KIPP & ZONEN
SINCE 1830

omni
INSTRUMENTS



METEON

Irradiance Meter

Instruction Manual

Declaration of Conformity

According to EC guideline 89/336/EEC 73/23/EEC

We **Kipp & Zonen B.V.**
Delftechpark 36
2628 XH Delft
The Netherlands

Declare under our sole responsibility that the products

Type: **Handheld Readout unit**

Name: **METEON**

to which this declaration relates are in conformity with the following standards

Imissions	EN 50082-1	Group standard
Emissions	EN 50081-1 EN 55022	Group standard
Safety standard	IEC 1010-1	

Following the provisions of the directive.

B.A.H. Dieterink
President
KIPP & ZONEN B.V.

Introduction

The Kipp & Zonen METEON is a high-performance sensor readout unit with integrated data logger.

The sensor sensitivity is programmed into the METEON such that the readout will show calibrated engineering units, rather than millvolts or microvolts.

Use of the data logger functions and programming the sensor sensitivity is done with the USB interface which is standard supplied to connect the METEON to a PC.

Specifications

A/D conversion: 16 bits

Input range (programmable):

Full scale voltage	Internal counts	Internal resolution
+/- 200 mV	20,000	10µV
+/- 100 mV	10,000	10µV
+/- 50 mV	5,000	10µV
+/- 25 mV	25,000	1µV
+/- 12.5 mV	12,500	1µV
+/- 6.25 mV	6,250	1µV

Basic accuracy after factory calibration	0.1%
Temperature sensitivity	< 0.5% over the full temperature range
Offset drift	< 3 µV over the full temperature range
Operation temperature range	-10 .. +40 °C
Storage temperature range	-20 .. +60 °C
Relative humidity	< 95% RH non-condensing
Input circuit	> 2 MΩ // 680 nF
Input low-pass filter	5 Hz
Input connectors	2 x 4mm banana plug
Display	LCD 4 digits with sign
Decimal dot position (programmable)	8888 or 888.8 or 88.88 or 8.888
Display update	At least 1 per second
Computer interface	USB 1.1 / 2.0 low speed
Supply current	< 2 mA
Batteries	2 AA (penlight) alkaline
Battery life (alkaline)	> 1200 hours (50 days) continuous use
Data logger memory	3518 samples
Data logger storage interval	2 .. 65535 seconds
Logged information	Min, max and average over log interval
Software compatibility	Windows 2000, Windows XP

Operation

The METEON accepts two AA size (penlight) batteries. Use alkaline types for best results. New, good quality batteries should give up to 50 days of continuous operation.

Remove the bottom cover of the enclosure to access the battery compartment. This can be done by pulling the side away with the index finger to release the bottom. Please take care to follow the instruction on the bottom of the METEON to avoid damage to the case. Extract the battery holder from the compartment, and install two fresh batteries. Notice the polarization. Replace the bottom cover and connect the sensor.







The METEON is now ready for use. Switch the METEON on with the push-button switch on the top.

To prevent that the METEON is switched off while logging, the on/off switched is mounted so that the button has to be pressed quite deep to switch on or off. You can feel it and hear it when the switch toggles. Press the small black button far enough with your nail or a pencil until you feel and hear it switch.

Software

Use of the software requires a PC with Windows 2000 or XP operating system and a USB interface. The software has built-in functionality for:

- programming the sensor sensitivity
- data logging functions

For each of these functions, an interface cable is required. This cable is used to connect a METEON to the USB bus on a PC. If your METEON comes bundled with a sensor, the sensitivity is already programmed into the METEON, In that case, the optional interface cable and the software give you access to the data logging functions only.

