



IMP-890 DATA ACQUISITION SYSTEM

FEATURES

- **Our Lowest Cost Data Logger**
- **Ideal for Small Automatic Weather Stations**
- **Internal/External Solid-State Storage**
- **Phone/Dedicated Line or Radio Telemetry**
- **Low Power**
- **Built-in Surge Protection**
- **Uses Same Software and Programming Instructions as the IMP-850/IMP-860**

The IMP-890 is a versatile digital data acquisition system suitable for environmental monitoring applications where only a few parameters will be measured. It can function as a stand-alone station or be operated via a computer singly or in a network.

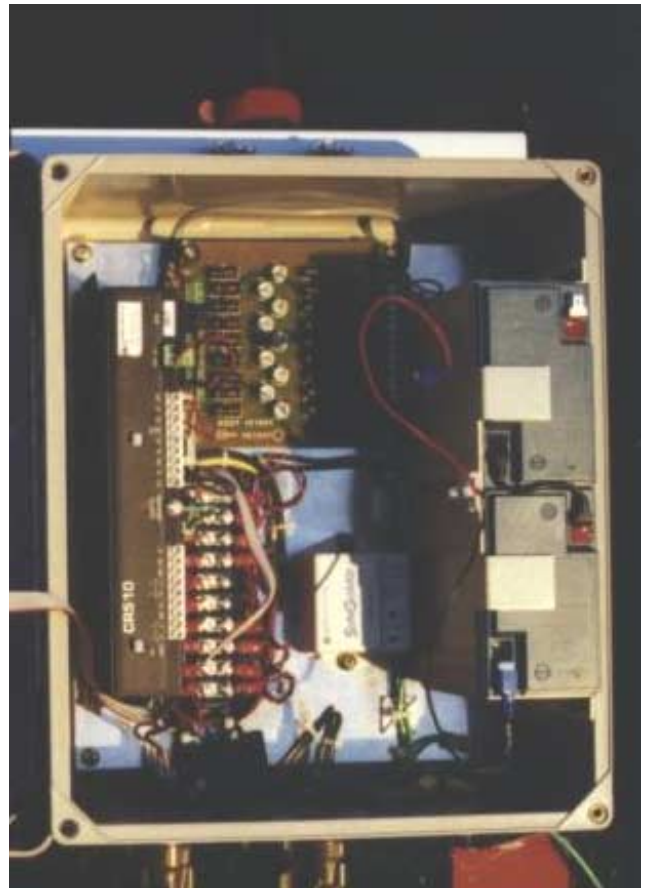
Direct sensor interface including the supply of excitation voltages is possible with the IMP-890. The input signals will then be processed as required. Data will either be stored in internal memory, removable solid-state module, or a remote computer for later processing. The solid-state module, or a removable solid state module, or a remote computer for later processing. The solid-state storage module can be used to transport and download a new operating program.

User programming of the IMP-890 is easily accomplished via an IBM PC-compatible computer with support software or an optional, portable keyboard/display unit. A comprehensive on board instruction set is included which can be programmed to perform calculations on any desired channel including interactions between channels. A custom operating program is factory supplied and can be modified by the user.

The basic IMP-890 (P/N 102467-G0-H0) consists of a P/N 102469 data logger mounted in a 16 x 14 x 6 inch, NEMA-4X enclosure with 128Kbytes of internal memory capable of storing up to 62,000 final data points. The G1 option provides an enclosure size of 18 x 16 x 8 inches and the G2 option is 24 x 24 x 8 inches. A rack mountable version of the IMP-890 is also available (P/N 102468-G0-H0) which uses only 5-1/4 x 19 inches of panel space.

The IMP-890 require a 12-volt DC power source such as our 8AH battery backup power supply (P/N 101139). When battery backup is not required, our P/N 100520-G0-H1 power supply is provided.

A large selection of communications, storage, measurement and control peripherals are available. Please contact Climatronics for a system quotation based on your specific requirements.



