USER'S MANUAL

PC PROGRAM FOR WINDOWS 11/10/8/7 AND FUTURE VERSIONS

MK30LP and MK30LPSimple Programs

V110

For

MK30LP Variants and MK30LP-CUBE On-line Microwave Deep Moisture Microwave Meters

These programs support the MK30LP products of Visilab including some tailored/OEM products

Note that small changes may appear in the latest program version.

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Revision History

V10.30 the production version released in February 2021. Generated with LV20-32
V10.39 new features added
V10.40 the program MK30LPSimple is introduced
V10.41 The reference calculation is made accessible through the MK30LP program
V10.41F additions to features, like division of archived data by channel 6 on the Archives page, and the optional web temperature sensor signal readout
V10.41G the web temp. options are now available in this software too. They are still in the terminal mode accessible from the second serial port as everything is.
V110 small enhancements and ther is a selector in the start of the program for using either MK30LP or MK30LPSimple programs.
V110K the WET/DRY settings are removed and meters are running in WET mode always

Contents

1. Introduction

This document instructs you on how to use the **MK30LP** PC user interface program with your product. Refer to the instrument's own user's manual covering details the meter itself. The **MK30LPSimple** program follows closely this program and the same guide applies with a limited set of features. The program images are displayed only if they are different.

This program has a great number of features most useful for all users of **MK30LP**. One can acquire real-time data from the meter and set up all features of the meters available through the serial port. A printer can be used for documentation as well as reporting to HTML files. All acquired and downloaded data is saved into the traditional **IRMA7** format which is compatible with all spreadsheet programs. In addition, one can save the same data into various formats for use with other software. This program is a true multitasking system capable of performing simultaneously several tasks at the same time. You can operate with the memory bank system and control it fully while at the same time acquiring e.g. real-time data for your quality control system. The program has been made as simple as possible to use it flexibly. There are no menus at all (except a few small ones associated with the graphical displays) and everything you see is what you get. All actions are started by pressing buttons and meter status is indicated with various LEDs. You are using a virtual instrument in your PC though there is a true instrument behind it producing the data at the other end of the communication cable.

1.1 Installation of the PC program

Important Notice for Windows 11/10/8/7 Users

Before starting, it is important to make sure you have administrator's rights in your PC to install programs, read and write files etc. with full and widest possible rights. If not, ask your computer/IT manager to do this phase for you or switch the PC user to an administrator. It is possible that after a successful installation, you encounter strange error messages when files are tried to be saved to a hard disk. These problems are mostly due to **insufficient file writing rights**. If it is about a data file saving when the data Acquisition is stopped, the system refuses to open a file for writing. You have as alternatives increasing the user rights or separately allowing full file rights to that particular folder you are trying to access. You can also find another folder for file saving which is not limited in access (e.g. My Documents, My Folders etc.). Also, if right after starting the program, an error message appears, it is likely from a missing configuration file of the program itself. This is not dangerous at all since you are about to set up the program features first and then to save the configuration.

The PC program is installed as follows. The simplest way is to locate the small program **Visilabinstaller.exe** or some other **install.exe** or **setup.exe** pointing to this program product on the USB stick and start it. You will be presented with a selector for installing one program at a time. To install a particular program, you can also do it by locating the program **setup.exe** in any of the pertinent folders of the USB memory stick. Start it and perform the simple and quick installation. You are then ready to start working with this program. Locate the icon for the program **MK30LP** and double-click it to start. A shortcut is created automatically onto your Desktop to easier locate it in the future. In the following we will shortly go through all the features available in this software. Most features are more or less trivial and do not require any deeper knowledge. The memory stick can be reused for any suitable purpose after this installation. Remember to make backup copies of the whole stick before you use it elsewhere. You can update to the latest version of this software on thew manufacturer's website (www.visilab.fi).

Now there is a selector for using either the full MK30LP or the reduced MK30LPSimple programs. The selector remains on the screen and the program is stopped with it at the end.

1.2 System Requirements

This software operates in Windows 11/10/8/7 environments if you have at least 750 MB of memory available. Hard disk space of 800 MB is required for installation and starting the program. Archives will most likely require more space. A 2000 MHz Pentium is the minimum CPU requirement but higher is recommended for quicker operation in various tasks. The minimum screen size required by this program is 1024 x 684 pixels. Smaller screens will lead to cumbersome use of the program and larger screens allow easier use of other programs at the same time.

1.3 Style Issues

All square buttons at any page start some action and are not left pressed down except for a limited time. Some rectangular buttons are settings which are either left as pressed down or are later updated by the program to reflect the status of the meter. The indicator lights are statuses read from the meter or generated by the program and can not be changed by the user directly. Typically, they have either a grey or orange colour. In some special cases, the colour may be red to warn the user of some problem.

There are some large buttons whose colour, when pressed down, is bright yellow instead of the regular orange. They are also left at their state until the user changes them himself. These buttons are used, for example, for **starting data collection**. This means polling data from the meter at regular time intervals. The purpose of this is to indicate the user to change himself the button's state or the operation. Each of these special buttons have an indicator light at the left edge of the display to remind of their use (a pending operation). There are also LEDs for other operations whose momentary operation may take a longer time to finish, like downloading a library.

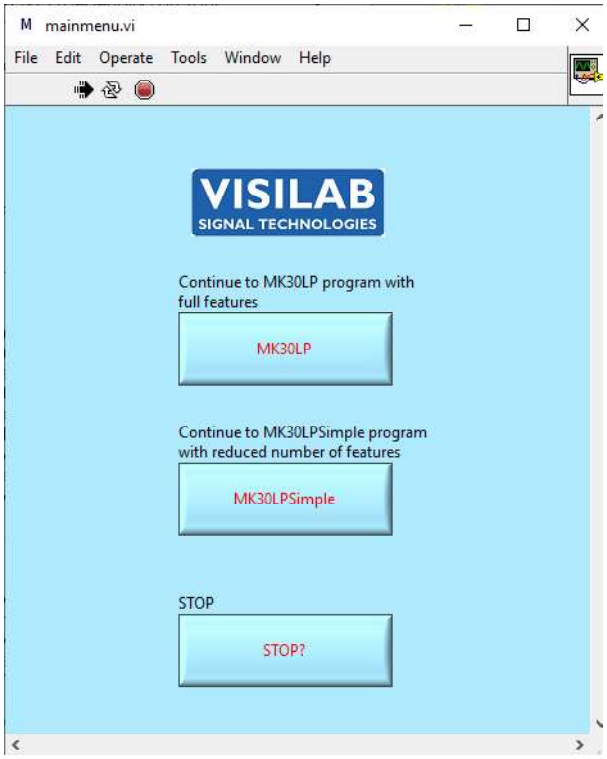


Figure 1-1. The main menu

Help

If you are in a trouble while using this program, try pressing the **F1** key (a function key) in your keyboard or click the square Help button on the right top corner. If you have a default HTML browser and a default PDF file reader available, this manual and other pertinent ones are available for you.

Editing

The managing and editing of any items in the dialogs is as otherwise in Windows. You can press buttons, type in text fields etc. **The only remark at this point is that please, do not end editing by pressing the Enter key as you may have accidentally have some button selected.** This is rare but may cause unexpected reactions at times. Instead, click the cursor of the mouse to any other safe location on the program's panels to stop data entry or modification.

Cursor Tip Help

Most buttons and display items have a built-in short textual description the purpose or use of each. Just move the cursor over the item and quickly you will see the text which will soon disappear. The same applies to retrieved file names where you can see some attributes of the data in it. This may prove useful as the start and stop times and sampling interval are declared.

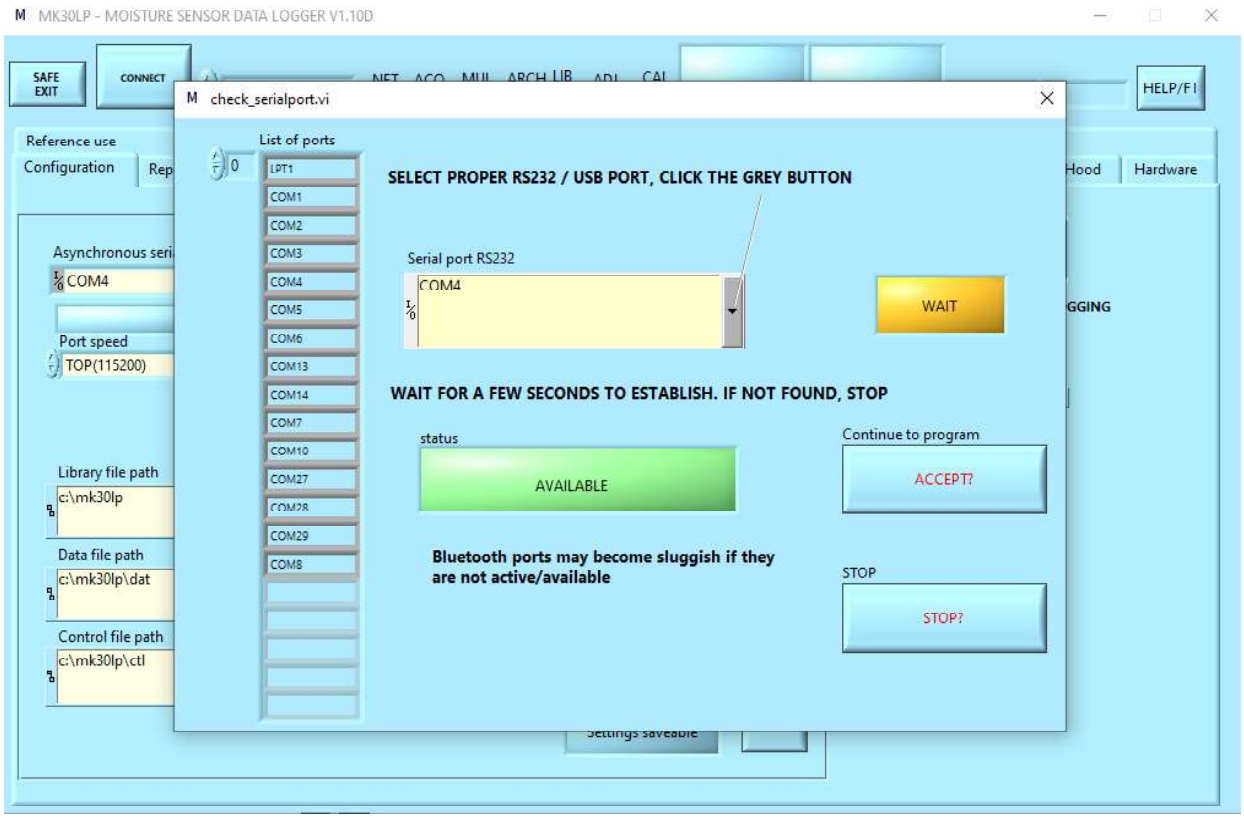


Figure 1-2. The selector for the communications port to be used. It can be changed later at any time but a valid port is required. The meter is not required to be present at this time.

2. Configuration Page

Before starting to use the program, you need to check the settings with **yellow background** (port, meter model and slave address). They need to be set before you can start communicating with the meter in **ON-LINE** state. The **port** selection is highly important and refers to the serial port your meter is connected with in your PC. Use only ports COM1 - COM255 or ASRL1-255 depending on your system. There are **USB to RS232 adapters** available for Windows operating system in case you do not have any RS232 ports in your PC. Incorrect port selection will cause error messages when you try to start using the software. Use the **arrow down button at the right end of the selector** to choose from the list of available ports. This setting is saved but it is wise if you do check it. Refer to Figure 2-1. The systems are now delivered with an isolated RS232-USB converter. Before using this software, please install the converter driver.

Stopping

To stop working with this software, turn off any pending tasks on their corresponding pages. Go to OFF-LINE state and optionally, save all settings used. Press the SAFE EXIT button to stop. Untimely pressing of this button will lead only to a short tone signal. In **emergency**, you can stop this program without saving either data or settings by pressing the small button marked X at the top rightmost corner. The actual stopping in normal operation is done with the Stop button of the main menu.

The meter's **slave address** is important for proper working of the communication. The default address is **1** but you may have changed it for some reason. In a multiple meter delivery, each of the meters will have its own address. The allowed range is 1 - 255. Zero is reserved for the program itself (master) and can not be used for slaves. Using an incorrect slave address will cause inoperable software with long delays between actions and messages like "No response" etc. If you have changed the address and can not remember it, go to Keyboard mode page and enter Keyboard mode. Restart the meter and press the space bar. Soon you should be able to go to the communication menu of the meter to check or set the address. Refer to the meter's User's Guide for details. Then, exit the Keyboard mode and you can then set the slave address at the Configuration page. An even more elegant and simple way of detecting perhaps several slaves attached to the local network is to use the **Network Explore task** (refer to Network page). The baud rate to be used with the MK30LP is always **115 200 bauds**.

To properly save all library, meter configuration and data files, it is recommended to set the two fields in this same box as well. The file path is used for saving the library and meter configuration files in the future. The recommended path is **C:\MK30LP** or something like depending on the product you are using. The data files generated during operation are saved into another directory whose path you can set in the lower dialog. The recommended path is **C:\MK30LP\DAT.** You can also use the small directory dialog buttons to the right to select and even create new paths. You can use any valid folder or directory names for these options. Just make sure they are both defined. Using the Windows' suggested **My Documents** folder is a good working place too with minimal accessibility problems which may be a nuisance in Windows. Create a few folders branching from this.

There is a control file folder required too, even if you are not using this feature. That is the folder where run-time control data files are saved. The suggested folder might be: **C:\MK30LP\CTL.** You can change it to anything more suitable for you.

Pressing the **"Save settings" key** will save the settings inside this box when starting the next session. Also, the most important settings on the Multiple slave page are saved. At the next launch of the program these settings are automatically restored.

Notice that changed settings are effective only after entering **OFF-LINE** first. Most of the operations available in this software are usable only if you have a meter connected to the serial port. The exceptions are the **Archives and Mathematics pages** which you can use without any meter connected to study retrieved data. This program works in Windows 10/8/7 and in future versions.

To start running the software, press the large button marked **"CONNECT"**. Pressing later on the same button (with name **"DISCONNECT"** at that time) again will return you to the same Configuration page after a few seconds. However, you need to have all pending operations stopped before doing that (yellow lights at the top edge). There is a small indicator on the Status page, "Settings saveable". It turns to orange colour and displays a text: "Settings locked" when you are accessing this page while in ON-LINE state.

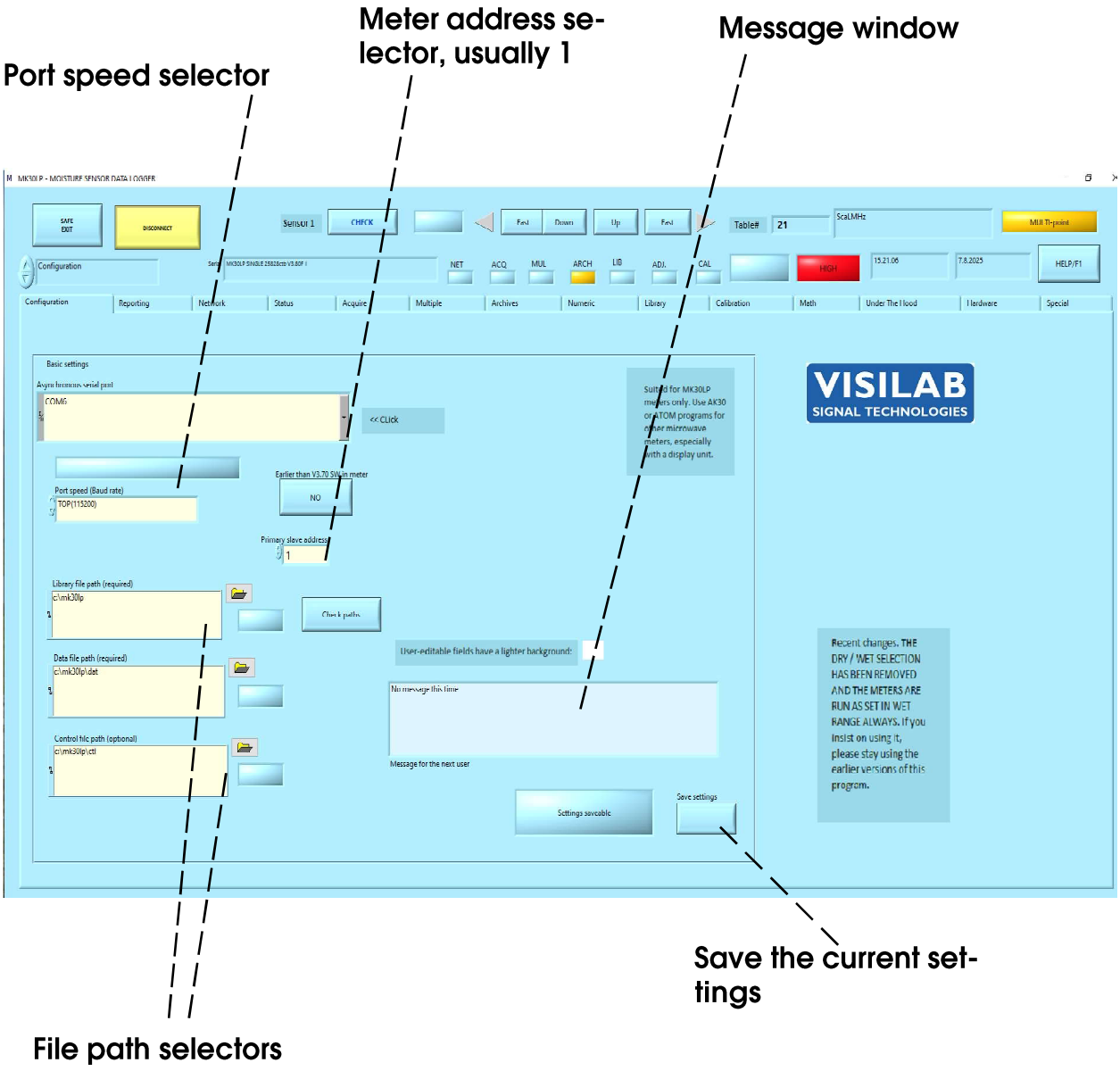


Figure 2-1. The Configuration page (MK30LPSimple on next page)

