Tips and guidance on how to use the portable instruments effectively

1. Which paper and fibre products can be measured?

- ☐ running webs
- ☐ laboratory sheets and samples
- ☐ static paper reels
- ☐ rotating reels
- ☐ pulp stacks and sheets
- ☐ paper forms
- ☐ corrugated
- ☐ textiles and felts
- ☐ fibre mass samples

2. Types of Measurement

Basic information, common for both models:

- ☐ The starting of data collection to a new memory bank (max 820 of them, each with maximum of 500 points) is indicated by a changed display colour. The banks remain even in case of powering down.
- ☐ Starting is initiated with the **Start button** or the **"+"** key. Stopping is made with the Start button or the **"-"** key. Automatic stopping happens when the preset number of points (or 500 max.) is reached.
- ☐ Data can be either analyzed in the meter or memory banks / profiles are downloaded to PC for further analysis, reporting and archiving.

3. Options for measurement, place the meter over the sample (sheet, web or reel etc.) and you can do any of the options, one or more simultaneously:

- ☐ read the numbers on the display, big numbers or small numbers and the graph of latest 64 readings
- ☐ start collecting data to a new memory bank / profile. Stop when done. Data is in a new memory bank
- ☐ establish a Bluetooth wireless link to a PC. Start a continuous data acquisition displaying readings until stopped. Move around the target to be measured and **everything** is recorded by your PC. You can use the program's numeric/graphic display at the same time and you can also start collecting data to a memory bank / profile.
- ☐ start a memory bank / profile **checking routine** in the PC (wireless) to download each new memory bankcreated in the meter. Go to your target position and start at each interesting point and then stopit. Each new memory bank is automatically downloaded to the PC. When you return to the PC, all the data is already there.

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4. Communications links available:

AK30

- ☐ Wireless Bluetooth and USB at the same time
- ☐ RS232 in the older versions of AK30

Avoid using the PC programs parallel through the different ports even if you can connect like it. The AK30 may contradict commands flowing in at the same time.

MK30R

- ☐ Wireless Bluetooth
- ☐ USB

These are not available at the same time and must be switch-selected

Memory Limits For Both Models

The maximum number of profiles / memory banks is 820. When this amount is achieved, the meter will refuse to add any more and the data acquired should be downloaded to a computer and then erased by using the menu in the meter.

5. Model-specific Features

Refer to each model's Quick and Short User's Guides and the full User's Guide for further details.

AK30

The NIR light penetrates very little, measuring surface moisture with infrared technology, down to 150 microns deep. In felts and fibre mats of loose structure, the penetration can be in the order of several millimeters. It can measure thick papers and reels and stacks the same. Thin papers as sheets may require a specific calibration depending on basis weight (BW). BW > 120 g/m2 goes as reels. Sheets are usually measured without any backing or over a black Aluminum plate. AK30 can measure static and rotating reels. The cross profile is made with a **time-based interval** (typically 0.2 sec). AK30 measures through the opening in the metal skid and that part should always touch the material evenly. AK30 is not sensitive to reel or web speed nor to the angle of its body relative to the machine direction. Everything stated in this paper about the AK30 is valid for the AK40GWP portable NIR moisture meter too.