Main window



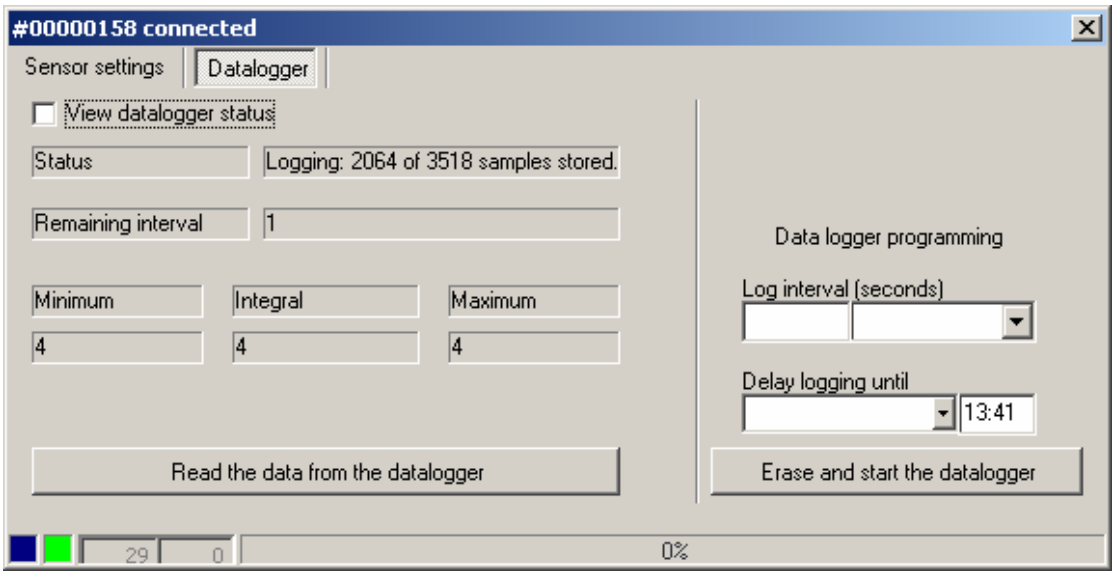
After installation, the software can be started from the Start menu. The main window allows you to:

- Open a previously stored file with logged data.
- About .. shows the software version and link to the Kipp & Zonen website
- Exit shuts down the METEON software

The bottom line of the main window shows help (if available) on the items where the mouse points to.



METEON window



All other functions related to the METEON are available in special windows, which will only open once you connect an METEON to USB interface cable to the PC. You can connect more than one of these interface cables to your PC, and for each of the interfaces a separate window will open. These windows may be on top of each other, move them around on your screen to reveal the ones that are covered.

When the PC cannot find a METEON connected to the cable, the caption of the window will be 'Nothing connected'. To connect a METEON, insert the connector from the cable into the METEON. The PC will automatically detect the METEON. If the PC does not detect the METEON, then check if the METEON is switched on, and check the batteries.

Once the METEON is detected, the caption of the window will show the serial number of the METEON that was connected.

When the view data logger status box is activated the actual logger data is visualized.

- Logger status:
  - the remaining memory (until 3518 samples is reached)
  - or memory full
  - low battery
  - idle
- the remaining interval time until the next sample is stored
- the actual min. max. and integral value over the chosen interval.

