

UBIQUITOUS INTEGRATED SENSOR APPLICATION TRAINER

CSN-2005



- Main unit(CSN-200)
- More than 20 experimental modules and sensor units
- External I/O board
- 2 USB, RS485, RF communication
- Sensor signal measurements
- Application software
- Sensor simulator(CS-SM01 : **Optional**)

■ FEATURE

CSN-2005 is very useful for various and systematical trainings as this trainer consists of one main unit(CSN-200), more than 20 units of sensor circuit experimental module and sensor unit, one bread-board module, one external I/O control module, and PC application software.



CSN-2005 makes various input/output setups and displays the results on LCD screen in text or graphic form. When connected to each sensor module, this trainer obtains the information of corresponding module. As such, CSN-2005 is designed to give the user greater convenience in administering experiment and exercise.

Through connection to PC and USB, input/output conditions and output results can be set or checked in PC. In case of wired network communication, RS485 is used to enable network configuration and communication. In case of wireless communication, RF network is configured to proceed with the exercise.

When PC or sensor control unit sends signals for external output, output is produced through EXT. or I/O. Therefore, through connection to application circuit, control can be administered per each input.

Each module consists of a sensor module and circuit module. So, even when the sensor is damaged, replacement can be easily completed. Connection to sensor control unit is achieved with 15-pin cable.

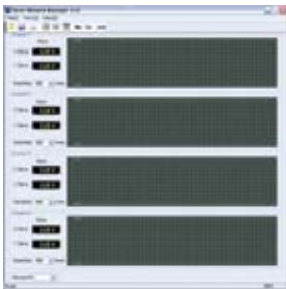
All power and input/output transmission is achieved through DSUB cable. Therefore, it does not require an additional power line or input/output line. In addition, each circuit module is equipped with a test point (TP). Therefore, each circuit value can be measured during experimental exercise and changes per input can be directly checked.

- ▶ Sensor signal measuring experiment through main unit (CSN-200)
- ▶ Real time measuring for sensor signal waves
- ▶ Digital graphic LCD display with high sensitivity
- ▶ Quick and precise response of measuring values
- ▶ PC interface through 2-USB / RS-485 communication
- ▶ Sensor characteristic experiment through PC application S/W
- ▶ Automatic recognition of sensor modules
- ▶ 4-Channel sensor experimental module interface
- ▶ External output control practice through sensing data
- ▶ RF(Radio Frequency) transmitting practice of sensor values
- ▶ Various analogue sensor characteristic practice
- ▶ Sensor signal AD converting and digital control
- ▶ Sensor circuit controlling practice through Microcomputer (CSN-200)



Main component of Integrated Sensor Application Trainer (CSN-2005)

- ▶ CSN-200 Sensor network system (Main unit)
- ▶ CS-201~220 Sensor circuit experimental modules
- ▶ CS-201-S~220-S Sensor units
- ▶ PC Application software
- ▶ Accessories, system case, and etc.



① Main



② Measuring



③ Normal IO



④ External IO

THE EXPERIMENTS AND PRACTICES OF MODULES

▶ AD590 Temperature transducer module

- Study the construction of AD590
- Understanding the characteristics of AD590
- Study the transduction principles of AD590
- Study the applications of AD590

▶ Gas, Smoke, Ethanol sensor module

- Study the principles and applications of gas/smoke sensors
- Study the principles and applications of ethanol sensors
- Study the principles and applications of gas/smoke & ethanol sensors

▶ A/D Hall sensor module

- Study the principal of analog, digital hall sensor
- Study the application of analog, digital hall sensor

▶ Thermocouple sensor module

- Study the construction of thermocouple
- Study the characteristic of thermocouple
- Study the transduction principle of thermocouple
- Study the application of thermocouple

▶ Photo cell sensor module

- Understanding the characteristics of photovoltaic cell
- Understanding the principles of photoelectric conversion
- Study the applications of photovoltaic cell



CS-201



CS-201-S



CS-202



CS-202-S



CS-203



CS-203-S



CS-204



CS-204-S(Thermocouple)



