Unkel Software Inc.

62 Bridge Street, Lexington, MA 02173

A great price on the *Hardware*

Deserves a Terrific Value on the *Software*

Let UnkelScope Junior convert the IBM DACA into a complete Data Recording System:

Menu Driven so you do not need to program

Graphical Display of Data, with Cursor Scrolling features

Port Data to other Programs for analysis

List Price: $125. ORDER BEFORE JANUARY 30 for **$99.**

OR

Let UnkelScope Level 2+ give you complete data acquisition, plus extensive analysis and experimental control features.

Spectral Analysis and Digital Filtering

Calibration and Conversion of Transducers

Process Control and Control of Experiments

Macro (Procedure) Capability to Automate your Tests

And Much More

NOW: FULL EGA SUPPORT

List Price: $549. ORDER BEFORE JANUARY 30 for **$349.**

The single copy UnkelScope program works for data acquisition boards by one hardware manufacturer. Call about multiple copy and site licenses.

No.	Product Description.	Unit Cost	Total	
	UnkelScope Junior Version for _____	~~$125~~		$99.
	UnkelScope Level 1 Version for _____	$349		
	UnkelScope Level 2+ Version for _____	~~$549~~		$349.

Ordering Instructions: Specify 'UnkelScope for IBM from Mendelson'

Also Available: Description of the IBM DACA for Programmers ($25. with purchase of any Unkel Software Product) and custom programming (call for prices.)

(617) 861-0181

Unkel Software Inc.

62 Bridge Street, Lexington, MA 02173

Unkel Software Introduces Junior

Unkel Software announces UnkelScope Junior, a data acquisition, display and storage program with the industry low price of $125 for a completely menu-driven package. UnkelScope Junior supports the same wide variety of data acquisition hardware as UnkelScope Level 2+ and the full purchase price of Junior can be applied toward an upgrade to Level 2+. UnkelScope Junior supports sampling on up to 4 channels, with a sample size of 1024 points on each. The data can be stored and retrieved from files, and these files can be converted to ascii files for porting to other programs/programming languages such as Lotus 1-2-3, dBase III, and others.

UnkelScope Junior uses the compact, toggled menu of UnkelScope Level 2+ to allow you to chose all the important data acquisition parameters in one screen. The controls are organized like an oscilloscope, stripchart recorder or x-y plotter, so there is no computer jargon to learn. With the setup parameters established, the SMPL/DSPLY option is used to take and display the data on the screen. You can set the triggering characteristics from a wide variety of sources and can save data on disk after a scan is complete. Further, you can create real-time plots of one signal vs. another signal, a feature not available in most data acquisition products.

UnkelScope Junior also has the 'Graphical Editing' capability of UnkelScope Level 2+. With graphical editing, you can scroll two cursors through your data determining the numerical values at each cursor, and the differences between values at the two cursors. The cursors can be moved quickly (4, 32 points at a time, or seek the next/previous minimum or maximum) or slowly (point by point). In addition, you can save the current values under the cursor in a disk file for later examination. You can also perform curvefits to portions of the data, compute enclosed areas and perform other activities where numerical results are needed.

UnkelScope Junior is the ideal way to get started quickly and efficiently in the Lab, and since the full purchase of Junior can be applied toward UnkelScope Level 2+, you can later add a high quality full service data acquisition and processing program when you need it.

UnkelScope Junior Specifications

Max. Channels Sampled: 4
Max. Channels Displayed: 2
Slowest Speed: once per 500 seconds
Fastest Speed: Limited by hardware
Max. Samples on Each Channel
- With 4 channels: 1024
- With 2 channels: 4096
- With 1 channel : 8192

UnkelScope Junior Requirements

IBM PC/XT/AT or compatible with
- 256k bytes memory or more
- 2 floppies or 1 hard disk/1 floppy

IBM Color Graphics Adapter or
- Hercules Graphics Card or
- equivalent of either

Data Acquisition Board

UnkelScope Junior comes with phone support for 60 days from purchase.
Trade-up to Level 2+ Offer is good for 1 year from purchase.

