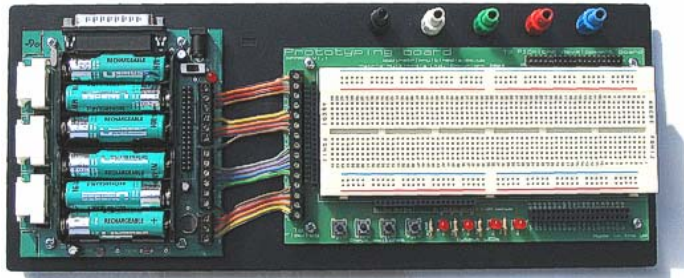
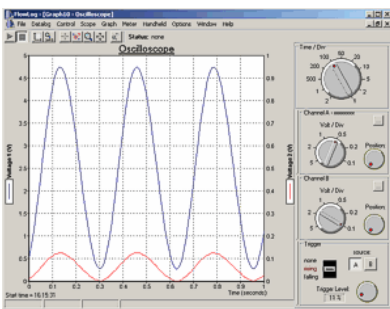


A low cost solution for electronics projects and experiments

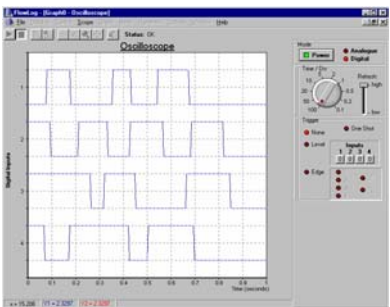


- 5V power supply
- 4 channel digital 'scope
- 2 channel analogue 'scope
- Prototype board with LEDs and switches
- On-screen meters
- Free datalogging and control software
- Leads included

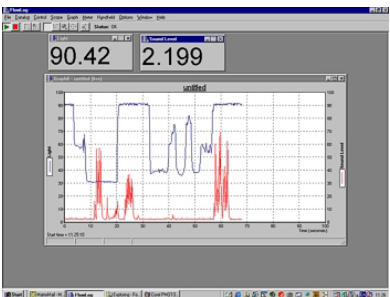
Software includes.....



...2 channel analogue 'scope...



....4 channel digital scope...



...on-screen meters and datalogging software

The Electronics Development Platform has been designed to provide a very low cost solution to allow students to both understand electronic circuits and to develop their own electronics projects. The platform connects to a personal computer and an external power supply. The platform provides a 5V power supply, a high quality prototype board with switches and LED indicators, free software which includes datalogging software, simple control software, a 4 channel digital 'scope, a 2 channel analogue 'scope and on-screen meters. A range of add-on sensors - including current and differential voltage - is also available.

The Electronics Development Platform has been designed to complement our range of well respected CD ROMs for learning electronics.

The package is provided in kit form with some assembly required. The package consists of:

- |                                  |         |                       |
|----------------------------------|---------|-----------------------|
| 1 off Flowlog Lite               | FLLIT   |                       |
| 1 off Flowlog backplate          | FLPLAT  | requires assembly     |
| 1 off Prototype board            | HPPROT  | requires assembly     |
| 1 off 25 way cable               | HPCABLE |                       |
| 1 off Power supply               | HPPSU2  | specify which country |
| 2 off Prototype board lead packs | FLLPCK  |                       |

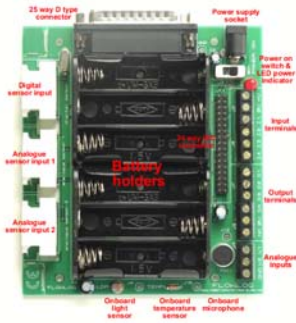
Further datasheets of all products are available separately. To understand the electrical performance please refer to the Flowlog datasheet.

Some soldering and assembly is required. All complex parts are supplied built and tested.

Designed to complement our range of CD ROMs for learning electronics:



# Hardware specification – Flowlog Lite



The Electronics Development Platform is based on Flowlog Lite

## Power supply

Minimum = 7.2V regulated  
Recommended = 9V DC regulated  
Maximum = 10V DC regulated  
See note 1

## Batteries

6 off dry cells or:  
6 off NIMH 1300mAh rechargeable cells  
see note 2

## Inputs

4 off connected via screw terminals  
Max input for logic 0 = 1.4V  
Minimum input for logic 1 = 2.8  
All inputs over voltage protected up to +/-12V

## Power outputs

4 off connected via screw terminals  
Output Low = 0V  
Output high when powered by 9V supply = 6.5V  
Output high when powered by 6 AA NIMH cells (nominal) = 6.5V  
Output high when powered by NIMH/NICAD AA cells (nominal) = 5V  
Output current = 300mA per output  
Bi-directional motors can be operated using 2 outputs  
See note 3

## On-board sensors

Temperature  
Range: 0 to 70 degrees  
Accuracy: 2 degrees  
Resolution: 0.1 degrees  
Light - not calibrated  
Sound level – not calibrated  
Voltage – 2 off - connected via screw terminals  
Range: 0 – 5V  
Resolution: 10 bit resolution (5mV)  
Accuracy: 15mV (provisional)

## External sensors

2 off analogue Vernier sensors  
full auto sense and calibration  
10 bit accuracy  
40uS max sample rate  
1 off digital Vernier sensors  
auto sense  
10uS max sample rate

## Communication

PC compatible parallel port

### Note 1

Flowlog will cope with supplies up to 20V. However using supplies higher than 10V with the Standard Flowlog will damage your recharge circuit if the recharge routine is invoked. Note that output voltage is supply voltage – 1.5V.

### Note 2

If using rechargeable cells only fit 1300mAh NIMH cells. The recharge circuit may damage NICAD and other cells with a lower rating and recharge current.