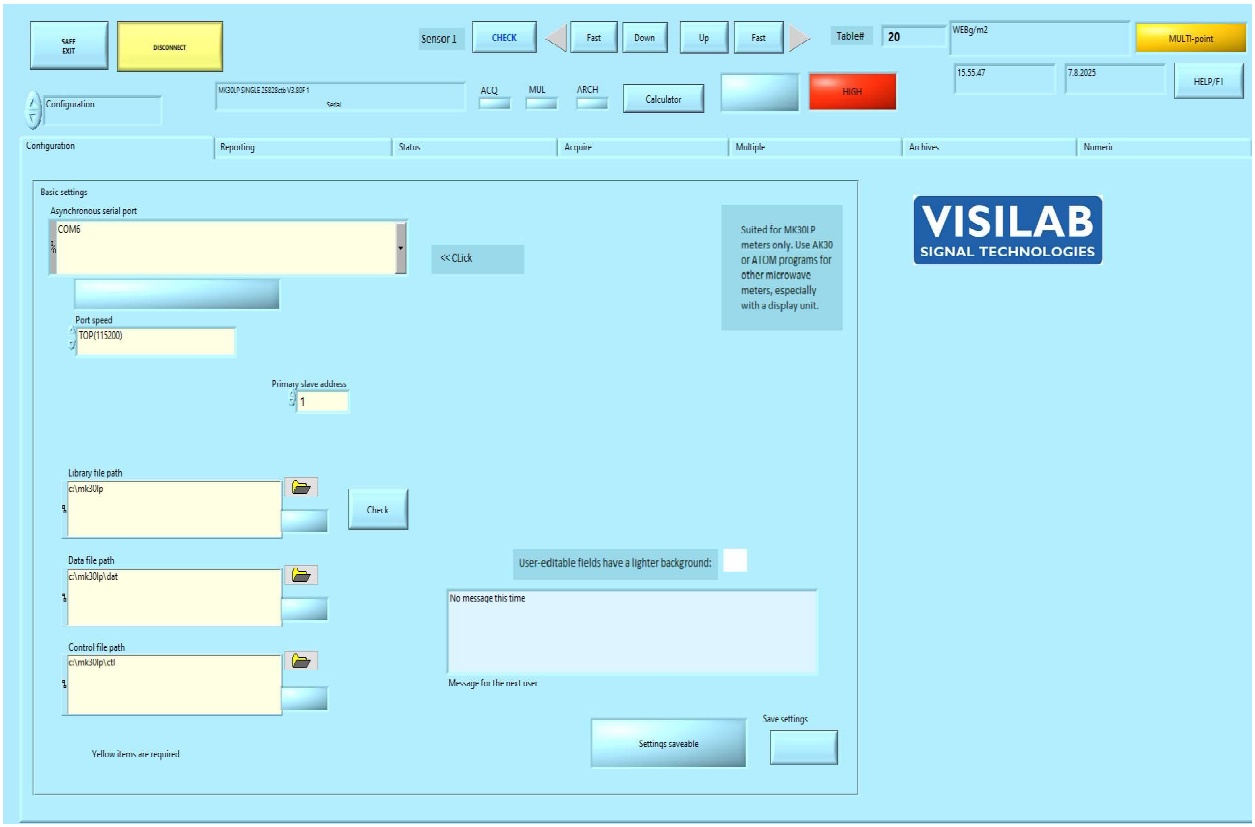
There is a message window available for free use. The idea is to type in some message and save the settings. The next time anyone enters this page will see the message. One screenful of text is the maximum amount, no novels, please.

2.1 Note for Multi-slave Operation

As this software is capable of collecting data from many slaves in a network (**LAN485** or **LAN232** products made by Visilab), it can flexibly retrieve data from all of them and you can check the configurations of each while running the Multiple slave operation. One of the slaves is selected as the **Primary slave** and the rest of them are just slaves. The primary slave is used in all other pages of the program, except the Multiple slaves page. In other words, you can start data acquisition on the Multiple slaves page for any slaves and at the same time, you can select freely the primary slave and use any of the other tasks available with that particular slave with only natural restrictions. This means that you can acquire data simultaneously from up to nine slaves. The primary slave address is assigned at the bottom of the display. **Do not change the address while you are already doing something with that slave (except the Multiple slaves page).** Else you may get glitches in signals or other unwanted results. The Acquire task, when started, will use the same primary slave address until it is stopped. Then, you can change the slave and start again.

2.2 High-speed Serial Port

The present on-line moisture meter **MK30LP** has a high-speed serial port for communications to a PC. The default bit rate is 115200 bauds. You can have up to 5 meter cables with RS232 connection. If you plan of having a long cable of tens of meters or even longer, products LAN232 and LAN485 are available. LAN232 works entirely with RS232 communications and wiring and you can acquire data



form eight meter at the same time and have an extended cable of 5 meters after the original 5 m cable. For really long distances, the LAN485 operates with RS485 and can support up to 15 meters and have legs longer than 300 meters. The LAN485 itself will be located near the PC. It does have a 100 m Bluetooth connection to the PC, RS232 5 meters and RS485 for a long cable. In addition it has a USB. These are all for connecting to the PC.

If you plan to change the baud rate, **it must be done both in this software and in the sensor**. When the change has been verified, save the meter configuration and also the program configuration. Thereafter, operation will continue normally at this new speed.

3. Meter Status Page

You can quickly check the meter settings by selecting the Meter status page. There, you can press the "CHECK STATUS" key to see all information possible of your meter.

You can see the meter's serial number at the leftmost corner. This same box, marked as "Sensor Status", contains data which can be retrieved from the meter. The button "Low power" reflects the powering status of the meter. If you wish to turn the meter into Low power state, press this button and then press "UPDATE STATUS" key. The following state is again an indication of the resulting meter status. The meter's head temperature is very important if it is installed into warm conditions. You can only read the temperature. See Figure 3-1.

The two remaining fields are the **Current sensor** and **Primary Slave address**. The current sensor selector is needed when one needs to specifically make an operation to a particular sensor in a DUAL system (Sensor 1 or 2). At this time the only possibility is at the calibration. Calibration tables belong to a calibration library inside the meter MK30LP (see Calibration page). The two sensors can use any of the 100 tables in it, even both the same table. Usually it is advisable to keep the tables separate from each other and one can assign tables 1 - 50 for the Sensor 1 and tables 51 - 100 for Sensor 2, just for clarity. Either sensor can be separately calibrated with this program. The calibration tables can be moved to the meter / from the meter and saved to a library file. The whole library can be uploaded to the meter / downloaded from the meter and saved to a file (see Library page for those operations). To indicate with which sensor one is working with, this selector on the Status page is critical. Here is the place to change it. Otherwise it has no further meaning. The program itself will toggle between the two sensors while working but will always restore back the one set by the user when something needs to be done. Note that if your system is **SINGLE**, keep always the current sensor at one (1). Else your calibration efforts may go wasted as the system would be working with a nonexistent sensor.

The **Primary Slave address** is important for allowing communication with the meter. Usually it is **1**.

The second box is marked as "Sensor 1". In this box you can select the calibration in use for the Sensor 1. You can press the Check button first the find out the current table. The arrow keys give an immediate effect in changing the table. You can scroll through the whole calibration library.

The third box is for Sensor 2 and is identical to the previous box affecting only the Sensor 2 (if your system is a DUAL).

The next box marked "Save MK30LP configuration", allowing you to save all the settings inside the meter to be used the next time it is booted up. The other button (Save cal. table) in this box is for saving the current calibration table in use in the meter for the current sensor. This is rarely used since the saving in table transfer is automatically done.

NOTE: Always CHECK first the settings before you SET or UPDATE them. The program does nothing in the background unless you explicitly ask it to do.

If a really quiet signal is required, press down the "Run-Time Filter" button. It activates a heavy-duty digital filter affecting both primary and secondary signals acquired (moistures Sensor 1 and Sensor 2, depending on model). It is useful in observing slow changes in quality control conditions. Of course, all fast events will be filtered away. The meter settings are always saved as usual but the Run-Time Filter is not saved for next session in this program.

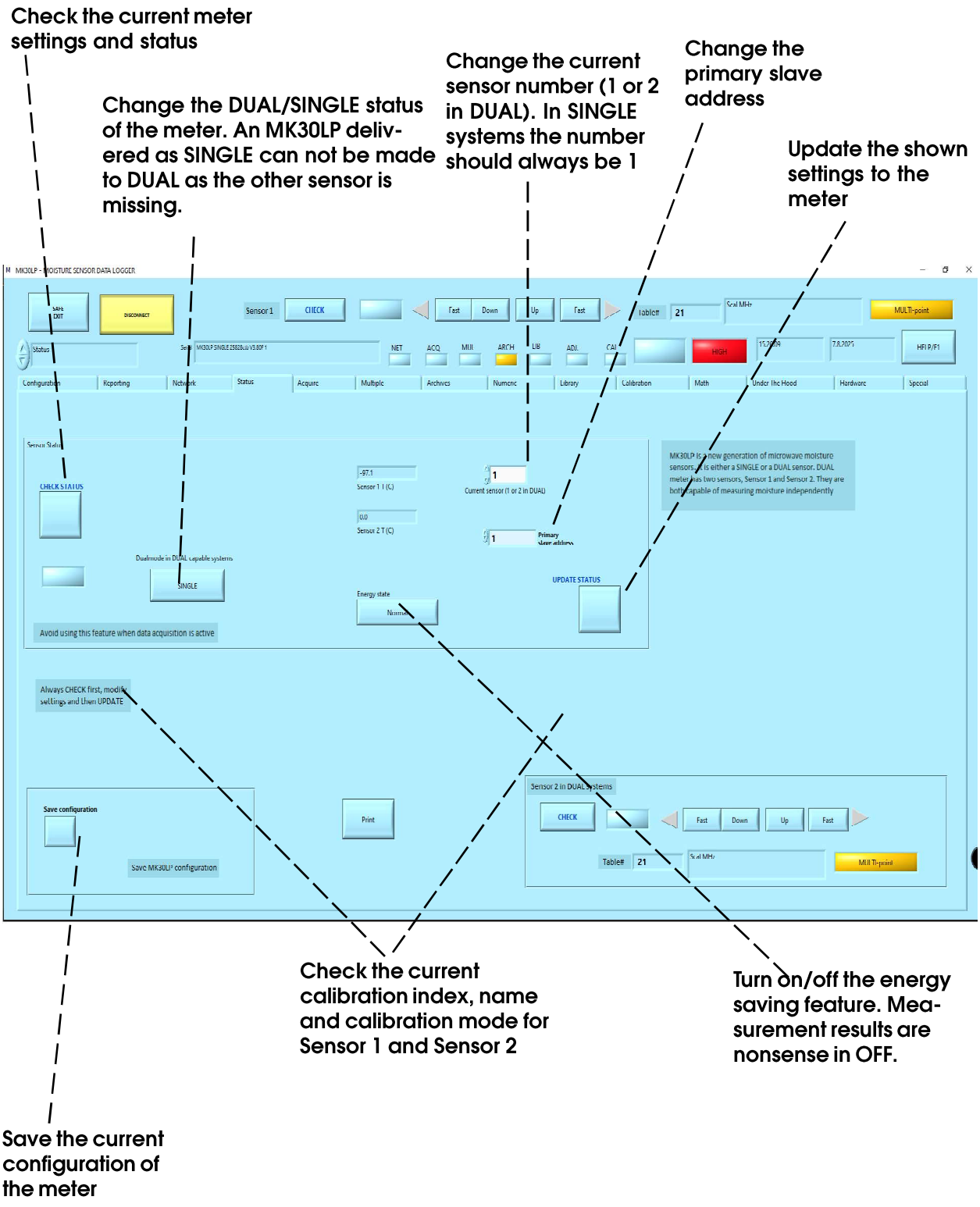
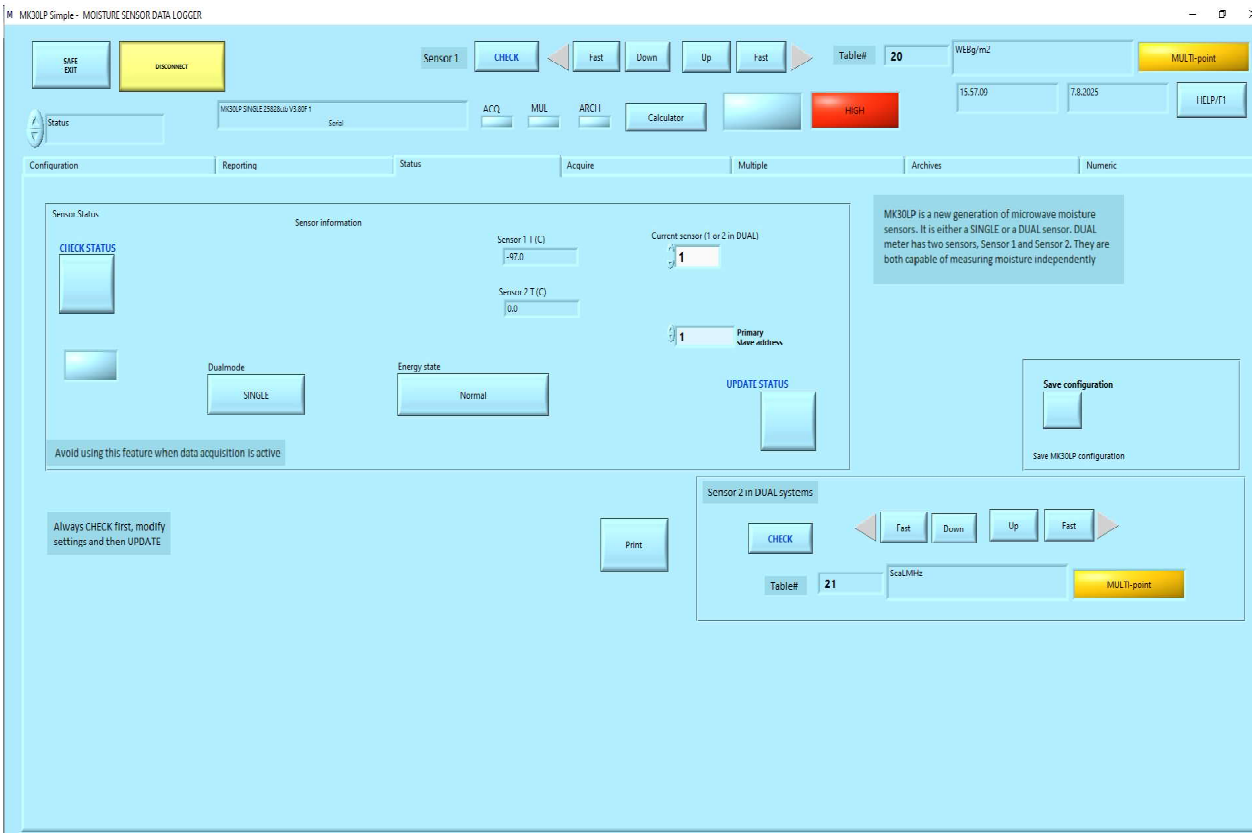


Figure 3-1. The Meter status page for checking/updating the meter's main features (MK30LPSimple on next page). Note that the primary slave address must be correct for this program to operate (default = 1)


MK30LP Simple - MOISTURE SENSOR DATA LOGGER
SAFE EXIT
DISCONNECT
Sensor 1
CHECK
Fast
Down
Up
Fast
Table#
20
MULTI-point
Status
Calculator
HIGH
HELP/F1
Configuration
Reporting
Status
Acquire
Multiple
Archives
Numeric
Sensor information
CHECK STATUS
Current sensor (1 or 2 in DUAL)
Dualmode
SINGLE
Energy state
Normal
UPDATE STATUS
Save configuration
Save MK30LP configuration
Avoid using this feature when data acquisition is active
MK30LP is a new generation of microwave moisture sensors. It is either a SINGLE or a DUAL sensor. DUAL meter has two sensors, Sensor 1 and Sensor 2. They are both capable of measuring moisture independently
Always CHECK first, modify settings and then UPDATE
Print
Sensor 2 in DUAL systems
CHECK
Table#
21
MULTI-point

4. Acquire Page

To start measuring, we assume you have the meter mounted to touch the running web or other surface. Go to Acquire page and press the large button, marked "Start" to change it to "Stop". This will start data retrieval from the primary slave meter if the connection is working correctly. The graphic display shows the accumulating signal values with automatic scaling. The time scale shows the correct time taken from your computer. Refer to Figure 4-1. If nothing seems to happen and the program becomes sluggish, either the slave address is incorrect or the baud rate is incorrect (use 115 200). This behavior applies to other similar tasks as well. Stop the Acquire operation and check the address (Status page).

