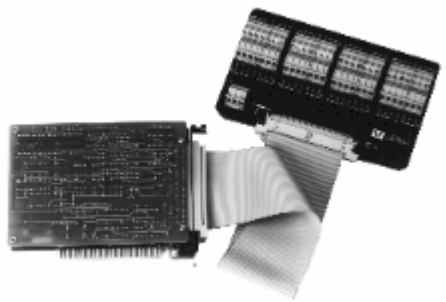
# UPC601-U

**UNIVERSAL SENSOR INTERFACE FOR PC DATA ACQUISITION**



## DESCRIPTION

The Validyne UPC601-U is a Universal Sensor Interface card for IBM PC/XT/AT or compatible computer. The UPC601-U will accept up to 16 analog sensor inputs directly; NO EXTERNAL SIGNAL CONDITIONING IS REQUIRED. Thermocouples, RTDs, potentiometers, strain gages, LVDTs and variable reluctance pressure transducers, as well as low-level DC voltages, may be wired directly to the UPC601-U IN ANY MIX OR COMBINATION. All required excitation and linearization is provided by the UPC601-U. 14 bit A/D resolution and 11 stages of programmable gain amplification to allow accurate measurement from sensor signal sources. The analog conversion rate is programmable to 5,000, 10,000, or 20,000 channels per second.

### Software

The UPC601-U comes complete with EASY SENSE, a menu-driven Data Acquisition software package that supports real time graphs of sensor inputs. The program will also record data continuously to a disk file for later analysis. Additionally, each card is shipped with Basic & C driver codes to put the UPC601-U under direct control of the user's program.

A special streaming mode allows continuous storage of sensor input data to disk at 10,000 channels per second. Post-processing provides linearized sensor data in ASCII file format. For high level voltage signals, the streaming rate may be increased to 20,000 channels per second.

## The UPC601-U Comes Complete With:

- ☐ Analog Input Terminal Block
- ☐ Five Foot Ribbon Cable for Terminal Block
- ☐ Easy Sense Software
- ☐ Basic and C Driver Codes

## Features

- ☐ **Direct Sensor Input To PC**
- ☐ **Accepts ANY COMBINATION of:** Thermocouples, Thermistors, Strain Gages, LVDT's, RTD's Variable Reluctance, Pots, Differential, or Single-Ended DC Volts
- ☐ **14 Bit A/D Over 11 Gain Ranges**
- ☐ **Frequency Inputs, Analog Outputs**
- ☐ **16 Bits of Digital I/O**

## Analog Inputs

Thermocouple types B,E,J,K,T,R, or S may be wired directly to the UPC601-U; accurate linearization (fourth-order polynomial) and reference junction compensation are provided. RTDs and thermistors may also be wired directly to the UPC601-U; a 4 Vdc, 1 mA source excitation is included. Linearization is provided for RTDs and Thermistors.

The UPC601-U supplies precision 4 Vdc excitation capable of driving 120 Ohm strain gages. Four-wire, five-wire, and six-wire input configurations are supported by the UPC601-U to provide lead wire compensation.

Any Validyne variable reluctance pressure transducer may be wired to the UPC601-U. AC exciation is supplied along with complete carrier demodulation.

Position measurement for your PC can be made using six-wire LVDTs. The UPC601-U provides 5kHz AC exciation and demodulation. Potentiometer used for position measurement can be wired directly to the UPC601-U.

In addition to sensors, the UPC601-U will also accept DC Voltages in any combination of differential and single-ended inputs. The full scale range is independently software programmable from ±10 mV to ±Vdc for each channel of DC input.

A frequency input channel is also available for signals from positive displacement flow meters, encoders, or magnetic speed pick-ups.

