag
 - (2) Flow rate control valve
 - (3) Power source : 110V/220V AC
3. Load Cell
 - (1) Construct strain gauge and bridge circuit
 - (2) Max. load : < 5Kg
 - (3) Electronic scale
4. Linear Variable-Differential Transformer (LVDT)
 - (1) Range : ± 5 mm
 - (2) Scale : 0.01mm
 - (3) Linear accuracy : 0.1%
 - (4) Excitation frequency : 350Hz
5. LUX Load
 - (1) Selectable light sources
 - (2) Light bulb luminous intensity adjustable
 - (3) Photovoltaic transducer open voltage : about 2V
 - (4) Photovoltaic transducer close current : about 0.08 μ A/lx
6. Angle/Distance Load
 - (1) Platform moving range : 300mm
 - (2) Adjustable transmitting/receiving angle : 30degree/step, 0 ~ 360degree
 - (3) Infrared receiver : Max. input wavelength = 940nm
 - (4) Ultrasonic transmitter/receiver : nominal frequency = 40KHz
7. Linear Scale
 - (1) Resolution : 0.005mm
 - (2) Max. range : 200mm
 - (3) Stepping motor with speed adjustment
 - (4) Voltage requirement : +5V DC
 - (5) Left/right directional switch
 - (6) Left/right limit switch
8. Standard Weight Set
 - 2 x 50g, 2 x 100g, 1 x 200g, 1 x 500g, 2 x 1Kg, 1 x 2Kg
9. Encoder Sensor Module
 - (1) DC power supply : +5V DC
 - (2) Output signal : A, B, Z
 - (3) Max. pulse frequency : 30KHz (300P/R)
 - (4) Max. speed : 6000rpm (300P/R)

Equipment Required

1. Power Supply
2. Power Supply (0 ~ ± 30 V/3A)
3. Computer Servicing Tool Kit
4. Alcohol Prep Pad
5. Digital Storage Oscilloscope (DSO) : 100MHz bandwidth, 1GS/s sampling rate and FFT function or better
6. Hand-held Digital Multimeter
7. Thermometer
8. Function Generator
9. Frequency Counter

Accessories

1. Experimental Manual
2. Connection Leads and Plugs
3. Magnet