You can work fine with the default settings without ever touching any adjustments of the display. If you are interested, explore the possibilities available by clicking either the right or left button of your mouse with the cursor over some display control. Learn the possibilities by reading what is in the help messages or in the dialogs to change the zooming, scales and colours of your display. If your display gets mixed up, do not be alarmed. You can always restart the software or try to restore it by studying the menus. There are some control buttons connected to the display only to make a great selection of settings. We are not going to any further details in this about them. This same applies to the other graphical displays which are very similar in features. This display does not have any cursors. The Archives display does. The cursors are used e.g. for determining the interval from which one calculates statistics of the signal or one can directly read the signal values on the curve.

The box at the top left corner (Select signals and start) has five buttons in it. You have just tried the first one which starts/stops the data acquisition. You can select with the other buttons the signals you wish to measure. When pressed down, the corresponding data will be collected as soon as the acquisition is on. You can start/stop collecting them even in the middle of acquiring other channels. Note, that file saving is only done if at the time of stopping or when 4096 samples have been collected, the corresponding channel button is pressed down. Else the data is displayed only and discarded. The next large button to the right of these is for printing the display graphics. You do not have to print out everything unless you really want to. All data is **always** saved into IRMA7 file format readable with any spreadsheet program too (if the button for the signal is down). You can later retrieve the files on the Archives page for statistics etc.

The small number display at the rightmost top corner together with a small LED indicator is the sample counter. It shows the total number of samples acquired after the operation started. The LED indicates when data is actively inquired from the meter. From it, you can determine when the serial bus may be overloaded (LED lit all the time). That may cause slipping in time schedules (see below). The Acquisition operation will stop after having 4096 samples taken. It will then save data to a file (or a set of files as configured on the Configuration page). Then, it will restart acquiring to have the next set of 4096 points. This will continue forever until you explicitly stop the acquisition. The intermediate stopping and saving is very fast and should not cause a significant loss of time.

You can change the way the data is acquired by adjusting the time interval (0.01 to 32000 seconds) at the center box' "Interval" control. Overloading will happen if you try to acquire too many signals at a too fast rate. Changing the interval after starting acquisition will have no effect until you stop and restart.

The last two buttons in this box are **markers** for adding/subtracting an adjustable shift to the signal. They are used for marking the beginning / stopping of some event or measuring point important to be recognized later when analyzing data. The marker height is adjustable on the **Reporting page**.

As you can see, there is an LED indicator at the top edge (ACQ) which is lit when you have started this operation. It is there to remind you of a pending operation which should be properly stopped

before stopping the program or doing something else. There are also some other operations which might interfere with this operation and therefore it is recommended to turn it off. **In principle, you can use most of the operations in this program simultaneously**. Of course, if you are uploading a new library to the meter, there is no sense in doing measurements at the same time as the calibration table in use may change. Glitches in signal may result even when the table is replaced with the same one.

Note that not all settings in the program other than those mentioned at the Configuration page, are not saved for the next session, only the data is. If you want to keep the settings, keep the program running all the time. The meter itself will remember its **Saved** settings after a bootup.

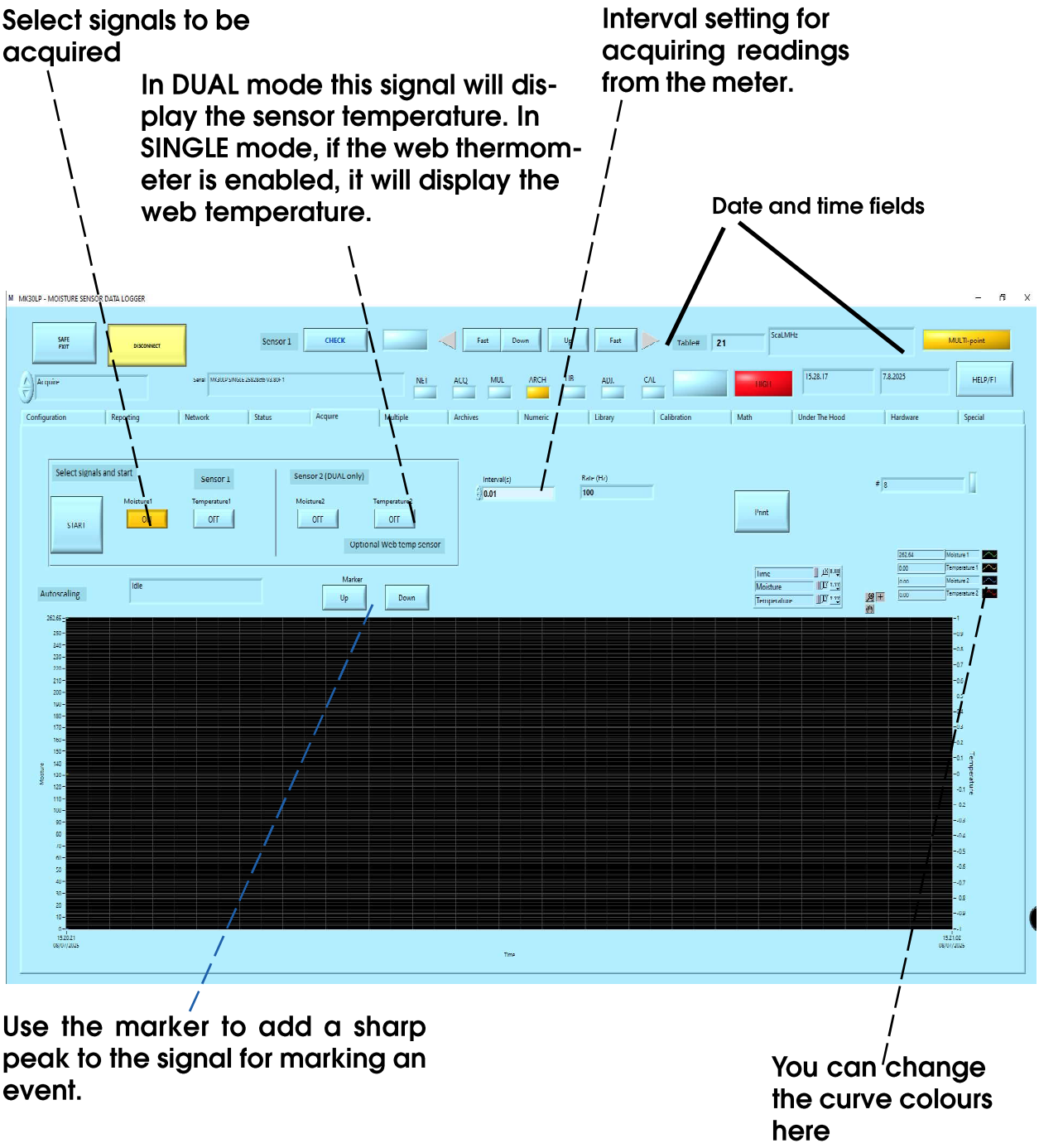


Figure 4-1. The Acquire page, data retrieved from the primary slave

5. Archives Page and Filtering

You can retrieve and display any old data files saved during program runs on this page, even while some other operation is running in the background. On this page you have eight channel selectors, statistics displays for each channel, a graphical display and the Print button. By pressing one of the channel keys, you can retrieve any old data file as long as you know where it is and what is its name. While moving the cursor over the name of the retrieved file, you are displayed the file attributes indicating some useful information of the original measuring event. The actual data is shown on the graphical display and the corresponding statistics are calculated automatically. You can move the cursors to proper points freely. The scaling is very much like on the Acquire page. In this way you can compare and study data and adjust the scaling to make it look best for printing. Note however, that the data files you can apply here are always the traditional IRMA7 data files. You can not retrieve any of the LVM, XML, HTML or Datalog files as they are targeted for other Windows applications. Refer to Figure 5-1.

5.1 Data files

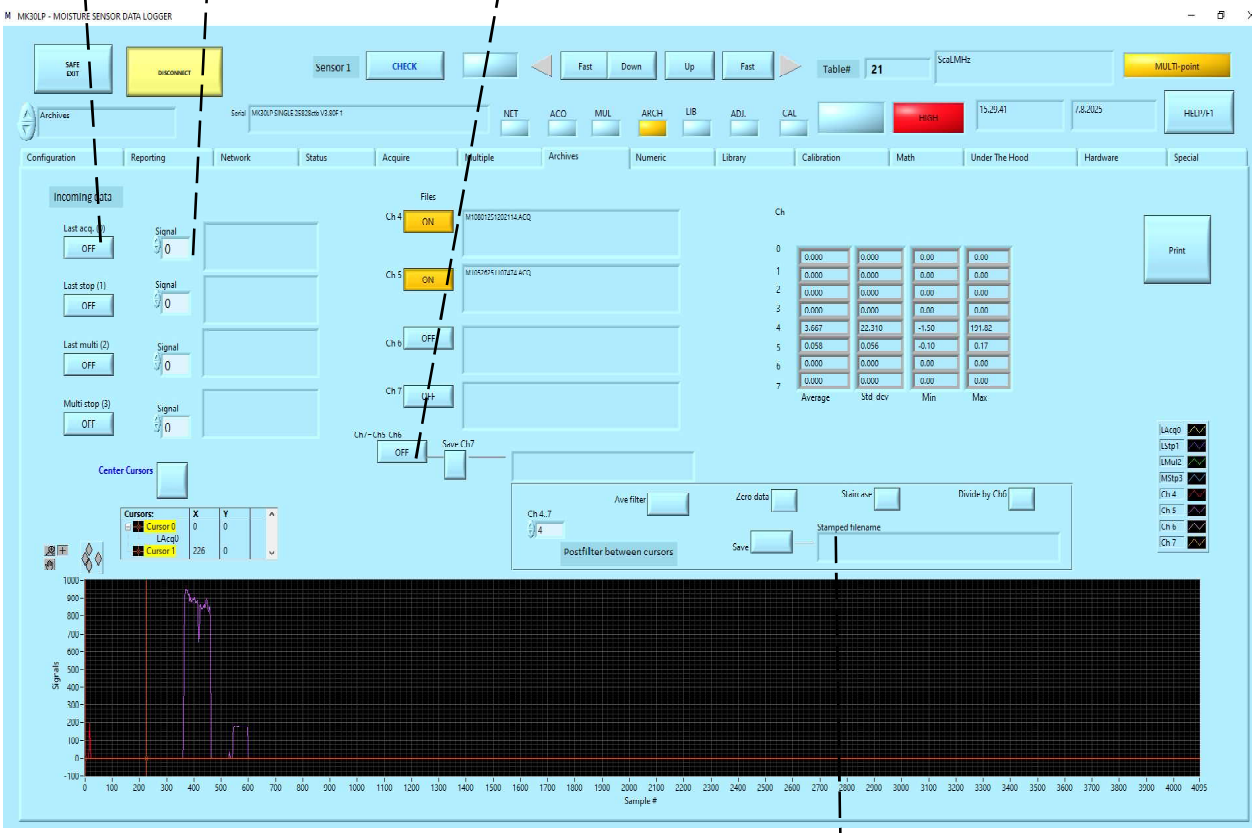
When you run the Acquire or Multiple slaves operation and you have selected to have the LVM, XML and Datalog files you will have files with the following names. See below an example directory listing.

```
Data of last modify           size        file name
-------------------------------------------------------------
03-07-2021  11:31 AM            28,984 HT0307041130420.ACQ
03-07-2021  11:31 AM            65,612 HT0307041130420.ACQLOG
03-07-2021  11:31 AM            28,834 HT0307041130420.ACQXML
03-07-2021  11:31 AM            85,975 HTACQ0307041130420.LVM
03-07-2021  11:30 AM            28,899 M0307041130424.ACQ
03-07-2021  11:30 AM            65,536 M0307041130424.ACQLOG
03-07-2021  11:30 AM            28,758 M0307041130424.ACQXML
03-07-2021  11:30 AM            85,888 MACQ0307041130424.LVM
03-07-2021  11:30 AM            28,983 WT0307041130424.ACQ
03-07-2021  11:30 AM            65,612 WT0307041130424.ACQLOG
03-07-2021  11:30 AM            28,834 WT0307041130424.ACQXML
03-07-2021  11:30 AM            85,971 WTACQ0307041130424.LVM
03-07-2021  11:31 AM            28,908 XM0307041130421.ACQ
03-07-2021  11:31 AM            65,536 XM0307041130421.ACQLOG
03-07-2021  11:31 AM            28,758 XM0307041130421.ACQXML
03-07-2021  11:31 AM            85,896 XMACQ0307041130421.LVM
03-07-2021  11:30 AM            28,909 XT0307041130424.ACQ
03-07-2021  11:30 AM            65,536 XT0307041130424.ACQLOG
03-07-2021  11:30 AM            28,758 XT0307041130424.ACQXML
03-07-2021  11:30 AM            85,897 XTACQ0307041130424.LVM
03-07-2021  11:41 AM           651,785 M0307041140380.LVM
03-07-2021  11:41 AM            28,899 M0307041140381.BNK
03-07-2021  11:41 AM            65,536 M0307041140381.BNKLOG
03-07-2021  11:41 AM            28,758 M0307041140381.BNKXML
03-07-2021  11:43 AM            33,012 M0307041143274.SPE
03-07-2021  11:43 AM            69,649 M0307041143274.SPELOG
03-07-2021  11:43 AM            32,871 M0307041143274.SPEXML
03-07-2021  11:43 AM            90,000 MSPE0307041143275.LVM
```

Select the signal. Its name is displayed to the right

Buttons for enabling calculated channel difference between 5 and 6, difference is delivered to channel 7

Buttons for selecting sources of data



Buttons for executing postfiltering, staircasing or partial zeroing to data on one of channels 4 to 7 affecting only data between the cursors, result can be saved to a file. Division operation by channel 6 signal is available.

Figure 5-1. The Archives page

```
03-07-2021  11:42 AM            29,926 T0307041141553.BNK
03-07-2021  11:42 AM            66,560 T0307041141553.BNKLOG
03-07-2021  11:42 AM            29,782 T0307041141553.BNKXML
03-07-2021  11:42 AM           707,202 T0307041141553.LVM
03-07-2021  11:42 AM                43 T0307041142163.BNK
03-07-2021  11:42 AM               123 T0307041142163.BNKLOG
03-07-2021  11:42 AM                86 T0307041142163.BNKXML
03-07-2021  11:42 AM               405 T0307041142163.LVM
---------------------------------------------------------------
```

You may get a large number of files in the worst case. Therefore, it is good to know how to recognize them. The file name coding consists of a set of letters, a date time numbering, and a file type coding. The key to codes are as follows.

Code	signal
M	moisture
G	gloss
WT	web temperature
HT	head temperature
XM	expansion module
XT	extra temperature
C	capacitance
SA0...7	signal A, multi-slave operation, channel 0...7
SB0...7	signal B, multi-slave operation, channel 0...7
SM	shifted signal, Math operation
RM	restored signal, Math operation
D	channel difference from calculated, real-time or post operation

code	source
ACQ	acquired signal
BNK	memory bank download
SPE	spectrum signal
CNV	calculated, shifted or restored data

code	format
ACQ	IRMA7 format, ASCII data as text
BNK	IRMA7 format, ASCII data as text, padded with the name of the bank
SPE	IRMA7 format, ASCII data as text
LVM	LVM file format (not readable back in this program)
XML	XML format (not readable back in this program)
LOG	Datalog format (not readable back in this program)
HTML	Report in HTML, mainly pictures and text
JPG	Image for the report in HTML. This can be used as an image in other written reports

Date time code key:

```
0307211141553
------            month, day and year
      ----        time in hours, minutes
          --      time in seconds
            -     a running random number
```

In this way the program produces files whose names are unambiguous but recognizable. Needless to say but it is advised to clean up the data file directory of unnecessary files regularly. Make backup copies to e.g. CD's before removing them if they have any remaining value.

The channels available on the Archives page consist of Last Acquired, Last stopped Acquired, Last Multiple slaves and Last Multiple slaves stopped. The data is carried directly from the corresponding pages without any intermediate files. The Last signals are true real-time signals acquired and the stopped signals are those which are stopped manually. You also have a signal selector to the right of each of the corresponding channel buttons. You can select any of the available signals with the corresponding name to the right. If the signal is not acquired, it is not displayed though its name is. Nonexistent signals are replaced with zero arrays.