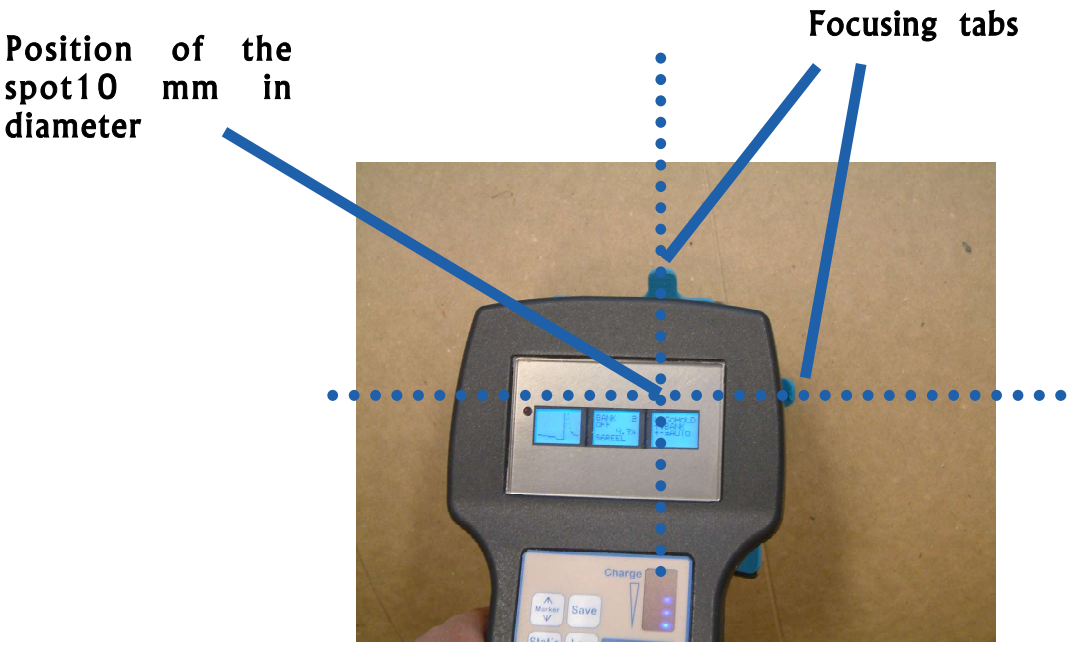
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Making a Static Or Moving Reel Profile Measurement With AK30

- ☐ Place the meter at the edge of the reel so that the metal skid is entirely touching it and is parallel to its surface. No gap or tilting angle is allowed.
- ☐ Press either the Start button on the left side or the "+" key on the keypad to start measuring.
- ☐ Start moving the meter along the profile at a steady pace (time-based operation)
- ☐ At the end stop the moving meter and press the Start button again or the "-" key on the pad. The profile is now saved into the meter, its statistics are shortly flashed and later on, you can download the profile to your computer. You can retrieve this profile in the meter to see its graph and statistics. You will need to be working in the **BANKS mode** (blue screen) to see any earlier data.
- ☐ You are ready to do another profile measurement at any time.