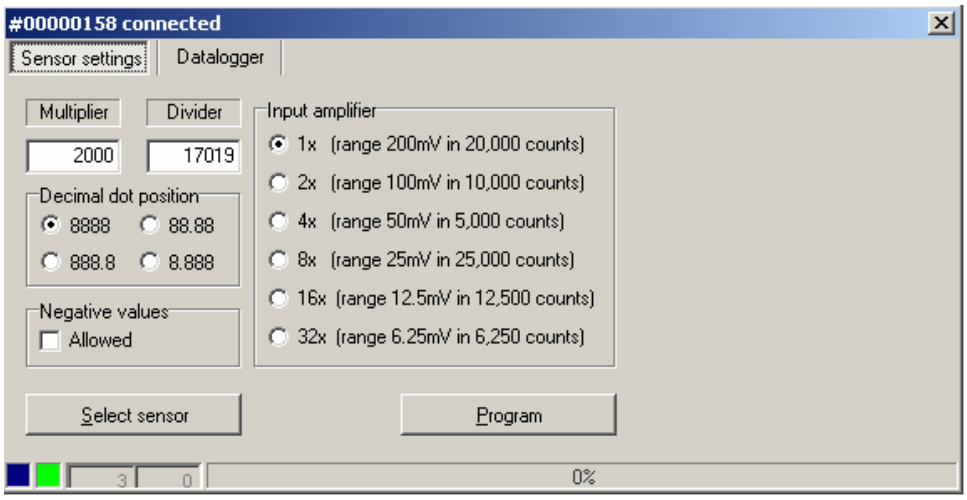
Programming the sensor sensitivity

The software is used to program the sensor sensitivity into the METEON. If the METEON came bundled with a sensor, your supplier may already have programmed the sensitivity of this sensor into the METEON. If that is the case, the software you received may not have this option.

Manually

If you want to manually enter the sensor settings, the required METEON setup is determined in the following steps:

1. Go to the ‘Sensor settings’ page. The full range output voltage of the sensor should be less than or equal to the full scale input voltage of the METEON. The full range output voltage is used to select the maximum input stage amplification factor of the METEON in the software.



   In the box that says ‘Input amplifier’ you can select the amplification that corresponds to the required full scale input.

2. Next to the amplification factor, you can read how many internal counts each input range will give you. The number that the METEON should display at the full scale input value is entered into the multiplier input field. The number of internal counts that corresponds to that full scale input is entered into the divider field.

3. The decimal dot position for the display is selected.

4. The METEON is programmed with the new settings. To do that. Click the ‘Program’ button.

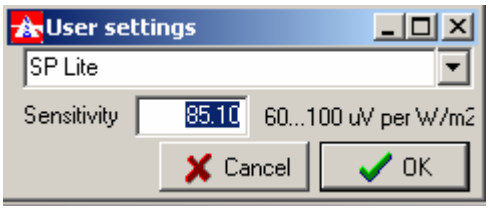
Wizard

Alternatively, the settings are generated by software through the Wizard. Depending on the sensor sensitivity, the Wizard will select the optimal input stage amplification for the METEON, and store appropriate values in the multiplier and divider fields. The position of the decimal dot in the display is also set. After the wizard is used, the METEON only has to be programmed to make it suitable for use with the specified sensor.

The following sensors are supported:

Sensor	Full scale	Sensitivity
CMP 3	2000 W/m2	5 .. 20 µV / W/m2
CMP 6	2000 W/m2	5 .. 16 µV / W/m2
CMP 11	4000 W/m2	7 .. 14 µV / W/m2
CMP 21	4000 W/m2	7 .. 14 µV / W/m2
CMP 22	4000 W/m2	7 .. 14 µV / W/m2
CM 4	4000 W/m2	7 µV / W/m2
SP Lite	2000 W/m2	60 .. 100 µV / W/m2
SP Lite *	4000 W/m2	9.5 .. 10.5 µV / W/m2
PAR Lite	10,000 µmol/m2s	4 .. 6 µV / µE/m2s
NR Lite	±500 W/m2	10 µV / W/m2
CUV 4	200 W/m2	1 mV / W/m2

Use the wizard to select the sensor model that is to be used, and then enter the sensitivity of the sensor. This is only required when the sensor is changed or when the METEON is bought without a sensor. Otherwise the sensitivity of your sensor is already in the METEON.