The first one is the real-time data which can be observed to progress all the time. You can select it from the original set of moisture or temperature with the small numerical selector. The second channel is the last stopped acquired signal. The third one is the selected channel from the Multiple slave operation and the fourth is the last stopped data from the Multiple slave operation. They both have numeric channel selectors besides the buttons. You can press the control without deactivating the channel button thus making it quicker to compare various data. You can apply channels 0...15 to both of them. If no data appears, you have not selected that particular channel for data acquisition (see page Multiple slaves). Index 16 is left for the calculated channel difference obtained in Multiple slaves.

Channels 4 - 7 are for retrieving saved files. Press the button and you will be asked to point out the file from a folder which you would like to open. When not needed anymore, press the channel button again and the file and its data disappear. **No changes are made to the file**. Channel 7 has double use. Regularly, it is used for retrieving files in the way channel 4 to 6 are. If you press first the button marked as Ch7=Ch5-Ch6, you will get a channel difference with the data of channels 5 and 6 subtracted from each other. Pressing **Save Ch7** will save the resulting data to a new stamped file.

You can move the two cursors to see the statistics of data between them, from all channels activated. The postfilter box contains buttons for filtering out the data on a selected channel between the cursors. This is used for cleaning up a signal if it has peaks from a web break or other interruptions or too high noise. Activate the channel by loading the data file, select the channel to be filtered, press Ave filter button and press Save button to write a stamped file of this new data. You can repeat the filtering as many times as you like without saving. Move the cursors to a new position and execute the filter again. There is also a button marked as "Zero data" for setting all data values to zero between the cursors. The Staircase filter forms a kind of staircase to the signal values starting from the left cursor value and connecting it horizontally straight to the right cursor value.

The measurement unit used is added as a text field to the tail part of each data file, at the end of each calibration table name.

Annotation

It might be tempting to add some text into various graphs while studying either signals coming in or after being analyzed with various methods. You can do it. It is allowed on all graphs except the **Acquire** and **Multiple Slaves** graphs. You can either write freely floating text or annotate certain data points into a curve. Right-click over the graph area and activate Create annotation option. A dialog will open:

The Annotation name is the text becoming visible. Lock style has options: Free, Snap to All Plots and Snap to One Plot. Locked Plot is the resulting name of the plot selected. You can also tick in the boxes Hide arrow and Lock name if you wish. Try these out to see the effect. The annotation is visible in reporting too but is not saved otherwise. You can later move the annotation text to a better position by dragging it with the mouse. When you do not need the annotation anymore and want to clear it, right-click on the graph again and select Clear annotation or Clear All annotations.

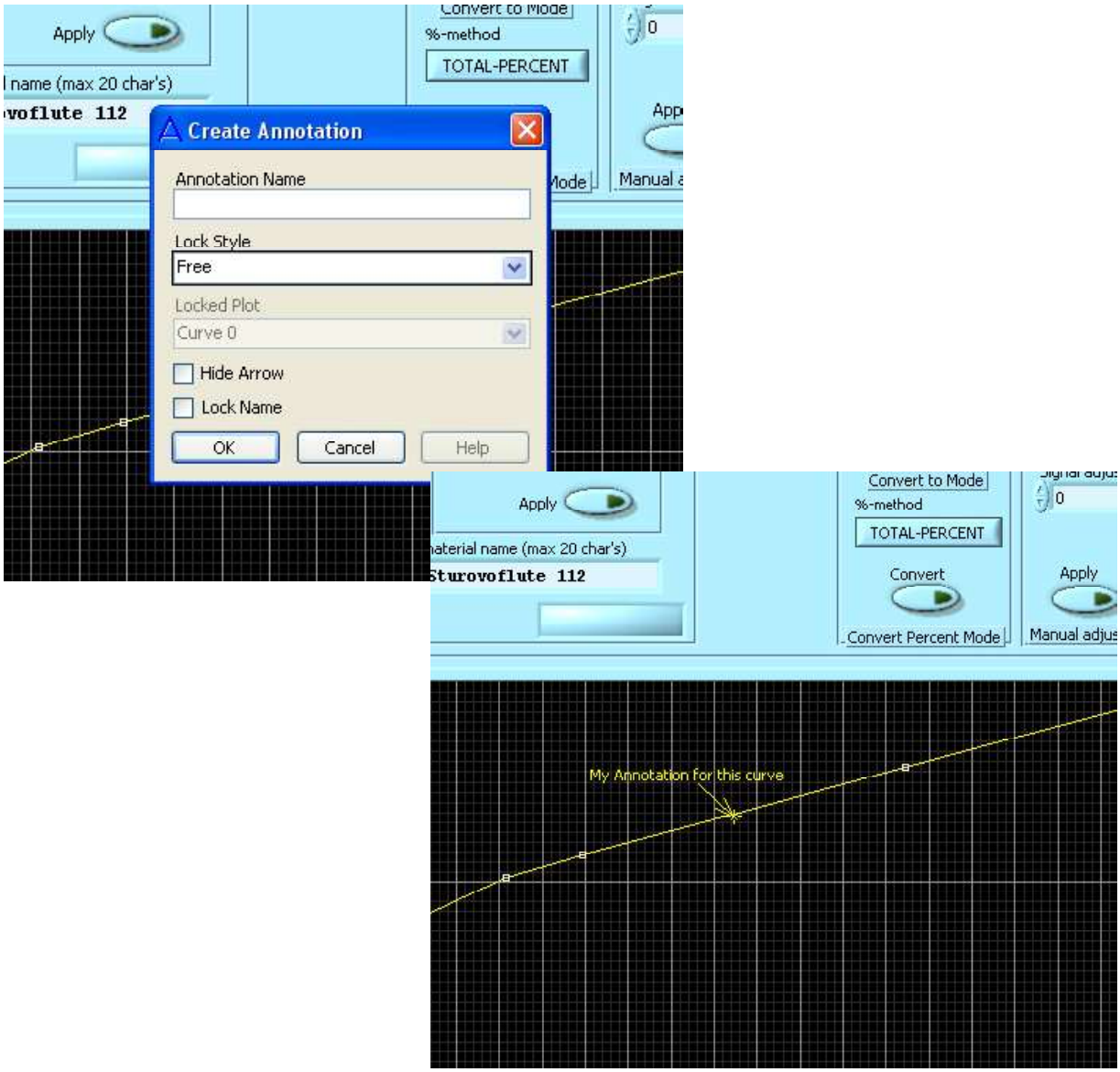


Figure 5-2. The Annotation dialog. Set the options and click OK. The second image after filling in some text.

6. Multiple Slaves Page

This page is very similar to Acquire page. You can acquire data **from up to eight meters** and their both Sensor 1 and Sensor 2 with full assignment of each channel. The slave addresses are needed here to make a difference between the meters. The collected data may be made visible on Archives page and also on the Numeric page.

The operating principle is the same as with the Acquire page. First, make your selections concerning the meters and press the large leftmost button to start collecting data. The time interval should also be checked before starting to acquire data. Do not offer too short intervals if you have several slaves and you wish to have both sensor signals from each slave. The temperature signals are not available in this operation.

Speed Issues

The serial port at 115 200 bauds can usually support about 10 to 20 samples/s. If you wish to have all eight channels with both signals (16 signals in all), the smallest working interval would nominally be 3.60 s for them. Using the LAN232 does not much help in this matter but using the LAN485 does. In that case, each sensor should be configured inside the cover to select RS485 operation. The other end of each sensor cable needs to carry the special plug fitting the LAN485. Then the LAN485 is powered and jumper selected to operate as an intelligent bridge between a PC and each meter. It will prevent overloading each sensor with unnecessary messages to other meters thus relieving the work load. That will give a higher throughput for the system.

The LAN485 can support up to 15 meters each having one or two sensors. Thus a maximum of 30 sensors can be connected to the LAN485. Having more LAN485 units makes it possible to hook up a much larger number of sensors to one PC. One thing heavily affecting is the low-level algorithm parameter selection made on the **Under the Hood** page. The sensors can be made much faster by giving up some of the accuracy and allowing a higher noise. In SINGLE mode, the acquisition rate is regularly 10 Hz and with an adjusted filter parameter down to 10, the rate can be up to 33 Hz. The LAN485 is designed in such a way that it will supply power to each of the 15 meters and the communication is via RS485. Therefore, each meter needs to be set up as RS485 with the jumpers inside it. The cable length in LAN485 can be very long, up to 300 meters by using proper twisted-pair cables. Refer to the User's Guide for the meters for technical details.

The LAN232 does not supply power to the meters and is capable of operating via RS232 using fairly short cables. It can support up to eight meters at 115 200 bauds.

Channel Assignment

To assign a meter to a channel is done by scrolling the slave display. Press the small arrows up/down at the center of the page marked as **Ch 0..7**. You can assign channels 0 to 7 for any meter you have installed in your system. **The channel number has nothing to do with the slave address.** All the meters must have differing slave addresses, else there will be inevitable collisions. Needless to say, the whole network will not function in that case. You need first to separately make sure that each slave's address makes sense. A simple way of doing this is to adjust the slave address and then press the button Check. If the slave exists, you will get a meter serial number into the small window close to the address control. You can try out as much as you can until you find the correct slave. A list of each slave can be seen on the **Network page**. If you have managed to offer a nonexistent slave address, the text window will show: "No response" after a few seconds. You can select the same slave to more than one channel. When the channel has been verified to be correct, you can toggle the two buttons marked as "Sensor 1" and "Sensor 2" to indicate the status. That is also shown on a small LED indicator array to the right. The top row is channel 0 and the bottom row is channel 7 with corresponding markers for the Sensors 1 and 2.

If the buttons are not pressed, the signals are not acquired. There are also small coloured squares for adjusting the curve colours. Clicking on them will open up a colour palette dialog with which you can create new colours or accept some existing colour to have a distinction between the signals on the graph. When you press the Check key for each slave you will also get the proper measurement unit used actually in that meter into the small window marked as Unit. If no checking is performed, the unit is obtained from the earlier saved settings or is left as "Check to see". It does not affect the data itself in any way.

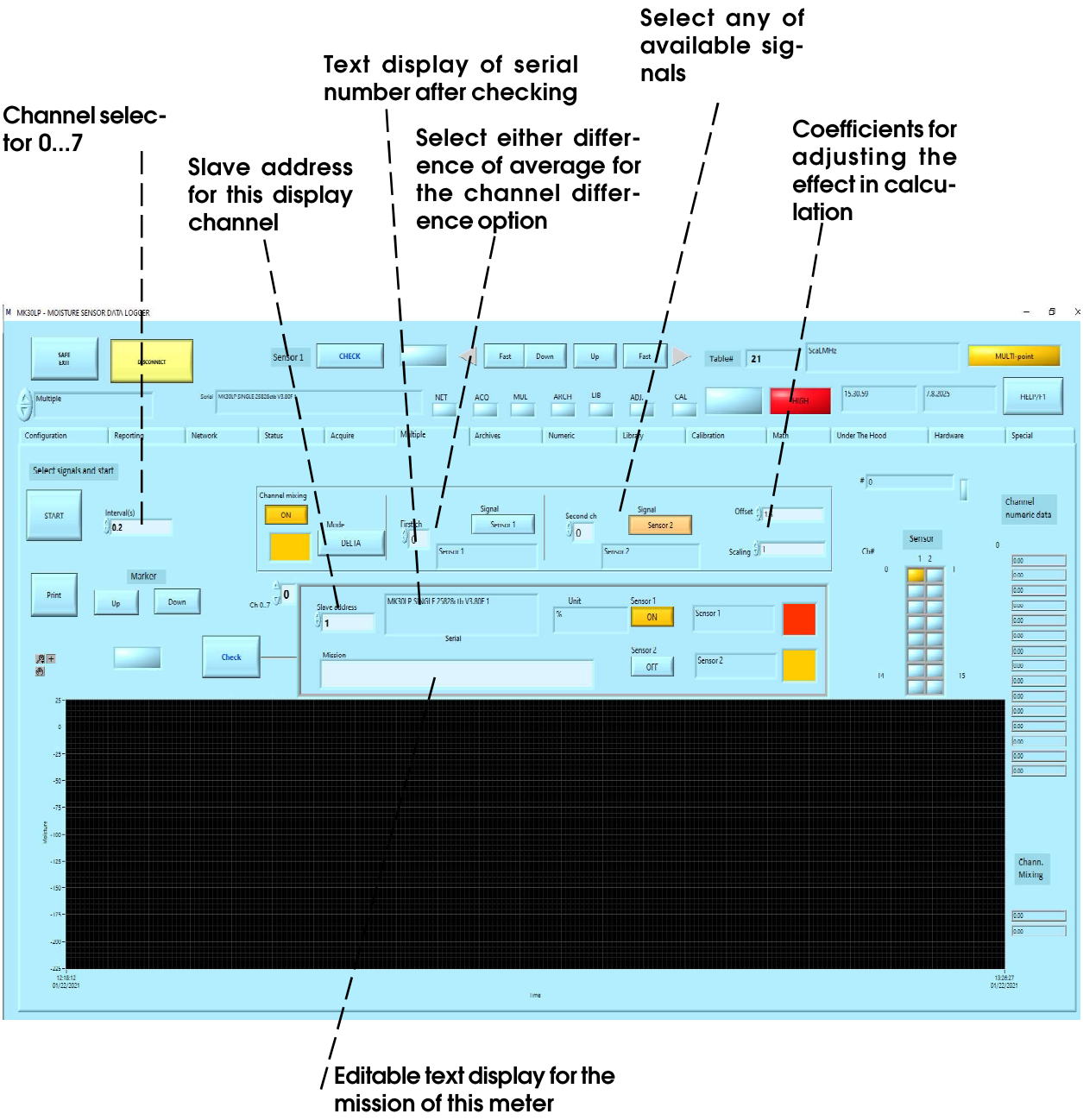


Figure 6-1. The Multiple sensors page with a sample signal from one meter. Change the signal curve colour by pressing the coloured square near the signal name.

You can assign each meter for a certain purpose and mark this with an editable text window below the serial number. This text will display the meter's mission in the future and is also added to the file end texts. Save the settings at the end of your measurement session and these text fields will be saved too.

The box **Channel difference** can be used to generate a new signal from the acquired signals by calculating either a difference or an average between two signals, in real time. The signals can be selected in this box by indicating the channels and the corresponding signal type (Sensor 1/ Sensor 2). The curve colours can be adjusted here too. When ready, press the corresponding ON/OFF button to ON to have the difference signal. Its data is automatically saved like any other signal. The file name is coded as **D** to indicate a calculated difference signal. The difference signal is shown on Archives page as well when you apply the index **16** for the selector of the **Last Multi selector**. There is a slope + offset option available here for changing the effect of this calculation.

While running this operation, you can add **markers** to the selected signals to indicate some event. The marker height is adjustable on the Reporting page.

Pressing the Print button will send an image of the graph to the printer. Statistics and more information is printed on the Archives page. HTML reporting saves an image of the display for your personal reports.

The settings on this page are saved for next session in this program if you press the **Save** button while exiting on the Configuration page. Return to Figure 6-1.

7. Library Page

On the Library page you can download the calibration **library** from the meter, save it to a library file, load a library file to the program and upload the library to the meter. You can also upload and download single calibrations in the libraries. In this way, you can tailor the library in the meter (or some library file on disk) to match your requirements. The only way you can affect any calibration **entry** on this page is to change its name. You can finally print out the corresponding calibration entry in full with a graph seen on the screen. This may prove useful for your documentation. See Figure 9-1. The calibration residing in the meter can also be checked and displayed on the graph to the right.

Note that these operations have no connection at this time with the Current sensor as either of them is able to use any table in the library. These are just for transferring tables/library to/from the meter and for tailoring the library.

To **download** the meter's library, press the button "DOWNLOAD". You can always do this safely, no harm is done to the meter. Then, the library is in the program's memory replacing the otherwise empty library generated at the time of starting the program. The library loaded or downloaded during a session is kept in memory until the program is stopped. You can save the library to a file by pressing the button "Save lib". The file format is ASCII text which means you can read the file into e.g. some spreadsheet program for further studying. Note, however, that the spreadsheet file formats are not in general compatible with this software. If you want to make any changes to the library file and return it back to the meter, care should be exercised and still there is a risk of damaging the file into unreadable state. Try to keep the file format as the original text format all the way. Old-fashioned plain ASCII text editors are more reliable in this respect.

Uploading a library to the meter is a critical operation as it will wipe away the old library in the meter. Unless you know exactly what you are doing you may destroy the library. It is advised to keep copies of the **original library** at a safe location to prevent any disaster. The same danger lies in uploading single calibration entries but the damage is not total. Be careful! You can check the current library name in the meter at any time in the box "Calibration in meter" (CHECK). No harm is done. If you wish to edit the name, do it in the text field and then send the new name to the meter by pressing SET. Uploading or Downloading a library file can be interrupted if any problems are found, by pressing the **Abort library transfer** button. The rest of the library entries are not transferred. If a library was to be downloaded, the rest of the entries are replaced with the earlier downloaded data or empty entries.

