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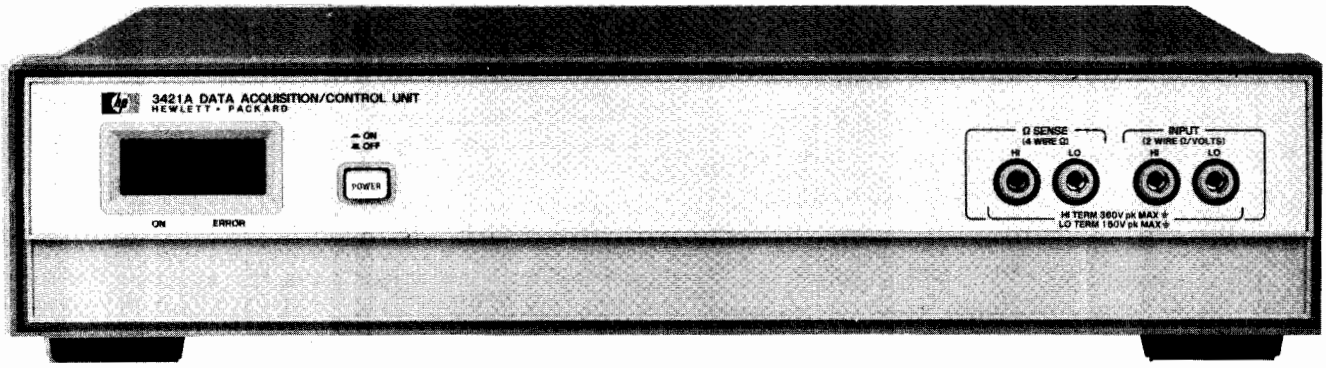
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DATA ACQUISITION, CONTROL & TEST

Data Acquisition/Control Unit

Model 3421A

- Up to 30 differential channels, 56 single-ended channels
- Electronic calibration for repeatable answers
- Built-in 5½ digit A/D converter with 1 μV sensitivity
- HP-IL (standard) and HP-IB (optional) with rear panel switch
- Optional 12 volt battery power
- "Sleep mode" for extended battery life in remote locations
- Front terminals for convenient DCV, ACV, 2 & 4-wire ohms, frequency and temperature
- Display shows channels closed, digital states and self-test conditions



HP-IL

DESIGNED FOR HP-IB SYSTEMS

Description

The HP 3421A Data Acquisition/Control Unit is the system that beats the high cost of data logging. Use it for that small data acquisition project with the assurance that it will quickly pay its own way.

The 3421A scans up to 30 channels, measuring DCV, ACV, 2- and 4-wire Ohms, Frequency, and Temperature. It also reads and writes digital information and stores up to 30 analog readings. The standard 3421A comes with an HP-IL interface for battery-powered flexibility or HP-IB for more computational power.

Up to three of the following assemblies may be added to the 3421A mainframe:

- 10-Channel analog multiplexer/actuator assembly with thermocouple compensation
- 8-bit input/8 bit output digital assembly
- Breadboard assembly for custom circuitry

Measurement Integrity

With its 5½, 4½, 3½ digit A/D converter, the 3421A can resolve 1 μV out of 300 mV to monitor thermocouples, strain gage bridges and other low-level transducers. Or it can read higher level signals by auto-ranging up to 300 volts dc.

System Versatility

Each 3421A can scan up to 30 differential channels or 56 single-ended channels of analog information. The 3421A is battery-powered, with latching relays that will not change state when the ac line power is removed. Battery power gives the 3421A it own uninterruptible power supply.

All functions are remotely programmable via either HP-IL or HP-IB. Use HP-IL with the 41 CV handheld calculator as a self-contained battery-powered data logger, or use HP-IB with the HP 85F Personal Computer for more programming performance.

Special 41C/CV ROM

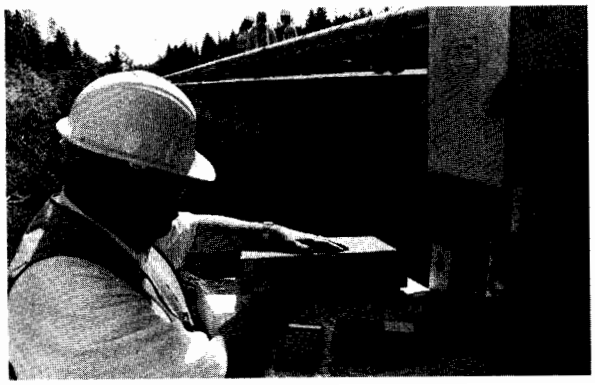
To make the 3421A more convenient for benchtop or field use, a Data Acquisition Pac (HP 44468A) is available for the HP 41C/CV handheld computers. Using the HP-IL I/O, this Pac gives the HP 3421A an operational front panel from the computer's keyboard using "soft" keys defined by a keyboard overlay and special ROM. It also includes a data logger program complete with special keyboard overlay to allow the user to enter beginning-and-ending scan sequence, to define the functions to be measured, to automatically compensate for the most common types of thermocouples and to simplify storage of data. Prompting is done on the HP 41 handheld computer's LCD display. The HP 41C/CV can be equipped with an HP 82182A Time Module which allows the operator to specify at what time scanning sequences are to take place and at what interval measurements are to be made.

The 41CV System

Combine the 41CV, the 3421A, the 82161A Digital Tape Drive, and the 82162A Printer/Plotter to make a portable low-cost data logger. The 44468A Data Acquisition Pac makes programming easy. It contains a 41CV Control ROM for the 3421A as well as two special 41CV keyboards. Each keyboard is dedicated to providing fast, simple function programming with the 41CV.