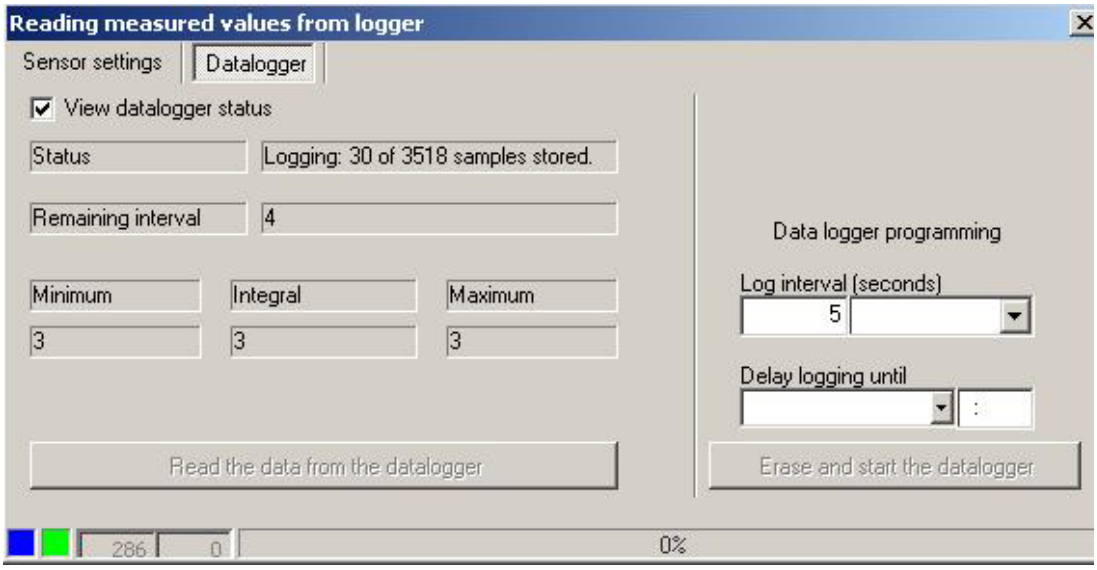


Data logger

The PC software is used to enter the data logger setup, and to transfer the setup to the METEON.

When the METEON is programmed with a new data logger setup, the logger memory in the METEON is erased, and then the new settings are used to start a new logging sequence. The logging only stops when the logger memory is full, when the batteries are depleted, or when the METEON is switched off. The PC software can be used to check the logging activities, and the METEON also shows some display characters to indicate what it is doing.

Note:
When the METEON is switched off, all logged values and settings remain in the (flash) memory, even when the batteries are removed.

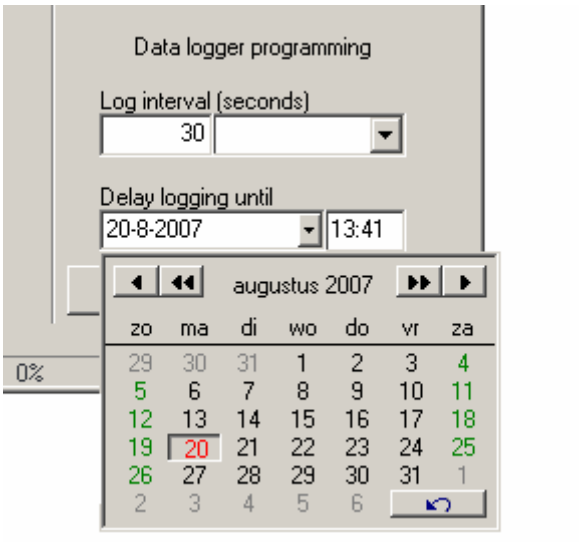


Log interval

The log interval is entered in seconds. The pull-down box can be used to preset the correct number of seconds for some popular log intervals. Note that the pull-down is only used for selecting a preset, the number on the left is the log interval that will be transferred to, and used by, the data logger in the METEON.

Initial delay

When logging starts, an optional delay can be used to postpone the start of the first logging interval until a specified date and time. This date and time at which the first interval will start, can be entered in the PC software. When the logger is busy counting down the delay for the first logging interval, the LCD on the METEON shows an 'I' that flashes at a slow (1 second on, one second off) rate.



In the example on the left the logging starts on Aug. 2007 13:41

Logging

Once the initial delay has elapsed (the initial delay can be 0) the first logging interval is started. The METEON is now actually logging, and the 'I' on the LCD flashes rapidly (½ second on, ½ second off)