Uploading a calibration requires a little bit more mouse exercise. First, check the current calibration index **in the meter** by pressing the button CHECK right above the index counter window. As a result, the text field below, the index display and the calibration mode indicator are updated together with the library name in the meter. This is the entry you are using for the Acquire operation right now. If you change it, you had better not to do any measurements at the same time. Press the keys UP, FAST UP, DOWN, FAST DOWN besides the index counter display to find the calibration you are interested in. This will change the current table in the meter but it should not be important at this time.

Then, go to the box "Calibration in PC" and click the arrows up and down right at the left edge of the index counter to find the other calibration entry in the PC library. The corresponding calibration curves are shown at the same time with some elementary information.

When ready with the selection, you can now either download a calibration from the meter by clicking the button DOWNLOAD above the word CALIBRATION or upload a calibration entry to the meter by clicking the button UPLOAD under the same word. The data are all updated at once.

You can also clear a particular table in the library. Select the correct index and press the Clear button. That table can then be uploaded to the meter if necessary.

In this way you can do complete tailoring of any library. It is advised that you change a little their names to match the indices, if moved to another index. A recommended practise is to make a backup copy of a new library by saving it. If changes are made to a library, it is recommended to change its name too.

The loaded or downloaded library is in use only on the **Library page and Math page**. Any other page uses either the meter's library or single entries loaded from the meter, directly. If you download a library from a meter or open a library file, you will be asked for the file name to save this possibly important file, at the time when you are leaving the program.

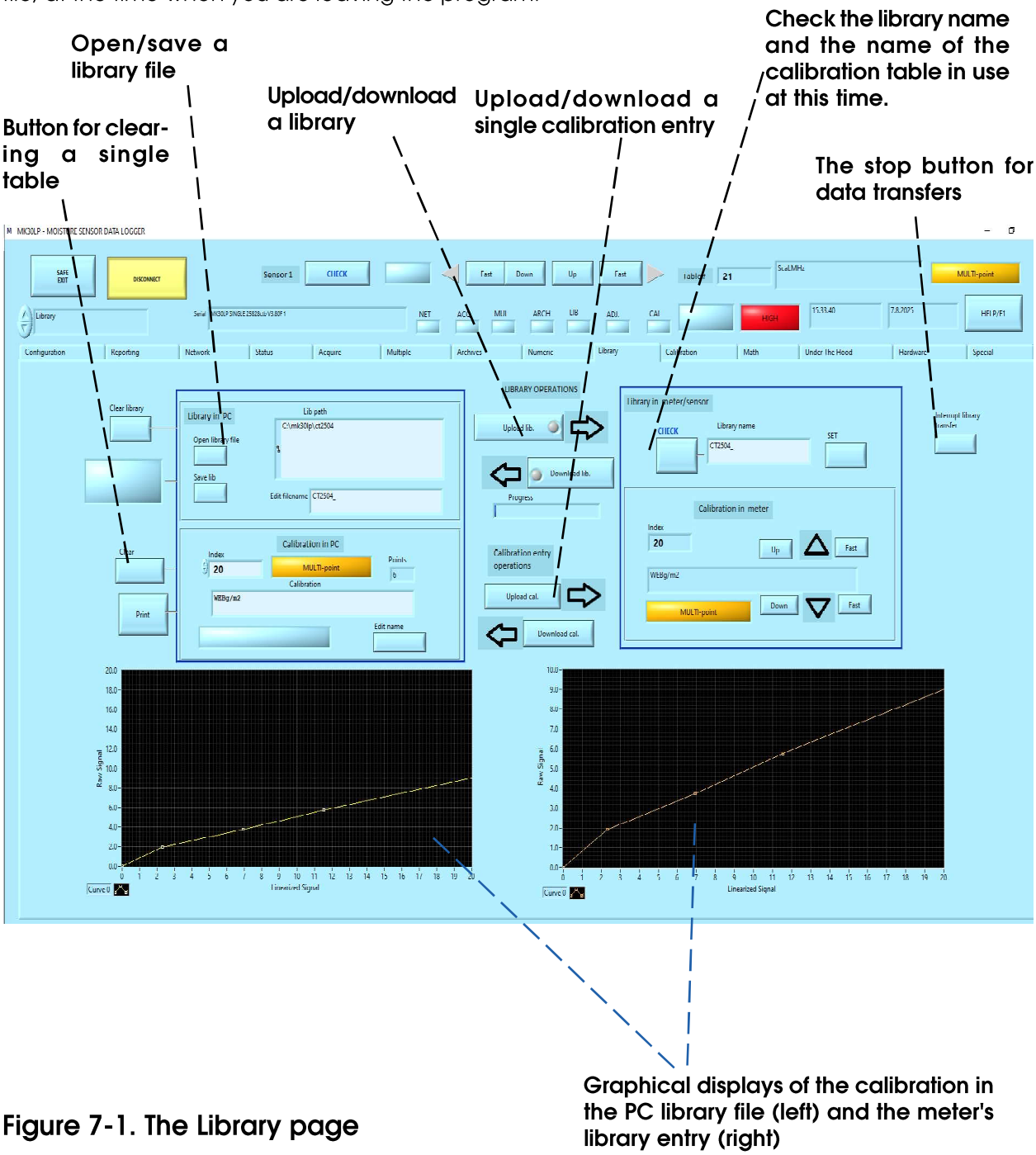


Figure 7-1. The Library page

8. Calibration Page

8.1 Regular Calibration Table Editing

Calibrations are usually made at field conditions with known samples or in laboratory conditions (for moisture samples: In a climate chamber and with a laboratory balance, an oven for drying samples is usually required). Refer to user's manual of your meter for more details of actually making the calibrations. This part of the program allows you to feed in the generated data and to take into use the new table. The calibrations consist of point pairs (**raw signal** and **linearized signal**, maximum 10 of them). They form together a calibration curve. Of these number pairs, only a number of points is in use (marked "Points in use"), not necessarily all points fed in to the table. The rest of the points at the higher moisture can be left inactive. If you wish to use a calibration table for linearization, it is required to have 2 to 10 points in use. Deflection from this will cause invalid signal data. Refer to Figure 8-1. Note that raw signal means the nonlinear signal from the meter. It is usually scaled up with 100 to get more significant numbers into use. The SCALE calibration is usually applied for scaling. Thus we

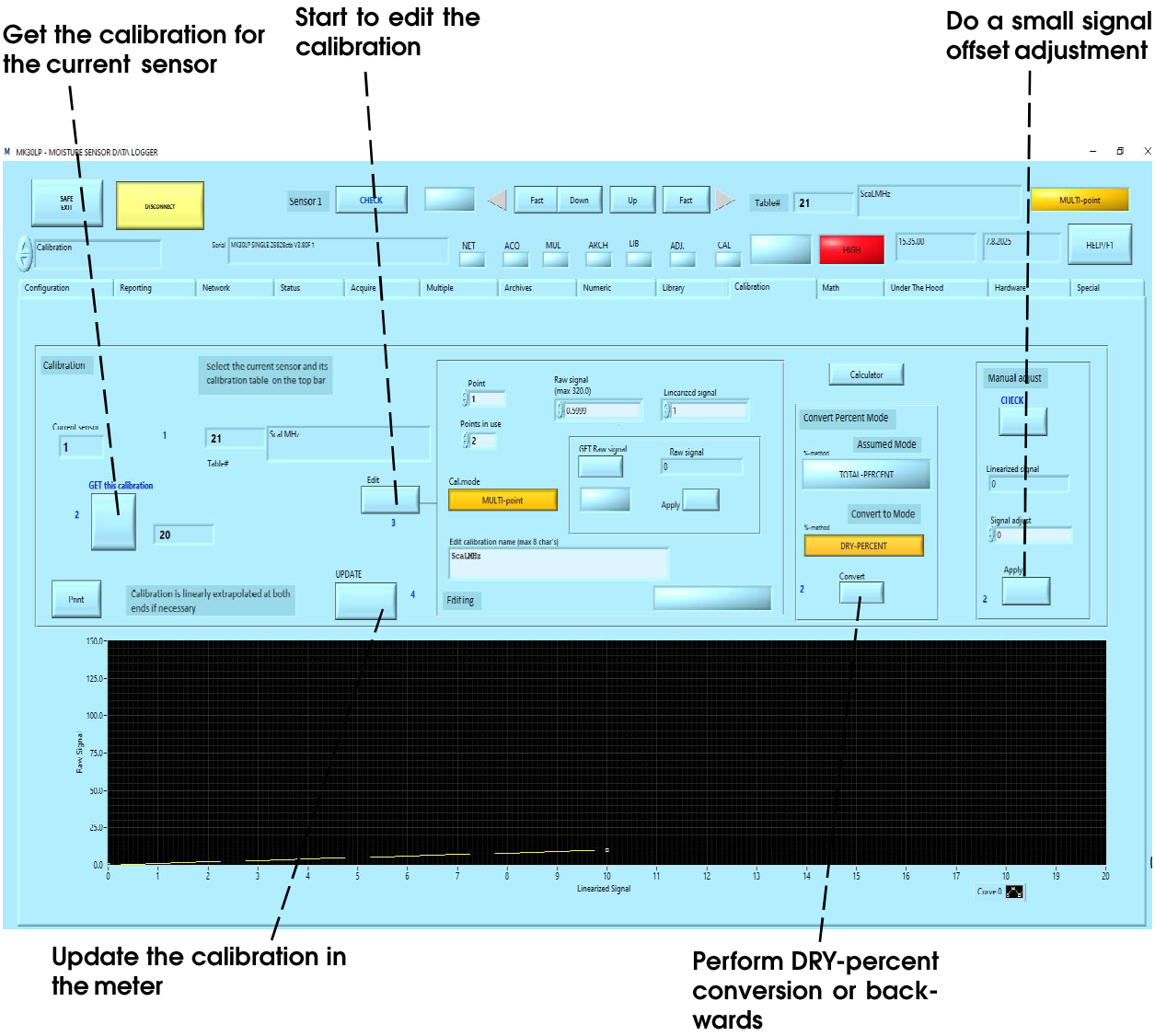


Figure 8-1. The Calibration page with an active table editing. Note the calculator button at the center for launching a simple calculator

strongly recommend that you keep the SCALE only for scaling and use the actual table entries for calibration (=linearization and proper scaling, 2 - 10 points). The coefficients of SCALE, are not user-accessible.

To edit a calibration, do the following:

☐ Select **Current sensor** properly on the Status page

☐ Select a suitable calibration with the buttons (CHECK/UP/DOWN etc. on the Status page). We assume you already have the calibration point data available.

☐ **Then on the Calibration page, press the GET calibration button to copy the table from the meter to the program's memory for editing.** You will immediately see a curve (if it can be displayed at all) and the first data point in the box marked "Editing".

☐ **Press the button "Edit" to start editing**. You can edit the name of this calibration and the number of points in use. The calibration mode can be set to reflect the use of the calibration table (MULTI = use the table, SCALE = do not use it). If the mode is left as SCALE, the table is not in use but, instead, the **SCALE linear scaling** is used. That is not a linearization at all, as pointed out above. The Point selector goes from 1 to 10 and you can fill in any points in any order but the points must be in increasing order in the table. Just click the small arrows at the left edge of this control. Do not leave any empty points when finished! Also, the raw signal/signal values must be increasing when the Point increases, else you will get a folded curve and the future signal values will be useless. Adjust the "Points in use" control to reflect the actual number of points to be used in the calibration.

☐ **Press the Edit button to stop editing**. The curve is now displayed and you can make a check against the curve you have possibly obtained earlier in your calibration measurements.

☐ If you are happy with this, you can **Update** the calibration in the meter by pressing the UPDATE button. You are ready to use the new calibration after this.

If you are doing real-time calibration with the meter in a climate chamber and you have the sample in front of the meter properly placed, you can, in the Edit phase, get a signal from the meter by pressing the GET raw signal button. The obtained signal is displayed in the small window besides the button. If you accept this signal for the current point, press the **Apply** button which **copies** the raw signal value to the signal field. Then you have to fill in the corresponding reading for the linearized signal (like the moisture value). These buttons are active only while editing.

8.2 Signal Adjustment

Sometimes it is required to do some offset adjustment to an existing calibration table or to fine tune some table just created (as in chapter 8.1), to make sure it has been done accurately. Do this as described below (see Figure 8-2 too), but, **first always do GET the table** from the meter belonging to the particular sensor 1 or 2 to start with. **This is important.** You need to know the moisture of the sample or web under the meter to complete this.

Place a sample under the meter and after a few seconds, press the button **Check** in the box "Manual Adjust". You will see the corresponding linearized signal value in the small numeric display under the Check button. If this needs some sort of correction as you happen to know the real linearized signal (=moisture value) value of this sample and know that the current table is otherwise correct, you can make an adjustment to the **raw signal value** (+/-offset). The amount of adjustment is usually very small

and is done in the numeric control on top of the button **Apply**. Edit the number and then press the Apply button. The adjusted table is reflected in the curve immediately. Press the Check button a few times to see the new signal reading. Iterate this until you are happy with the result (close to your target value). The table is automatically updated to the meter while doing the adjustment and pressing the Apply button. Adjusting affects only **a single table in your library and is used now by the Current sensor**. The delta value in Signal Adjust field is cleared every time a new table is downloaded from the meter with GET.

8.3 Method for Percent Calculation

There are two methods in general use, total percent (most usual) and dry percent (rare). In the first, the calculation is referred to the current total weight and in the latter it is referred to the dry weight. These methods differ quite a lot from each other in spite of their similarities. The percent readings are related to each other in the following ways:

ptotal = pdry * 100 /(pdry + 100)

and

pdry = ptotal * 100 / (100 - ptotal)

The relationship is very nonlinear. Since the MK30LP moisture meters are linear by nature when using the total percent method, using calibrations defined as dry percent for them, will result in highly nonlinear calibrations.

8.4 Conversion for Percent Method

On this page you can convert a calibration originally made with one method to another. GET the calibration from the meter, select the new mode from the lower button and press the Convert button. This will complete the conversion but it does not upload the new table to the meter. You have to do it yourself by pressing the Update button. Refer to Fig. 10-4. You can repeat this process back and forth as many times as you need after toggling the mode between conversions. Every time the calibration name is modified a little to indicate the current method. The calibration name is limited to 20 characters and this will limit soon.

9. Mathematics Page

On this page you can convert earlier acquired signals to be recalibrated or having a shift in signal. The need may arise if measurements are done accidentally using an incorrect calibration. Shifting consists of scaling and adding an offset. Pure rescaling is useful when you have obtained the raw signal which is usually scaled up with 100.0 to get more significant figures. To make it a true raw signal, one has to rescale the data with 0.0100 or divide it by 100.

9.1 Restoring

Using the signal restoration is easy. First, load a library file from the hard disk or download the library from the meter in question. The same library is used in this task. If the original incorrect calibration used in measurements and the correct one are not in the same library, do some library manipulation first to let them reside in the same library. Then, return to the Math page again. Press the "Original file" button to select an archive file to be restored. The corresponding data is shown.

Press the "Restore" button to activate recalculation of the signal which is displayed also. Select the Old index used to match the original index and the New index to match the intended table. Calibration names are shown to avoid any mistakes. The restored signal data can be saved by pressing the "Save restored" button. The file name is stamped and shown. If there are any problems with the table entries, a small error LED is lit besides the problem source. Check the table. At least two points are required for the valid table and not two entries are allowed to have the same numeric value.

9.2 Shifting

If only a shift in signal is required instead of calibration change, use the "Shift" button after selecting the file. No library is required to be used in this case. Adjust the shift value with the small control window. You can watch the resulting signal and by pressing the "Save shifted" button, a new file is created with a stamped name shown. The shifting obeys the following general mathematics:

shifted = scaling * data + offset

No error checking is possible here and all responsibility lies at the user. Printed and optionally HTML reports can be generated from this page. Refer to Figures 14-1 and 14-2. No automatic saving is done here either. You have to press the Save buttons when ready.

