IMP-900/950 DATA ACQUISITION SYSTEM

FEATURES:

- Direct Sensor Inputs
- Control Outputs
- 2 Mbytes of Battery-Backed SRAM
- Phone/Dedicated Line or Radio Telemetry
- Optional Built-in Keyboard and Display
- Built-in Surge Protection
- MODBUS interface

The IMP-900/950 is a versatile digital data acquisition system suitable for environmental monitoring applications requiring only a limited number of inputs. It can function as a stand-alone station or be operated via a computer singly or in a network. The IMP-950 contains a built-in keyboard and data display, the IMP-900 does not.

Direct sensor interface including the supply of excitation voltages is possible with the IMP-900/950. The input signals will then be processed as required. Data is stored in the 2 Mbyte battery-backed SRAM internal memory, and/or a removable solid-state storage 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 is easily accomplished with a PC-compatible computer and the logger support software. An optional, portable keyboard/display unit (CCR1000KD) or the built-in keyboard/display of the IMP-950 can also be used to program the system and view data. 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-900/950 consists of either data logger mounted in a 16 x 14 x 6 inch, NEMA-4X enclosure with 2 Mbytes of internal memory capable of storing up to 1,000,000 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-900/950 is also available which uses only 5-1/4 x 19 inches of panel space.

The IMP-900/950 requires a 12-volt DC power source such as the 8AH battery backup power supply (P/N 101139). When battery backup is not required, our P/N 100519 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**
10 ms to 30 min. @ 10 ms increments

**ANALOG INPUTS**
NUMBER OF CHANNELS: 3 differential or 6 single-ended, individually configured; Channel expansion provided by CAM16/32 Relay Multiplexers and CAM25T Thermocouple Multiplexers.

**RANGES, RESOLUTION AND TYPICAL INPUT NOISE**

Basic resolution (Basic Res) is the A/D resolution of a single conversion. Resolution of DF measurements with input reversal is half the Basic Res. Noise values are for DF measurements with input reversal; noise is greater with SE measurements.

<table>
<thead>
<tr>
<th>Input Range (mV)</th>
<th>Basic Res (mV)</th>
<th>±0.8°C, -55° to 85°C (-XT only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>±2500</td>
<td>1330</td>
<td>192</td>
</tr>
<tr>
<td>±250</td>
<td>667</td>
<td>192</td>
</tr>
<tr>
<td>±25</td>
<td>6.7</td>
<td>19.2</td>
</tr>
<tr>
<td>±2</td>
<td>0.63</td>
<td>1.9</td>
</tr>
<tr>
<td>±0.2</td>
<td>0.063</td>
<td>0.58</td>
</tr>
</tbody>
</table>

ACCURACY:

<table>
<thead>
<tr>
<th>Setting (mV)</th>
<th>±0.06% of setting + 0.8 mV</th>
<th>±0.12% of setting + 0.8 mV</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.5 mV</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>±2 mV</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>±25 mV</td>
<td>25</td>
<td>26</td>
</tr>
</tbody>
</table>

**INPUT NOISE VOLTAGE**

<table>
<thead>
<tr>
<th>Range (mV)</th>
<th>Basic Res (mV)</th>
<th>±0.8°C, -55° to 85°C (-XT only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>±2500</td>
<td>1330</td>
<td>192</td>
</tr>
<tr>
<td>±250</td>
<td>667</td>
<td>192</td>
</tr>
<tr>
<td>±25</td>
<td>6.7</td>
<td>19.2</td>
</tr>
<tr>
<td>±2</td>
<td>0.63</td>
<td>1.9</td>
</tr>
<tr>
<td>±0.2</td>
<td>0.063</td>
<td>0.58</td>
</tr>
</tbody>
</table>

**ANALOG OUTPUTS**

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

**RANGE AND RESOLUTION:** Voltage outputs programmable between ±2.5 V with 0.67 mV resolution.

ACCURACY:

<table>
<thead>
<tr>
<th>Setting (mV)</th>
<th>±0.06% of setting + 0.8 mV</th>
<th>±0.12% of setting + 0.8 mV</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.5 mV</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>±2 mV</td>
<td>2</td>
<td>2.4</td>
</tr>
<tr>
<td>±25 mV</td>
<td>25</td>
<td>26</td>
</tr>
</tbody>
</table>

**CURRENT SOURCING/SINKING:** ±25 mA

**RESISTANCE MEASUREMENTS**

MEASUREMENT TYPES: The IMP-900 series provides ratio metric 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.

<table>
<thead>
<tr>
<th>Range (mV)</th>
<th>Basic Res (mV)</th>
<th>±0.8°C, -55° to 85°C (-XT only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>±2500</td>
<td>1330</td>
<td>192</td>
</tr>
<tr>
<td>±250</td>
<td>667</td>
<td>192</td>
</tr>
<tr>
<td>±25</td>
<td>6.7</td>
<td>19.2</td>
</tr>
<tr>
<td>±2</td>
<td>0.63</td>
<td>1.9</td>
</tr>
<tr>
<td>±0.2</td>
<td>0.063</td>
<td>0.58</td>
</tr>
</tbody>
</table>

**PERIOD AVERAGING MEASUREMENTS**

The average period for a single cycle is determined by measuring the duration of a specified number of cycles. The period resolution is 192 ns divided by the specified number of cycles to be measured; the period accuracy is ±0.01% of reading + resolution. Any of the 6 SE inputs can be used for period averaging. Signal limit are typically required for the SE channel.

