

DM-620 Data Logger - PC Interface Software Program

Operating Guidelines

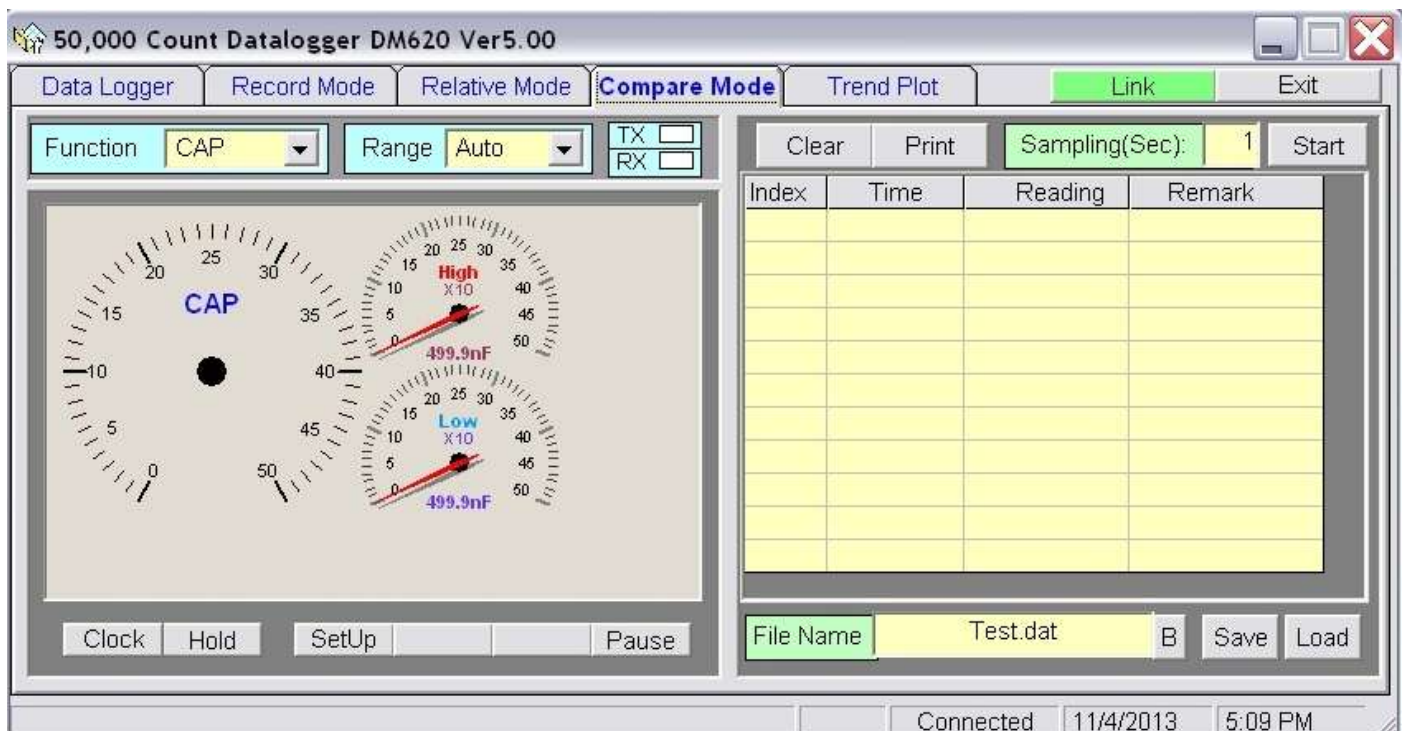


Figure 1: Compare Mode

INTRODUCTION:

The Digital Multimeter (DMM) Data Logger comes with a CD-ROM that contains a software program that can be installed onto a computer hard drive. This program provides a user-friendly interface through which the Data Logger can be controlled. Data collected via the Data Logger while it is connected via USB cable to the computer (PC = Desktop or Laptop), can then be saved to the hard drive and stored for later retrieval by the interface, or even by another program capable of processing the raw data into a usable form.

The following guidelines have been written to describe how to use the PC Interface software program '50,000 Count Data Logger DM620 Ver5.00'. This information is displayed on the top of the PC interface window.