SPECIFICATIONS

Electrical specifications are valid over a -25° to +50°C range unless otherwise specified; non-condensing environment required. To maintain electrical specifications, yearly calibrations are recommended.

PROGRAM EXECUTION RATE

Program is synchronized with real-time up to 64 Hz. One measurement with data transfer is possible at this rate without interruption.

ANALOG INPUTS

NUMBER OF CHANNELS: 2 differential or 4 single-ended, individually configured.

ACCURACY: $\pm 0.1\%$ of FSR (-25° to 50°C);
 $\pm 0.05\%$ of FSR (0° to 40°C);
e.g., $\pm 0.1\%$ FSR = ± 5.0 mV for ± 2500 mV range

RANGE AND RESOLUTION:

Full Scale Input Range (mV)	Resolution (μ V)	
	Differential	Single-Ended
± 2500	333	666
± 250	33.3	66.6
± 25	3.33	6.66
± 7.5	1.00	2.00
± 2.5	0.33	0.66

INPUT SAMPLE RATES: Includes the measurement time and conversion to engineering units. The fast and slow measurements integrate the signal for 0.25 and 2.72 ms, respectively. Differential measurements incorporate two integrations with reversed input polarities to reduce thermal offset and common mode errors.

Fast differential voltage: 4.2 ms
Slow differential voltage: 9.2 ms
Differential with 60 Hz rejection: 25.9 ms

INPUT NOISE VOLTAGE (for ± 2.5 mV range):
Fast differential: 0.82 μ V rms
Slow differential: 0.25 μ V rms
Differential with 60 Hz rejection: 0.18 μ V RMS

COMMON MODE RANGE: ± 2.5 V

DC COMMON MODE REJECTION: >140 dB

NORMAL MODE REJECTION: 70 dB (60 Hz with slow differential measurement)

INPUT CURRENT: ± 9 nA maximum

INPUT RESISTANCE: 20 Gohms typical

ANALOG OUTPUTS

DESCRIPTION: 2 switched, active only during measurement, one at a time.

RANGE: ± 2.5 V

RESOLUTION: 0.67 mV

ACCURACY: ± 2.5 mV (0° to 40°C);
 ± 5.0 mV (-25° to 40°C);

CURRENT SOURCING: 25 mA

CURRENT SINKING: 25 mA

FREQUENCY SWEEP FUNCTION: The switched outputs provide a programmable swept frequency, 0 to 2.5 V square wave for exciting vibrating wire transducers.

RESISTANCE MEASUREMENTS

MEASUREMENT TYPES: The IMP-890 provides ratiometric bridge measurements of 4- and 6-wire full bridge, and 2-, 3-, and 4-wire half bridges. Precise dual polarity excitation using any of the switched outputs eliminates dc errors. Conductivity measurements use a dual polarity 0.75 ms excitation to minimize polarization errors.

ACCURACY: $\pm 0.02\%$ of FSR plus bridge resistor error.

PERIOD AVERAGING MEASUREMENTS

DEFINITION: The average period for a single cycle is determined by measuring the duration of a specified number of cycles. Any of the 4 single-ended analog input channels can be used. Signal attenuation and AC coupling are typically required.

INPUT FREQUENCY RANGE:

Signal peak-to-peak ¹	Min.	Max.	Pulse w.	Max Freq. ²
500 mV	5.0 V	2.5 μ s	200 kHz	
10 mV	2.0 V	10 μ s	50 kHz	
5 mV	2.0 V	62 μ s	8 kHz	
2 mV	2.0 V	100 μ s	5 kHz	

¹ Signals centered around data logger ground

² Assuming 50% duty cycle

RESOLUTION: 35 ns divided by the number of cycles measured

ACCURACY: $\pm 0.03\%$ of reading

TIME REQUIRED FOR MEASUREMENT: Signal period times the number of cycles measured plus 1.5 cycles + 2 ms

PULSE COUNTERS

NUMBER OF PULSE COUNTER CHANNELS: 2 eight-bit or 1 sixteen-bit; software selectable as switch closure, high frequency pulse, and low level AC. An additional channel (C2/P3) can be software configured to read switch closures at rates up to 40 Hz.