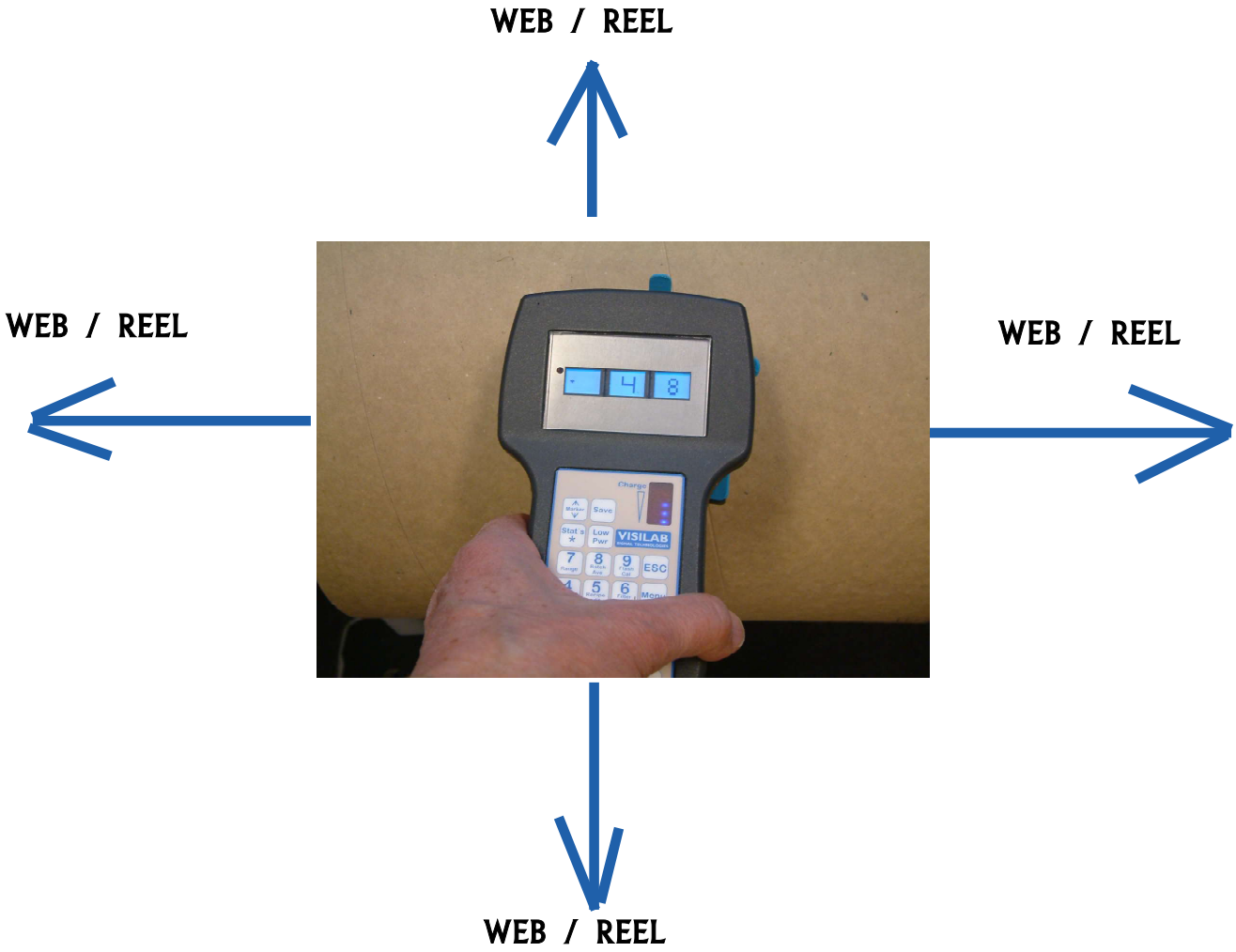
The time interval normally used would be 0.2 seconds or five points per second. 500 points allow thus a measurement of 100 seconds duration. AK30 can thus make profile measurements of both moving and static reels with a time-based point synchronization of distance.

Note the blue plastic focusing tabs in the Figure below. There are two horizontal and one vertical tab indicating the position of the actual measuring spot under the meter. The spot will be at the point where a line drawn from tab to horizontally and vertically will meet. This information is very useful while measuring narrow reels or samples.



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Effect of directions for the AK30



AK30 measurement can be done in **any direction** referring to the running web or reel.

If the paper has a strong fiber orientation, apply the direction used in calibrations or turn the meter for maximum reading

Web profile measurement is time-based. Usually the time interval is 0.2 sec or 5 points /sec.