CS-205



CS-205-S

▶ **Infrared TX/RX sensor module**

- Understanding the characteristics of infrared (IR) transducers
- Study the driver circuits of IR transducers
- Study the receiver circuits of IR transducers
- Study the applications of IR transducers

▶ **P2000 pressure sensor module**

- Study the structure of pressure sensor
- Study the operation principle of pressure transducer
- Study the application of pressure transducer

▶ **Voltage to frequency converter module**

- Study the principles of voltage-to-frequency conversion
- Study the principles of frequency-to-voltage conversion
- Study the operation of photo encoder

▶ **Frequency to voltage converter module**

- Study the principles of voltage-to-frequency conversion
- Study the principles of frequency-to-voltage conversion
- Study the operation of photo encoder

▶ **Pyroelectric & thermister sensor module**

- Study the principles of pyroelectric sensor operating
- Study the applications of pyroelectric sensor
- Study the principles of thermister sensor operating
- Study the applications of thermister sensor

▶ **Ultrasonic sensor module**

- Understanding the characteristics of ultrasonic waves
- Study the transmission and reception of ultrasonic waves
- Study the applications of ultrasonic transducers in the filed of control and instrumentation

▶ **Photo TR & photo interrupter sensor module**

- Study the characteristics photoconductive detector
- Study the applications of photoconductive detector

▶ **PT-100 sensor module**

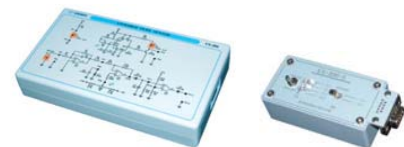
- Study the characteristics of resistance temperature detector (RTD)
- Study the construction of Pt-100
- Study the characteristics of Pt-100
- Study the transduction circuit of Pt-100
- Study the application of Pt-100

▶ **Humidity transducer module**

- Study the classification of humidity sensor
- Study the construction and characteristics of humidity sensor
- Study the applications of humidity sensor

▶ **Strain gauge sensor module**

- Study the operating principles of strain gauge
- Understanding the characteristics of strain gauge
- Study the applications of strain gages



CS-206

CS-206-S



CS-207

CS-207-S



CS-208



CS-209



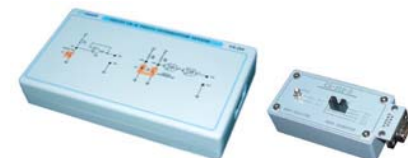
CS-210

CS-210S



CS-211

CS-211S



CS-212

CS-212S



CS-213

CS-213-S / PT-100



CS-214

CS-214-S



CS-215

CS-215-S

▶ **Magnetic resistor sensor module**

- Study the types of magnetic resistor sensor
- Study the structure and characteristics of magnetic resistor sensor
- Study the application of magnetic resistor sensor

▶ **Crystal temperature module**

- Study the types of crystal temperature sensor
- Study the structure and characteristics of crystal temperature sensor
- Study the application of crystal temperature sensor

▶ **Bread board module**

- Practice the construction of parts on breadboard
- Study the applications of various sensor circuits

▶ **External I/O board module(Included cables)**

- Practice the control of external equipments by the input characteristics and variations of sensor signal
- Practice the control of external equipments and I/O
- Practice the control of 8-relay port
- Practice the control of 4-TTL I/O
- Experiment of 4-Photo coupler signal input
- Practice the control of DA output



Mechanical experimental sensor modules

▶ **Linear scale module (Included sensor) : CS-218**

- Linear scale characteristics
- Movement measurement

▶ **Load-cell weight transducer module (Included sensor) : CS-219**

- Load-cell characteristics and converter circuit
- Weight measurement
- Digital scale

▶ **LVDT transducer module (Included sensor) : CS-220**

- LVDT characteristics and converter circuit
- Position measurement
- Distance measurement

Optional accessories

- CRF-200 RF communication kit (for PC) : 1ea
- **CS-SM01 Sensor Simulator**
CS-SM01 Sensor Simulator is an equipment that the user can make a sensor experiment very conveniently at the laboratory room and give a physical variation to its sensor units. With this simulator, the user can do various simulations needed for sensor experiments like a temperature experiment, a pressure experiment, and etc.
- **The main functions of CS-SM01**
Temperature load control, Humidity control, Pressure generating, LUX control, Voltage sourcing, Frequency generating, and etc.