## Specifications

| | |
|---|---|
| **Available I/O:** | 16 single-ended inputs (which can be paired up for up to 8 differential inputs) and one additional input for thermocouple cold junction compensation. 1 channels of frequency input. |
| **Type of Inputs:** | Thermocouple, RTD, Strain Gage, LVDT/RVDT/VR, Voltage, Resistance, Potentiometer, and Thermistor. One frequency input, TTL or AC. |
| **Mechanical:** | Half size plug-in board for PC/XT/AT or compatible occupies one expansion slot. |
| **Environmental:** | 0 to +70 °C, 95% RH, non-condensing. |
| **I/O Connections:** | 50 pin ribbon cable connects analog input terminal block to board edge connector. Separate frequency input with mating connector supplied. |
| **Configuration:** | All channels are programmable for PC software. |
| **Power Required:** | +5 Vdc @ 0.7 A, +12Vdc @ 50 mA, Sensor excitation current additional 200 mA maximum from +5V supply. |

| **I/O** | |
|---|---|
| **Thermocouples:** | Type B,E,J,K,T,R,S, linearized output °C or °F. Typical resolution 0.05 °C. |
| **RTD:** | 10 Ohm to 2K Ohm, 0.00392 or 0.00385 alphas, linearized -200 to +850 °C. Platinum, nickel, copper, and thermistor probes. 3 or 4 wire configuration. Excitation from internal current source provided. Typical resolution, 0.05 °C. |
| **LVDT/RVDT/VR:** | 2.5 mV/V to 1280 mV/V full scale in ten binary ranges: 2.5/ 5/ 10/ 20/ 40/ 80/ 160/ 320/ 640/ 1280 mV/V. 4 VAC, 5kHz excitation provided. |
| **Strain Gages:** | Typically 350 Ohm (120 Ohm minimum). Full Bridge configuration. Partial bridges completed with adapted. Sensitivity to ±2.5 mV/V FS (±1250 µ-strain FS, resolution 0.15 µ-strain, typical from strain gage with gage factor or 2). 4 Vdc precision excitation provided. |
| **PC I/O Ports:** | 8 sequential addresses in PC I/O space. Selectable starting address. |
| **Voltage:** | ±10 mV to ±10.24 V full scale, single-ended or differential input in 11 binary ranges: 10/ 20/ 40/ 80/ 160/ 320/ 640/ 1280/ 2560/ 5120 mV and 10.24 Vdc. |
| **Excitation:** | Integral 4 Vdc for Strain Gages, (0.2 A dc maximum). Current source for RTDs 1.0 mA. 4 Vac @5 kHz synchronous carrier demodulator for variable reluctance, LVDT and RVDT devices. |
| **Input Protection:** | Voltage protection to ±20 Vpk, (power off), or ±35 Vpk (power on). Typical static discharge to 4 KV is survived. |
| **Common Mode:** | ±10V. |
| **Crosstalk:** | -115db or better. |
| **Resolution:** | 14 bits (±13 bits) |
| **Averaging:** | Programmable averaging on each channel. |
| **Sample Rate:** | Low level inputs – 10,000 channels/Sec. High level inputs - 20,000 channels/second. |
| **Accuracy:** | Total system error 0.02% FS. All calibration factors are stored in EEPROM for each channel. Range tempco typically 50ppm/°C. Offset autozero tempco typically 0.15 µV/°C. Linearity, symmetry errors typically 0.012%FSR. |
| **Channel Scanning:** | Number of channels used software selectable. |
| **Math Functions:** | Slope and Intercept, (Y = mX + b). Polynomial Thermocouple & RED linearization. |
| **Data Storage:** | Software included supports continuously streaming of data to disk at maximum sampling rate. |
| **Frequency Inputs:** | 0.02 Hz to 50 kHz with 16 bit resolution. TTL or AC input. Three selectable sensitivity levels in AC mode. |
| **Resistance:** | 10 Ohms to 12K Ohms, full scale. |

## ADVANTAGES

- ☐ Ideal for Laptop Computers
- ☐ No Signal Conditioning Needed
- ☐ 14 Bits A/D On 11 Programmable Ranges
- ☐ Complete with Data Acquisition Software

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