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MK30R

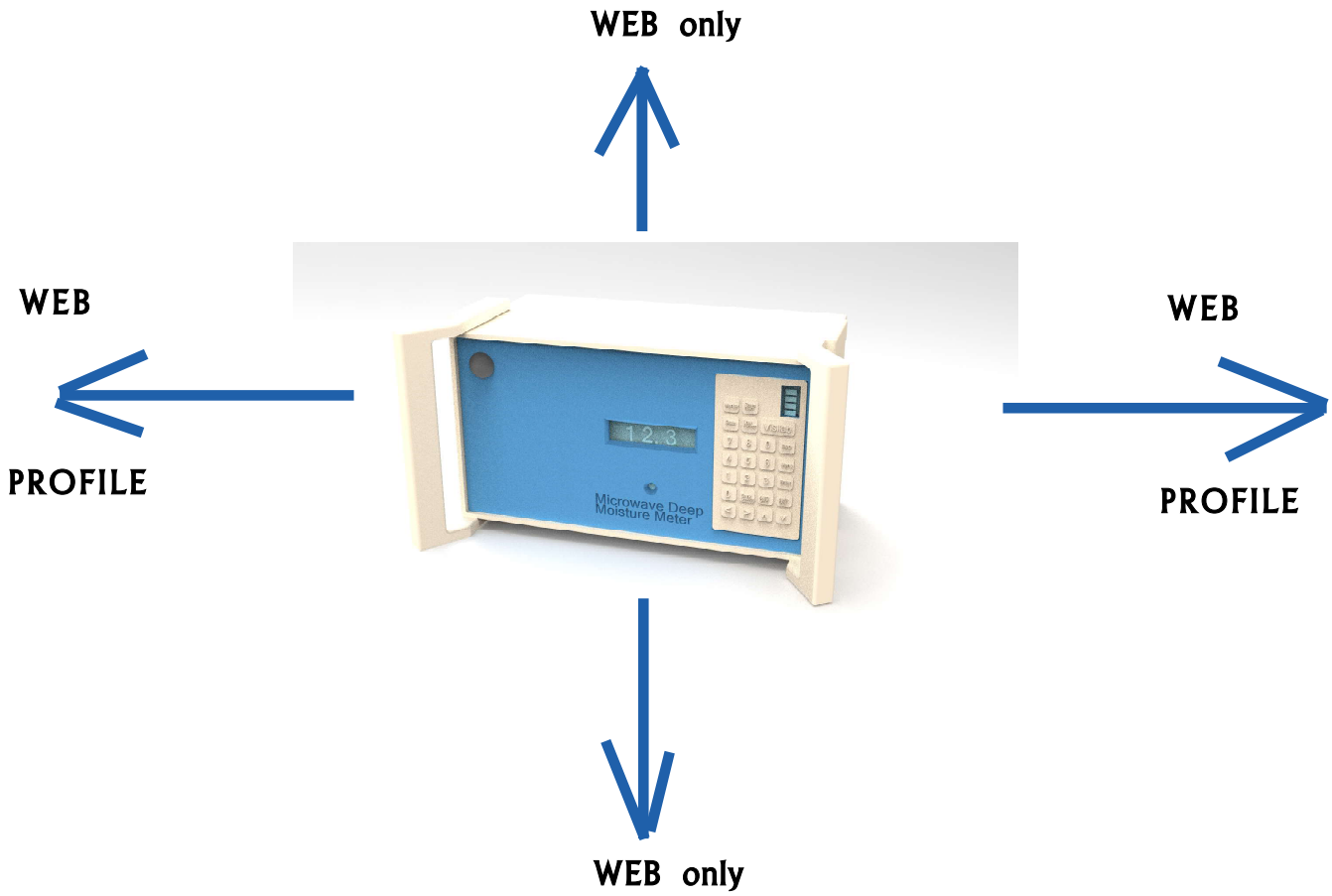
It penetrates typically to 35 mm with microwaves. To get an accurate reading of a thick sample, it should be at least 35 - 45 mm thick. MK30R has a switch on the bottom for selecting either **WEB** or **PROFILE** measurements, disabling or enabling the **travel sensor** operation. Measuring a sheet should be made with no background (a free draw) in the WEB setting (time-based intervals). Sample sheets can be placed on the sensing surface when the meter is placed on the desk upside down and the reading is either visible on the PC linked to it or the Start button is pressed to capture a series of data to be checked afterwards. The sheet is held by hand tightly to avoid any gap and wrinkles. Measuring stacks can be done easier just by placing the meter on them. **It is important that any air between the layers must be pressed out**. Running webs are measured by holding the MK30R lightly touching and maintaining the sensing area strictly parallel to the web with no gap. Avoid pressing too hard causing the web to break. MK30R carries also a general purpose calibration for measuring practically any web giving a result in **g/m2 of water**. MK30R is not sensitive to the angle of the web velocity nor its speed in **WEB** measurements.