If your data acquistion board is not listed, give us a call, we may already have completed the version for it.

(617) 861-0181

UnkelScope

Software Package for the Laboratory

DESCRIPTION

UnkelScope is an integrated software package for data acquisition and control, data display and features extensive in-program data analysis. UnkelScope, compatible with data acquisition boards and systems by most manufacturers, has a menu-driven interface to turn the IBM PC/XT/AT or compatible into a comprehensive replacement for expensive Strip Chart Recorders, x-y plotters, or oscilloscopes. AND the computer-based system adds extensive processing capability unavailable in such devices. UnkelScope requires no special computer instincts and its clear and direct menu interface is appropriate for scientists, engineers and technical support staff. The recorded data is well documented so months later you will know what the data means.

Data Acquisition, Experiment Control and Data Processing

APPLICATION EXAMPLES

Engineering and Scientific research
Academic teaching and research
Medical research
Clinical measurement
Equipment design
Process control
Automation of laboratory functions (including automatic testing)

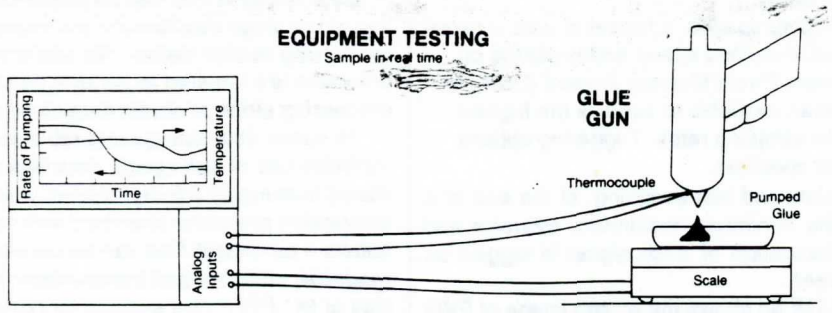


FIGURE 1

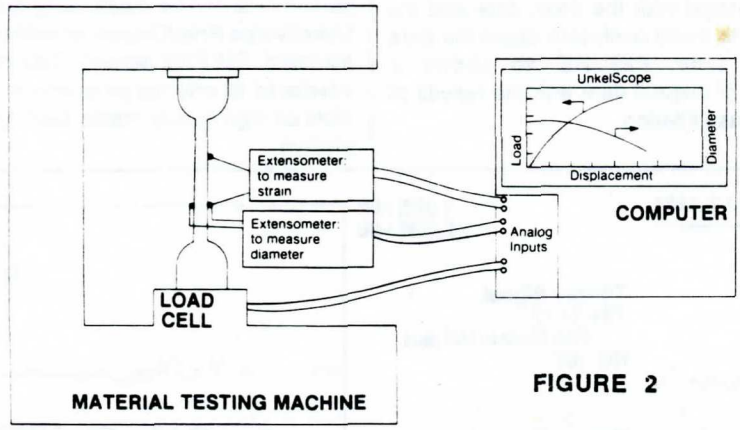


FIGURE 2

FEATURES

* Completely menu driven to get all features with NO PROGRAMMING
* Works with IBM PC/XT/AT and compatibles
* Supports real-time data acquisition on boards by most manufacturers
* See data in real time or as quickly as hardware allows
* Display measured signals vs. time or vs. other measured signals
* Zoom in on data. High resolution plots
* Store, retrieve data files; labels, time, date stored for the record
* Compare current data with previously stored data
* Hardcopy of plots direct from program
* Extensive triggering modes and sources
* Transducer calibration and conversion
* Integration, differentiation and common functions
* Experiment control coordinated with data taking
* Closed Loop Control - Proportional, PID, on/off with deadband
* Filtering - improve signal-to-noise with high, low and band pass filters
* Spectral Analysis - compute and plot power spectral density, cross correlation and more
* Customization to testing sequence - procedure (macro) capability provides automatic execution of all operations
* Read out of time and voltage from two independent cursors; other graphics oriented data manipulations.
* Supports coprocessor if present
* Files can be ported to other programs such as 1-2-3
* Full User's guide, Quick Reference and installation guides
* One-year updates and Phone Service

