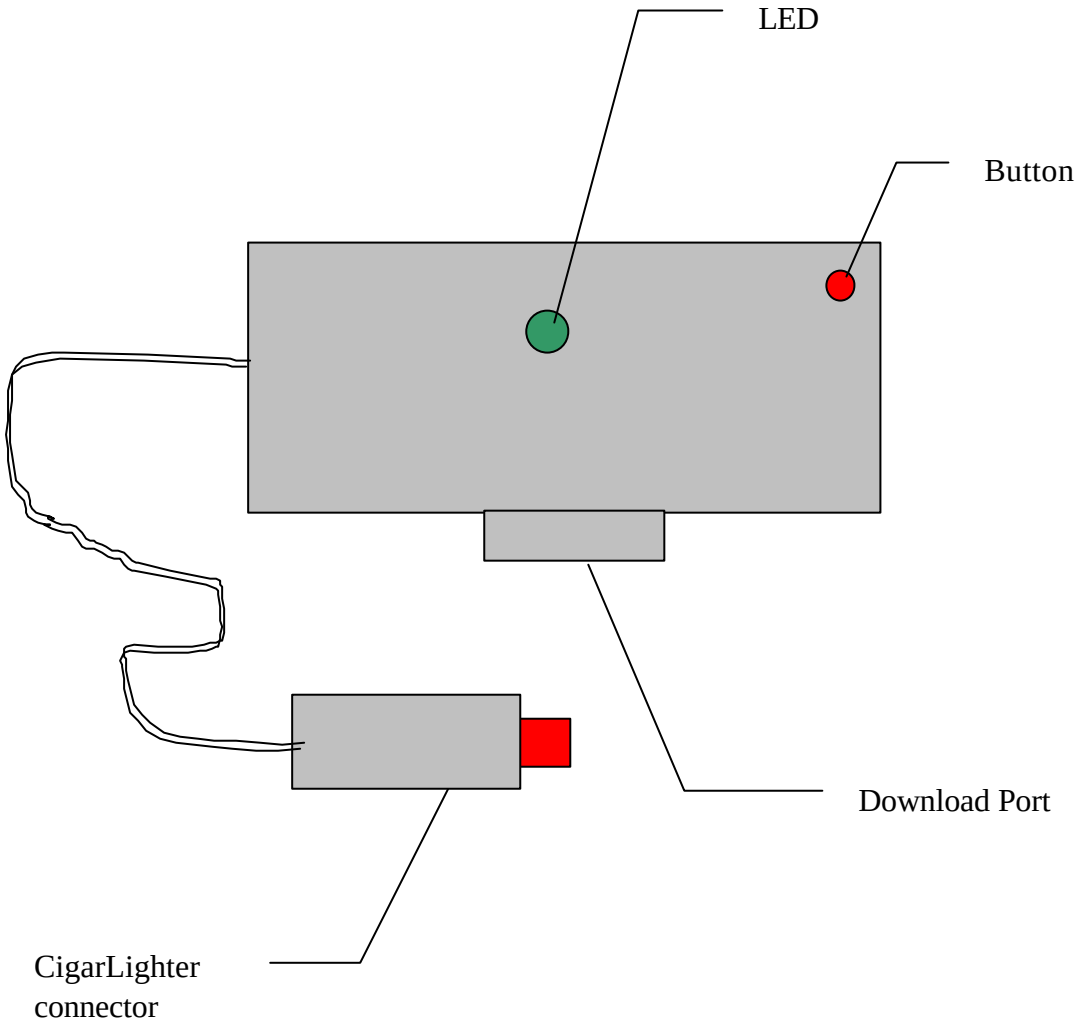
DataLogger Instructions

Overview

The Datalogger is a standalone device which records voltage data presented to its Cigarlighter connector for later playback to a PC, where it may be imported into presentation software such as MS Excel. Its power supply is obtained from the system it's connected to.



Quick Start guide

Before starting engine, plug DataLogger in. No other equipment is required. Green LED blinks. Allow 20 secs before starting. Up to 11 hrs of data may be recorded.