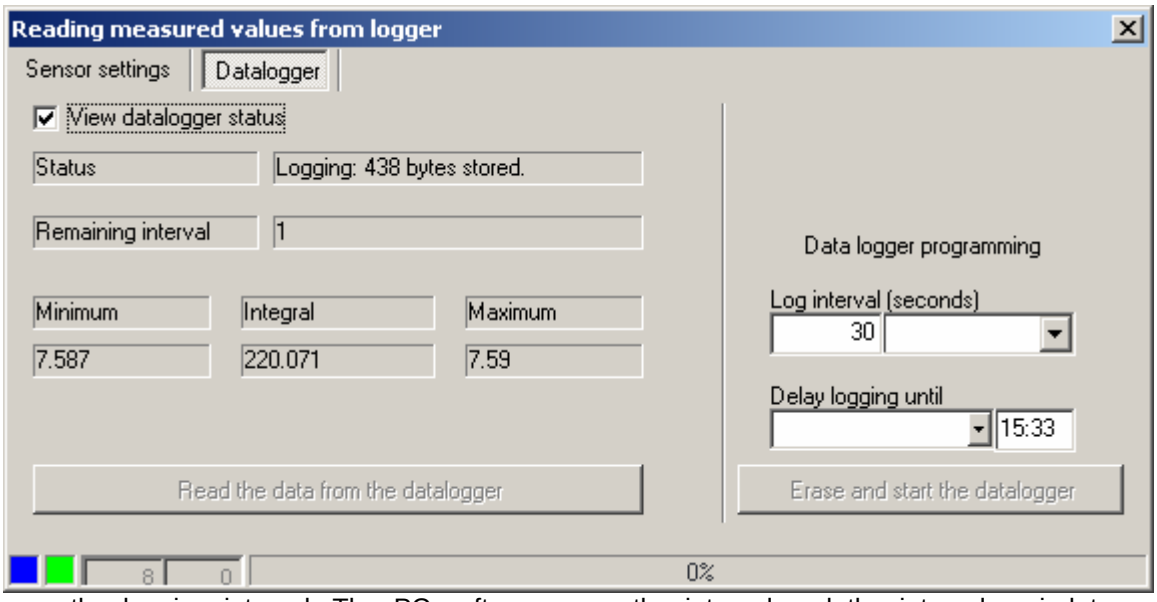
Logged values

During a logging interval, the METEON accumulates minimum input value, maximum input value, and average input value. Once the logging interval has elapsed, the values are stored in the logger memory and the next interval is started. Each time the METEON stores a new set of values in the logger memory, it flashes the 'm' sign on the display. Logging only stops when the logger memory is full, when the batteries are depleted, or when the METEON is switched off.

Read status

You can view the logger status while the logger is active. Reading the status will not interfere with the logging process.

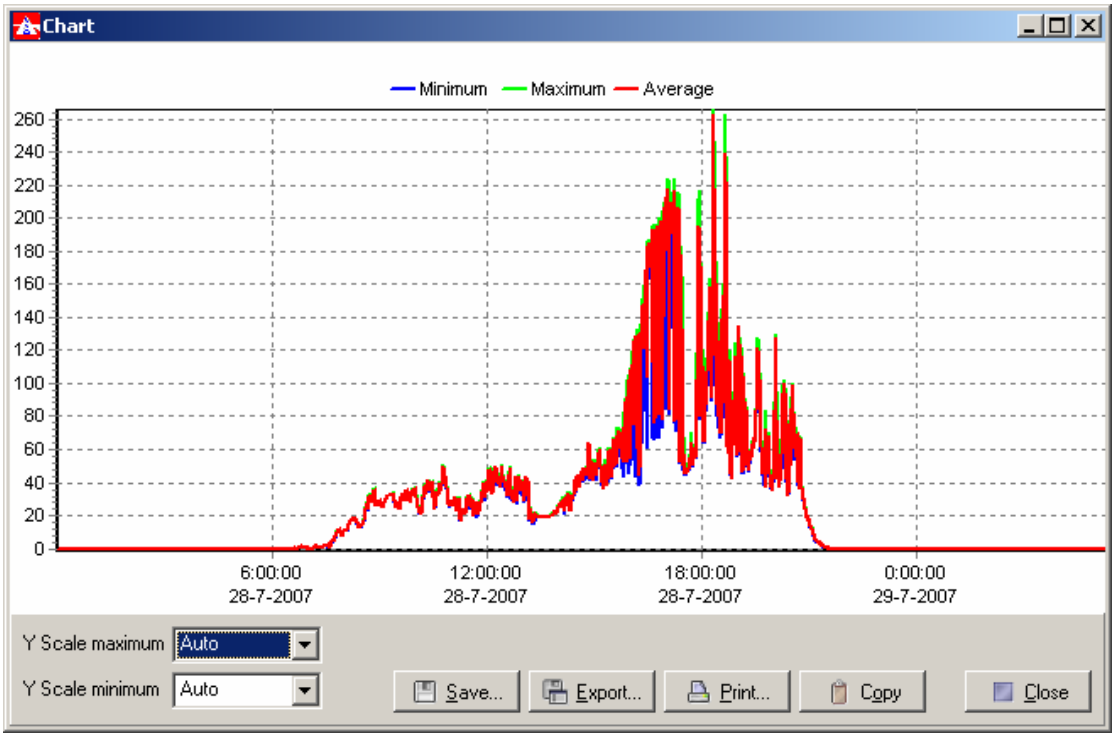
The status will show what the logger is doing, how much time remains in the current interval (if the logger is logging) and what the measured values are. The logger measures an integral