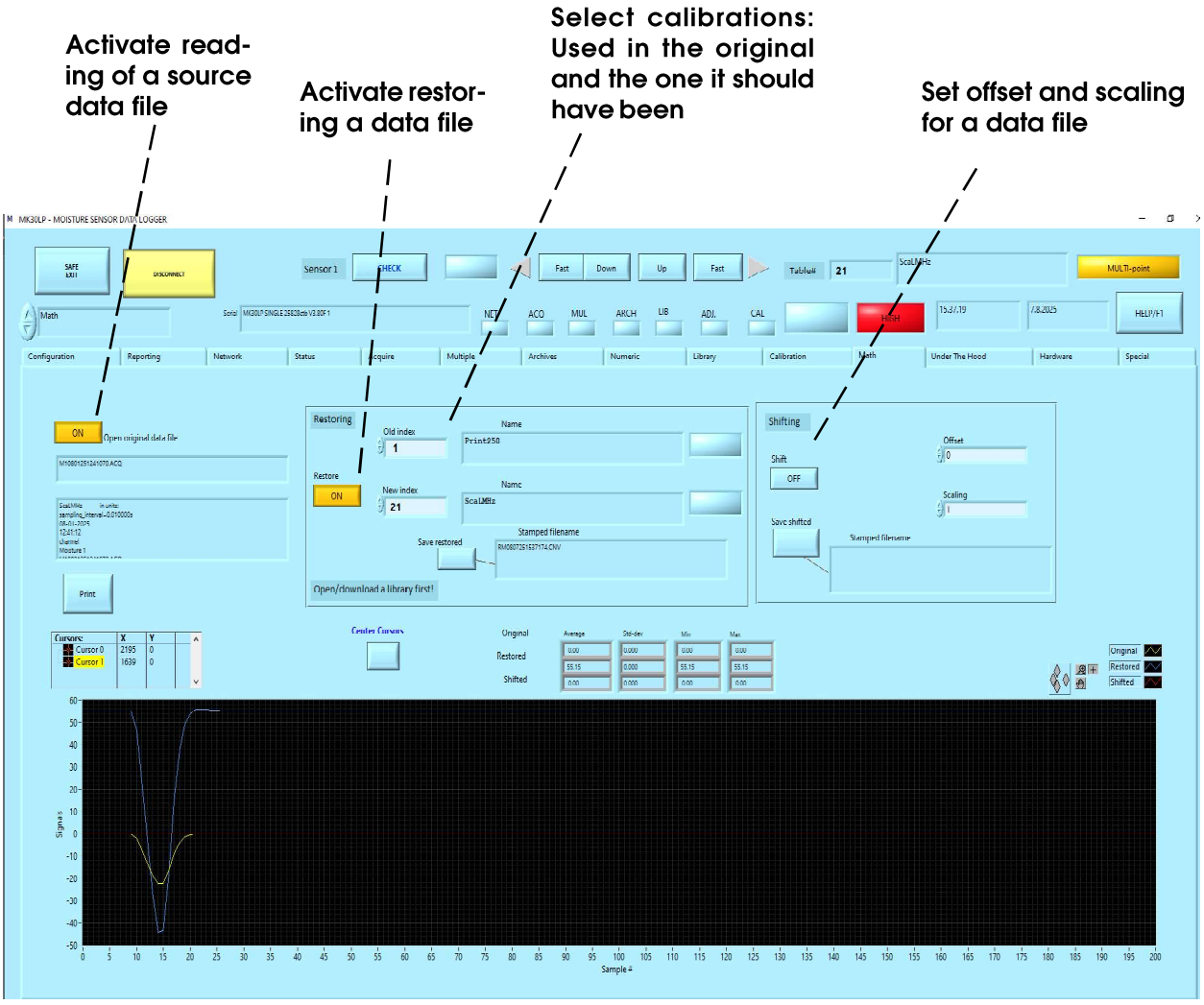


Figure 9-1. The Math page, signal restore

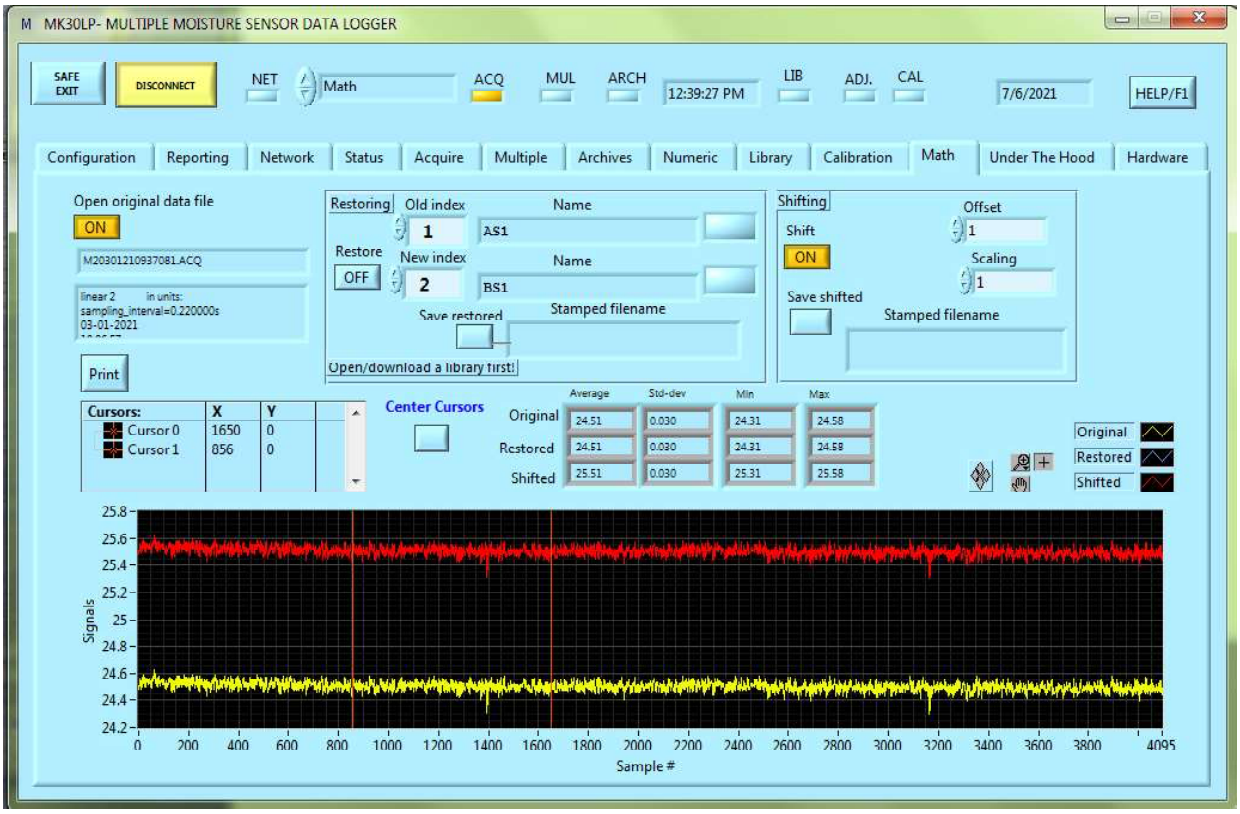


Figure 9-2. The Math page, signal offset/slope

10. Network Page

When several meters are connected, situations arise where one or more of the meters seem to be inaccessible or their slave addresses may be unknown. On the Network page you can check the network status and find out the addresses.

Note that overlapping addresses can not be resolved with the tools on Network page. The slave with the same address has to be disconnected and its address be set until differing from the others. The manufacturer can advise on how to change the address in each meter. Delivered systems a re preconfigured and no overlapping addresses should be there.

You can Explore the available slaves to collect their addresses. Press the "Explore" button and wait until it has found all slaves connected. It will study all addresses from one to 255 and this will take a few minutes. You can interrupt this if you are sure all slaves are found already, by releasing the same button. The slaves are listed in the array with a large yellow LED lit. An entry with a legal address 255 but an empty serial number and dark LED means simply an empty slot in the array. If more than 10 slaves are in the network, you can apply the numeric control at the left top corner to scroll and show the rest of the slaves. The current Primary slave is indicated here with a LED too. This collected data is valid during the session. Of course, it is not able to reflect any changes in the real world unless you Explore it again. You can limit the number of slaves checked with the control on the left edge, to save time. You can stop exploring by pressing the big button again.

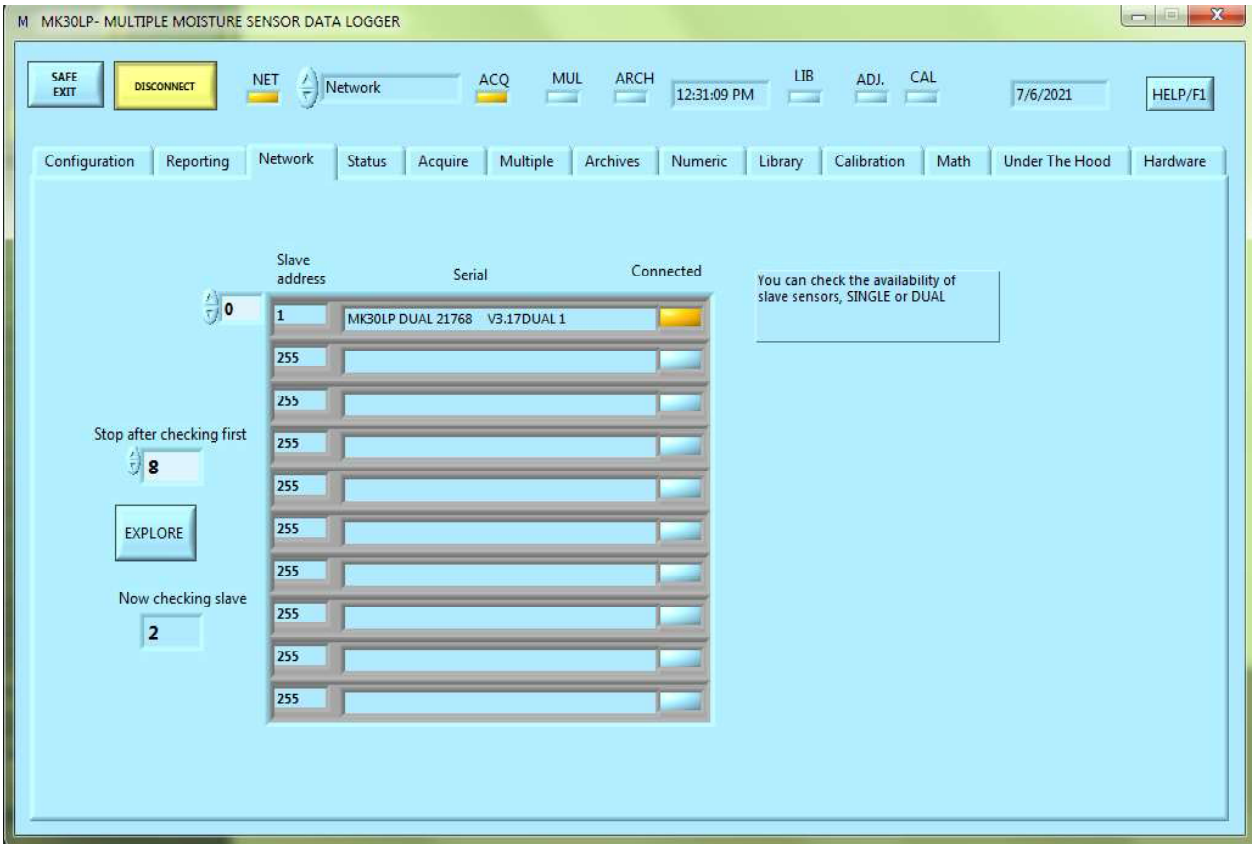


Figure 10-1. The Network page showing one slave found, which is the primary slave.

11. Reporting Page

11.1 Selections for Reporting

There are some optional settings on this page which are not saved. The buttons "LVM-file", "XML-file" and "Datalog" enable creation of data files in other formats in addition to the traditional IRMA7-files which themselves are quite useful for spreadsheet programs etc. The LVM format is typical for LabView-based systems. XML format is mostly for Active-X software and Datalog files are used for signal processing and datalogging. Note that this software **always** saves traditional IRMA7 data files to the data file path you have defined. If you have not defined a path for files, you will get error messages every time the program tries to save a file. **You don't have the possibility of turning it off.** This will save you a lot of headache as all of your primary data is saved. The only discomfort you may have is that you have to clean up the data file directory occasionally to prevent it from overflowing physical memory limits. The typical data file size is about 32 kb for each run or each partial run in Acquire. Refer to Figure 16-1.

You can use the Printing method selector. You have the options of Standard, Postscript or Bitmap printing. Use the Standard by default as it usually works the best way in all environments. If your printer is fully Postscript compatible, you may take advantage of its greater graphical quality. If you meet any problems in printing, try to select another option or adjust the features of your printer. You can turn off the printing by selecting the Printing button. It is ON by default. The Windows default printer is always used for all hardcopy printouts. You can use the HTML reporting by pressing HTML report ON. The resulting HTML and JPG files are saved among other data files.

You can also add two text lines to each data file indicating perhaps your intention with the measurement. Use the two text controls in the box "Project info in data files". This editing must be done prior to starting the measurements. Doing it afterwards is not helpful.

The marker which is available both in Acquire and Multiple slaves tasks, can be adjusted by height in the lowest left box "Marker". The default value is 0.5 units.

11.2 Control Files

One can produce data files at regular time intervals saved with just a simple group of data. These data points can be used in a production machine feedback control system as a simple means of data transport. To use this feature, either in Acquire task or in Multiple Slaves task or both at the same time, one needs to select the Control file path on Configuration page. The control files are created there and are each available immediately after creation. Select a valid path or folder for it. It can be in another computer accessed via network.

On this page you select which task will create the files and at which time interval. Do not make the interval too small since file creation in Windows is not a fast operation, especially if the folder is elsewhere. The files are named with the familiar date and time stamp plus other information making them always unique. The contents of the file are in ASCII form readable with almost any general program, containing the latest moisture value.

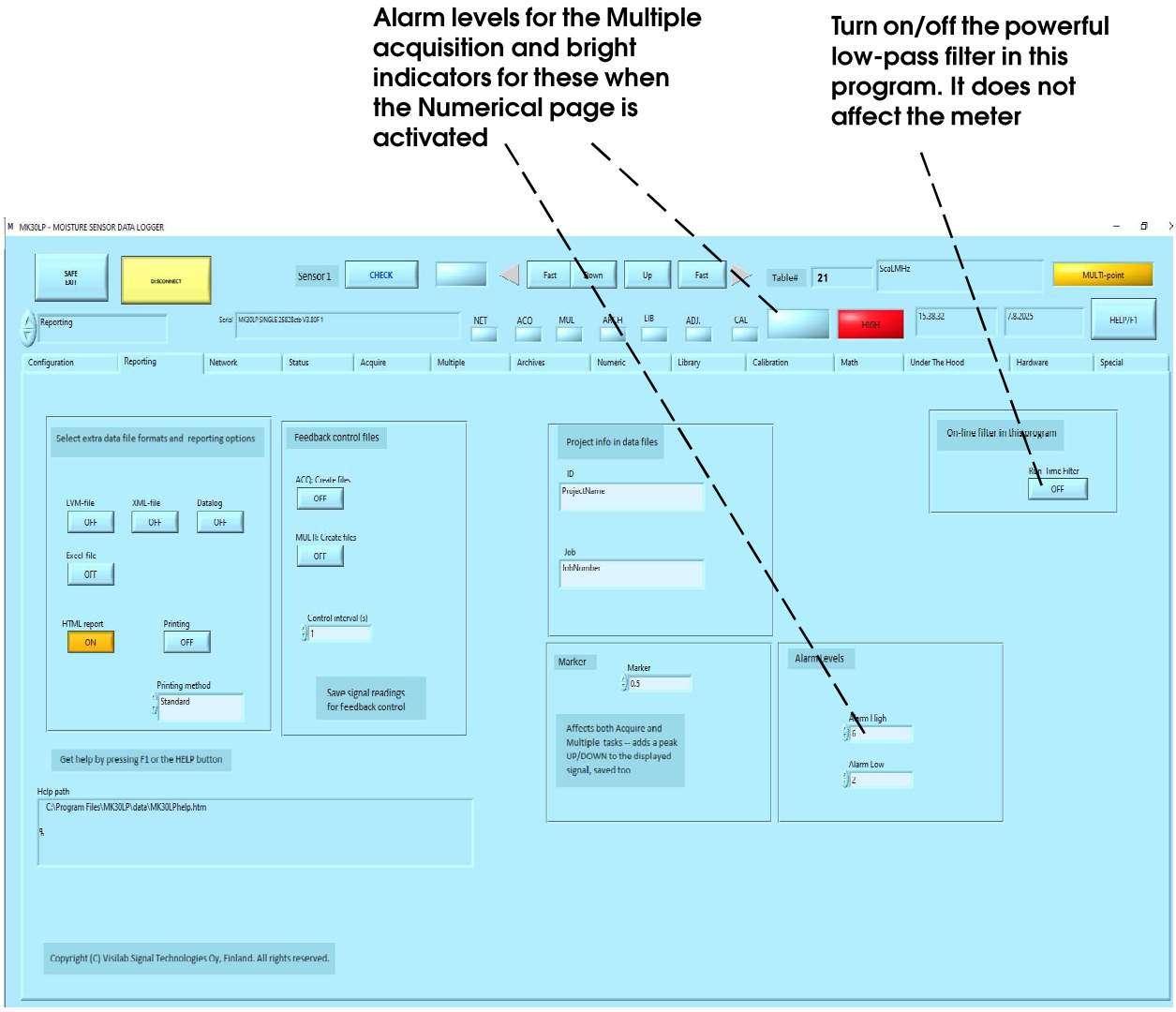


Figure 11-1. The Reporting page for selecting optional report formats and marker height in Acquire and Multiple sensors

12. Numeric Display Page

Sometimes the need arises for having a large high-contrast display which can be seen at a long distance. For example, the paper mill's operators often need it while adjusting the machine or they do their usual machine supervision drills. The Numeric Display page allows one to select any of the acquired data channels and display its latest value at a pace of one reading per second. The channel can be reselected anytime. The display's one decimal accuracy is available if the reading's whole part does not exceed 99. If higher readings are required, disable the decimal.

