

**Model PM4-DL2 and
Option PM4-OPT-DL2
Datalogger
User Guide**

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Table of Contents

1	Introduction	3
2	Mechanical Description	4
3	Electrical installation	5
4	PM4-DL and PM4-OPT-DL data logger option plugin software	7

1 Introduction

The 2Mb datalogger is available in 2 main forms, firstly it is available as model PM4-DL2 which is a stand alone datalogger, secondly it is available as a plug in option board for a PM4 panel meter.

Model PM4-DL2 is a stand alone data logger which requires 12 to 24 DC power supply and is available in 4 versions namely:

PM4-DL2-DC-22 (RS232 port for PC and RS232 port for external instruments)

PM4-DL2-DC-24 (RS232 port for PC and RS485 port for external instruments)

PM4-DL2-DC-42 (RS485 port for PC and RS232 port for external instruments)

PM4-DL2-DC-44 (RS485 port for PC and RS485 port for external instruments)

When supplied as an option board for a PM4 panel meter the datalogger is powered from the panel meter and requires no auxiliary power. The option board is available in the following versions:

PM4-OPT-DL2-22 (RS232 port for PC and RS232 port for external instruments)

PM4-OPT-DL2-24 (RS232 port for PC and RS485 port for external instruments)

PM4-OPT-DL2-42 (RS485 port for PC and RS232 port for external instruments)

PM4-OPT-DL2-44 (RS485 port for PC and RS485 port for external instruments)

The datalogger is supplied on CD with download software part number SOFT-DL1 for setup and communication. Details of this software relating to the datalogger are given in this manual, refer to the **Download Software User Guide** for further details.

Up to 16 channels can be logged with logging rates selectable from 1 sample per second to 60 minutes per sample. The sample rate selected is the time to sample all channels e.g. if set for 1 second then all channels will be logged once per second.

The number of records the datalogger can hold will vary with the number of channels selected and the memory size. Check the **Datalogger Properties** window under **View** in the download software to check the number of records available.

Once the datalogger is connected to the PC and any external instruments are connected to the datalogger run the Download software and configure via the PM4-DL plugin menu provided in the software. Refer to page 7.

Green and red LEDs can be seen near the power supply connector. The green LED will flash each time a successful data transfer is made between the datalogger and connected instruments (approx. once per second), the red LED will flash each time there is a failure in data transfer. The LEDs do not indicate when communication is made between the datalogger and the PC.

Number of records

The number of records available can be checked under **Datalogger Size** which can be accessed via **View > Datalogger Properties** windows. The number of records which can be stored will vary depending on software version and is subject to change. Below are approximate values, contact supplier if a more exact value is required for a particular configuration.