NOTE: There is no 'readme.doc' file on the CD Rom Version 5.0 that is enclosed with the Data Logger, despite what is mentioned in the printed manual, chapter 7-4. The printed manual is the most comprehensive summary of the Data Logger's functions that has been provided to date. These guidelines follow from chapter 7 of the Data Logger DMM User's Manual (User Manual), and they will make a few references to various pages that are relevant to the operation of the LoggerDMM software supplied on the DM620 CD ROM Ver 5.00.

REMEMBER: When the PC-based Logger software is connected to the Data Logger unit via the USB cable, and the LoggerDMM software and the device are 'Linked', then the PC program is in control of the data logging operations. All changes in parameter and function settings in each available mode can and must be performed via the PC interface. The physical buttons on the DMM Data Logger handset panel are frozen, except the POWER button. In this manner, the PC software interface does the same thing as the LOCK button on the front panel. Even the light button is disabled.

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When a user activates a mode of operation for a particular function from the PC interface controls, the Data Logger will display its normal form of the same mode and function on the LCD screen. i.e. Click with the mouse on 'Relative Mode' on the PC interface menu tabs and 'Function OHM', and Relative Mode screen will be displayed on the Data Logger itself to log readings for resistance in ohms. The Data Logger and the PC software do not show each mode in the same way on screen. See chapter 3-3 in the User Manual for DISPLAY MODE MENU MAP.

Every action initiated from the PC interface is mimicked simultaneously on the Data Logger LCD screen. The two devices work in near perfect unison when they are linked, and the data readings displayed on the PC screen are the same as those recorded on the Data Logger LCD screen. See chapter 3-2 of the User Manual.

MODES- GENERAL DESCRIPTIONS:

There are five modes of operation available via the PC Interface – Data Logger Mode, Record Mode, Relative Mode, Compare Mode, Trend Plot Mode. When the DMM Handset and the computer are connected and in a linked state, these modes are chosen from the PC interface by clicking on the tabs at the top of the window.

Data Logger Mode – Measures the readings for a function at set intervals and stores these raw values in memory. In every mode, the time at which each reading is taken is also recorded. See Fig 2.

Record Mode – Simply records the readings of a function, and tracks the Max and Min readings as they are taken. See Fig 4.

Relative Mode – Simply records the deviation from a set reference value for a particular function, and tracks the percentage error above or below the set reference as the measurements are read. See Fig 5.

Compare Mode – Set a high value and a low value for a particular function and the device will report if the measured readings are at or above the high limit or at or below the low limit values. It also conversely shows when the values recorded fall within those limits. See Fig 1.

Trend Plot Mode – Basically the same as Data Logger Mode except that the logged readings are also plotted on a simple graph as they are taken by the DMM handset. In Setup, the user can set the reference value, and the vertical (Y-axis) and horizontal (X-axis) divisions on the graph. See Fig 3.

STEPS TO USE PC INTERFACE:

1. Press the power button on the Data Logger. The start up screen displays a product logo: "SMTECH.DM620A". Underneath it displays 'S/N' and a number matching the serial number on the back of the machine. It also states a date: "Cal: 11-30-2011". This is the calibration date, and corresponds to when the unit was tested at the factory before being shipped.
2. Once the Data Logger is turned on and has entered the ready state, the user can press 'MENU' button to choose the Mode in which the device ought to operate. The 'FUNC' button will activate another menu from which the function or parameter being measured can be selected by the user. The activation of these modes and functions are described in the User Manual in chapter 3-1-7.
3. Using the supplied probes, the user can take data measurements for the desired function. The user chooses the mode that is appropriate to giving accurate results in a format that is most relevant to the task. The Data Logger does NOT need to be connected to a computer in order to collect data. The Data Logger can do this at a remote location for as long as the internal battery will permit operation to continue, usually around 12 hours on a single full charge.

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- With the PC or Laptop computer switched on and booted up, and the USB cable connected from the Data Logger into the PC, load the 'LoggerDMM' program that has been installed from the CD-ROM onto the hard drive. The installation of this software follows the normal patterns of installing new programs onto a Windows-based computer, from Windows XP through to Windows 7.