Now:

Supporting boards from MetraByte, Analog Devices, Strawberry Tree, BurrBrown, ANASCO, MicroWay, CyberResearch, Interleave, Action Instruments, ICS, Interactive Structures, Qua Tech, Tecmar, IBM, Data Translation, Contec

Available from:

Unkel Software, Inc.
62 Bridge Street
Lexington, MA 02173
Phone: (617) 861-0181

BASIC OPERATION

UnkelScope is a menu-driven package with a compact , "toggled" structure so you do not have to remember commands or valid values. The menus show all related information on the same screen. To specify a parameter, you move to the choice with the up and down arrow keys, then toggle to the desired value using left and right arrow keys. The program is self checking, so only valid options and combinations are shown. The command menu allows selection of the general activity.

Setup for data acquisition

The setup for data acquisition is organized and displayed on a single screen so there is no confusion over related options in different screens of a layered menu. FIGURE 3 shows the setup screen highlighting the region of the menu defining Vertical Trace 1 of the display. The input channel, trace label and real-time display axis limits are selected here. The A/D converter range is shown, and for boards with software programmable gain, this gain is selected by toggling to the desired value. With the exception of labels, choices are toggled from properly selected values and the current selections are highlighted in reverse video to make it easy to see where you are in the menu.

Toward the bottom of FIGURE 3 is the Horizontal Trace Block. In the example shown, illustrating a unique feature of UnkelScope, an analog input has been chosen for the horizontal trace, creating a real-time y vs. x plot. The signals can also be set in an x vs. time format.

The sampling rate is selected from the fastest possible allowed by the hardware, to a slow rate of 1 sample each 500 seconds. The slow rate allows total data acquisition times exceeding 20 days. Some boards can sample at speeds above 100 Khz.

UnkelScope has extensive triggering options selected and displayed in the Triggering Block. The start of sampling can be triggered by the keyboard, a TTL level signal or by one of the analog inputs. To allow quick changing of conditions, the complete setup of parameters can be saved on the disk and retrieved later. This makes it easy to use UnkelScope on several experiments without delay.

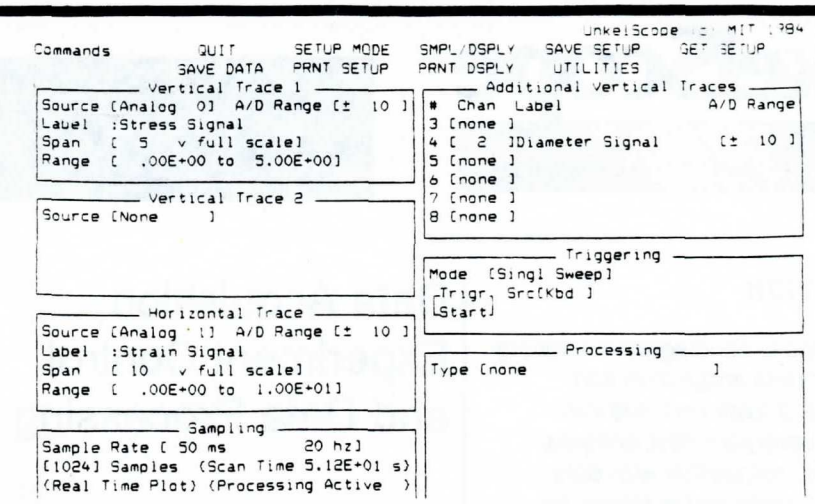


FIGURE 3: Example setup screen showing how all parameters *defining data acquisition are chosen on the same screen.*

Data acquisition and display

For slow speed (slower than 50 Hz on an XT), sampled data is plotted in real time on the computer monitor. At speeds less than 1Hz, the numerical value of each sample is shown on the screen, giving a combined digital voltmeter (DVM) and plotted display. User-selected triggering options define how the sampling process is started and what action is taken at the end of a sampling process. For example, 'auto' causes the scan to be repeated with no intervention by user. Or set the sampling to trigger only after a character is typed on the keyboard and prevent the trace from being overwritten until you are ready.