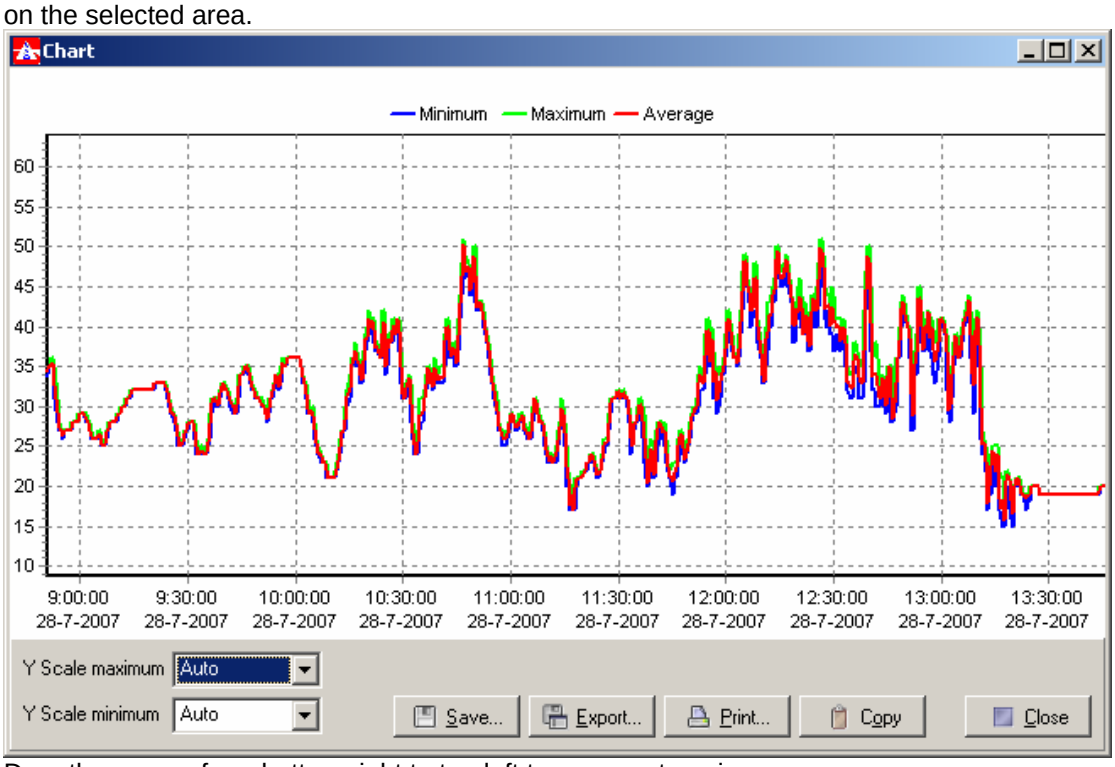
over the logging interval. The PC software uses the integral and the interval period to calculate an average value over the logging interval.