Data Acquisition Full Instructions

Connecting the Cigar lighter connector to a supply between 11 and 16V initiates capture of voltage data and subsequent logging to internal memory.

Allow at least 10 seconds before starting for the Averaging function to read the pre-start battery voltage.

Logging occurs at the rate of 1 per 10 seconds, collectively called a ‘Run’. Each logged voltage value is the average of 32 previous ‘snapshot’ voltage measurements made over the 10 second period.

Acquisition continues until the Datalogger is removed from the supply.

Each new Run made is recorded with a unique ‘Run Number’ and this appears with the recovered data. The Run Number is initialised at manufacture and cannot be reset.

An LED is a general status indicator. It will be seen to light briefly when first connecting to a supply. When logging of data is taking place it will be seen to briefly ‘pulse’ an at approx 3Hz rate.

All data Runs recorded on the Datalogger are appended with that previously stored until the memory is full. This occurs after approx 11 hrs of recording and is indicated by the LED flashing at 1.5Hz with equal on/off periods, after which no further datalogging takes place.

When the Datalogger is powered from the CigarLighter connector (>8V), pressing the Red Button briefly will interrogate the current Run Number being recorded and display this number as a series of flashes on the LED, i.e. 5 flashes then 3 flashes means Run 53 is presently being recorded.

Data Retrieval Full Instructions

Recorded data is output on the Datalogger's built in 9 way port. It shall be connected to an IBM Compatible PC COM Port. No connection should be made to the Cigarlighter connector when playing back data.

Any means of capturing serial data and writing it a file may be used, but here we will use Window's Hyperterm program, found within the Accessories program group (it may need installing from the 'Add/Remove Programs' dialogue).

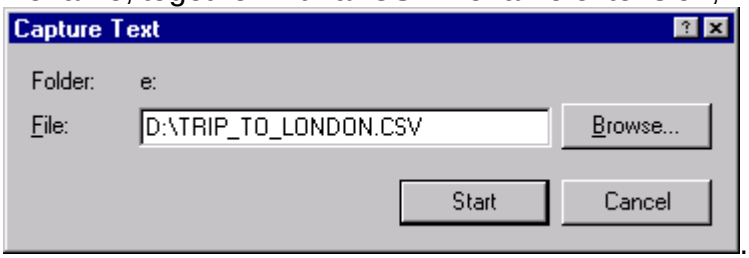
Launch the Hyperterm program (i.e. Start/Run/'hyperterm.exe') . The 'Connection Description' dialogue window appears (below), enter a name for the connection such as 'DATALOGGER', and click 'OK'

A 'Connect To' dialogue appears, to which you must select the Com Port you have connected the Datalogger to, and click 'OK'.

A 'COMx Properties' dialogue appears, enter the following settings, 1200, 8, None, 1, None.

This will supply power and activate the Datalogger (through the Com port's RTS signal). The LED will have flashed briefly when the Datalogger is first powered. The LED will be lit, but dim when powered.

From the Pull Down Menu select: 'Transfer', 'Capture Text...' The dialogue 'Capture Text.' appears. (If desired, you may browse to the area for the saved file to be placed). Enter a suitable filename, together with a .CSV filename extension, i.e.



Then click 'Start'. Data received on the selected Com Port will be sent to above specified File as well as appearing on the screen.

Press the Red Button briefly. All recorded Data shall now appear on the screen in a form similar to:

```
0048,13.93
0048,13.97
0048,13.99
0048,13.98
pip
0049,13.00
0049,13.00
.       .
.       .
.       .
End of file
```

Once data transfer from the Datalogger has started it cannot be paused or stopped. The LED will flicker while data is being sent. End of data is indicated by the LED flashing twice and an ‘End of file’ message appearing as last entry on data. Recorded Runs are separated by the token ‘pip’.

To close the saved File being created on disk, From the Pull Down Menu select: ‘Transfer’, ‘Capture Text’ and select ‘Stop’. The saved file on disk is now ready for use.