For higher speeds, a full set of data is taken at the user-defined speed and is plotted on the screen. Direct Memory Access (DMA) is used when available to acheive the highest possible sampling rates. Triggering options are user specified.

For slow and fast sampling, at the end of a scan the minimum, maximum, average and RMS fluctuation of each signal is logged on the screen.

FIGURE 4a shows the screen image of EKG data taken with the UnkelScope. The data plot is well annotated with the time, date and the trace labels to avoid confusion about the data at a later time. FIGURE 4b shows a comparison of original data with the results of digital low pass filtering.

Data storage and retrieval

Sampled data can be saved in a disk file and then retrieved and replotted by UnkelScope. The time and date are automatically stored as is a user-supplied identifying tag for the file. Data from files is retrieved by selecting a trace of the file as a Vertical Trace input. New data can be taken while previous data, or a standard trace, is shown on the screen for comparison. UnkelScope can be applied to measurement in any discipline as shown by other examples in this document. Data originally stored as Y.vs. x, can be replotted as y vs. time and x vs. time.

Data stored in files can be processed by any of the steps described in the in-program processing section below. No additional programs are required to perform these processing steps or obtain data displays.

To speed data storage and retrieval and to minimize use of disk space, data files are stored in compact (binary) format. Using the conversion programs (standard with your software purchase) files can be converted to readable, printable and transportable ASCII files or to ".PRN" files suitable for porting to Lotus 1-2-3 or other programs. Hardcopies of plotted data can be made using the UnkelScope Print/Display capability or the standard IBM Print Screen. Data files can be interfaced to external programs to obtain data plots on high quality media such as pen plotters.

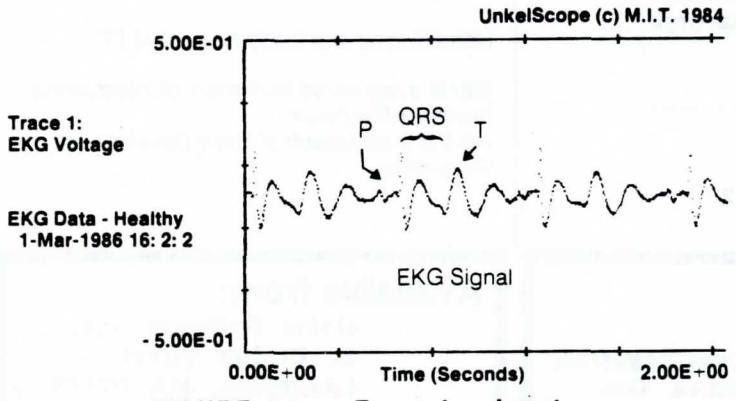


FIGURE 4a: Example heart signal displayed versus time.

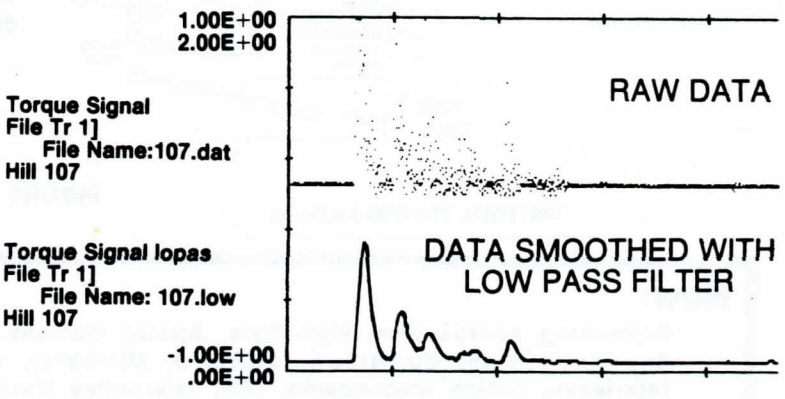


FIGURE 4b: Raw signal and low pass filtered signal displays one signal processing.