Read data

Use the PC software to read the logger memory from the METEON. You can do this while the METEON is logging, reading data will not interfere with the logging process. When the data from the logger memory is collected, it will be presented in a chart.

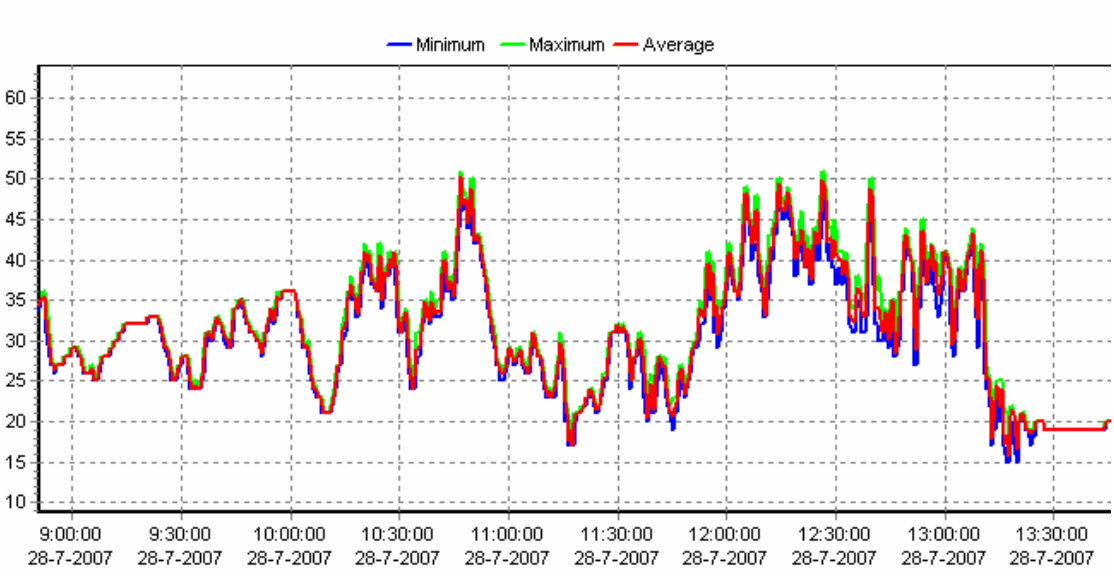


The Y scale can be manually set, and you can also use the mouse to zoom in on a specific area of the chart. Drag the mouse pointer from the top left corner of the area of interest, to the bottom right corner of the area of interest. When the mouse is released, the chart will zoom in on the selected area.



Drag the mouse from bottom right to top left to zoom out again.

Save the data in a logger data file, or export the data in a text format that can be imported in a spreadsheet.
Use the Copy button to place the chart on the clipboard, ready to be pasted into a word document.



DISPLAY

The METEON display can show 4 digits and a minus sign. All other characters in the display are indicated below



▲	data from PC to METEON through USB
▼	data from METEON to PC through USB
BAT	indicates battery low, replace with 2 AA Alkaline types
m	writing data in METEON memory
l	logging started (0.5 s interval)
	waiting for initial delay to pass (1 s interval)

The actual reading (613) is in **W/m^2** or **µmol/m^{2}s** depending on the connected sensor. On the back side of the METEON this unit is displayed together with the related sensor and corresponding serial number.

KIPP & ZONEN
SINCE 1830

Our customer support remains at your disposal for any maintenance or repair, calibration, supplies and spares.

Für Servicearbeiten und Kalibrierung, Verbrauchsmaterial und Ersatzteile steht Ihnen unsere Customer Support Abteilung zur Verfügung.

Notre service 'Support Clientèle' reste à votre entière disposition pour tout problème de maintenance, réparation ou d'étalonnage ainsi que pour les accessoires et pièces de rechange.

Nuestro apoyo del cliente se queda a su disposición para cualquier mantenimiento o la reparación, la calibración, los suministros y reserva.

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