**INPUT FREQUENCY RANGE:**

<table>
<thead>
<tr>
<th>Input Frequency (Hz)</th>
<th>Input Signal (μV RMS)</th>
<th>Input Signal (μV RMS)</th>
<th>Pulse Width (μs)</th>
<th>Frequency (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>±2500 mV</td>
<td>500 mV</td>
<td>10 V</td>
<td>2.5 μs</td>
<td>200 kHz</td>
</tr>
<tr>
<td>±250 mV</td>
<td>10 mV</td>
<td>2 V</td>
<td>10 μs</td>
<td>50 kHz</td>
</tr>
<tr>
<td>±25 mV</td>
<td>5 mV</td>
<td>2 V</td>
<td>62 μs</td>
<td>8 kHz</td>
</tr>
<tr>
<td>±2 mV</td>
<td>2 mV</td>
<td>2 V</td>
<td>100 μs</td>
<td>5 kHz</td>
</tr>
</tbody>
</table>

**PULSE COUNTERS**

NUMBER OF PULSE COUNTER CHANNELS: 2-24 bit; software selectable as switch closure, high frequency pulse, and low level Ac.

**MAXIMUM COUNTS PER SCAN:** 16.7 x 10³

**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**

Maximum Input Frequency: 250 kHz
Voltage Thresholds: Count upon transition from below 0.9 V to above 2.2 V after input filter with 1.2 μs time constant.
Maximum Input Voltage: ±20 V

**LOW LEVEL AC MODE**

Internal ac coupling removes dc offsets up to ±0.5 V
Input Hysteresis: 1 mV @ 1 Hz
Maximum AC Input Voltage: ±20 V

**DIGITAL I/O PORTS**

DESCRIPTION: 4 ports selectable, under program control, as binary inputs or control outputs. They also provide edge timing, subroutine interrupts/wake up, switch closure pulse counting, high frequency pulse counting, asynchronous communications (UART), SDI-12 communications, and SDM communications.

HIGH FREQUENCY MAX: 400 kHz
SWITCH CLOSURE FREQUENCY MAX: 150 kHz
OUTPUT VOLTAGES (no load): high 5.0V ±1V, low < 0.1V
OUTPUT RESISTANCE: 330 ohms
INPUT STATE: high 3.8 to 5.3 V, low -0.3 to 1.2 V
INPUT RESISTANCE: 100 kohms
INPUT HYSTERESIS: 1.4 V

**SWITCHED 12 V**

One independent 12 V unregulated source switched on and off under program control. Thermal fuse hold current = 900 mA @ 20°C, 650 mA @ 50°C and 360 mA @ 85°C

**SDI-12 INTERFACE STANDARD**

The control ports may be configured for SDI-12 asynchronous communication. Up to ten SDI-12 sensors are supported per port. It meets SDI-12 Standard version 1.3 for data logger mode.

**CE COMPLIANCE**

STANDARD (S) TO WHICH CONFORMITY IS DECLARED:
IEC 61326:2002

**CPU AND INTERFACE**

PROCESSOR: Hitachi H8S 2322 (16 bit CPU
BAUD RATES: Selectable from 300 bps to 115.2 kbps.

**MEMORY**

2 Mbytes of flash for operating system; 2 Mbytes of battery-backed SRAM for CPU usage, program storage and data storage.

**OPTIONAL REMOVABLE KEYBOARD DISPLAY**

8 line x 21 character LCD and 16-digit keyboard

**SERIAL INTERFACES**

COM1 (CS I/O, used to interface with IMP data logger peripherals), COM2 (Standard RS-232 communication port)

**BAUD RATES**

Selectable from 300 bps to 115.2 kbps.

**CLOCK ACCURACY**

±3 minute per year (-30° to 85°C)

**SYSTEM POWER REQUIREMENTS**

VOLTAGE: 9.6 to 16 Vdc

SLEEP MODE:

-0.6 mA
1 Hz Scan (8 diff. meas., 60 Hz rej., 2 pulse meas.)
900 mA @ 20°C
650 mA @ 50°C
360 mA @ 85°C

**EXTERNAL BATTERIES**

12 Vdc nominal; reverse polarization protected

**PHYSICAL SPECIFICATIONS**

SIZE: 9.5” x 4.1” x 2.0” (24.1 x 10.4 x 5.1 cm)

**E-Mail:** sales@climatronics.com

**Rev. 10 Nov 2008**

Climatronics Corporation
140 Wilbur Place
Boehemia, NY 11716-2404

TEL: 631-567-7300
FAX: 631-567-7585