### Note 3

Output current and voltage will not be linear as all Flowlogs contain auto-resettable fuses. When an output is high and it is shorted to ground then the internal fuses will not recover until about 20 seconds after short is removed.

# Software specification

## Datalogging

### Modes of operation

#### Live graph mode

- 10,000 samples
- Simultaneous graphing, datalogging and control program
- Records data from all 12 inputs and outputs simultaneously
- Simultaneous meter displays

#### Fast datalog mode

- 8,000 samples
- 40uS max sample rate for analogue inputs
- 10uS sample rate for digital inputs
- Trigger on event, data transition, time or value
- Operates independently of the PC/Palm

#### Event driven mode

Sample data on an event – the press of a button or when an input is triggered. Up to 8,000 samples.

### Analysis

Manipulation tools in Flowlog include:

- Graph annotation
- Auto scaling
- Control of graph appearance – point type, thickness, line type etc.

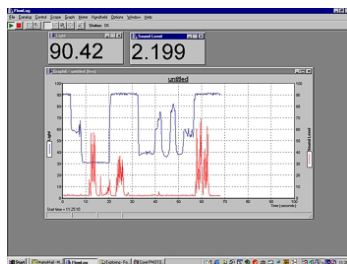
Export to Excel, SID (Insight compatible) and Graphical analysis

### Task assistance

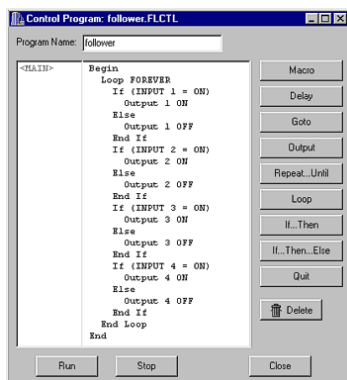
- Full library facility (including dump to Palm)
- Full task and condition wizard

### Sensor functions

- Auto-id and calibration for Vernier sensors
- Compatibility with third party sensors
- Calibration of any sensor possible



Typical screen showing live graph and meter displays



Typical control program

## Control

Flowlog control is a simple drag and drop control language that is designed to allow novices to write control programs. The drag and drop interface and accompanying dialogue boxes ensure that it is impossible to make syntax errors.

The control system executes each line of a program at 10mS intervals. This stepped approach allows Flowlog to simultaneously provide live graph and to maintain the PC/Palm interface.

Comands available include:

- Macro
- Delay
- Goto
- Output
- Repeat until
- Loop
- If... Then...
- If... Then... Else...
- Quit

The Macro facility allows users to build routines which are called repeatedly. This simplifies the writing and editing of programs and keeps structures simple.

## Electrical measurement

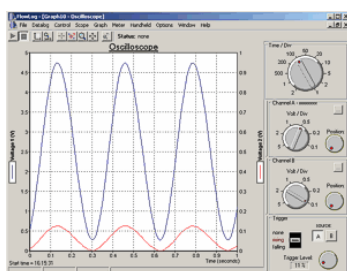
Flowlog provides two types of oscilloscope which form the heart of the electrical measurement function:

### Analogue scope

- 2 channel, 0-5V, 25kHz
- Auto, level, rising and falling, and one-shot trigger
- Can display any 2 of 8 external sensors, on-board sensors, or on-board voltage inputs

### Digital scope / Logic analyzer

- 4 channel, 0-5V 100kHz
- Displays all 4 inputs simultaneously
- Auto, one shot, level or edge (rising or falling) trigger on any input
- Max input for logic 0 = 1.4V
- Minimum input for logic 1 = 2.8



Typical analogue oscilloscope screen

# Sensors

A complete range of sensors for real world interaction

When using these sensors with Flowlog students can take advantage of the built in intelligence in each sensor which allows Flowlog to auto identify the sensor and to auto calibrate it. This makes datalogging and experiments easier to carry out and saves time in the classroom. A complete list of sensors and their specifications are listed on our web site.

A separate datasheet gives further details on all sensors.



Barometer



Current probe



Dual range force sensor



Differential voltage probe



ECG sensor



Heart rate monitor



Gas pressure sensor

Product	Code
Bar Tape	HSTAPE
Barometer	HSBAR
Colourimeter	HSCOL
Conductivity probe	HSCON
Current probe	HSDCP
Differential voltage probe	HSDVP
Dissolved oxygen probe	HSDO
Dual-range force sensor	HSDFS
ECG electrodes	HPELEC
ECG sensor	HPEKG
Extra long temperature probe	HSTPL
Fast response photogate	HSVPG
Flow rate sensor	HSFLO
Gas pressure sensor	HSGPS
Heart Rate Monitor	HSEHR
Instrumentation amplifier	HSINA
Low-g accelerometer	HSACC
magnetic field sensor	HSMG
Microphone	HSMCA
Motion Detector	HSMD
O <sub>2</sub> gas sensor	HSO <sub>2</sub>
pH sensor and amplifier	HSPH
Picket Fence	HSPF
Radiation Monitor	HSRM
Relative humidity sensor	HSRH
Respiration monitor belt (requires gas pressure sensor)	HSRMB
Rotary Motion sensor	HSRMS
Smart Pulley Attachment	HSSPA
Thermocouple	HSTCA
Three range light sensor	HSLS
Turbidity sensor	HSTRB
Wide range stainless steel temperature probe	HSTMP



Instrumentation amplifier



Low g accelerometer



Motion detector



O<sub>2</sub> sensor



Magnetic field sensor



pH sensor



Temperature probe



colourimeter



thermocouple



gas pressure sensor