Data transfer may take place as many times as desired and whether or not a ‘Capture Text’ applies.

To erase the Datalogger’s memory, press and hold down the Red Button for about 6 seconds until two long flashes are seen on the LED. During this waiting time the LED will flash fast to alert you that the data is about to be erased. Releasing the button at any time before the 2 flashes cancels the erase request. The Red Button Erase function is disabled when the Datalogger is powered from the CigarLighter connector.

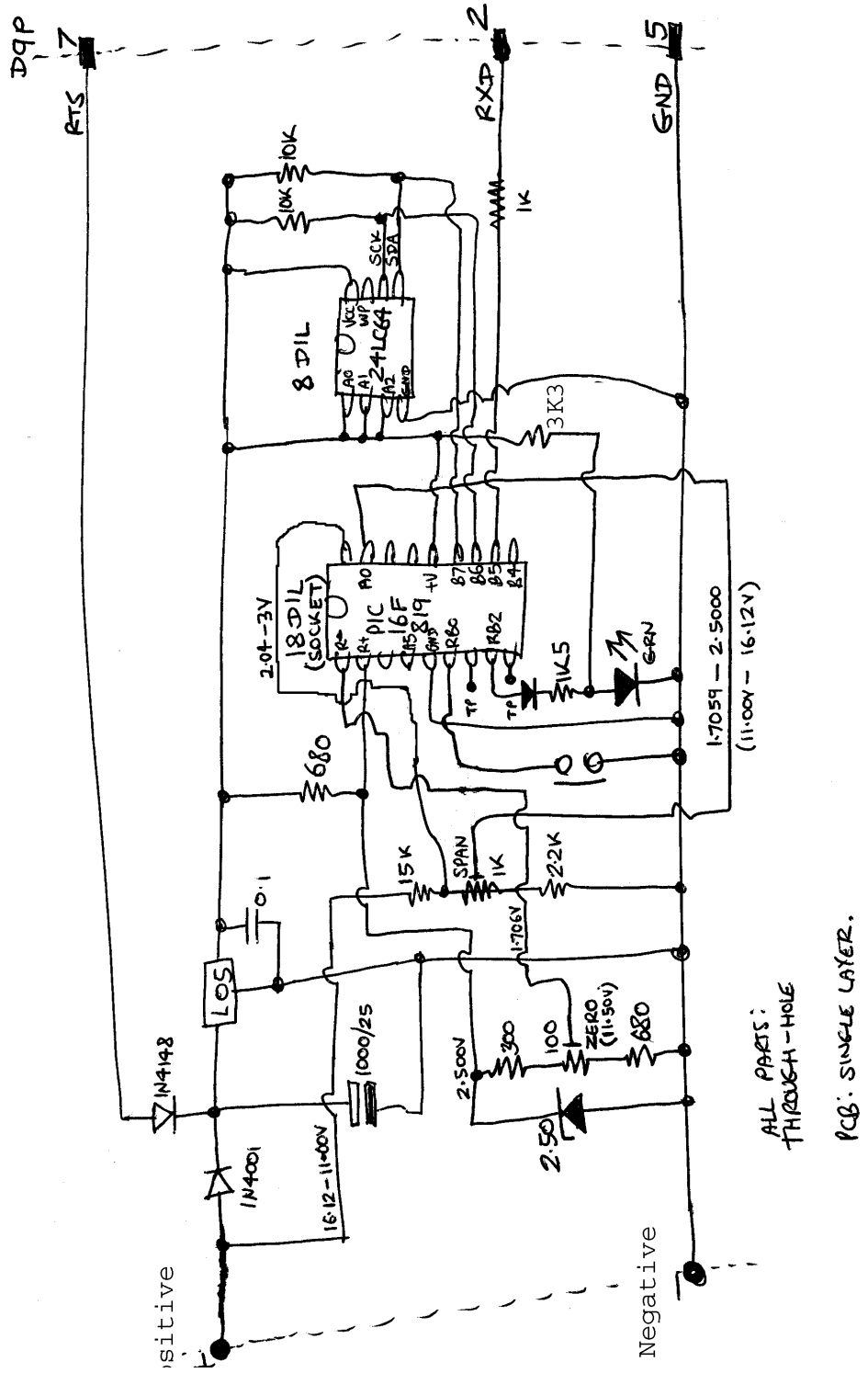
When Hyperterm is closed, it will ask you if you want to save the Session. If ‘Yes’ is selected, this saved session may be used for future use without entering the settings.