MK30R can measure both rotating and static reels. The rotating reels are measured similar to sheets, setting is **WEB**. When measuring static reels and an accurate profile is needed, the switch is turned to **PROFILE**. The travel meter gives impulses for sampling at intervals of 20 mm. MK30R is held along the line of cross profile for the travel meter to work properly. Any angle will cause either errors in profile distance or even prevent it working as the wheel is not rotating. ***The PROFILE setting should not be used for other applications as its wheel is vulnerable to sideways impacts.*** MK30R will indicate the switch position when changed and also when powered on. The switch itself is also indicating the setting as seen under the meter. The WEB setting is recommended to be used at any other times to keep it safe.

Note that MK30R does not tolerate metal objects near the sensing head, causing significant errors in readings. Also soothe and metal particles and Titanium Oxide will disturb it much.

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Effect of directions for the MK30R



MK30R **WEB** measurement can be done in any direction referring to the running web or reel. It is insensitive to fiber orientation and web direction. *Make sure the travel sensor is in its stall and not touching the paper surface.* MK30R can be used for profile measurements in WEB setting by using the **time base**, usually 0.2 sec intervals.

MK30R **PROFILE** measurement can be done only along the long axis of the unit. The **travel sensor** is in active use after selecting it with the switch under the meter. ***Never use the travel sensor into other directions.***

MK30R can be used for measuring webs with the travels sensor with an increment of 20 mm. This allows capturing time series with accurate intervals. This is for slow webs only. There are more options available in the meter Menu for this kind of measurement, please refer to the user's guide. The increment can be modified from 10 to 1000 mm in steps of 10 mm.

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Making a Moving or Static Reel Profile Measurement With MK30R (travel sensor not used)

☐ If not already set, turn the switch on the bottom to **WEB** setting (travel sensor is off).
☐ Place the meter at the edge of the reel so that the metal skid is entirely touching it and is parallel to its surface. No gap or tilting angle is allowed. The big asterisk "*" marking on the front panel indicates accurately the hot spot of the measurement.
☐ Press either the Start button on the left side or the "+" key on the keypad to start measuring.
☐ Start moving the meter along the profile at a suitable pace to cover the side length
☐ At the end stop the moving meter and press the Start button again or the "-" key on the pad. The profile is now saved into the meter, its statistics are shortly flashed and later on, you can download the profile to your computer. You can retrieve this profile in the meter to see its graph and statistics. You will need to be working in the BANKS mode (blue screen) to see any earlier data.
☐ You are ready to do another profile measurement at any time.

The time interval normally used would be 0.2 seconds or five points per second. 500 points allow thus a measurement of 100 seconds duration. MK30R can thus make profile measurements of both moving and static reels with a time-based point synchronization.

Making a Static Reel Profile Measurement With MK30R (travel sensor in use)

☐ If not already set, turn the switch on the bottom to **PROFILE** setting.
☐ Place the meter at the edge of the reel so that the metal skid is entirely touching it and is parallel to its surface. No gap or tilting angle is allowed. The big asterisk "*" marking on the front panel indicates accurately the hot spot of the measurement.
☐ Press either the Start button on the left side or the "+" key on the keypad to start measuring.
☐ Start moving the meter along the profile but not too fast. Maximum speed is about 50 cm/sec
☐ At the end stop moving the meter and press the Start button again or the "-" key on the pad. The profile is now saved into the meter, its statistics are shortly flashed and later on, you can download the profile to your computer. You can retrieve this profile in the meter to see its graph and statistics. You will need to be working in the BANKS mode (blue screen) to see any earlier data.
☐ You are ready to do another profile measurement at any time.

Note that the maximum number of points in a profile is 500 which means with a 20 mm interval a maximum reel width of 10 meters.

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