1 channel 280,000 records

2 channels 196,000 records

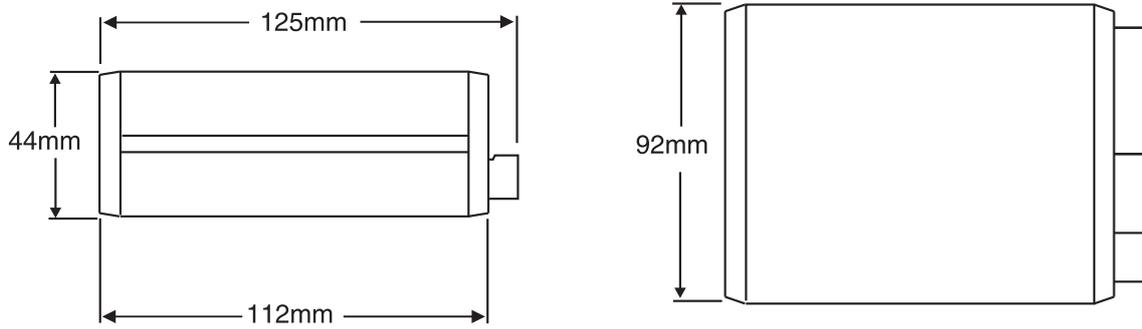
4 channels 122,000 records

8 channels 70,000 records

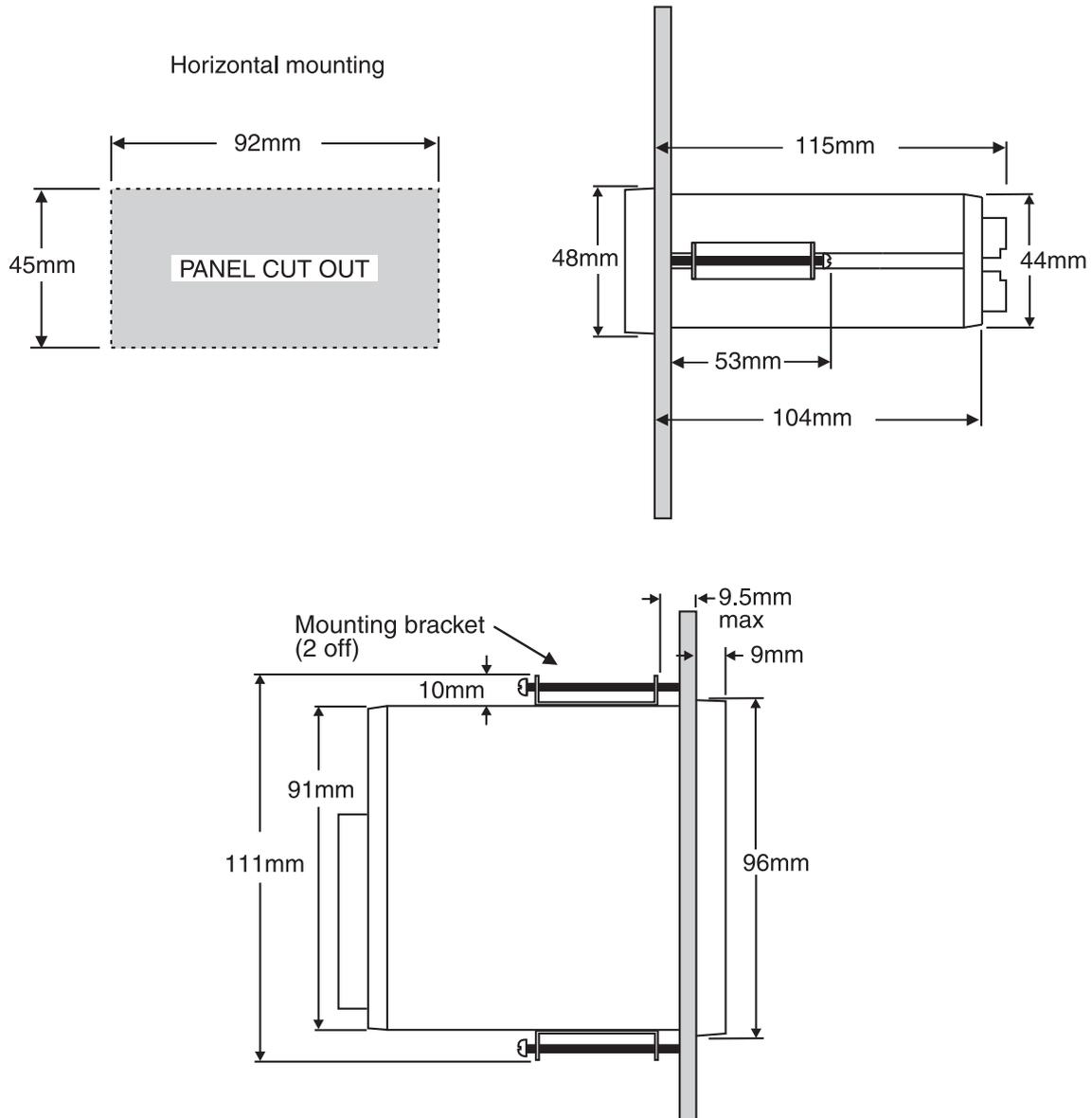
16 channels 37,000 records

2 Mechanical Description

Mechanical details for the stand alone version model PM4-DL2 are shown in the diagram below.
Weight: 250gms.