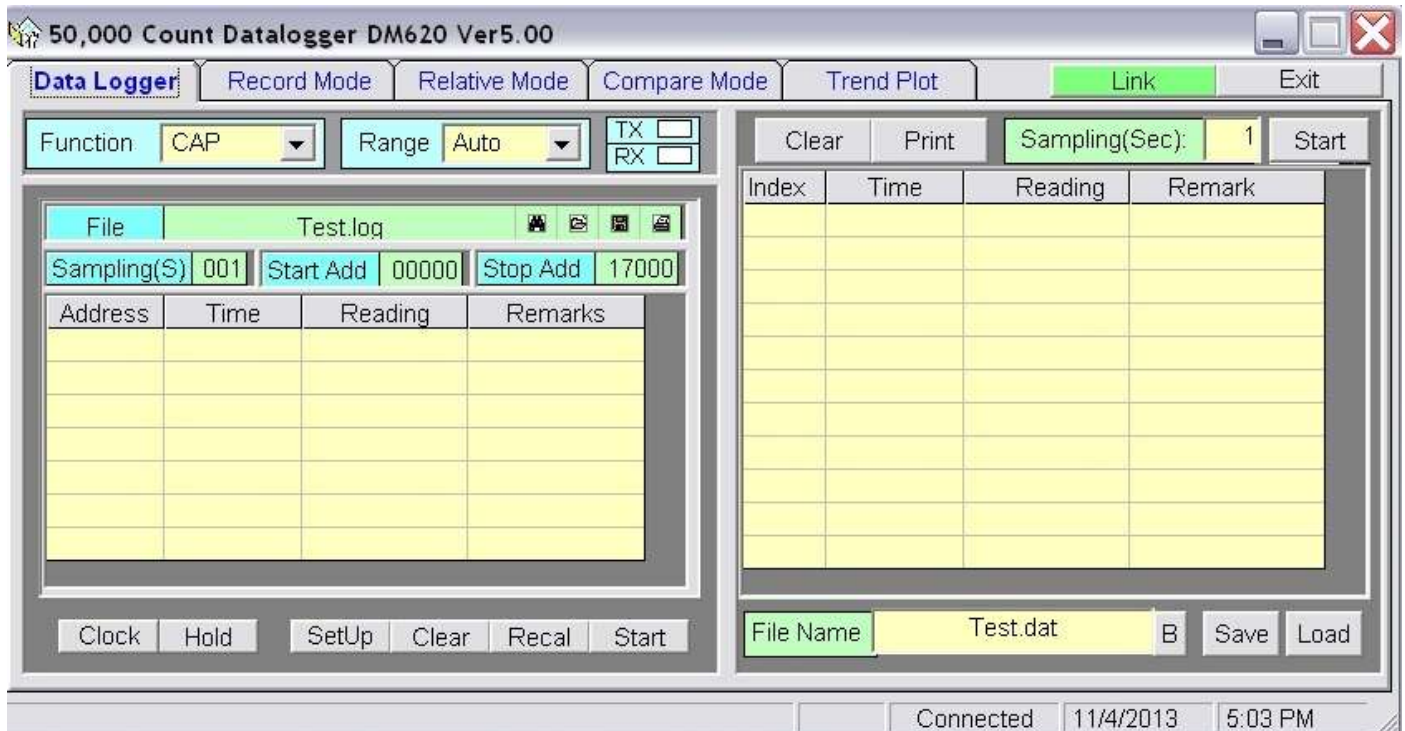


Figure 2: Data Logger Mode

- Once the Logger program has begun running, the following screen should appear (Fig 2), although the LHS may be different since the program will show whatever mode the Data Logger is in when the link is established:
- On the lower status bar of the Logger program window you will see the word 'DISCONNECTED'. This means that the Logger program interface and the Data Logger multimeter device are not synchronised via the USB link. To link the two devices together electronically, so that they can operate in SYNC with each other, the user must use the mouse to click a 'button' called 'LINK' on the PC interface window (top right). Once this has been clicked the Data Logger and the computer will talk to each other. The evidence of a successful linkage will be the appearance of the word 'Connected' in the bottom status bar. In the Data Logger DMM User's Manual, Section 3-2 shows which ICONS appears on the Data Logger LCD to indicate the status of the device. Number '5' shows the presence of an active USB link between the PC and the Data Logger.
- While the PC and Data Logger are linked via USB, the PC interface program will be able to record or log data measured through the device's probes. What data is measured and in what mode it is presented is determined by the user. The first mode that can be used is 'DATA LOGGER' mode. This appears as a label on a tab across the top of the Logger program window, on the far left side. See the picture above. These tabs carry the same labels as are displayed for the modes listed when the user presses the MENU button on the Data Logger, when the Data Logger is disconnected from the PC.
- Regardless of which mode is active in the PC interface, there will always be two windows within the Logger program window – one on the left and another on the right. The RHS window does not change, and displays the word 'Sampling (Sec):' at the top of it, while the LHS window changes for each mode of operation. In the Data Logger mode, the left and right side windows look quite similar, as shown.