When stopping the program, it is **not** necessary to end this feature from working. Before you can do any setup on this page, you need to click on the small button edge at the left edge of the small black cover. It acts as a simple lock and opens and closes it. You can select the signal, select either one decimal or no decimals for the reading and you can bypass the regular measurement unit by pressing the small button. You can edit your own private unit for this measurement or even show a four-letter message. See Figure 12-1.

The available channels are as follows:

0...15: Moisture from Multiple Slaves page, channels 0..7
16: Difference channel from Multiple Slaves page, channel 16
17: Moisture 1 signal from Acquire page
18: Temperature 1 from Acquire page
19: Moisture 2 signal from Acquire page
20: Temperature 2 from Acquire page

You can experiment with the buttons here, no harm is done in any case.

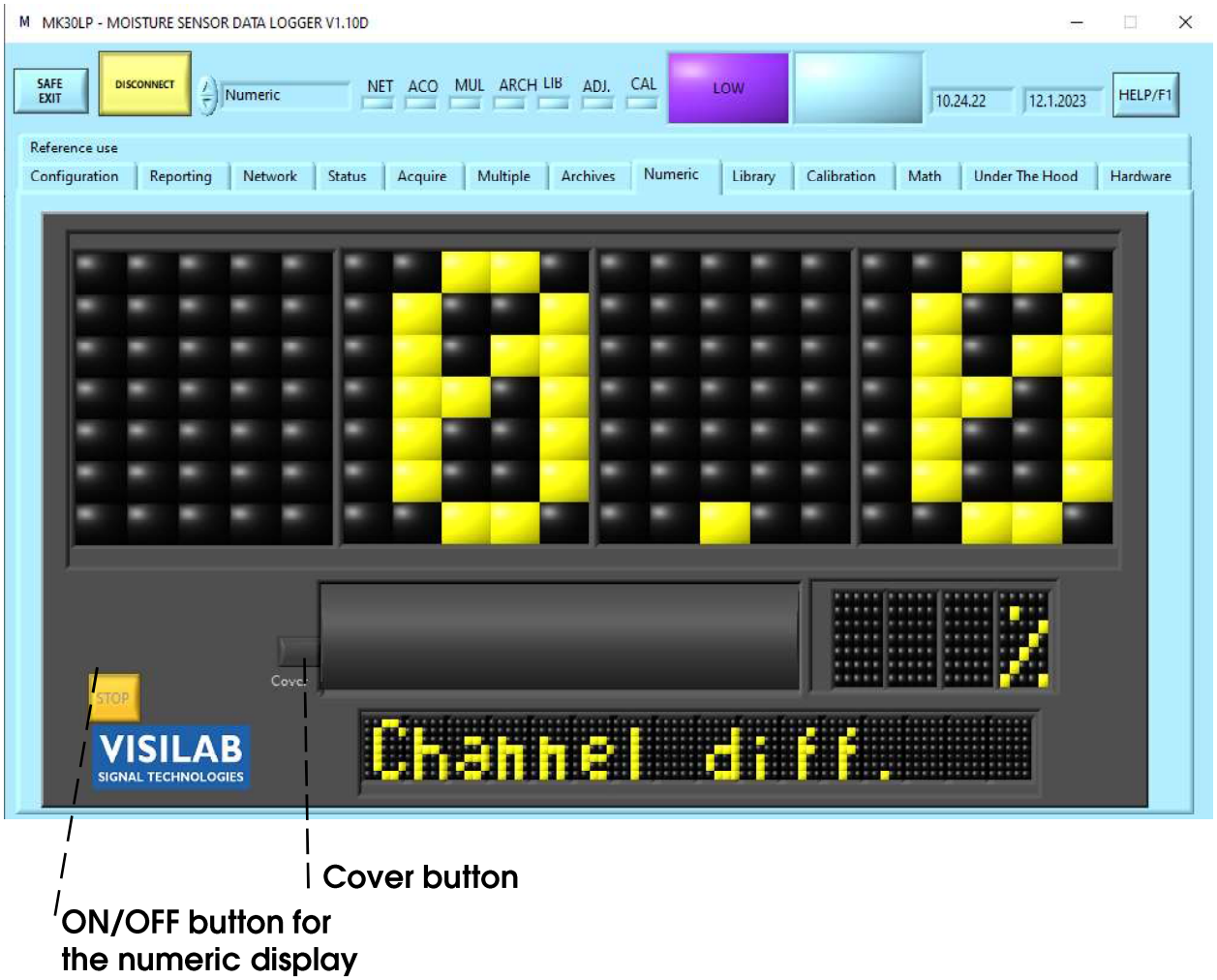


Figure 12-1. The Numeric Display page for showing the selected data channel

13. Under the Hood Page

The Under the Hood page allows low-level configuration of the meter which is not usually necessary at all. Only the zeroing of the sensors may be required occasionally if they become dirty or have some notable wear-out. After a successful change of parameters on this page, use the Save configuration button on the Status page to save the indicated settings in the meter. Else the new settings will be discarded when repowered.

When checking the settings, do not operate fast as the system needs to make some inquiries. It is not advised to quickly press all the buttons as that may lead to incorrect results.

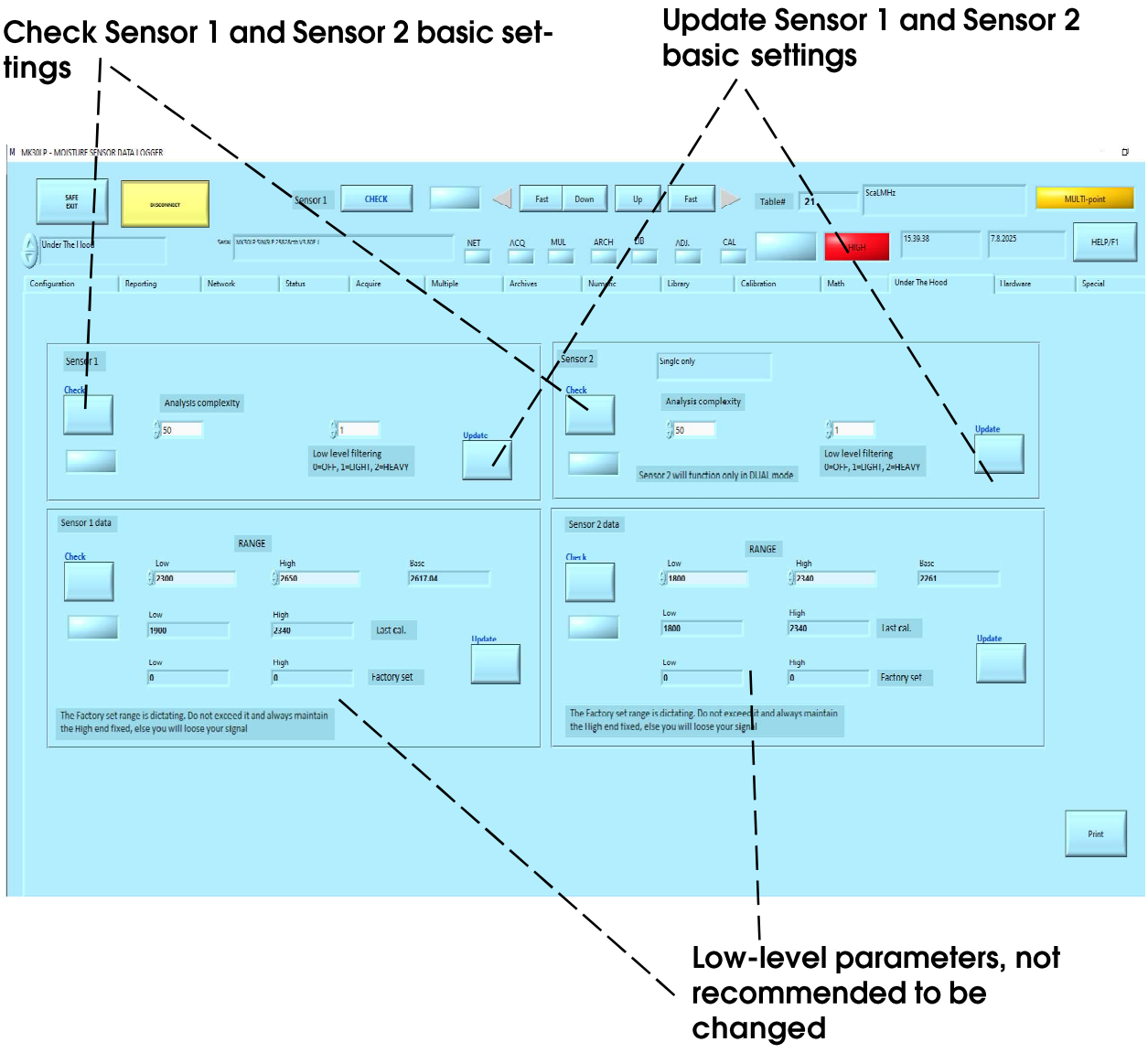


Figure 13-1. The Under the Hood page for showing the low level details. Modification is not recommended.

14. Hardware Page

The Hardware page allows lowest-level configuration of the meter. The analog output scaling can be done in this task. Also the baud rate can be set in the meter. If that is done, then the baud rate of this program must be made the same to communicate again. Note that none of these settings are saved in the meter at this point but must be done separately on the Status page. To release the selections in the system-critical part, press the button **Service only**. Else they will be inaccessible.

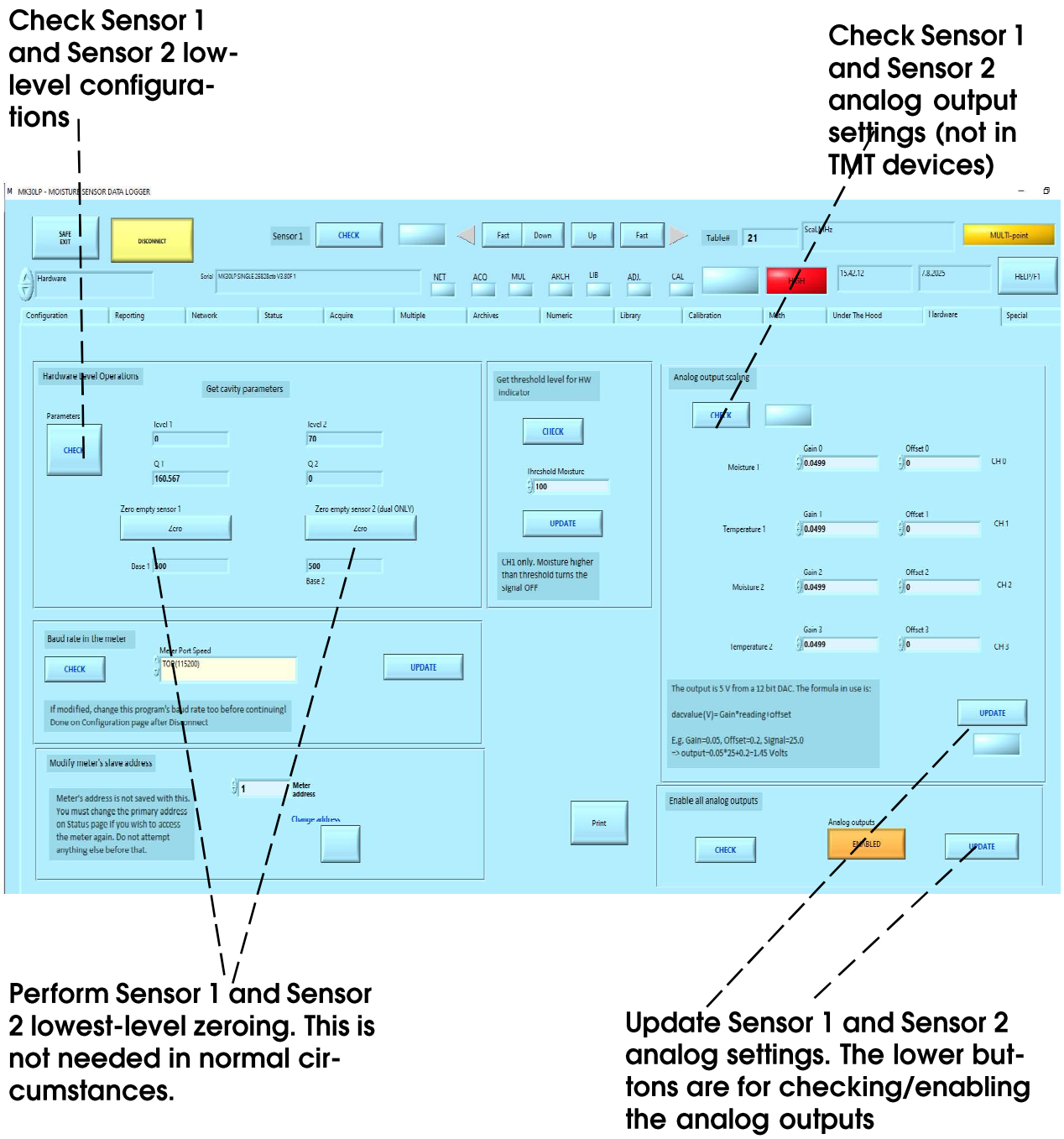


Figure 14-1. The Hardware page for showing the lowest level details. Modification is not recommended unless you know what you are doing

15. Special Page

This page allows modifying the use of the reference system.