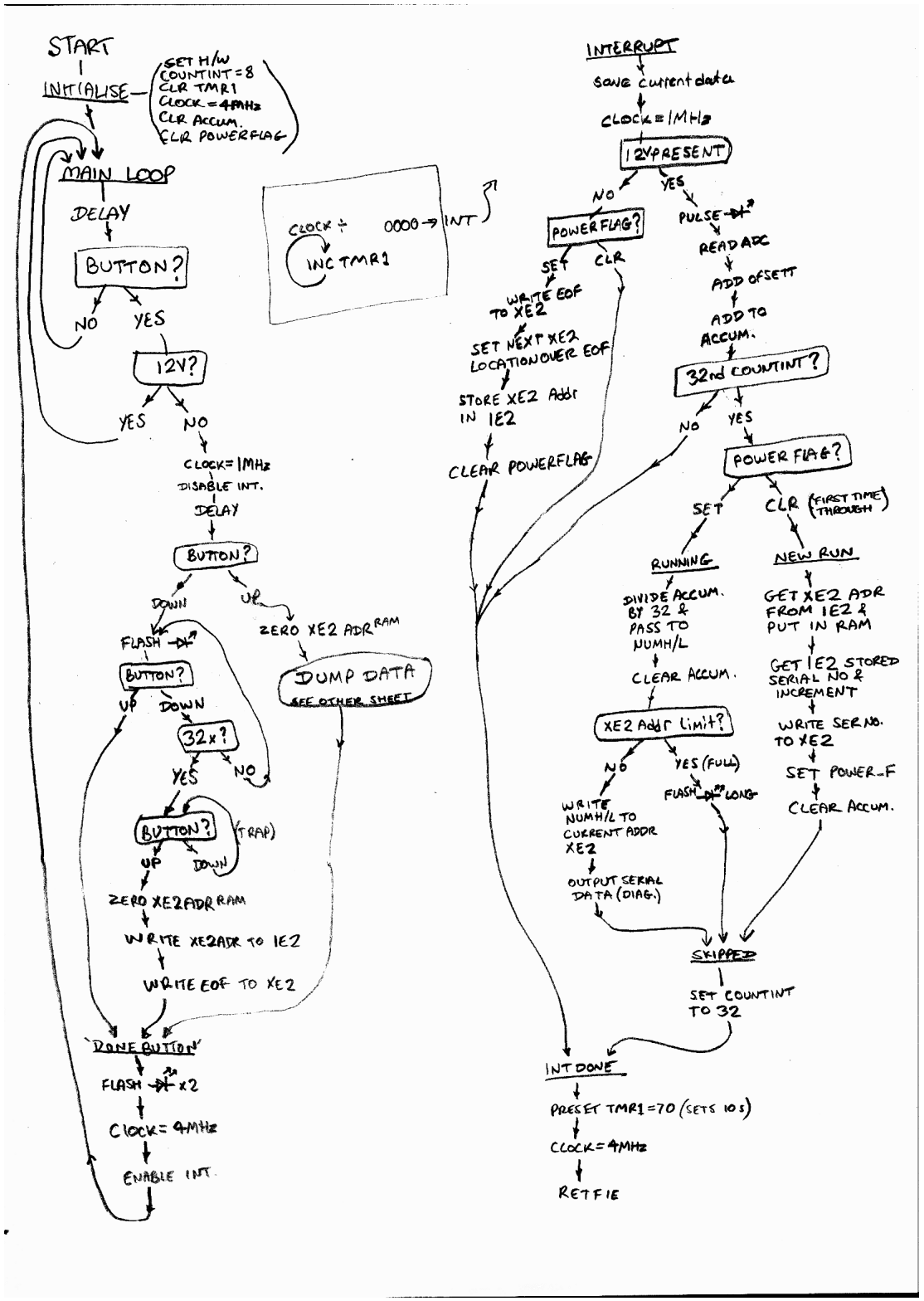
If the recorded data is to be viewed by Hyperterm only without saving to disk, it is not necessary to set up Capture Text.