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9. You will find 'START' buttons on each window in most modes. The LHS START button will start and stop or pause the data collection underway in the chosen mode, according to the format of that mode (Trend Plot , Data Logger, Record Mode, Relative Mode, Compare Mode). The RHS START button will start and stop the data measurement underway in that window under any mode, and the format will be the same for every mode.
10. When the 'START' button is pressed, you will see the data for that function appear on the PC window. It should also appear on the Data Logger screen as well, since clicking the START button on the PC interface is the same as pressing the START button on the device itself. Click that START button again, and the logging should stop.
11. Press / Click the 'CLEAR' button to clear the data measured. Both the LHS and RHS halves of the main PC interface window have CLEAR buttons which will remove / delete the data recorded in that window.

BUTTONS THAT ARE COMMON IN THE PC INTERFACE AND THE DMM HANDSET:

Almost all the buttons which are present on the front panel of the Data Logger as also available on the PC interface. Many of the soft keys that are operated by the function buttons on the Data Logger front panel – F1 to F4 – are also available in a given mode on the PC interface. These operation buttons are usually placed under the LHS screen log and correspond to the mode that is active at that time. See the USER Manual chapter 3-2 and 3-3 for more information.

- Data Logger buttons that have corresponding software operators are: FUNC (Function); HOLD (Hold), AUTO# (Range).
- Data Logger soft key function buttons that have corresponding software operators are: Reset, Pause, Setup*, Set, Beep, Exit, Start, Recal^, Clear, Clock (not for time setting as such, which is contrary to the function of the Clock softkey on the Data Logger itself).

*** SETUP** –In the PC interface, this button has the same operation as the commonly used F1 function softkey for SETUP on the physical device. For each function selected by the user, the SETUP command allows the measuring parameters or limits to be set for that function in the chosen mode. See User Manual chapter 3-1-7 for more details. The actual SETUP button on the Data Logger front panel is only used by the Data Logger itself to setup the unit's system operating conditions, as described in the User Manual chapter 3-1-10.

^ RECAL – This button appears on the LHS window in Data Logger mode ONLY. It is used to recall data stored on the Data Logger device directly for a particular function or measurement parameter. This data is collected without the Data Logger – PC link being active i.e. independently of the Logger software. Clicking on this button in the interface will transfer the values stored in the Data Logger into the PC program LHS window. From here the data can be saved into a file and kept for later retrieval (See below for instructions). When in Data Logger mode and not connected to the PC, press the F3 softkey 'Recal' on the Data Logger to recall the stored data from memory to the LCD screen.

AUTO - There is no AUTO button in any mode on the PC interface, and the AUTO button on the device is disabled when the PC and the Data Logger are synchronised via a USB link. However, the 'Range' button that is present in every mode menu in the PC program, operates the same as the AUTO button on the front panel. When the Data Logger is independent of the PCB, Auto ranging is the default condition for each function. Pressing AUTO once disables auto-ranging and removes the mark 'AT' from the LCD screen. This then permits the user to set the range for that function manually by pressing the up/down cursor arrows on the front panel. The 'Range' button in the PC interface is also programmed to default to 'AUTO' ranging, but any available range can be chosen by clicking on the 'Range' button and using the mouse to choose an appropriate range for the function. Some functions have a limited range and some only operate in automatic ranging. The ranges that are available for each function are stated for the

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DM-620 in chapter 5 of the User Manual. (The method of manually setting the range for measuring function values using the Data Logger when not connected to the PC, is not explained in the supplied manual.)

ICONS IN THE LHS / RHS WINDOWS OF THE PC INTERFACE:

In Data Logger and Trend Plot modes, the PC interface allows the user to find, save, load, and print data files stored on the computer. These operations are controlled by clicking on icons as described below:

- Binoculars = Find a file in the software directory.
- Folder = Open the filename displayed in the field.
- Diskette = Save the data in the LHS log sheet or on the trend plot graph into the filename displayed in the field.
- Printer = print the data in the log or on the graph into a .tif extension file.