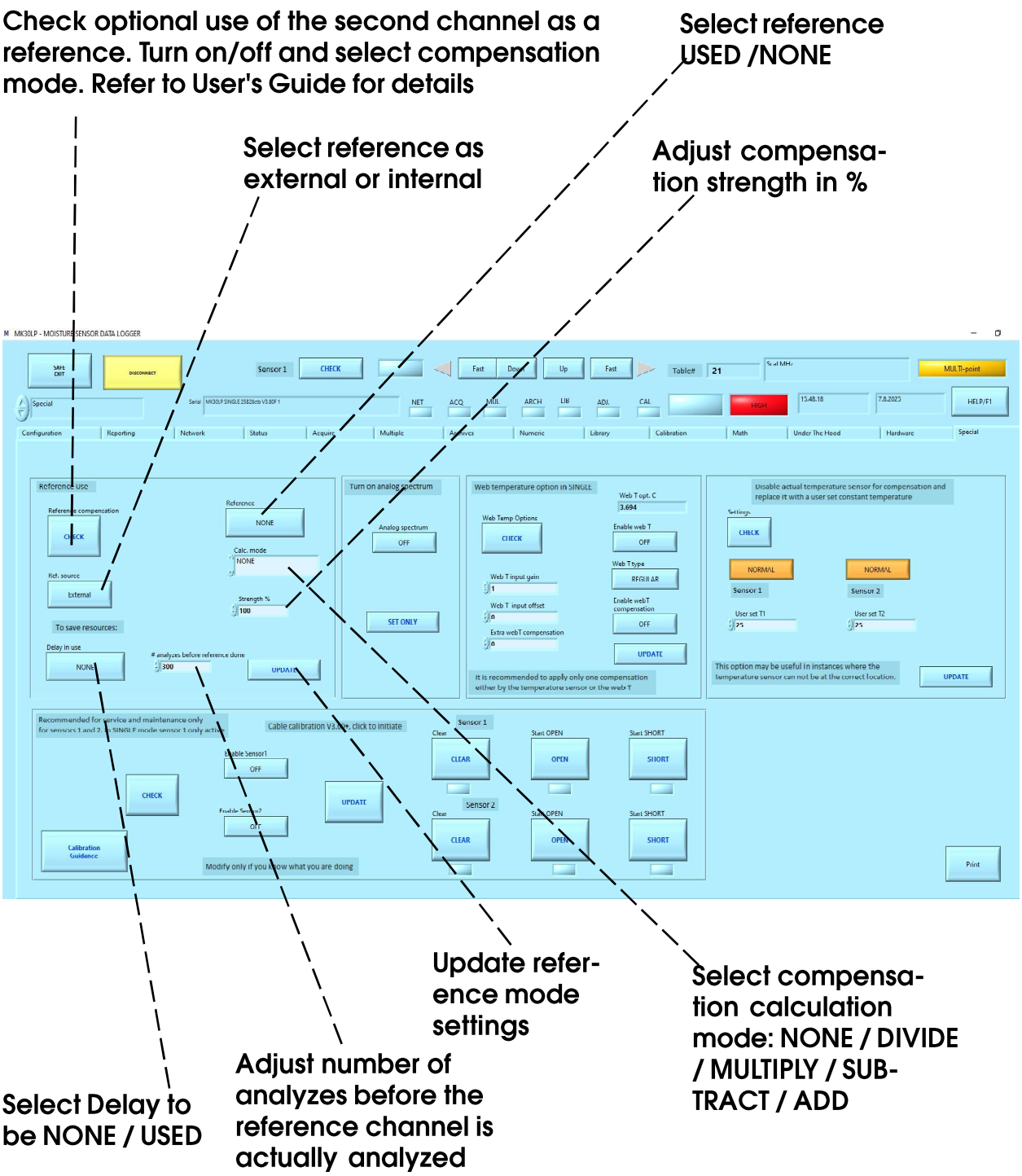
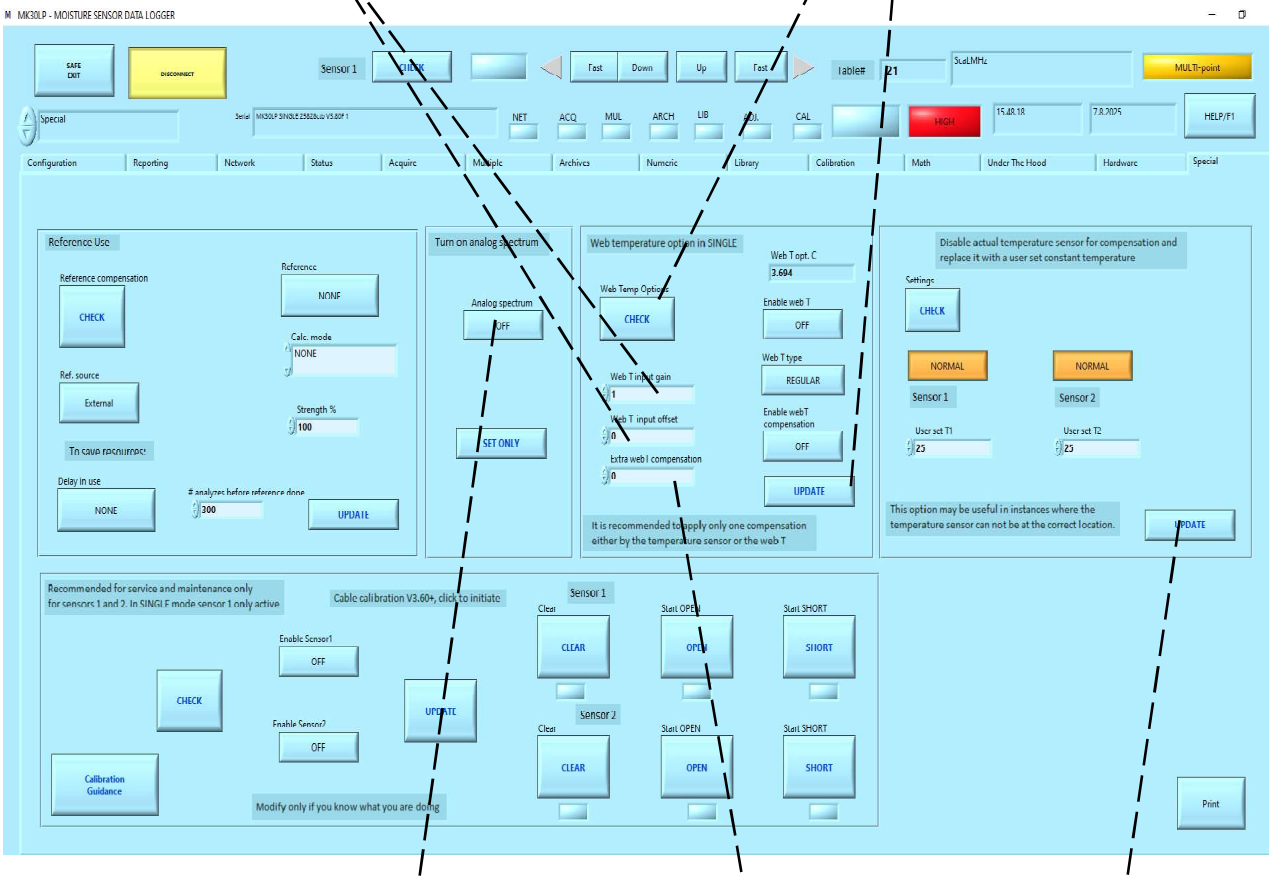


Figure 15-1. The special page, reference selections. Modification is not recommended unless you know what you are doing. Refer to the **Technical Manual** following the sensor (not in the website). That document contains plenty of technical details and gives the basic information on use of the reference.

Check and show the reading of the optional web thermometer in SINGLE mode. Enabling of this channel is made at factory while installing the IRT. The coefficients are shown also.

Gain and offset for the measured web temp. analog signal to calibrate the reading



Show the spectrum as a series of analog curves after each analysis on DAC CH0. Enabling this is temperary only and will turn itself of when repowered

Linear compensation coefficient for the measured web temp.

Update the settings

Figure 15-2. The special page, other selections. Modification is not recommended unless you know what you are doing. If the web temperature is installed, all coefficients and settings are factory made. If the sensor is replaced, a new calibration may be required.

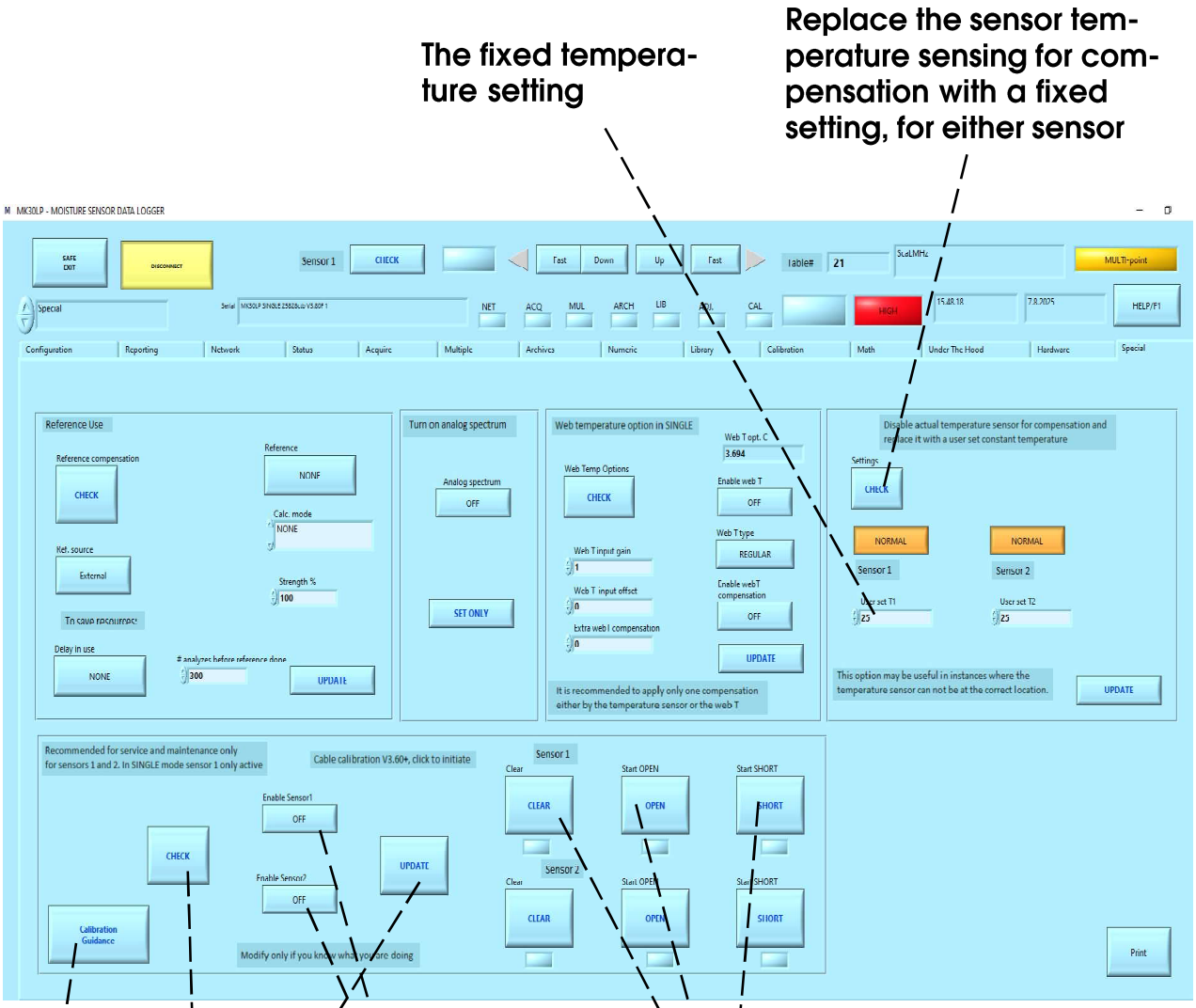


Figure 15-3. The special page, other selections. Modification is not recommended unless you know what you are doing. Do not touch the cable compensation system unless you know what you are doing. It is mainly meant for service and maintenance operations when long cables are replaced.

The Reference can be modified. Read the sensor's User Manual first.

The cable calibration system isnormally used only in servicing the sensor. Avoid making any changes to it unless you know what you are doing.

The use of a constant temperature for compensation may be needed in cases where the sensing head itself can not track the accurate temperature of the target material. Usually the reason is a very high temperature gradient near the tip of the sensor. If the material temperature is known, however, the fixed temprature selection allows accurate compensation replacing the measured incorrect temperature.

16. Terminal Use

By connecting an RS232 terminal with a baud rate of 115 200 baud to the internal connector for the terminal, one can communicate with the sensor. All settings and data are available. This is the approximate display seen while measuring normally. The two lowest lines are displayed only if a Continuous display is commanded by pressing "c". There is a Help system available by pressing "?". It will indicate the single-letter commands available. "ESC" will bring you to the internal text-based menu. The measurements are not possible while in the menu. When returning from the menu, remember to save the settings, else you will not be able to start normal measurements.

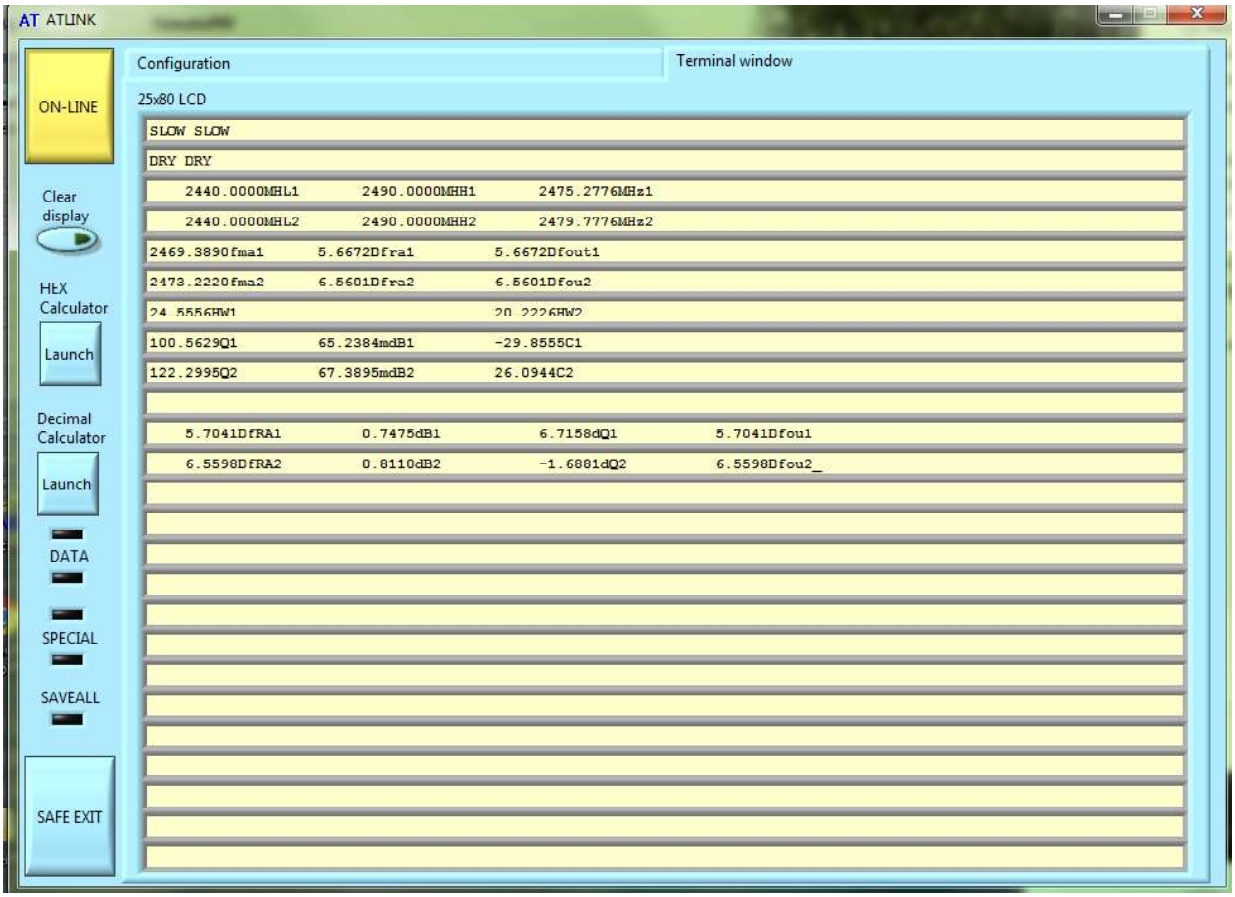


Figure 16-1. The Terminal screen

17. OFF-LINE Use

The MK30LP and MK30Simple software are designed to be used with **MK30LP** and **MK30LP-CUBE** microwave moisture sensors only including some tailored variants of them. Without a meter connected to the PC and the program, delays, invalid data, ineffective commands etc. will appear on some of the pages. The only pages which can be used effectively, are: **Archives and Mathematics**. When using these pages, refer only to existing data files, not to any meter signals. A sensor is not required to be connected **but at least some device tro the USB/COMxx port** so that valid port does exist although it is not used.

18. Note for Users

It is recognized the need of having user feedback. If you ever meet any bugs or problems with this software, check first our web site to see if the latest version available there has this bug fixed. You can then download that version. Else, you can report all problems to us at **support@visilab.fi**. Thank you for your cooperation.

19. Appendix B, Error Message Dialogs

19.1 Some of the Most Important Error Messages

While starting or using the software you may encounter the following error situations. Below we explain how to proceed at that time.

19.2 Incorrect Asynchronous Serial Port

This is the most common error caused by selecting a serial port which does not exist or is already reserved for some other application. Press the Continue button and check the port. Then, try again. Refer to Fig. 23-1.

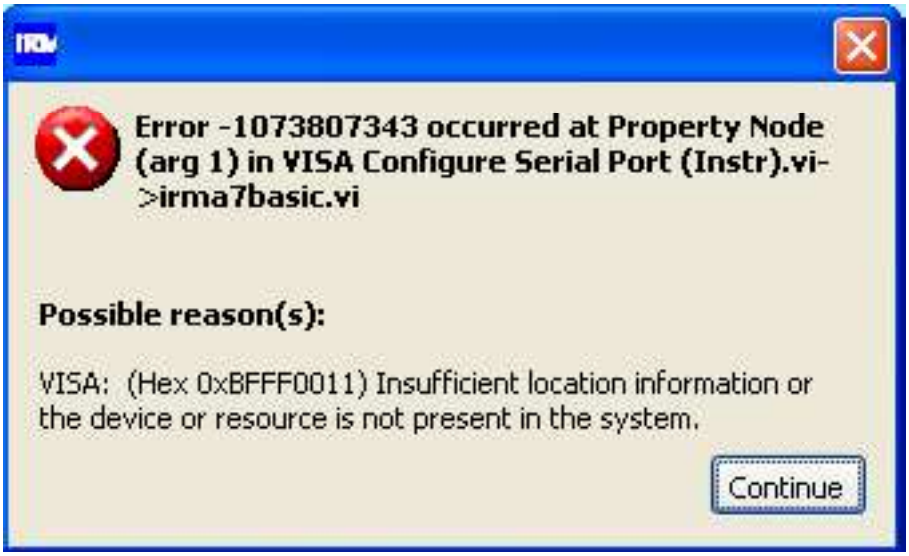


Figure 19-1. The case of incorrect serial port (a VISA-related message)

19.3 Incorrect Path or Nonexistent File

This is the direct result of not defining and setting a sensible path for data files. Press Continue and check what you have done on the Configuration page. Save settings when happy with them to avoid this to happen again. Refer to Fig. 23-2.

Figure 19-2. The case of nonexistent path or file

19.4 User Interrupt or Nonexistent File

This is the direct result of canceling retrieval of any data file to, for example, the Archives page. Press Continue and press again the file name button to clear it. This might also happen if you tried to access a file via network but met some access restriction. Refer to Fig. 23-3.

Figure 19-3. The case of User interrupt when accessing a file

19.5 Trying to Open a Nonexistent Settings File

This is the result of not finding any file containing the basic settings of this program (of type "ini") . Press Continue and check all program settings. Then, on the Configuration page, press the Save settings button. The error message will not be displayed again after this. Refer to Fig. 23-4.

Figure 19-4. The case of nonexistent settings file (.ini file)

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