Specifications

Recorded data voltage range	11.00 to 16.12V
Repeatability	20mV
Temperature stability	<20mV over entire operating temp range.
Maximum input voltage	18V (might actually be 25V)
Reverse polarity protection	Yes
Overvoltage protection	No
Ambient Operating Temperature	-20 to +50 degC
Memory capacity	11.2 hrs (4k samples)
Memory technology	EEPROM / Flash
Memory endurance	more than 700hrs / , ('Run' number tracks life)
Memory	user-replaceable, 8 pin DIP socket
Download Port	Based on RS232C: 1200bps, 8bits, N parity, N stop bit. No Protocol. Voltage levels non-standard: 0 and -5V
Diagnostic Mode:	While powered from 12V, serial data may be read from the Download Port, as well as being recorded in memory

Calibration:	Set up in Diagnostic Mode. Input 16.00V, adjust '16.12V' preset for 16.00V. Input 11.10V, adjust '11.00' preset for 11.10V


DGP
RTS
RXD
GND
10K
10K
1K
8 DIL
24LC64
SCL
SDA
3K3
18 DIL (SOCKET)
PIC 16F 819
2.04-3V
680
1K5
GRN
1.7059 - 2.5000 (11.00V - 16.12V)
15K
SPAN 1K
2.2K
1.706V
0.1
LOS
1N4148
1N4001
1000/25
16.12-11.00V
2.500V
300
100
ZERO (11.50V)
680
2.50
ALL PARTS: THROUGH-HOLE
PCB: SINGLE LAYER.
Negative


START
INITIALISE
SET H/W
COUNTINT=8
CLR TMR1
CLOCK=4MHz
CLR ACCUM.
CLR POWERFLAG
MAIN LOOP
DELAY
BUTTON?
NO
YES
12V?
YES
NO
CLOCK=1MHz
DISABLE INT.
DELAY
BUTTON?
DOWN
UP
ZERO XE2 ADR RAM
DUMP DATA
SEE OTHER SHEET
FLASH
BUTTON?
UP
DOWN
32x?
YES
NO
BUTTON?
(TRAP)
UP
DOWN
ZERO XE2ADR RAM
WRITE XE2ADR TO IE2
WRITE EOF TO XE2
'DONE BUTTON'
FLASH x2
CLOCK=4MHz
ENABLE INT.
CLOCK ÷
0000 → INT
INC TMR1
INTERRUPT
SAVE current data
CLOCK=1MHz
12V PRESENT
NO
YES
POWERFLAG?
SET
CLR
WRITE EOF TO XE2
SET NEXT XE2 LOCATION OVER EOF
STORE XE2 Addr IN IE2
CLEAR POWERFLAG
PULSE
READ ADC
ADD OFSETT
ADD TO ACCUM.
32nd COUNTINT?
NO
YES
POWER FLAG?
SET
CLR (FIRST TIME THROUGH)
RUNNING
DIVIDE ACCUM. BY 32 & PASS TO NUMH/L
CLEAR ACCUM.
XE2 Addr Limit?
NO
YES (FULL)
FLASH LONG
WRITE NUMH/L TO CURRENT ADDR XE2
OUTPUT SERIAL DATA (DIAG.)
NEW RUN
GET XE2 ADR FROM IE2 & PUT IN RAM
GET IE2 STORED SERIAL NO & INCREMENT
WRITE SER.NO. TO XE2
SET POWER_F
CLEAR ACCUM.
SKIPPED
SET COUNTINT TO 32
INT DONE
PRESET TMR1=70 (SETS 10s)
CLOCK=4MHz
RETFIE