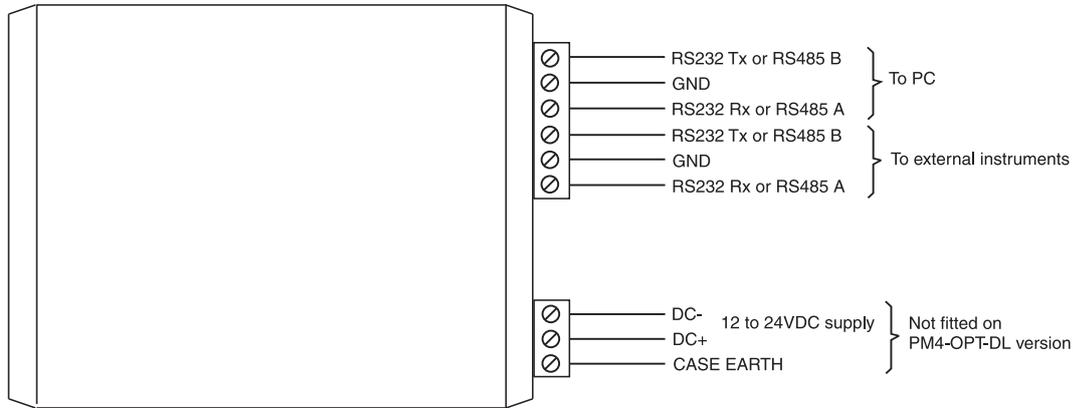


Mechanical details for the PM4-OPT-DL2 fitted inside a PM4 panel mount display are given below.
Weight: typically 450 gms.



3 Electrical installation

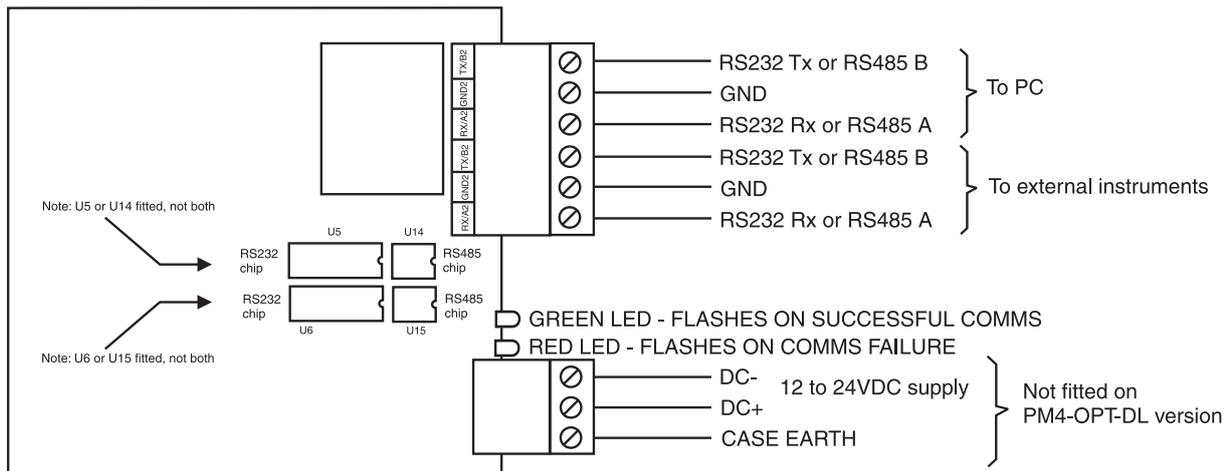
Electrical connection details are shown in the diagrams below. Plug in screw terminals allow for wires up to 2.5mm² to be connected. Power consumption is approx. 15mA at 24VDC and 30mA at 12VDC.



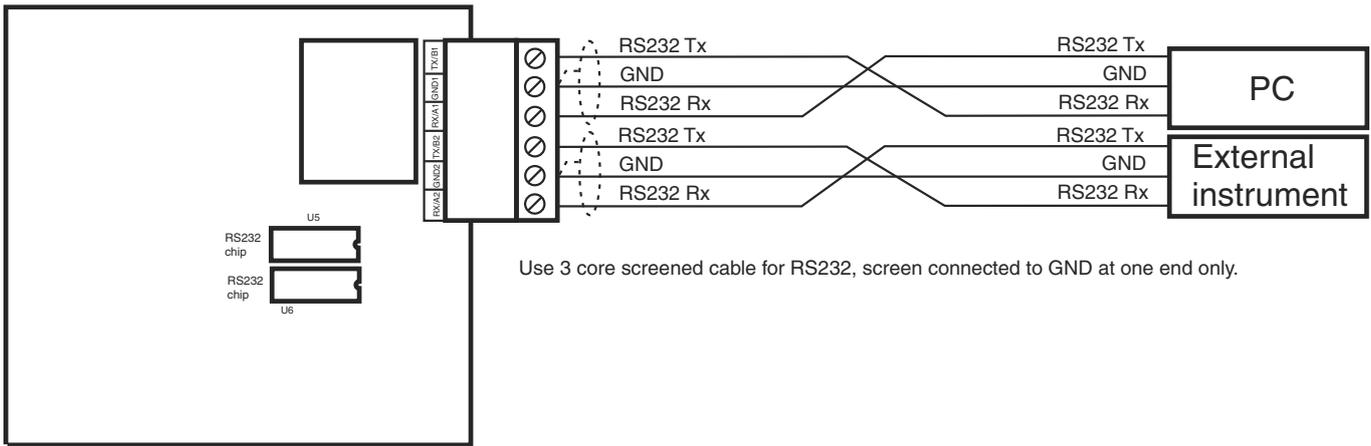
1 CASE EARTH	
2 DC SUPPLY +	
3 DC SUPPLY -	
4 RS485 A EXTERNAL	
5 GND EXTERNAL	
6 RS485 B EXTERNAL	
7 RS232 Rx TO PC	
8 GND TO PC	
9 RS232 Tx TO PC	
PM4-DL-DC-24	SERIAL No.