EXPERIMENT CONTROL AND PROCESS CONTROLLER

UnkelScope can also coordinate control of your experimental apparatus with data sampling or provide process control using a digital-to-analog output port. The Sequenced Switching option allows you on/off control of up to four devices (through TTL logic output on board). Up to five regions can be specified each with its own set of values. Change from one state to another can be made on the basis of time or when a sampled value triggers a condition. This option can be used to keep a device from exceeding a specified limit during an experiment . It can also be used to make an on/off with deadband process controller.

The traversing option, unique to UnkelScope, coordinates the 'stepping' of one parameter of the experiment with data sampling. The traversing option provides analog output or control signals for a stepper motor. For example, UnkelScope can be used with a positioning device (such as a stepper motor-driven traversing stage) to plot the flow velocity across an air jet as shown in FIGURE 5. Or UnkelScope can control a frequency generator to display the response of a dynamic system as a function of frequency.

Open loop and closed loop control of a process is also provided by UnkelScope. Closed loop control includes a PID (proportional-integral-derivative) controller, or any subset of it including a proportional controller. The command and feedback signals are chosen from any trace (sampled or file) and the output signal is provided to any valid digital to analog output channel. All options are menu selected as shown in FIGURE 6.

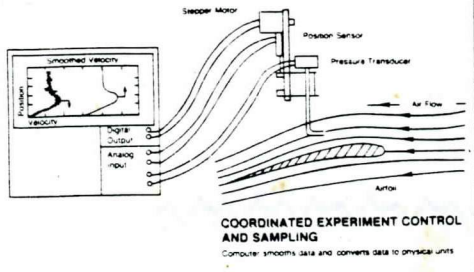
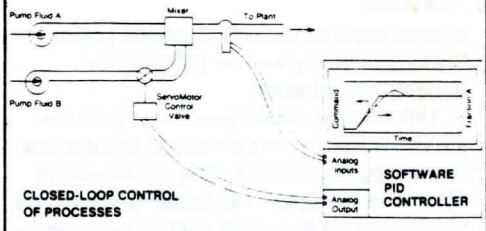


FIGURE 5: Unique traversing option allows coordination of sampling with change in "position."



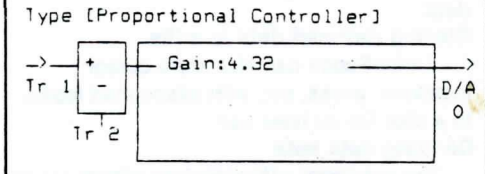


FIGURE 6: A proportional controller implements a closed loop device control (PID controller also available). Setup menu allows full selection of controller parameters.

IN-PROGRAM PROCESSING

To its data acquisition, display and experiment control capabilities, UnkelScope adds extensive in-program processing capability, so you will not have to port your data to a spreadsheet or data base program (but you can if you wish to.)

Calibration and conversion

With UnkelScope, you can calibrate a transducer and then convert the voltage values to physical values, in real-time if desired. The calculation process includes a display of the linear curve fit to the calabration data.

Signal processing

Digital signal processing includes not only FFT related functions, but also digital filtering to improve signal quality. You can, for example, low pass filter data to remove high frequency noise, or can determine the spectral content of a signal by computing and displaying the Spectral Density. As shown in FIGURE 7, data processing is selected by menus similar to the data setup menus. For the case shown, the Spectral Density is found for contents of Vertical Trace 1. The Hamming Window is selected to reduce 'leakage'; other windowing functions are also available. A Power Spectral Density is shown in FIGURE 8 and shows some peaks and several broader regions of activity.

Common functions

UnkelScope can also integrate and differentiate a signal and can transform a trace by several common functions (exp, natural log, square, square root, absolute value, inverse.)

Display of reduced data

Since the results of each process step are stored in an UnkelScope file, you can display any of the results you calculate

CUSTOMIZATION

UnkelScope is setup such that we can add capability to it relatively easily. We have worked with OEMs to produce special features that apply to their equipment or data analysis needs. This approach allows quick development and consistent and well developed menu structures. If you are interested in a custom version of UnkelScope, give us a call.

```
Utilities    Return-Scope Calibration  Conversion   Point Plot   Statistical
             Functions    Edit Data    Get  Proced  Make Proced  Facts About

 Statistical
      Input file name:rrtest.joe
 Label from Input File:rr intervals by joe
     Output file name:rrspec.joe
 Label for Output File:spectra of intervals

Trace  Label                    Operation        Parameters
Vert 1:psd intervals            [PowerSpectrum] Window [Hamming]
```

FIGURE 7: Inprogram processing menu showing application of spectral density.