There are no icons in the RHS of the main window. This side does offer similar data transport operations as described thus regardless of what mode is activated in the LHS Window:

- B = Browse for or find a file in the software directory.
- Save = Store the data in the RHS log sheet.
- Load = load or open a file of the name displayed in the field to view the data already saved.
- Print = print the data in the log or on the graph into a .tif extension file.
- Start and Clear and Sampling are also buttons that are used to operate the data measurement features of the RHS window.

IMPORTANT: The buttons 'TX' and 'RX' that appear in the interface on most LHS window modes, exist merely to show that data is being transmitted to (TX) and received from (RX) the Data Logger via the PC interface link. These icons light up briefly from time to time during operations to show that the PC and the Data Logger are communicating via the active link.

FILE MANAGEMENT WITHIN THE PC INTERFACE:

At the bottom of the RHS screen window, you should see 'FILE NAME' and "Test.dat" in the field beside it. This is the name of the file into which logged data measurements can be saved. You can also rename it by clicking on it and typing a new name in this format "NAME.DAT".

Click the mouse pointer on the 'B' beside the file name on the RHS. This should bring up a new mini window to browse the PC file directory wherein the Logger program saves its important data files. You can use the directory tree displayed to determine where the file is saved. Once that has been done, close that window and then click 'SAVE' to save your file to the location you have chosen in whatever name you have selected for the purpose of your data measurements.

There are other files used by the PC interface program to store different types of data, depending on which mode is being used to record the data. Only TEST.DAT can be renamed from within the Logger program. The other files – Test.trd and Test.log – cannot be changed, but files of different names can be created using Notepad. Simply open Notepad program in Windows, and save a blank file of whatever name into the disk location where the TEST files are already saved. The formats of the files thus saved are as follows:

- Test.trd >>> Name.trd. The file must have the '.trd' extension to be recognised by the Trend Plot mode.

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- Test.log >>> Name.log. The file must have the '.log' extension to be recognised by the Data Logger mode.

Newly created files with these extensions can then be opened within the PC interface within the correct mode and used to store data for a particular event, and then saved for future reference. The '.log' and '.trd' files contain data that can only be opened successfully within the Logger program when the Data Logger is connected and the PC interface is activated and the two linked. But the 'XXXX.dat' files can be open externally in Notepad, and these files can be imported into Microsoft Excel spread sheet program.

USING THE DM-620 HANDSET AS A DATA LOGGER:

1. Refer to User manual 3-1-5. Use the MENU button to select the Data Logger mode on the DMM. Use the FUNC button to choose function.
2. Activate SETUP (F1) to set the variable limits within which you need to measure the data for the chosen function.
3. Hit F4 to START the logging of the data. Log the readings at the probes for as long as required – seconds, minutes, hours, days (unit will need to be plugged into the power source via the USB cable to keep the battery charged).
4. Select the START tab again to stop recording the data once the required number of samples has been collected. These data values are automatically saved in the Data Logger memory and can be retrieved later by pressing the RECAL button (Softkey F3 in Data Logger Mode).
5. Connect the Data Logger handset to the PC via the USB cable.
6. Start the LoggerDMM program. The PC interface window will appear on screen. See Fig 2.
7. Click on the 'LINK' button at the top RHS of the window to synchronise the Data Logger and the PC interface and thus allow them to communicate. The word 'CONNECTED' will appear in the status bar on the bottom of the LoggerDMM window, and from now on, the PC controls the Data Logger functions completely (except the Power button).
8. When the PC / Laptop and the Data Logger are linked / connected, click the Data Logger mode tab on the top left of the PC screen.
9. Then click the 'RECAL' button on the bottom of the LHS window of the interface, beneath the empty log sheet. The data from the Data Logger will now load into the PC interface Data Logger mode log sheet.
10. To save the data thus transferred into a file on the PC hard drive, click the mouse pointer on the small diskette icon located to the right of the filename 'Test.log'. Click on OK and the data will be safely stored in the Test.log file on the computer.
11. Click on 'CLEAR' button in the PC interface to clear the data. This data file can be opened again by clicking on the open folder icon to retrieve the 'Test.log' file contents and display them again on the screen within the interface.