Instrument data label (example)

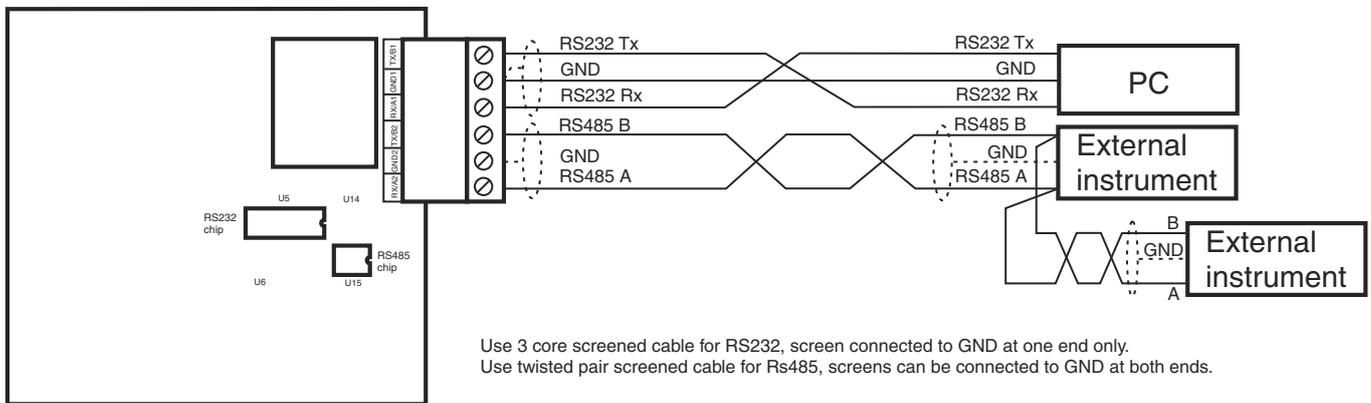
PCB layout for PM4-DL2 and PM4-OPT-DL2



RS232 connection example



RS232 and RS485 connection example



DIP switch settings

DIP switch SW1 is factory set to allow the PC to detect the serial output types used by the data-logger. Altering the DIP switch setting will not alter the serial output unless the communications chips are also changed.

The DIP switches 1 and 2 are used as follows:

DIP switch 1 ON = RS485 communications to PC, OFF = RS232 communications to PC.

DIP switch 2 ON = RS485 communications to external device, OFF = RS232 communications to external device.

4 PM4-DL and PM4-OPT-DL data logger option plugin software

The PM4 model data logger is available as either a standalone data logger or can be fitted internally into most of the PM4 range of instruments. This section describes the plugin software which provides as setup window for communication with the datalogger.