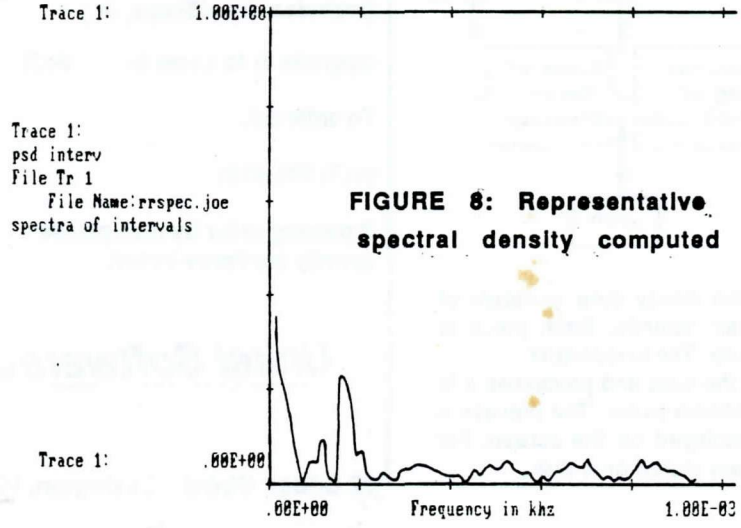


FIGURE 8: Representative spectral density computed

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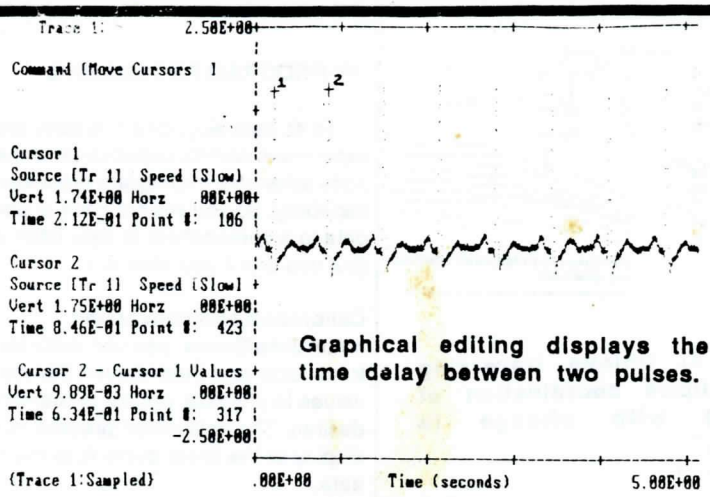


Graphical editing displays the time delay between two pulses.

GRAPHICAL EDITING

UnkelScope supports several graphical 'editing' features allowing you to examine and manipulate data in the graphical format.

Cursor scrolling

In the UnkelScope Graphical Editing Utility, you can move two independent cursors through data stored on the screen. The numerical voltage and time values corresponding to each of the cursors are shown on the screen. UnkelScope also displays the difference in time and voltage of the points located by the two cursors. Both cursors can be setup on the same trace or the cursors can be positioned on different traces. The cursor can be moved through the data by moving over 1, 4, or 32 points, or by seeking the next peak or next minimum. An example use is to determine the time delay between events, such as the time between pulses in the heart signal shown in FIGURE 4a.

Computing an area

UnkelScope allows you to compute the areas between your data curve and the line connecting the cursors. This allows you to determine the area (with baseline correction) corresponding to a peak in chromatography data.