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USING THE DM-620 SOFTWARE IN TREND PLOT MODE:

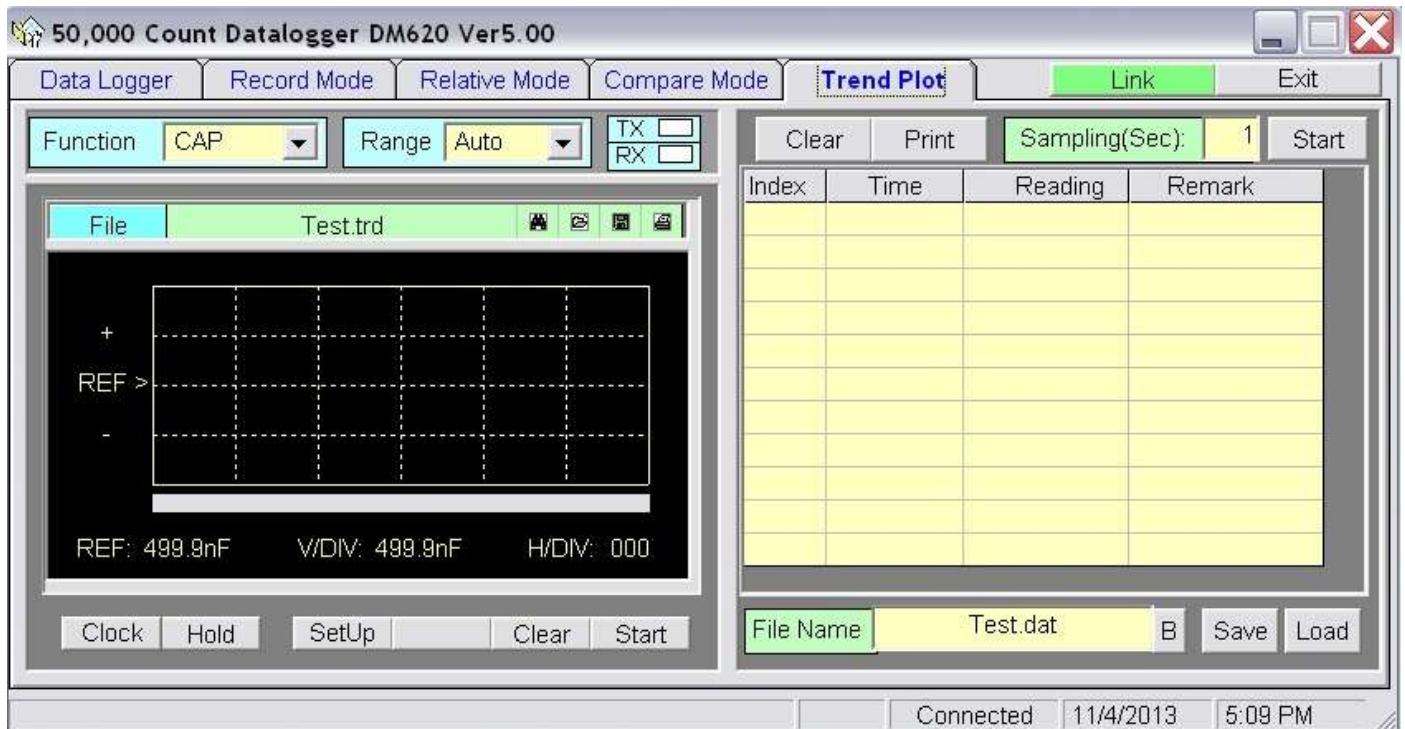


Figure 3: Trend Plot Mode

1. Connect the Data Logger to the PC via the USB cable.
2. Start the LoggerDMM program. The PC interface window will appear on screen.
3. Click on the 'Link' button at the top RHS of the window to synchronise the Data Logger and the PC interface and thus allow them to communicate. The word 'Connected' will appear in the status bar on the bottom of the LoggerDMM window, and from now on, the PC controls the Data Logger completely (except the Power button).
4. When the PC / Laptop and the Data Logger are linked / connected, click the 'Trend Plot' mode menu tab on the top right of the PC screen. (On the Data Logger, Trend Plot mode is called 'TREND MODE'.)
5. Activate SETUP to set the limits within which you need to measure and plot the data for the chosen function.
6. Click START on the LHS of the PC Interface window, underneath the graph grid. Log the readings at the probes for as long as required.
7. Select the START button again to stop recording the data once the required number of samples has been collected. These data values are automatically plotted in the graph, and have also been stored in memory.
8. The Trend Plot data can be saved into the 'Test.trd' file. To save the data thus collected into a file on the PC hard drive, click the mouse pointer on the small diskette icon located to the right of the filename 'TEST.TRD'. Click on OK and the data will be safely stored in the 'Test.trd' file on the computer.
9. Click on 'CLEAR' button in the PC interface to clear the data. This data file can be opened again by clicking on the open folder icon to retrieve the 'Test.trd' file contents. This data will be displayed again as a graph plot on the screen within the interface.