■ Technical Specification

Specifications of CSN-200 Sensor network system (main unit)

Display	Graphic LCD multifunction display, 320 x 240 dots
	Backlight(Blue color)
Sensor input port	Number of channel : 4-channel
	14 pin D-sub connector
	Analog input : 12 bit, 2- input channel
	Digital I/O : 5-I/O channel
	Power line : $\pm 12V$, $\pm 5V$ DC
	The others interface : EEPROM data and clock interface
EXT. I/O port	34-pin digital I/O connector 1ea
	8-Relay control port
	4-digital output (TTL)
	4-digital input (TTL)
	4-photo coupler input
	1-PWM output
	DA output 0~10V
	$\pm 12V$, $\pm 5V$ DC
Communications	USB PC interface port 2ea (front 1ea, rear 1ea)
	RS485 (com1/com2) PC interface port 1ea
	RF (Radio frequency) interface port- includes RF ANT. 1ea
	Microcomputer firmware down load ISP port 1ea
Control function key	Function key switch 4ea
	Channel selector key 3ea
Operating temperature	-5°C ~ +45°C (23°F ~ 113°F)
storage temperature	-35°C ~ +65°C (-31°F ~ 149°F)
Power supply	AC 85 ~ 264V, 50/60Hz
Dimensions	290(W) x 260(D) x 180(H)mm / 11.4(W) x 10.2(D) x 7.1(H)inches
Weight	3.35Kg / 7.39lbs.

Standard Experiment Modules & Devices

Descriptions	Module No.	Module name	Sensor unit
Pack-I (Basic)	CS-201	AD590 temperature transducer module	CS-201-S
	CS-202	Gas, smoke, ethanol sensor module	CS-202-S
	CS-203	A/D Hall sensor module	CS-203-S
	CS-204	Thermocouple sensor module	CS-204-S/ Thermocouple
	CS-205	Photo cell sensor module	CS-205-S
	CS-206	Infrared TX/RX sensor module	CS-206-S
	CS-207	P2000 pressure sensor module	CS-207-S
	CS-209	Voltage to frequency converter module	None
	CS-209	Frequency to voltage converter module	None
Pack-II (Optional)	CS-210	Pyroelectric & thermister sensor module	CS-210-S
	CS-211	Ultrasonic sensor module	CS-211-S
	CS-212	Photo TR & photo interrupter sensor module	CS-212-S
	CS-213	PT-100 sensor module	CS-213-S/PT-100
	CS-214	Humidity transducer module	CS-214-S
	CS-215	Strain gauge sensor module	CS-215-S
	CS-216	Magnetic resister sensor module	CS-216-S
	CS-217	Crystal temperature module	CS-217-S
Pack-III (Optional)	CS-218	Linear scale module (Included sensor)	
	CS-219	Load-cell pressure transducer (Included sensor)	
	CS-220	LVDT transducer (Included sensor)	
Optional	CS-220B	Bread board module	None
	CS-220I/O	External I/O board module(Included cable)	None

※ The specifications or designs of this equipment can be changed without prior notice in order to quality improvement.

Accessories

Standard accessories

- Ac power cable(1.2m) : 1ea
- User's manual : 1ea
- Experiment & Practice guide book : 1 volume
- USB cable (CSN-200 to PC) : 1ea
- DSUB 9-pin cable (Sensor module to sensor unit) : 1ea
- DSUB 15-pin cable (CSN-200 to sensor module) : 4ea
- Experimental cord(2mm plug type) set : 1ea
- Jumper wire set : 1ea
- Module case : 1ea



1-800-517-8431

99 Washington Street
Melrose, MA 02176
Phone 781-665-1400
Toll Free 1-800-517-8431

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