Storing reduced data in a file

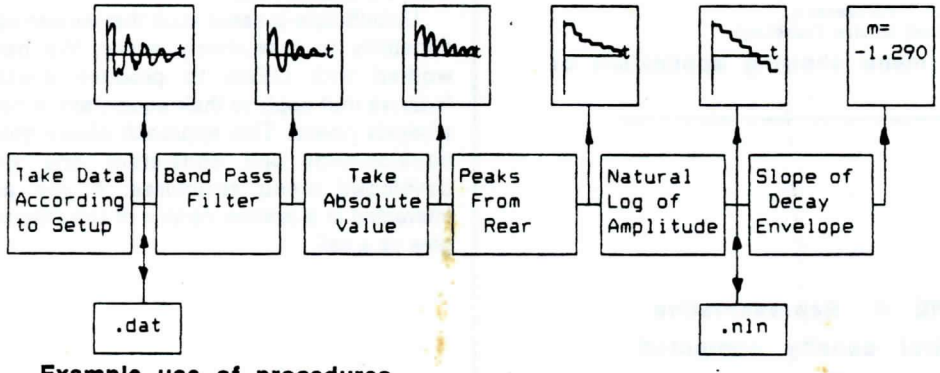
UnkelScope can also store cursor locations, areas, etc. with associated labels to a disk file for later use.

Dividing data sets

The graphical editing feature allows you to save sections of data set for further use analysis and other features such as curvefitting a section of the curve.

PROCEDURES

An established sequence of data taking, processing and display can be automated by using the procedure (macro) capability of UnkelScope. There is no new programming language to learn - simply let UnkelScope remember your key strokes as you go through the procedure the first time. UnkelScope then stores the sequence of key strokes so you can execute them later. You can stack simple procedures to make a more complex procedure and can define how many time to perform the procedure. The automatic file sequencing allows you to save separate data files for each execution of the procedure. If you wish you can have a specific procedure execute each time UnkelScope starts. As an example, the procedure capability can be used to sample a system transient and then display the Power Spectral Density to identify the natural frequency.



Example use of procedures

In the manufacture of elements for a system, the decay time constant of oscillation of one component must be between certain bounds. Each piece is subjected to an impulse and the oscillation allowed to decay. The functions in UnkelScope are combined into a procedure that takes the data and processes it to get the slope of the decay envelope - the sequence is shown below. The process is fully automated with the final result - the slope - displayed on the screen. For permanent recording, the raw data and the final results are stored on a disk.

DOCUMENTATION

UnkelScope comes with complete documentation, including User's, Installation and Short guides plus a Tutorial Disk.

SUPPORT AND UPDATES

With your purchase of UnkelScope Level 2+, you will receive software updates for one year as well as access to the experience and technical support of Unkel Software.

With your purchase of UnkelScope Junior, you receive 60 days support and can apply the full purchase price to the purchase of UnkelScope Level 2+.

MINIMUM SYSTEM REQUIREMENTS

IBM PC, PC/XT, PC/AT, or fully compatible computers.

Two diskette drives or one hard disk and one diskette drive (sampling, display and hardcopy can be performed with a single diskette-drive system.)

UnkelScope Level 2+ is shipped with two versions: A version requiring 256k bytes, allowing sampling of 1024 points on each of 8 channels (uses coprocessor if present but does not require it); and a version requiring 512k bytes and a coprocessor, allowing sampling of 4096 points on each channel. The user can also select to run less channels with more samples on each. UnkelScope Junior requires 256k bytes and allows 1024 points on each of 4 channels (uses coprocessor if present, does not require it.)

Data Acquisition hardware from one of the following companies:

MetraByte	Analog Devices
Strawberry Tree	BurrBrown
ANASCO	MicroWay
CyberResearch	Interleave
Action Instruments	ICS
Interactive Structures	QuaTech
Tecmar	IBM
Data Translation	Contec

IBM Color Graphics Board (or compatible) or Hercules Graphics Card (or compatible).

UnkelScope, Jr. $125
(no processing)

UnkelScope Level 2+ $549
(Includes UnkelScope, Jr.)

Upgrade Jr to Level 2+ $425

To order call:

(617) 861-0181

If placing order by mail please specify hardware board.

Unkel Software Inc.

62 Bridge Street Lexington, MA 02173