MAXIMUM COUNT RATE: 16 kHz, eight-bit counter; 400 kHz, sixteen-bit counter. Channels are scanned at 8 or 64 Hz (software selectable).

SWITCH CLOSURE MODE

Minimum Switch Closed Time: 5 ms
Minimum Switch Open Time: 6 ms
Maximum Bounce Time: 1 ms open without being counted

HIGH FREQUENCY PULSE MODE

Minimum Pulse Width: 1.2 μ s
Maximum Input Frequency: 400 kHz
Maximum Input Voltage: ± 20 V
Voltage Thresholds: Count upon transition from below 1.5 V to above 3.5 V at low frequencies. Larger input transitions are required at high frequencies because of input filter with 1.2 μ s time constant. Signals up to 400 kHz will be counted if centered around +2.5 V with deviations $\geq \pm 2.5$ V for ≥ 1.2 μ s.

LOW LEVEL AC MODE

(Typical of magnetic pulse flow transducers or other low voltage, sine wave outputs.)
Input Hysteresis: 14 mV
Maximum AC Input Voltage: ± 20 V
Minimum AC Input Voltage:
(Sine wave mV RMS) Range (Hz)
20 1.0 to 1000
200 0.5 to 10,000
1000 0.3 to 16,000

DIGITAL I/O PORTS

Port C1 is software selectable as binary input, control output, or as an SDI-12 port. Port C2/P3 is input only and can be software configured as an SDI-12 port, a binary input, or as a switch closure counter (40 Hz max).

OUTPUT VOLTAGES (no load): high 5.0V ± 0.1 V; low < 0.1V

OUTPUT RESISTANCE: 500 ohms

INPUT STATE: high 3.0 to 5.5 V; low -0.5 to 0.8 V
INPUT RESISTANCE: 100 kohms

SDI-12 INTERFACE STANDARD

DESCRIPTION: Digital I/O Ports C1-C2 support SDI-12 asynchronous communication; up to ten SDI-12 sensors can be connected to each port. Meets SDI-12 Standard version 1.2 for data logger and sensor modes.

EMI and ESD PROTECTION

The IMP-890 is encased in metal and incorporates EMI filtering on all inputs and outputs. Gas discharge tubes provide robust ESD protection on all terminal block inputs and outputs. The following European standards apply:

EMC tested and conforms to BS EN61326:1998.

CPU AND INTERFACE

PROCESSOR: Hitachi 6303

PROGRAM STORAGE: Up to 16 Kbytes for active program; additional 16 Kbytes for alternate programs. Operating system stored in 128 Kbytes Flash memory.

DATA STORAGE: 128 Kbytes SRAM standard (approximately 60,000 data values). Additional 2 Mbytes Flash available as an option.

OPTIONAL KEYBOARD DISPLAY: 8-digit LCD (0.5" digits)

PERIPHERAL INTERFACE: 9 pin D-type connector for keyboard display, storage module, modem, printer, card storage module, and RS-232C adapter.

BAUD RATES: Selectable at 300, 1200, 9600 and 76,800 for synchronous devices. ASCII communication protocol is one start bit, one stop bit, eight data bits (no parity).

CLOCK ACCURACY: ± 1 minute per month

SYSTEM POWER REQUIREMENTS

VOLTAGE: 9.6 to 16 Vdc

TYPICAL CURRENT DRAIN: 1.3 mA quiescent, 13 mA during processing, and 46 mA during analog measurement.

BATTERIES: Any 12 V battery can be connected as a primary power source. Several power supply options are available. The Model CR2430 lithium battery for clock and SRAM backup has a capacity of 270 mAh.

PHYSICAL SPECIFICATIONS

SIZE: 8.4" x 1.5" x 3.9" (21.3 cm x 3.8 cm x 9.9 cm)
Additional clearance required for serial cable and sensor leads.

WEIGHT: 15 oz (425 gm)

WARRANTY

Three years against defects in materials and workmanship.



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