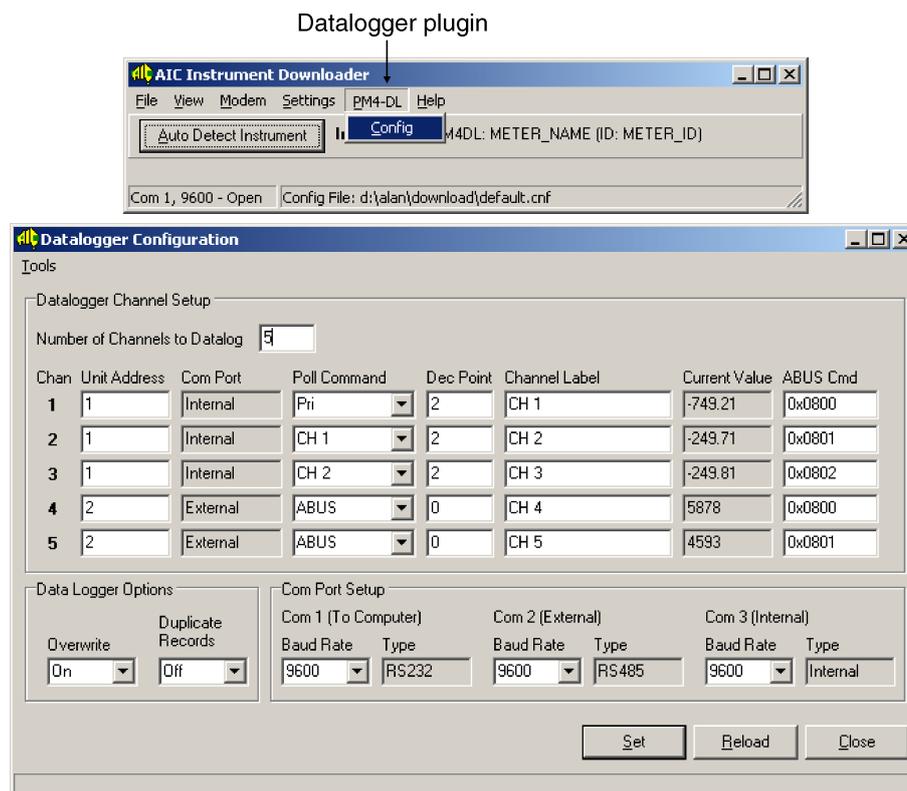
The datalogger also contains inbuilt event logger memory which automatically records dates and times of events such as power on/off, changes to setup, software and hardware errors and eventlog memory clearance. The **Event Logs** and **Eventlogger Properties** windows can be accessed via **View** in the main **AIC Instrument Downloader** window. The eventlogger will hold up to 510 records i.e. Datalogger memory size shown in the **Eventlogger Properties** window minus 1.

The number of records the datalogger can hold will vary with the number of channels selected and the memory size, see page 3.

Important - instruments connected to the data logger must have their **Output** function set to **POLL** or **ABUS**, this includes any instruments to which the datalogger is fitted as an option board. The download PC software must be set for **ABUS** operation i.e. **Supports AIC Binary Protocol** box must be ticked in the **Settings > Instrument Setup** window and in this same window the **Single Instrument Mode** box must be ticked as the software is only communicating with a single instrument i.e. the datalogger irrespective of how many external instruments are connected to the datalogger.

Install the PC software and connect to the datalogger and power up the datalogger then click on the **Auto Detect Instrument** window. When this plugin software is provided the main menu will show the datalogger plugin as shown below.

Note: certain changes such as the number of channels in this window will not detect the change until the datalogger is powered down then powered up again or until the data logger memory is cleared using the **Reset Datalogger** button in the **View > Datalogger Properties** window.



The **Datalogger Configuration** menu which appears when this **Config** is selected at the **PM4-DL** window contains the following:

Set button - if any changes to the items in this window are made the changes will only be stored and become active when the **Set** button is clicked.

Reload button - Clicking on the **Reload** button will refresh the values displayed in the **Current Value** window.

Close button - closes the configuration window.

Number of channels to datalog - up to 16 channels can be selected.

Unit address - this must be set to match the **Addr** function setting in the instrument being communicated with on that channel. Address 1 is reserved for use when the datalogger is housed internally in a PM4 display.

Poll Command - allows the selection of **Pri** (primary) **Sec** (secondary), **Ter** (tertiary) or **Quad** (Quaternary) or **CH 0** to **CH 8** or **ABUS**.

If the instrument being communicated with has more than one channel available then this section allows selection of which of these channels is actually polled for data. The table which follows shows the various channels used for PM4 instruments, the same commands would be used for the equivalent LD and RM4 range instruments. If the instrument is not shown in the table below then only the primary **Pri** channel and in some cases the remote input value is available. Where remote inputs are used the secondary **Sec** poll command will return the value of the selected remote input function.