The 85F System (The 3056DL)

The 3421A can also be combined with the 85F Personal Computer for even easier and more powerful data logging. Dedicated software enhances the system with Menu programming, Subroutine programming, instrument panel emulation and graphic analysis. It makes data logging as easy as answering a few questions on the CRT display.



Use thermocouples with the HP 3421A to measure the temperature of a bridge section to tell the best time to resurface the roadbed. Or use the dc voltage function to monitor the galvanic effect that causes steel reinforcing rods to corrode inside the concrete.

The HP 41CV handheld calculator can turn on the 3421A Data Acquisition/Control Unit, trigger it to scan a list of 30 channels, instruct the digital cassette to store all 30 readings on tape and then power down the entire system until the next time interval passes.

The 3421A is not limited to portable applications. It is equally useful in laboratory situations, where its 0.01% accuracy, 1 microvolt sensitivity and 5½ digit resolution assure you of reliable answers.

Digital inputs, actuator outputs and a breadboard assembly give the laboratory designer a great deal of instrument flexibility while HP-IB compatibility adds the option of a more powerful instrument controller.



3421A Mainframe Specifications

The 3421A mainframe comes with:

- A 5½, 4½, and 3½ digit integrating A/D converter
- Thermocouple compensation
- Type T thermocouple linearization built in
- HP-IL
- 30-reading storage buffer
- LCD 30 channel display with power and error indicators
- Electronic calibration
- Rechargeable battery
- High level command set

All specifications apply for relative humidity less than 85% at 30 degrees C.

DC Voltage

Ranges: 300 mV, 3 V, 30 V, 300 V, Autorange
Basic accuracy: ±(.009% Reading + 3 counts); 5½ digits
Reading rates: 2 to 35 readings/second

Resistance

Ranges: 300 Ω, 3 kΩ, 30 kΩ, 300 kΩ, 3 MΩ, 30 MΩ; Autorange
Basic accuracy: ±(.012% Reading + 3 counts); 5½ digits
Reading rates: 2 to 35 readings/second

AC Voltage

Ranges: 3 V, 30 V, (300 V with 44469A divider)
Converter type: averaging
Resolution: 3½ or 4½ digits
Basic accuracy: 4½ digits: ±(0.5% reading + 60 counts), 45 Hz to 500 Hz; ±(1% reading + 60 counts), 30 Hz to 1 kHz

Counter

The counter is part of the mainframe circuit, and is multiplexed through the channel relays.
Resolution: 65,535 counts
Frequency: 1 Hz to 10 kHz
Modes: frequency, Totalize

Thermocouple Thermometer

Type T thermocouple linearization is built in. For other thermocouple types, the reference junction temperature is available on each multiplexer assembly.

Option 020 10-Channel Multiplexer Assembly

Each multiplexer assembly has 10 relays. They can be configured as 10 multiplexers, 9 multiplexers plus one actuator, or 8 multiplexers plus two actuators. The actuators are capable of switching 252 VAC. One 3421A mainframe can accommodate up to 3 assemblies.

Option 040 Breadboard Assembly

The breadboard assembly is convenient for constructing custom circuitry. It comes complete with a manual describing the circuit that enables the 3421A to communicate directly with an 8-bit microprocessor.

Option 050 Digital I/O Assembly

Option 050 has 8 isolated input lines and 8 isolated output lines for both monitoring and controlling external digital devices.

Option 212 12 Volt Power Assembly

The 12 volt assembly provides the necessary isolation and voltage regulation to allow use of a 12 volt automotive battery as a power supply. This option also provides connectors to charge the 41CV controller, the 82161A Cassette Drive and the 82162A Printer/Plotter. The system will operate in an automotive environment such as from a cigarette lighter with the engine running or off. Option 212 cannot be ordered if Option 201 has been specified.

Ordering Information

Options

Input and I/O Assemblies

020: Ten Channel Multiplexer Assembly with thermocouple compensation, connector block.
040: Breadboard Assembly with connector block
050: 8 bit in, 8 bit out Digital I/O Assembly with connector block
201: add HP-IB interface. Allows use of EITHER an HP-IB or HP-IL controller
212: add 12 volt power assembly. Cannot be added if opt 201 is specified

3421A/41CV System Options

541: Add 41CV for 3421A control. This option includes the HP 41CV handheld calculator, 44468A Data Acquisition Pac with 3421A/41CV Control ROM, 82160A HP-IL Interface Module for 41CV, and an 82182A Time Module
561: Add 82161A Digital Cassette Drive (HP-IL)
562: Add 82162A Printer/Plotter (HP-IL)

Power and Frequency Options

315-346: Line Power options from 100 V/50 Hz–240 V/60 Hz

Rack Mount and Manual Options

401: Side Handle Kit
907: Front Handle Kit
908: Rack Mount Kit
909: Rack Mount with Handle
910: Extra Manuals

Field Installation Kits

44462A: 10-Channel Multiplexer Assembly with thermocouple compensation, connector block
44463A: extra connector block for above
44464A: Breadboard Assembly with connector block
44465A: 8 bit in, 8 bit out digital I/O assembly with connector block
44466A: Extra connector block for digital or breadboard assembly
44468A: Data Acquisition Pac for 41CV
44469A: Six 10:1 dividers for measuring 300 VAC (one pair comes standard with each option 020)

Accessories

34118A: Test Lead Kit

3421A Data Acquisition/Control Unit

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