NOTE: In Trend Plot mode, it is possible and perhaps necessary to simultaneously use the RHS window to record the actual data values that are registering as plot points on the graph on the LHS, and also on the Data Logger LCD itself.

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Simply click START button at the top of the RHS window next to the word 'Sampling'. (The RHS window never changes shape regardless of the mode selected for the LHS window, which alters form for each different mode to match what is normally displayed on the Data Logger's LCD screen.) The RHS side data recording feature is the only means of collecting and storing raw data for a chosen function and saving that data in 'Test.dat' file to the PC.

It is also possible to collect and ultimately save data in the RHS window while operating in all other modes except Data Logger mode. Indeed, the other modes and the RHS data log sheet are SUPPOSED to be used together in order to collect raw data and save it into 'test.dat' into a form that can be processed by other programs. Only Data Logger and Trend Plot modes have their own data files that can be saved and retrieved in that mode via the PC interface.

WARNING!: If you try to record data both in the Data Logger Mode log sheet (LHS) and the RHS log sheet, the whole system will quickly freeze, since the two sides are essentially doing the same task at the same time. If the PC interface becomes unresponsive, the solution is to power off the Data Logger. This will forcibly break the link via the USB cable, and the PC interface will be restored and can commence logging data again.



Figure 4: Record Mode

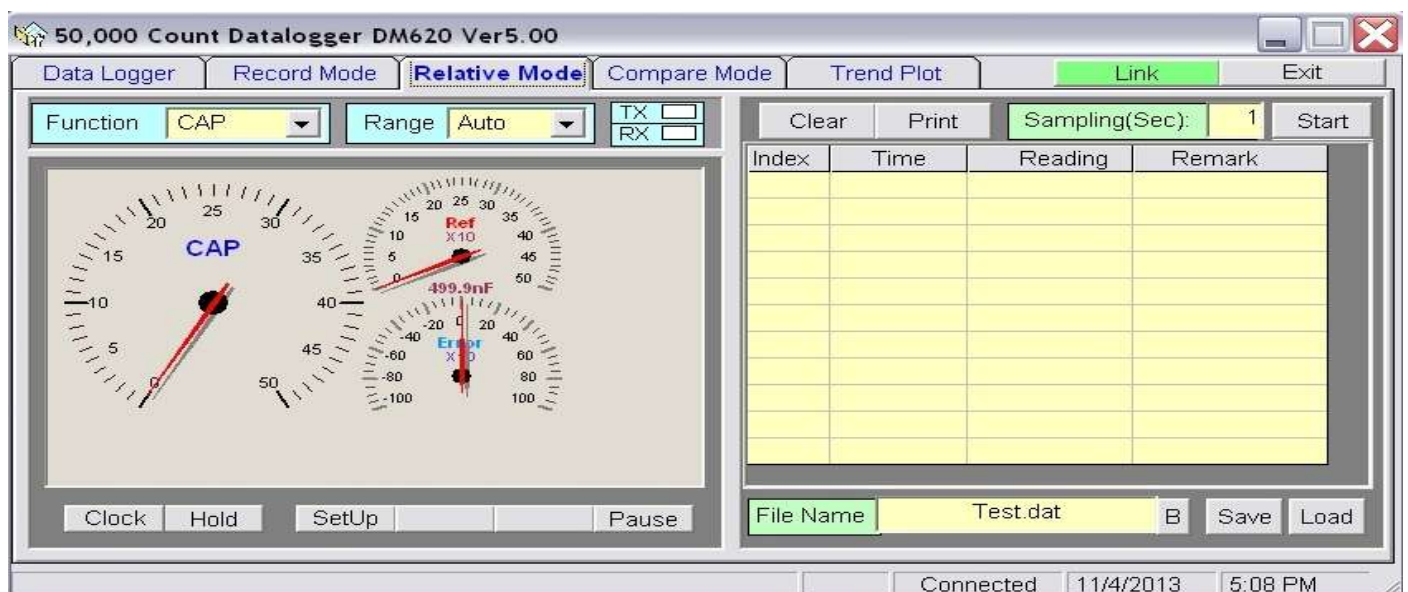


Figure 5: Relative Mode