The instrument selected must have its **OpUt** function set to **POLL** unless **ABUS** is selected.

If **ABUS** is selected then the **ABUS Cmd** section of this window must have the channel value entered and the **OpUt** function of the instrument being polled must be set to **ABUS**. The **ABUS Cmd** values may vary slightly depending on the instrument connected generally 0x0800 is used for channel 1 (or for the arithmetic result in arithmetic units), 0x0801 is used for channel 2 (or channel 1 in arithmetic units) 0x0802 is used for channel 3 (or channel 2 in arithmetic units) etc.

If a poll command other than **ABUS** is selected for a channel the **ABUS Cmd** window will still be seen but will not have any effect on the communication to that channel.

Model	Poll Comand
PM4-CO	Pri for main display value (conductivity or resistivity) Sec for temperature value
PM4-2CO	Pri for channel 1 display value (conductivity or resistivity) Sec for temperature value Ter for channel 2 display value (conductivity or resistivity)
PM4-IV3	CH 0 for the arithmetic result value CH 1 for channel 1 display value CH 2 for channel 2 display value CH 3 for channel 3 display value
PM4-LN2	CH 1 for channel 1 display value CH 2 for channel 2 display value
PM4-IVT	Pri for rate value Sec for total value
PM4-LNT	Pri for linearised rate value Sec for linearised total value
PM4-PH	Pri for main display value (pH or Redox) Ter for temperature value
PM4-RT8	Pri for highest value Sec for lowest value Ter for average of all channels Quad for maximum difference between all channels CH 1 to CH 8 for individual channel values
PM4-TR	Pri for rate value in FAkE or both mode or total in totl mode Sec for total value in both mode
PM4-QC	Pri for rate value in FAkE or both mode or total in totl mode Sec for total value in both mode

Dec Point - selects the decimal point place for the channel. Note that if the decimal point is changed it will be altered for all records.

Channel Label - allows each channel to be named for identification purposes.

Current Value - shows the value for that channel at the time the window was opened or at the time the window was last updated by clicking on **Reload** button or by the automatic refresh, see “Datalogger Configuration Tools Menu” which follows.

The **Com Port** section of this menu allows the setup of the baud rate for communications to the computer (Com 1) to external instrument (Com 2) and for internal communication (Com 3) when the datalogger is housed inside a PM4 display.

The **Data Logger Options** section of this menu allows choices for **Overwrite** and **Duplicate Records**.

Overwrite - Set the **Overwrite** to **Off** if you do not want to overwrite existing records in memory i.e. logging stops when memory is full. Set the **Overwrite** to **On** if you want to enable overwriting of existing records in memory i.e. when memory is full the logger overwrites earliest records.

Duplicate Records - The datalogger can be set to always store records when the logging period is reached or to only log records if the values on the input channels have changed since the last logging period. Set the **Duplicate Records** to **On** if you wish to log a record every time the log update time is reached i.e. even if the readings have not changed records will be stored in memory. Set the **Duplicate Records** to **Off** if you do not want to store duplicate

records. If set to **Off** then the data will only be added to the memory if data on one or more of the channels changes. The date/time and value of the first steady records will be saved and the date/time and value of the last steady records will also be saved. For example if a single channel is being logged and the values at that channel are 1, 2, 3, 4, 4, 4, 4, 4, 4, 4, 2, 3 at the time logging is scheduled then with the **Duplicate Records** set to **On** all of the records will be stored together with date and time. If **Duplicate Records** is set to **Off** then the records stored together with date and time would be 1, 2, 3, 4, 4, 2, 3. i.e. the 4 at the beginning of the unchanged string and the 4 at the end are stored but those in the middle are not. If multiple channel inputs are used then the record for all channels will be logged if one or more channels changes value.

4.1 Datalogger Configuration Tools Menu

The following selections are available under the Datalogger Configuration window Tools menu:

Enter Password - the password is not implemented in this version. Click on **Cancel** if you are in this window.

Form Capture - allows the **Datalogger Configuration** window to be saved as a bitmap or sent to a printer connected to the PC.

Auto Refresh - the auto refresh can be disabled or set to update once per second or once per ten seconds. If the window is not auto refreshed the values shown under **Current Window** will not update until the **Reload** button is clicked or until the **Datalogger Configuration** window is closed and opened again.